



**California Emissions Estimator Model®**

# **User's Guide**

**Version 2013.2**

Prepared for:  
**California Air Pollution Control Officers Association (CAPCOA)**

Prepared by:  
**ENVIRON International Corporation and the California Air Districts**

Date:  
**July 2013**

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## Acknowledgements

This program has been developed by ENVIRON International Corporation (ENVIRON) in collaboration with South Coast Air Quality Management District (SCAQMD) and California air districts. The following individuals should be recognized for their contributions to this program

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California Emission Estimator Model (CalEEMod)<sup>®</sup>

Version 2013.2

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# 1 Introduction

This User's Guide (Guide) to the California Emission Estimator Model (CalEEMod)<sup>®</sup> is meant to give the user an introduction on how to use the program as well as document the detailed calculations and default assumptions made in associated appendices. The purpose of CalEEMod is to provide a uniform platform for government agencies, land use planners, and environmental professionals to estimate potential emissions associated with both construction and operational use of land use projects. It is intended that these emission estimates are suitable for use in California Environmental Quality Act (CEQA) compliant documents for air quality and climate change impacts. In addition individual districts may develop additional uses for the model's emission estimates to show compliance with local agency rules.

CalEEMod utilizes widely accepted models for emission estimates combined with appropriate default data that can be used if site-specific information is not available. These models and default estimates use sources such as the United States Environmental Protection Agency (USEPA) AP-42 emission factors, California Air Resources Board (ARB) vehicle emission models, studies commissioned by California agencies such as the California Energy commission (CEC) and CalRecycle. In addition, local air districts were given the opportunity to provide default values and existing regulation methodologies to use in their specific regions. If no information was provided by local air districts, appropriate state-wide values were utilized if regional differences could not otherwise be defined. Since new information and regulations are always changing, local agencies should be consulted to determine any recommended values to use that may differ from the defaults currently used in CalEEMod. User's of CalEEMod should keep in mind the assumptions and limitations of the default data in CalEEMod. A large majority of the default data associated with locations and land use is based on surveys of existing land uses. Caution should be taken if the project deviates significantly from the types and features included in the survey that forms the substantial evidence supporting the default data. In these situations site specific data that is supported by substantial evidence should be used if available.

The model provides a number of opportunities for the user to change the defaults in the model, however, users are recommended to provide justification for changing the defaults (e.g., reference more appropriate data) in the "Remarks" box provided at the bottom of the screen. Further, the user is reminded that CalEEMod is an emissions model and not an enforcement mechanism, thus, the user should ensure correct data is inputted, including the choice and percent reduction of mitigation most applicable to the land use project being evaluated.

## 1.1 Purpose of Model

CalEEMod provides a simple platform to calculate both construction emissions and operational emissions from a land use project. It calculates both the daily max and annual average for criteria pollutants as well as total or annual greenhouse gas (GHG) emissions which can be used in support of analyses in CEQA documents such as Environmental Impact Reports (EIRs) and Negative Declarations. In addition, default values for water and energy use are quantified which may be useful for other sections in an EIR or represent opportunities to incorporate the

rigorous site-specific information from the other EIR sections. Specifically the model aids the user in the following calculations:

- Short term construction emissions associated with demolition, site preparation, grading, building, coating, and paving from the following sources
  - Off-road construction equipment
  - On-road mobile equipment associated with workers, vendors, and hauling
  - Fugitive dust associated with grading, demolition, truck loading, and roads (Fugitive dust from wind blown sources such as storage piles are not quantified in CalEEMod which is consistent with approaches taken in other comprehensive models.)
  - Volatile emissions of reactive organic gasses (ROG) from architectural coating (*including painting on parking lots*) and paving.
- Operational emissions associated with the fully built out land use development
  - On-road mobile vehicle traffic generated by the land uses
  - Fugitive dust associated with roads
  - Volatile emissions of ROG from architectural coating
  - Emissions from off-road equipment (e.g., forklifts, cranes) used during operation
  - Off-road emissions from landscaping equipment
  - Volatile emissions of ROG from consumer products and cleaning supplies
  - Wood stoves and hearth usage
  - Natural gas usage in the buildings
  - Electricity usage in the buildings (GHG only)
  - Electricity usage from lighting in parking lots and lighting, ventilation and elevators in parking structures
  - Water usage by the land uses (GHG only)
  - Solid waste disposal by the land uses (GHG only)
- One-time vegetation sequestration changes
  - Permanent vegetation land use changes
  - New tree plantings
- Mitigation impacts to both short-term construction and operational emissions
- Several of the mitigation measures described in CAPCOA's Quantifying Greenhouse Gas Mitigation Measures<sup>1</sup> have been incorporated into CalEEMod.

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<sup>1</sup> Available at : <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>



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## 2 Program Installation

The program is distributed and maintained by the California Air Pollution Control Officers Association<sup>2</sup>. The most recent version can be downloaded from [www.caleemod.com](http://www.caleemod.com).

### 2.1 Operating System Requirements

CalEEMod was programmed by ENVIRON using Microsoft SQL Compact Edition in conjunction with a Visual Basic Graphical User Interface (GUI). CalEEMod requires the following system requirements:

- Microsoft Windows XP, Vista, or 7 Operating System
- Microsoft .Net Framework 4 or higher
- 90 Mb hard drive space available

### 2.2 Installation Procedures

#### To install

1. Be sure to uninstall any previous versions of CalEEMod before installing a new version as some file names will be the same potentially confusing the computer. To uninstall for most computers, under Settings, Control Panel. Programs and Features, highlight CalEEMod .msi and .exe files and then click 'uninstall.'
2. Ensure you have the required Microsoft .Net framework 4 or higher installed on your machine. If not install this first. It is available free from Microsoft at <http://www.microsoft.com/net/download.aspx>
3. Download the installation files (setup.exe and CalEEMod\_2013.2.msi).
4. Click the setup.exe file that you downloaded. This should walk you through the rest of the installation.
5. The default directory for CalEEMod is C:\CalEEMod\. The user may select alternative locations for installation<sup>3</sup>. The user will also be prompted to select to install CalEEMod for everyone who uses the computer or just the current user.
6. Click "Next" until the installation has completed. Then click close to exit the installer.
7. Click the link below to install SQL Server Compact 3.5 SP2

<http://www.microsoft.com/downloads/details.aspx?familyid=E497988A-C93A-404C-B161-3A0B323DCE24&displaylang=en>

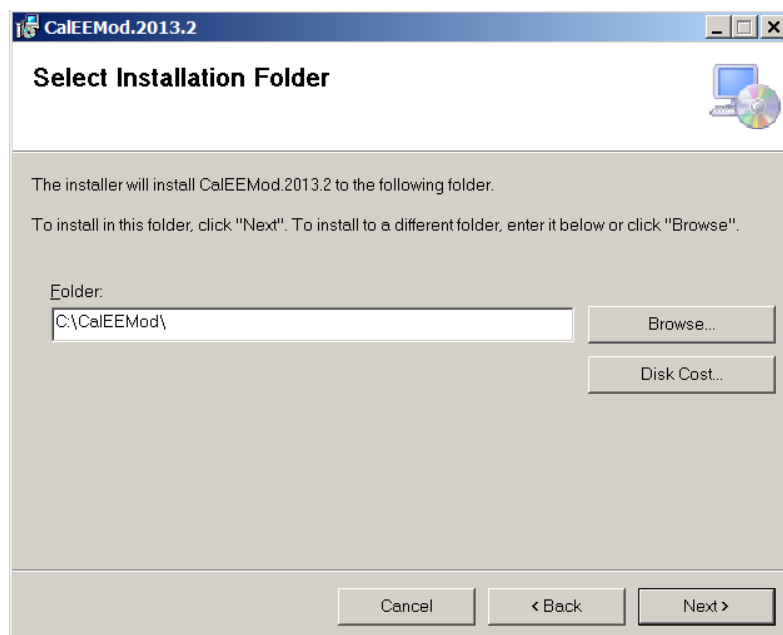
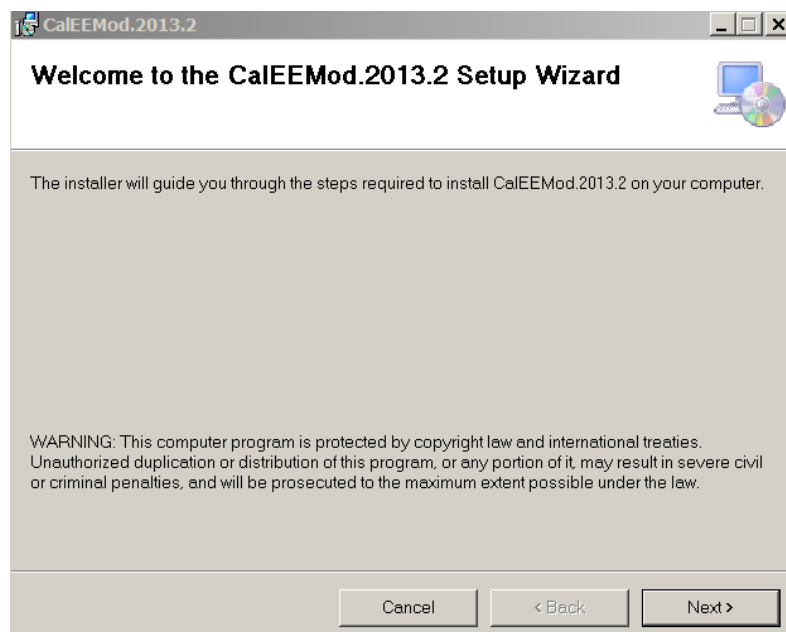
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<sup>2</sup> CalEEMod® 2012 All Rights Reserved by California Air Pollution Control Officers Association.

<sup>3</sup> If you use windows Vista or 7, please be aware of file privileges which may not allow access rights to some folders during program operations such as C:\Program Files\

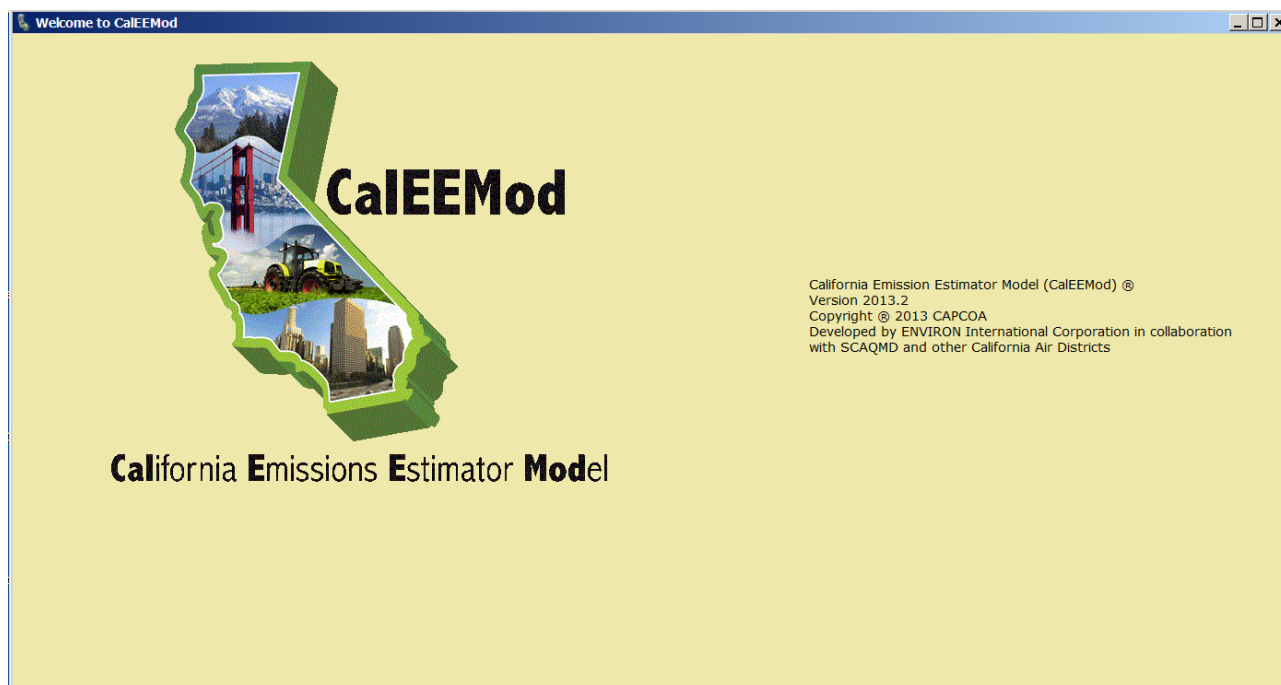
Once this file is downloaded, unzip the file anywhere on your computer and run the installation file (setup.exe). Be sure to follow the instructions on Microsoft's website and locate the appropriate .msi file. For 32-bit computers, one needs SSCERuntime\_x86-ENU.msi and on a 64-bit computer, install both the 32-bit and the 64-bit version of the SQL Server Compact 3.5 SP2 MSI files. Existing SQL Server Compact 3.5 applications may fail if only the 32-bit version of the MSI file is installed on the 64-bit computer.

8. If you have any further trouble installing CalEEMod, make sure you have appropriate user privileges and the system requirements.



## 2.3 Starting CalEEMod

The installation will create a short cut icon on the desktop as well as add CalEEMod to the Programs available from the Start Button. Select CalEEMod from the program files or double click on the CalEEMod short cut. This will open CalEEMod.



## 3 Using CalEEMod

CalEEMod is designed as a linear series of screens with an individual purpose such as project characteristics, construction schedule and equipment, operational activity, mitigation measures, etc. The user is expected to input basic information about the project such as location, land use type (e.g., residential, commercial, retail, etc.) and its size. The functionality of the model is to populate later screens with pre-determined defaults based on basic project and location information provided by the user. However, if more accurate information is known, the user has the ability to override the defaults provided.

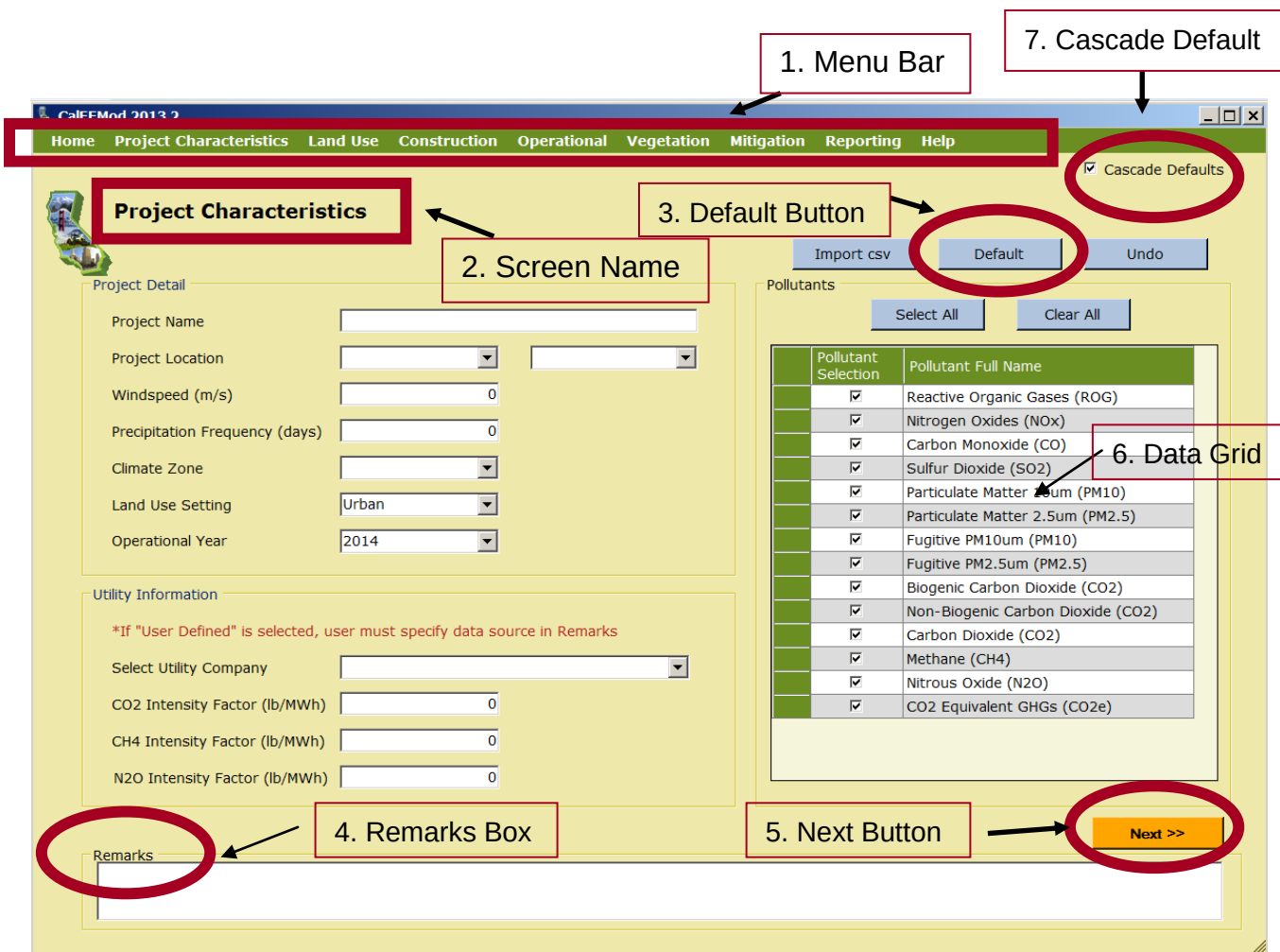
The figure on page 7 identifies some key features of CalEEMod which are described below.

1. **Menu Bar:** A drop down menu found on all screens. The “Home” menu controls file features such as New Project, Open Project, Save Project, and Save As Project. The “Help” will link to appropriate information for the relevant screen from this User’s Guide. All other menus will allow navigation between screens in any order.
2. **Screen Name:** Identifies the name of the current screen.

3. **Default Button:** This button allows the restoration of program defaults if the user has changed any values on the screen. User entered values will be highlighted yellow to clearly indicate that they have been changed from the defaults. The user will be prompted if they would like to restore default for the current or last cell or the whole page. "Import CSV" will allow a user to load in a csv file for a specific data grid. "Cancel" cancels the previous action.
4. **Remarks:** This section at the bottom of each screen allows the user to enter comments regarding any user defined values entered on this screen. This is meant to assist reviewers of the program in determining justification for values selected.
5. **Next Button:** This button when clicked will take the user to the next sequential step. Later modules will also have a "Previous" button that will take the user back to the previous sequential step.
6. **Data Grid:** This is a common box where values for the variables defined across the top to be filled in. The number of rows will automatically be adjusted based on the number of rows of information required to define the information. The last row is indicated with an asterisk (\*) and once information is started to be added to this row a new row will be added at the end. To delete a row select the desired row to delete, and hit the delete button on your keyboard (This is allowed unless the data grid is a fixed list such as the Pollutant selection list.). Scroll bars (both horizontal and vertical) will occur automatically if necessary.
7. **Cascade Default:** CalEEMod version 2013.2 introduces a new feature freezing the downloading of programmed defaults. Each input screen displays a box called "cascade default" automatically checked to populate defaults in future screens. However, if the "cascade default" box is unchecked, no defaults will be populated in subsequent screens. Unless all the necessary input parameters required for a proper analysis are known, it is recommended the user runs the model at least once with "cascade default" clicked on to allow the defaults to be populated. Then, if the user would like to change project parameters (e.g., number of dwelling units, building square footage, etc) without cascading new defaults in later screens, then uncheck the "cascade default" box when in the land use screen. This feature will prove useful for those users who override the defaults with specific project information (e.g., construction schedule, construction equipment, water use, energy use, etc.) and would like to evaluate different project scenarios with the same basic project information (i.e., land use type, location). If unchecking the "cascade default" box, the user should also be aware of the following:
  - *All subsequent screens will freeze defaults*
  - Changes to screens after land use (e.g., adding a new construction phase) will not cascade defaults relating to that change or add new tabs (e.g., trips and VMT, dust material movement) so any necessary input information will have to be added manual or impact will not be calculated
  - If changing or adding a land use type (e.g., from single family housing to a hospital), the future screens will not reflect the new land use type so some calculations (e.g., impacts from energy and water use) will not be properly performed

If a land use type is changed or added, it is recommended to click on the “cascade default” so the future screens can be populated with appropriate defaults and included in the analysis.

The next sections will give you some quick details on how to get started with a project in CalEEMod. Section 4 gives more specific details about each individual screen the user can encounter in CalEEMod.



The screenshot shows the CalEEMod 2013.2 software interface. The interface is divided into several sections:

- 1. Menu Bar:** Located at the top, containing options: Home, Project Characteristics, Land Use, Construction, Operational, Vegetation, Mitigation, Reporting, and Help.
- 2. Screen Name:** A label pointing to the 'Project Characteristics' tab in the menu bar.
- 3. Default Button:** A button labeled 'Default' located below the menu bar.
- 4. Remarks Box:** A text area labeled 'Remarks' at the bottom left of the screen.
- 5. Next Button:** A button labeled 'Next >>' located at the bottom right of the screen.
- 6. Data Grid:** A table listing various pollutants and their full names, with checkboxes for selection.
- 7. Cascade Default:** A checkbox labeled 'Cascade Defaults' located in the top right corner of the main window.

The 'Project Characteristics' section includes fields for Project Name, Project Location, Windspeed (m/s), Precipitation Frequency (days), Climate Zone, Land Use Setting (set to Urban), and Operational Year (set to 2014). The 'Utility Information' section includes a note: "\*If 'User Defined' is selected, user must specify data source in Remarks", and fields for Select Utility Company, CO2 Intensity Factor (lb/MWh), CH4 Intensity Factor (lb/MWh), and N2O Intensity Factor (lb/MWh). The 'Pollutants' section includes buttons for 'Select All' and 'Clear All'.

| Pollutant Selection                 | Pollutant Full Name               |
|-------------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> | Reactive Organic Gases (ROG)      |
| <input checked="" type="checkbox"/> | Nitrogen Oxides (NOx)             |
| <input checked="" type="checkbox"/> | Carbon Monoxide (CO)              |
| <input checked="" type="checkbox"/> | Sulfur Dioxide (SO2)              |
| <input checked="" type="checkbox"/> | Particulate Matter 2.5um (PM10)   |
| <input checked="" type="checkbox"/> | Particulate Matter 2.5um (PM2.5)  |
| <input checked="" type="checkbox"/> | Fugitive PM10um (PM10)            |
| <input checked="" type="checkbox"/> | Fugitive PM2.5um (PM2.5)          |
| <input checked="" type="checkbox"/> | Biogenic Carbon Dioxide (CO2)     |
| <input checked="" type="checkbox"/> | Non-Biogenic Carbon Dioxide (CO2) |
| <input checked="" type="checkbox"/> | Carbon Dioxide (CO2)              |
| <input checked="" type="checkbox"/> | Methane (CH4)                     |
| <input checked="" type="checkbox"/> | Nitrous Oxide (N2O)               |
| <input checked="" type="checkbox"/> | CO2 Equivalent GHGs (CO2e)        |

### 3.1 Home

This is the part of the file menu bar that controls the file saving and opening features. The available options are:

- New Project
- Open Project
- Save
- Save As
- Exit

The user should select Open Project if they wish to load in a project that has been previously saved. Note that this will remove any information that has been entered into the GUI unless it has been saved to a file. Save will save the currently loaded project database as a Microsoft Excel file that can be used to open this project again into CalEEMod. Save As will allow the user to change the name of the saved project file. Exit will close CalEEMod. The Microsoft Excel file can be edited following the format of the save file to quickly make edits outside of the Graphical User Interface (GUI). The user will still need to use the GUI for reporting of results. This can be most useful in making changes to construction lists. Individual tabs can be loaded in as a .csv file in various places in CalEEMod to minimize the data entry.

### 3.2 Defining a Project

In order to define a project, the user will have to enter information on both the Project Characteristics screen and land use screen. After entering information on these two screens, CalEEMod will populate all of the other information required to calculate unmitigated construction (unless there is demolition, grading, or site preparation) and operation emissions using default data. Demolition, grading, and site preparation requires additional information regarding the amount of material to be demolished and material (debris, soil, etc) transported to or from the site that is entered on the appropriate construction screens. If site specific information will not be used, the user can jump to entering mitigation measures followed by reporting. If the user has any site-specific information that will replace the default information, this should be entered on the appropriate screens and provide justification for the change in the "Remarks" section at the bottom of each screen before moving on to mitigation and reporting. This justification for the default override will be printed in the report so the user is encouraged to provide a robust reasoning to allow for seamless review of the analysis.

### 3.3 Altering Default Data

CalEEMod was designed to allow for ease in changing default assumptions. Site-specific information that is supported with substantial evidence required by CEQA, is preferred when it is available. However, it is often the case that site-specific information is not available. CalEEMod was designed to assume reasonable default assumptions supported by substantial evidence to

the degree available at the time of programming. CalEEMod is based on fully adopted methods and data. Therefore, draft methods and data are not used as defaults.

### **3.4 Mitigation**

Common construction mitigation measures that impact the calculations in CalEEMod have been incorporated as options for the user to select. At this time, required mitigation measures to comply with individual fugitive dust rules have not been incorporated in unmitigated calculations due to different interpretations of CEQA guidance regarding required mitigation.

Several mitigation measures from CAPCOA's Quantifying Greenhouse Mitigation Measures have been incorporated including combinations and caps when using multiple mitigation measures. Some mitigation measures are not as amenable to simple input information or are less common in their use and therefore not included at this time. CalEEMod was designed to include typical mitigation measures that are some of the more effective measures available to development projects. If mitigation measures are not available as options in CalEEMod, the user can likely alter values in the program that will allow for adjustment of hand calculated reductions due to mitigation that may be less common. This will require separate runs of CalEEMod files in order to properly account for unmitigated and mitigated scenarios.

### **3.5 Reporting**

This is the part of the program that allows the user to select predefined reports that will display the emission calculation results. The user will be able to view these on a screen and save as either a Microsoft Excel file or a pdf file.

## **4 Detailed Program Screens**

### **4.1 Project Characteristics**

The project characteristics screen is where the user enters key location, electricity company information and pollutants they want to analyze. The information on this screen needs to be entered before proper default information can be used in subsequent screens. Changes on this screen will result in overriding user defined data with defaults in subsequent screens where this information is used. Under the Project Detail section the user enters the Project Name which will appear in the reports. The user then selects information from drop down boxes or overrides the default values in the text boxes. Each of the information categories on this screen are described in more detail below.

#### **Project Location**

The user selects the region in which the project is located. The user first selects if they want to choose an Air District, Air Basin, County, or State-wide. The second drop down box will give the list of specific locations based on the first drop down box which the user selects. For counties

that are divided between air districts, air basins or district requested subregions; the county is followed by the sub-county area which can influence some of the default values selected by modules. Consult your lead agency on their preference for location. This primarily influences on-road vehicle emissions, trip lengths, water supply and treatment electricity use, solid waste disposal rates, amount of paved roads, days of landscaping equipment use, architectural coating emissions, and hearth usage.

### **Wind Speed and Precipitation Frequency**

Selection of project location will fill in the default wind speed and precipitation frequency. The user can choose to override this information and type in a different value. The wind speed is in units of meters per second and is used in some fugitive dust calculations. Precipitation frequency is the number of days in a year that has precipitation greater than 0.01 inches in a day and is used in fugitive dust calculations.

### **Climate Zone**

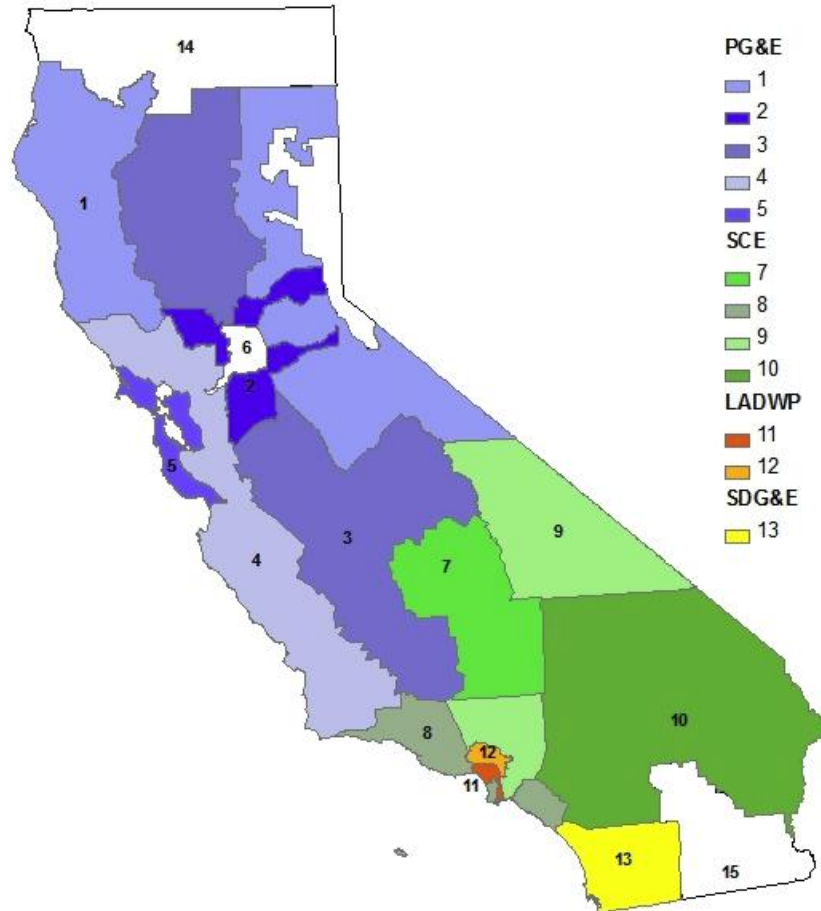
Selection of project location will restrict the climate zones available for the user to choose from based on the climate zones in the project location. The climate zones used are based on CEC forecasting climate zones (different than Title-24 building climate zones) as used in the California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS)<sup>4</sup>. The figure below indicates these climate zones. A spreadsheet is available in Appendix F, which allows the user to look up climate zones based on city or zipcodes if a user needs further assistance in selecting the appropriate climate zone.

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<sup>4</sup> CalEEMod v. 2013.2 has been updated to incorporate the October 2010 version of RASS.



## CEC Forecast Climate Zones<sup>5,6</sup>



### Land Use Setting

This is where the user indicates if the project is located in a rural or urban setting. The user should contact their local air districts for guidance on the appropriate land use setting to select as the definition used may differ based on the definitions used to support the urban and rural trip lengths in the relevant air basin.

<sup>5</sup> Adapted from Figure ES-2 of CEC. 2010. Residential Appliance Saturation Survey. Available online at: <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF>

<sup>6</sup> White spaces represent areas served by other electric utilities not included in survey.

## Operational Year

The user should indicate the first year the project will be fully operational that they wish to use as a basis for determining emission factors for all operational modules. CalEEMod can handle the following years: 1990, 2000, 2005, 2010-2025, 2030, 2035, and 2040. This was done to limit the file size associated with vehicle emission factors. CalEEMod is currently designed for one year that initiates the beginning of the full operation of the project. However, it is recognized that some projects could be phased so the operation of the project begins over more than one year. In that case, it is recommended the user run the model multiple times for the various input parameters for each operational year.

## Utility Information

The user should select the appropriate electricity utility provider from the list or select “user defined”. If a specific utility is entered, the default GHG intensity factors will be filled in. The user will need to enter values if “user defined” is selected. These values are used to determine the GHG emissions associated with electricity use in various modules. The default values are based on ARB’s Local Government Operations Protocol (LGO)<sup>7</sup>(CO<sub>2</sub>), updated public utility protocols (CO<sub>2</sub>), and E-Grid values (CH<sub>4</sub> and N<sub>2</sub>O). The CO<sub>2</sub> intensity factor used as defaults in CalEEMod are based on the latest reporting year available for each of the different utilities. Table 1.2 in Appendix D provides the default CO<sub>2</sub> intensity factor used and reporting year from which the factor was identified for each of the utilities. As with other defaults in the model, if a new value is identified before the defaults are updated, the user has the ability to override the default and provide justification for the change in the “Remarks” section at the bottom of the “Project Characteristics” screen.

## Pollutants

The list of pollutants to the right of the screen automatically has all boxes checked. Uncheck any pollutants you don’t want reported. Some of the pollutants are a combination of other identified pollutants such as Carbon dioxide (CO<sub>2</sub>) is made up of biogenic and non-biogenic carbon dioxide. CO<sub>2</sub> Equivalent GHGs is the Global Warming Potential (GWP) weighted value of all GHGs. GWPs are based on the IPCC’s Second Assessment Report<sup>8</sup>.

## Remarks

The user can enter any remarks to describe the reasonable explanation and justification of non-default values or to add additional detail regarding the basis for information used such as relevant EIR sections. These remarks are included in the report and will assist a reviewer in understanding the reasons for a change in the default value (e.g., new trip rate based on a project specific traffic study conducted by *(reputable traffic engineers)*).

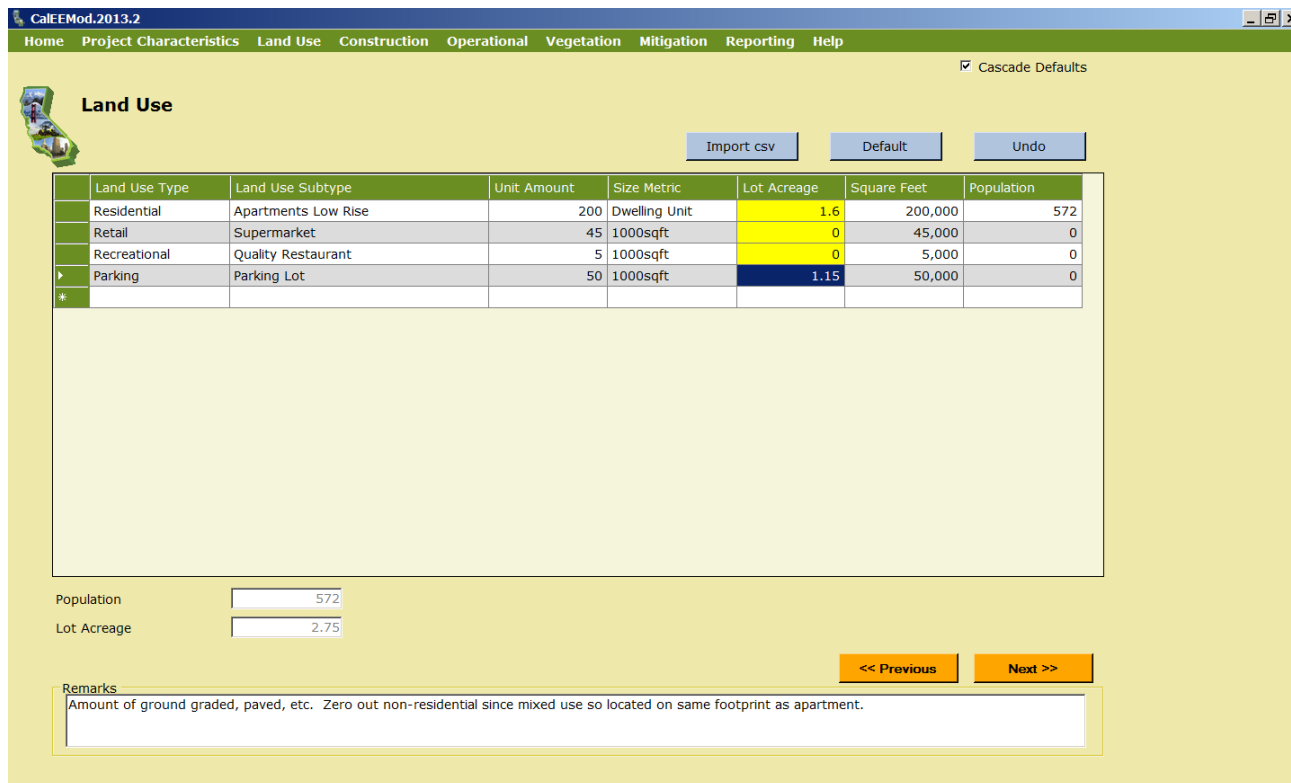
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7 Available at: <http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm>

8 Available at: <http://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf>

## 4.2 Land Use

This screen is used to define the specific land uses that will occur at the project site. The land uses, size features and population are used throughout CalEEMod in determining default variables and calculations.



CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

☒ Cascade Defaults

**Land Use**

Import csv Default Undo

| Land Use Type | Land Use Subtype    | Unit Amount | Size Metric   | Lot Acreage | Square Feet | Population |
|---------------|---------------------|-------------|---------------|-------------|-------------|------------|
| Residential   | Apartments Low Rise | 200         | Dwelling Unit | 1.6         | 200,000     | 572        |
| Retail        | Supermarket         | 45          | 1000sqft      | 0           | 45,000      | 0          |
| Recreational  | Quality Restaurant  | 5           | 1000sqft      | 0           | 5,000       | 0          |
| Parking       | Parking Lot         | 50          | 1000sqft      | 1.15        | 50,000      | 0          |

Population: 572

Lot Acreage: 2.75

Remarks: Amount of ground graded, paved, etc. Zero out non-residential since mixed use so located on same footprint as apartment.

<< Previous Next >>

### Land Use Type

The user selects from the drop down list of the primary land use types: Commercial, Educational, Industrial, Residential, Retail, Recreational, and **Parking**. The 63 different land uses types were chosen for inclusion in CalEEMod because each has an established trip rate critical for mobile source calculations.

This program specifically designates parking areas as a separate land use rather than as a part of an associated non-residential land use (e.g., commercial buildings, retail facilities, etc.). Due to the nature of the available data, parking (i.e., driveway) for residential land uses have been incorporated (see discussion under Lot Acreage) so no separate parking land use needs to be identified. For a better understanding of how CalEEMod treats parking based on the footprint and lot acreage of residential and non-residential land uses, please refer to the following figure. As depicted, the lot acreage of a residential land use includes the parking and building footprint. For non-residential land uses, the lot acreage is the same as the building footprint so parking needs to be added as a separate land use.

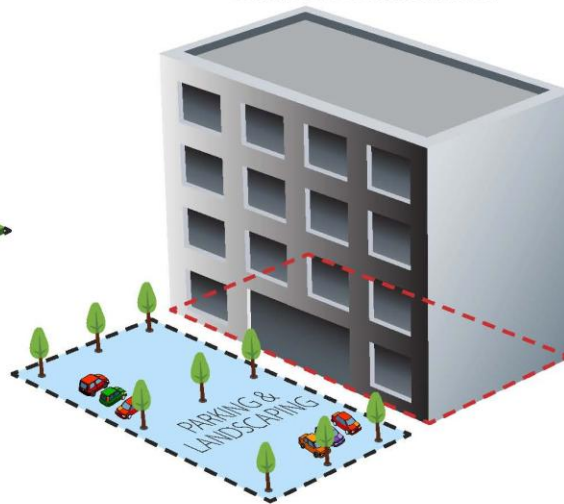
## CalEEMod Default Lot Acreage for Res and Non Res Land Uses

RESIDENTIAL  
SINGLE FAMILY DWELLING



Lot acreage & building footprint are NOT equal.  
Lot acreage includes grading for parking & landscaping.

NON-RESIDENTIAL  
COMMERCIAL OFFICE BUILDING



Lot acreage & building footprint are equal; add parking as separate land use and assign associated square footage and acreage.

For the parking land use, two primary options are available: parking lots or parking structure (e.g., garages). There are four types of parking structures for the user to choose – enclosed, enclosed with an elevator, unenclosed, or unenclosed with an elevator. The reason for the specific description is to properly calculate energy impacts from ventilation and elevator operation. Parking as a separate land use made the estimate of default acreage and paving area easier.

For those land uses not listed (e.g., roads, underground parking, pipelines, etc.) each land use type has a “User Defined” land use subtype associated with it that the user can select if the other land use subtypes do not describe or reflect the project being analyzed. It is critical to understand that there is no default data (including size metric) associated with the “User Defined” land uses and all information that is based on these land uses will need to be entered by the user otherwise no emissions will be calculated. Also, whatever size metric (e.g., per acre, per 1000 square foot, etc.) the user chooses for the “User Defined” land use needs to be applied to all subsequent default values (e.g., gallons of water used *per acre* or *per 1000 square foot*) associated with that “User Defined” land use. An alternative approach would be to choose a land use that most closely fits the proposed project and allow the model to populate with pre-

determined defaults. Then, go back through the model and modify the defaults with any known specific project information.

## Land Use Subtype

Tabbing over to the next column in a row, the user selects from a drop down list of available land use subtypes based on the primary land use type selected. The user also has the option to select a "User Defined" land use subtype, however, as discussed above, no default data will be available and the user will have to enter in subsequent screens the appropriate values. Land use subtypes are based primarily on the ITE land use definitions used for (mobile source) trip generation rate information. In some cases similar generalized land uses or surrogate data was mapped to some land use subtypes in order to generate the default data needed for various modules.

**Table 1: Land Use Sub Type Descriptions**

| Land UseSubType                   | Description <sup>1</sup>                                                                                                                                                                                                                                                                         | ITE Number |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>RESIDENTIAL</b>                |                                                                                                                                                                                                                                                                                                  |            |
| Apartments High Rise              | High-rise apartments are units located in rental buildings that have more than 10 levels and most likely have one or more elevators.                                                                                                                                                             | 222        |
| Apartments Low Rise               | Low-rise apartments are units located in rental buildings that have 1-2 levels.                                                                                                                                                                                                                  | 221        |
| Apartments Mid Rise               | Mid-rise apartments in rental buildings that have between 3 and 10 levels.                                                                                                                                                                                                                       | 223        |
| Condo/Townhouse                   | These are ownership units that have at least one other owned unit within the same building structure.                                                                                                                                                                                            | 230        |
| Condo/Townhouse High Rise         | These are ownership units that have three or more levels.                                                                                                                                                                                                                                        | 232        |
| Congregate Care (Assisted Living) | These facilities are independent living developments that provide centralized amenities such as dining, housekeeping, transportation and organized social/recreational activities. Limited medical services may or may not be provided.                                                          | 253        |
| Mobile Home Park                  | Mobile home parks consist of manufactured homes that are sited and installed on permanent foundations and typically have community facilities such as recreation rooms, swimming pools and laundry facilities.                                                                                   | 240        |
| Retirement Community              | These communities provide multiple elements of senior adult living. Housing options may include various combinations of senior adult housing, congregate care, assisted living, and skilled nursing care aimed at allowing the residents to live in one community as their medical needs change. | 255        |
| Single Family Housing             | All single-family detached homes on individual lots typical of a suburban subdivision                                                                                                                                                                                                            | 210        |

**Table 1: Land Use Sub Type Descriptions**

| Land UseSubType                      | Description <sup>1</sup>                                                                                                                                                                                                                                                                                                   | ITE Number |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>EDUCATIONAL</b>                   |                                                                                                                                                                                                                                                                                                                            |            |
| Day-Care Center                      | A day care center is a facility where care for pre-school age children is provided, normally during the daytime hours. Day care facilities generally include classrooms, offices, eating areas and playgrounds.                                                                                                            | 565        |
| Elementary School                    | Elementary schools typically serve students attending kindergarten through the fifth or sixth grade. They are usually centrally located in residential communities in order to facilitate student access and have no student drivers.                                                                                      | 520        |
| High School                          | High schools serve students who have completed middle or junior high school.                                                                                                                                                                                                                                               | 530        |
| Junior College (2Yr)                 | This land use includes two-year junior, community, or technical colleges.                                                                                                                                                                                                                                                  | 540        |
| Junior High School                   | Junior High schools serve students who have completed elementary school and have not yet entered high school.                                                                                                                                                                                                              | 522        |
| Library                              | A library is a facility that consists of shelved books; reading rooms or areas; and sometimes meeting rooms.                                                                                                                                                                                                               | 590        |
| Place Of Worship                     | A church is a building in which public worship services are held. A church houses an assembly hall or sanctuary; it may also house meeting rooms, classrooms and occasionally dining catering or party facilities.                                                                                                         | 560        |
| University/College (4Yr)             | This land use includes four-year universities or colleges that may or may not offer graduate programs.                                                                                                                                                                                                                     | 550        |
| <b>RECREATIONAL</b>                  |                                                                                                                                                                                                                                                                                                                            |            |
| Arena                                | Arenas are large indoor structures in which spectator events are held. These events vary from professional ice hockey and basketball to non-sporting events such as concerts, shows, or religious services. Arenas generally have large parking facilities, except when located in or around the downtown of a large city. | 460        |
| City Park                            | City parks are owned and operated by a city.                                                                                                                                                                                                                                                                               | 411        |
| Fast Food Restaurant W/O Drive Thru  | This land use includes fast-food restaurants without drive-through windows. Patrons generally order at a cash register and pay before they eat.                                                                                                                                                                            | 933        |
| Fast Food Restaurant With Drive Thru | This category includes fast-food restaurants with drive-through windows.                                                                                                                                                                                                                                                   | 934        |
| Golf Course                          | Golf courses include 9, 18, 27 and 36 hole courses. Some sites may also have driving ranges and clubhouses with a pro shop, restaurant, lounge and banquet facilities.                                                                                                                                                     | 430        |
| Health Club                          | These are privately-owned facilities that primarily focus on individual fitness or training. Typically they provide exercise classes; weightlifting, fitness and gymnastics equipment; spas; locker rooms; and small restaurants or snack bars.                                                                            | 492        |

**Table 1: Land Use Sub Type Descriptions**

| Land UseSubType                     | Description <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                           | ITE Number |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| High Turnover (Sit Down Restaurant) | This land use consists of sit-down, full-service eating establishments with turnover rates of approximately one hour or less. This type of restaurant is usually moderately priced and frequently belongs to a restaurant chain.                                                                                                                                                                                                                   | 932        |
| Hotel                               | Hotels are places of lodging that provide sleeping accommodations and supporting facilities such as restaurants; cocktail lounges; meeting and banquet rooms or convention facilities; limited recreational facilities and other retail and service shops.                                                                                                                                                                                         | 310        |
| Motel                               | Motels are places of lodging that provide sleeping accommodations and often a restaurant. Motels generally offer free on-site parking and provide little or no meeting space and few supporting facilities.                                                                                                                                                                                                                                        | 320        |
| Movie Theater (No Matinee)          | Movie theaters consist of audience seating, single or multiple screens and auditoriums, a lobby and a refreshment stand. Movie theaters without matinees show movies on weekday evenings and weekends only; there are no weekday daytime showings.                                                                                                                                                                                                 | 443        |
| Quality Restaurant                  | This land use consists of high quality, full-service eating establishments with typical turnover rates of at least one hour or longer. Quality restaurants generally do not serve breakfast, some do not serve lunch; all serve dinner. This type of restaurant usually requires reservations and is generally not part of a chain. Patrons commonly wait to be seated, are served by a waiter, order from menus and pay for meals after they eat. | 931        |
| Racquet Club                        | These are privately-owned facilities that primarily cater to racquet sports.                                                                                                                                                                                                                                                                                                                                                                       | 491        |
| Recreational Swimming Pool          | This is a typical recreational swimming pool that may be associated with community centers, parks, swim clubs, etc.                                                                                                                                                                                                                                                                                                                                |            |
| <b>PARKING</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |
| Enclosed Parking Structure          | This is an enclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting and ventilation, and will be more than one floor with no elevator.                                                                                                                                                                                                                                      |            |
| Enclosed Parking with Elevator      | This is an enclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting and ventilation, and will be more than one floor with an elevator.                                                                                                                                                                                                                                      |            |
| Other Asphalt Surfaces              | This is an asphalt area not used as a parking lot (e.g., long driveway, basketball court, etc.)                                                                                                                                                                                                                                                                                                                                                    |            |
| Other Non-Asphalt Surfaces          | This is a non-asphalt area (e.g., equipment foundation, loading dock area, etc.).                                                                                                                                                                                                                                                                                                                                                                  |            |
| Parking Lot                         | This is a typical single surface parking lot typically covered with asphalt. This land use will require lighting.                                                                                                                                                                                                                                                                                                                                  |            |
| Unenclosed Parking Structure        | This is an unenclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting but not ventilation. It will be more than one floor with no elevator.                                                                                                                                                                                                                                 |            |
| Unenclosed Parking with Elevator    | This is a unenclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting but not ventilation. It will be more than one floor with an elevator.                                                                                                                                                                                                                                  |            |



**Table 1: Land Use Sub Type Descriptions**

| Land UseSubType                   | Description <sup>1</sup>                                                                                                                                                                                                                                          | ITE Number |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>RETAIL</b>                     |                                                                                                                                                                                                                                                                   |            |
| Automobile Care Center            | An automobile care center houses numerous businesses that provide automobile-related services, such as repair and servicing; stereo installation; and seat cover upholstery.                                                                                      | 942        |
| Convenience Market (24 Hour)      | These markets sell convenience foods, newspapers, magazines and often beer and wine. They do not have gasoline pumps.                                                                                                                                             | 851        |
| Convenience Market With Gas Pumps | These markets sell gasoline, convenience foods, newspapers, magazines and often beer and wine. This includes convenience markets with gasoline pumps where the primary business is the selling of convenience items, not the fueling of motor vehicles.           | 853        |
| Discount Club                     | A discount club is a discount store or warehouse where shoppers pay a membership fee in order to take advantage of discounted prices on a wide variety of items such as food, clothing, tires and appliances. Many items are sold in large quantities or in bulk. | 857        |
| Electronic Superstore             | These are free-standing facilities that specialize in the sale of electronic merchandise.                                                                                                                                                                         | 863        |
| Free-Standing Discount Store      | Discount stores offer centralized cashiering and sell products that are advertised at discount prices. These stores offer a variety of customer services and maintain long store hours seven days a week.                                                         | 815        |
| Free-Standing Discount Superstore | The discount superstore is similar to the free-standing discount stores with the addition that they also contain a full-service grocery department under the same roof that shares entrances and exits with the discount store area.                              | 813        |
| Gasoline/Service Station          | This land use includes gasoline/service stations where the primary business is the fueling of motor vehicles. They may also have ancillary facilities for servicing and repairing motor vehicles.                                                                 | 944        |
| Hardware/Paint Store              | These stores sell hardware and paint supplies and are generally free-standing buildings.                                                                                                                                                                          | 816        |
| Home Improvement Superstore       | These are free-standing facilities that specialize in the sale of home improvement merchandise.                                                                                                                                                                   | 862        |
| Regional Shopping Center          | A shopping center is an integrated group of commercial establishments that is planned, developed, owned and managed as a unit. A shopping center's composition is related to its market area in terms of size, location and type of store.                        | 820        |
| Strip Mall                        | Small strip shopping centers contain a variety of retail shops and specialize in quality apparel, hard goods and services such as real estate offices, dance studios, florists and small restaurants.                                                             | 814        |



**Table 1: Land Use Sub Type Descriptions**

| Land UseSubType                   | Description <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                             | ITE Number |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Supermarket                       | Supermarkets are free-standing retail stores selling a complete assortment of food: food preparation and wrapping materials; and household, cleaning items. Supermarkets may also contain the following products and services: ATMs, automobile supplies, bakeries, books and magazines, dry cleaning, floral arrangements, greeting cards, limited-service banks, photo centers, pharmacies and video rental areas. | 850        |
| <b>COMMERCIAL</b>                 |                                                                                                                                                                                                                                                                                                                                                                                                                      |            |
| Bank (With Drive-Through)         | Drive-in banks provide banking facilities for motorists who conduct financial transactions from their vehicles; many also serve patrons who walk into the building.                                                                                                                                                                                                                                                  | 912        |
| General Office Building           | A general office building houses multiple tenants where affairs of businesses commercial or industrial organizations or professional persons or firms are conducted. If information is known about individual buildings, it is suggested that this land use be used instead of the more generic office park.                                                                                                         | 710        |
| Government (Civic Center)         | A group of government buildings that are interconnected by pedestrian walkways.                                                                                                                                                                                                                                                                                                                                      | 733        |
| Government Office Building        | This is an individual building containing either the entire function or simply one agency of a city, county, state, federal, or other governmental unit.                                                                                                                                                                                                                                                             | 730        |
| Hospital                          | A hospital is any institution where medical or surgical care and overnight accommodations are provided to non-ambulatory and ambulatory patients. However, it does not refer to medical clinics or nursing homes.                                                                                                                                                                                                    | 610        |
| Medical Office Building           | This is a facility that provides diagnoses and outpatient care on a routine basis but is unable to provide prolonged in-house medical and surgical care. One or more private physicians or dentists generally operate this type of facility.                                                                                                                                                                         | 720        |
| Office Park                       | Office parks are usually suburban subdivisions or planned unit developments containing general office buildings and support services, such as banks, restaurants and service stations, arranged in a park-or campus-like atmosphere. This should be used if details on individual buildings are not available.                                                                                                       | 750        |
| Pharmacy/Drugstore W/O Drive Thru | These are retail facilities that primarily sell prescription and non-prescription drugs. These facilities may also sell cosmetics, toiletries, medications, stationery, personal care products, limited food products and general merchandise. The drug stores in this category do not contain drive-through windows.                                                                                                | 880        |

**Table 1: Land Use Sub Type Descriptions**

| Land UseSubType                    | Description <sup>1</sup>                                                                                                                                                                                                                                                                                            | ITE Number |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Pharmacy/Drugstore With Drive Thru | These are retail facilities that primarily sell prescription and non-prescription drugs. These facilities may also sell cosmetics, toiletries, medications, stationery, personal care products, limited food products and general merchandise. The drug stores in this category contain drive-through windows.      | 881        |
| Research & Development             | R&D centers are facilities devoted almost exclusively to R&D activities. The range of specific types of businesses contained in this land use category varies significantly. R&D centers may contain offices and light fabrication areas.                                                                           | 760        |
| <b>INDUSTRIAL</b>                  |                                                                                                                                                                                                                                                                                                                     |            |
| General Heavy Industry             | Heavy industrial facilities usually have a high number of employees per industrial plant and are generally limited to the manufacturing of large items.                                                                                                                                                             | 120        |
| General Light Industry             | Light industrial facilities are free-standing facilities devoted to a single use. The facilities have an emphasis on activities other than manufacturing and typically have minimal office space. Typical light industrial activities include printing, material testing and assembly of data processing equipment. | 110        |
| Industrial Park                    | Industrial parks contain a number of industrial or related facilities. They are characterized by a mix of manufacturing, service and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. Many industrial parks contain highly diversified facilities.    | 130        |
| Manufacturing                      | Manufacturing facilities are areas where the primary activity is the conversion of raw materials or parts into finished products. It generally also has office, warehouse, R&D functions at the site.                                                                                                               | 140        |
| Refrigerated Warehouse-No Rail     | This is a warehouse that has refrigeration but no rail spur.                                                                                                                                                                                                                                                        | 150        |
| Refrigerated Warehouse-Rail        | This is a warehouse that has refrigeration and a rail spur.                                                                                                                                                                                                                                                         | 150        |
| Unrefrigerated Warehouse-No Rail   | This is a warehouse that does not have refrigeration and no rail spur.                                                                                                                                                                                                                                              | 150        |
| Unrefrigerated Warehouse-Rail      | This is a warehouse that does not have refrigeration but has a rail spur.                                                                                                                                                                                                                                           | 150        |

1. Based on land use descriptions in ITE Trip Generation 8th Edition. In September 2012, ITE published the 9<sup>th</sup> edition that updated some of the trip rates from the 8<sup>th</sup> edition. The updates are not yet incorporated into CalEEMod. However, the user has the ability to override the trip rate default but is expected to justify the change in the "Remarks" section at the bottom of the Operational -Mobile screen.

## Unit Amount

Tabbing over to the next column, the user enters the appropriate size of the land use in terms of the size metric selected. This will be used to calculate the rest of the columns in this datagrid.

## Size Metric

Tabbing over to the next column in the land use identification row, the user can select another size metric unit if it is available for that land use subtype. For example, a school land use allows the user to define its size by the number of students, building square footage, or number of employees. Please note that the square footage, which is used for calculating such impacts as architectural coatings and energy use, relates to the total building square footage and not the building footprint or lot acreage (which is used for housing density as well as grading and site preparation calculations).

## Lot Acreage (datagrid)

The user should override the default value if known. For multi-use, multistory building, the square footage should be preserved for each individual land use and the acreage assigned to the residential portion or split between non-residential land uses if there is no residential. The figure below provides an example of a mixed use project and how to apply the appropriate square footage and acreage for an accurate calculation of air quality impacts.

Acreage is used to estimate housing density as needed for calculations (see Table 2) and total acreage for the project is used in assigning construction default data (e.g., grading, site preparation, etc.). Based on ITE data, CalEEMod is able to estimate the acres per dwelling unit (DU) for residential land use. For example, 10 apartments in a low rise will need a 0.625 acre lot (10 DU divided by 16 acres/DU). According to the California Energy Commission's Residential Appliance Saturation Survey (RASS), low rise apartments are 1000 square foot per DU (see Table 2.1) so the building footprint is 0.23 acres (10 DU x 1000 sq ft/DU divided by 43,560 sq ft per acre). Thus, the lot space beyond the residential footprint accounts for driveway and landscaping.

## Example of Mixed Use Project in CalEEMod

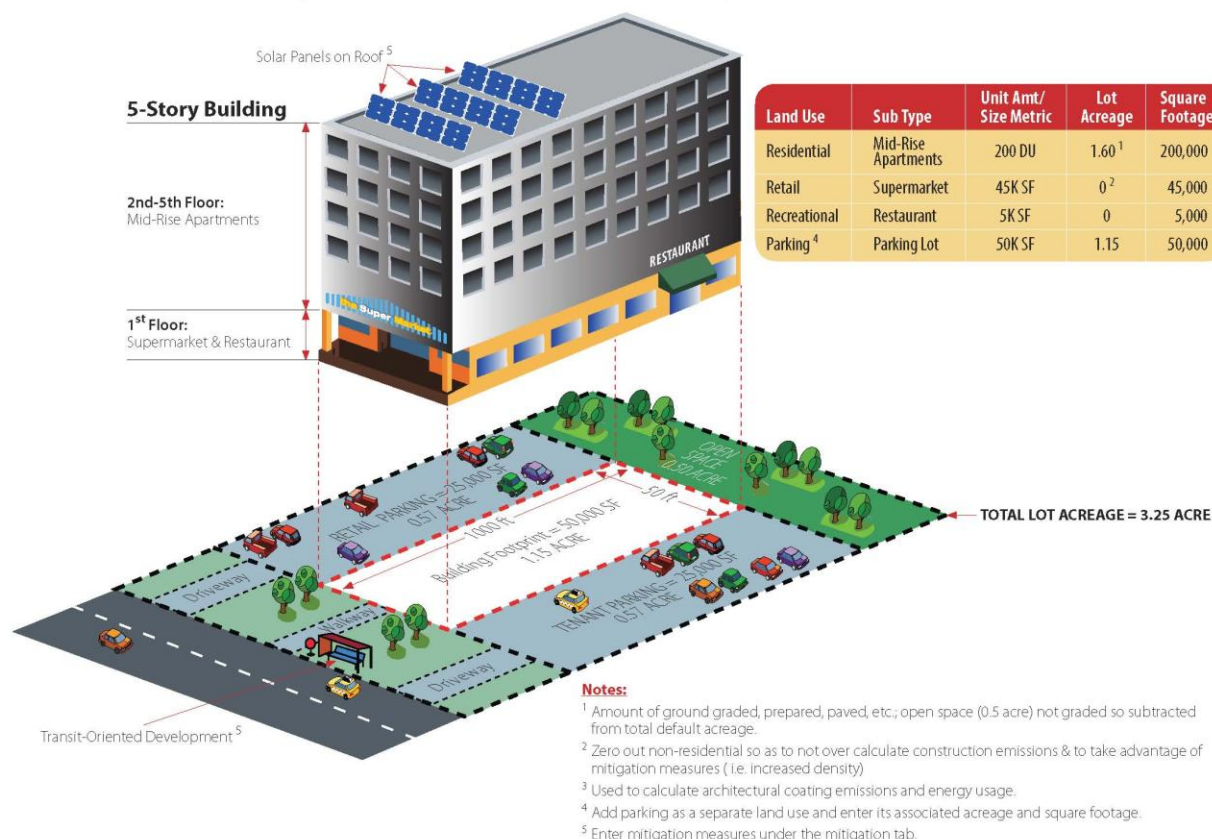


Table 2: Default Housing Density

| Land Use Sub Type                 | Density (Dwelling Units/Acre) |
|-----------------------------------|-------------------------------|
| Single Family Housing             | 3                             |
| Apartments low rise               | 16                            |
| Apartments mid rise               | 38                            |
| Apartments high rise              | 62                            |
| Condo/townhouse                   | 16                            |
| Condo/townhouse high rise         | 64                            |
| Mobile Home Park                  | 8                             |
| Retirement Community              | 5                             |
| Congregate care (Assisted Living) | 16                            |

1. Based on the density assumed in ITE Trip Generation 8th Edition

### **Square Footage**

The user should override the default value if known. This is the total building square footage.

### **Population (datagrid)**

This is the population estimated for the land use identified. The user should override the default value if known.

### **Population and Lot Acreage (text box)**

This is the total population and acreage of all land uses entered in the data grid. This is for informational purposes of values that will be used by the program and can't be changed by the user.

## **4.3 Construction**

The construction screen introduces the first of a tabbed structure subscreens. There are seven subscreens for construction with each one listed in the grey area under the screen name. To jump to different subscreens: the user can use the next and previous buttons, click on the grey tab name, or use the menu bar. Default information is based on a survey of construction sites grouped by construction phase and lot acreage performed by SCAQMD which can be found in Appendix E. The default construction equipment list and phase length are most appropriate for the size and types surveyed while the survey has been extrapolated to indicate default values, more detailed site specific equipment and phases are highly suggested in these cases for the most accurate results.

### **4.3.1 Construction Phase**

This is the screen where the user enters the type of each construction phase and the date range of these phases. The date of the construction phase is critical in determining the correct emission factor for the off-road equipment since CARB's factors change each year. Default phases are based on the total lot acreage of the project. Depending on the project being modeled, not all phases will be necessary (e.g., not all projects require demolition). In addition multiple phases of similar types may be used for large projects with build out in stages. If the project has demolition, grading, and site preparation phases, additional project specific data will need to be entered on Demolition subscreen and Dust from Material Movement subscreen.

#### **Phase Name**

The user should enter a unique name for the phase in the text box.

#### **Phase Type**

The user selects from the drop down list the type of construction phase: Site preparation, demolition, grading, building construction, paving, and architectural coating. This influences the types of calculations and default assumptions for on-road vehicle trips and fugitive emissions that occur in subsequent construction subscreens. The definitions of the default data phases are as follows:

- 
- Demolition involves tearing down of buildings or structures.
  - Site Preparation involves clearing vegetation (grubbing and tree/stump removal) and stones prior to grading.
  - Grading involves the cut and fill of land to ensure the proper base and slope for the construction foundation.
  - Building Construction involves the construction of structures and buildings.
  - Architectural Coating involves the application of coatings to both the interior and exterior of buildings or structures and includes parking lot striping as well as painting of the walls of parking structures.
  - Paving involves the laying of concrete or asphalt such as in parking lots or roads.

### Start Date and End Date

The user can enter with the aid of a calendar, the start and end dates. The default start date is 1/1/2014 starting with demolition with subsequent phases starting the next day after the previous phase's end date. Changes to these cells will alter the total days estimated for the phase.

### Days per Week

The user can select from a drop down box the number of days per week (5, 6, or 7) the project will operate. Five days per week is assumed to be Monday through Friday, and six days per week is Monday through Saturday.

### Total Days

The total number of days in the construction phase is indicated. If the end date or the days per week are changed, clicking in this cell will recalculate the number of days. If the total number of days for a phase is changed, then once leaving this cell, the program will adjust the end date based on the start date for that phase.

## 4.3.2 Off-Road Equipment

This subscreen shows the off-road equipment usage for each phase. Since equipment lists can be lengthy, the user must go through a different subscreen for each phase. This is done by selecting the appropriate phase name from the drop down list or the Previous or Next buttons located next to the phase name. The emission calculations associated with this screen are from off-road equipment engine use based on the equipment list and phase length. The fugitive emissions from off-road equipment performing work are associated with additional information in other construction screens.

The user enters in the datagrid each piece of equipment in the phase in a new row. The user enters the unit amount and hours per day of equipment usage. Horsepower and load factors are loaded with the default average values of the mode tier according to population based on OFFROAD2011, but the user can override these values. Since CalEEMod is restricted in the

years of OFFROAD emission factors, CalEEMod will use the lower end year if a construction year is in between a year of OFFROAD values in the database. For example if a construction phase is in 2027, CalEEMod will use OFFROAD emission factors from 2025.

For site specific construction equipment lists including equipment not specifically listed can be added under the Other Equipment categories or Off-Highway Trucks listed in CalEEMod matching the closest in horsepower to the missing equipment for each phase the construction equipment is operating. For inclusion of water trucks and cement trucks specifically can be considered in two ways although both of those trucks were part of the SMAQMD vendor trip survey during construction. The first is to use the Off-Highway Trucks category in this screen. The second is to add these as additional vendor trips in the Trips and VMT screen.

### **4.3.3 Dust from Material Movement**

This subscreen is used to enter the information necessary to calculate the fugitive dust emissions associated with grading phases. Three distinct fugitive dust calculations are performed as described in Appendix A: dust from dozers moving dirt around, dust from graders or scrapers leveling the land, and loading or unloading the dirt into haul trucks. These methods have been adapted from USEPA's AP-42 method for Western Coal Mining. The user needs to enter the amount of material imported and exported to the site in order for CalEEMod to estimate hauling trips correctly from material transport. There is an option to select either ton of debris or cubic yards. The user also selects if the import and export of material are phased. If they are phased a truck comes in with material and leaves with another load of material to export. Non-phased trips have one-way of the haul trip performed with an empty truck. Phasing material import and export reduces the number of haul trips. The number of acres that are displayed represent the total acres traversed by grading equipment assuming a blade width of 12 feet. In order to properly grade a piece of land multiple passes with equipment may be required. The acres is based on the equipment list and days in grading or site preparation phase according to the anticipated maximum number of acres a given piece of equipment can pass over in an 8-hour workday. See Appendix A for the equipment specific grading rates.

### **4.3.4 Demolition**

This subscreen is used to enter the amount of material that is demolished if demolition phases are selected. The user can enter either the ton of material or the building square footage. Fugitive dust emissions from the demolition are then calculated. Demolition fugitive dust emissions are based on the methodology described in the report prepared for the USEPA by Midwest Research Institute, Gap Filling PM<sub>10</sub> Emission Factors for Selected Open Area Dust Sources.

### **4.3.5 Trip and VMT**

This subscreen is used to provide the number and length of on-road vehicle trips for workers, vendors, and hauling. It also allows the user to select different weightings of vehicle fleet mixes and is either the EMFAC mix for the region, or an mix of the vehicle classes listed. HHDT,MHDT is a 50/50 percent mix of heavy-heavy duty trucks and medium-heavy duty trucks. LDA,LDT1,



LDT2 is 50/25/25 percent mix of light duty autos, light duty truck class 1 and light duty truck class 2. Since CalEEMod is restricted in the years of EMFAC emission factors, CalEEMod will use the lower end year if a construction year is in between a year of EMFAC values in the database. For example if a construction phase is in 2027, CalEEMod will use EMFAC emission factors from 2025.

The number of workers is 1.25 times the number of pieces of equipment for all phases except building construction and architectural coating. Building construction estimates the number of workers based on the types of land use and their size based on an analysis of a study conducted by SMAQMD. This study and its analysis are included in Appendix E. The number of workers for architectural coating is based on 20% of the building construction workers.

The number of vendor trips for building construction phase is based on a study performed by SMAQMD based on land use types and their size. As noted earlier, the SMAQMD trip survey during construction counted cement and water trucks as vendor trips. These values were placed under the “building construction” phase in CalEEMod. If the “building construction” phase is being eliminated and there are known water (and/or cement) trucks, it is recommended to consider those vendor trips under another phase or accounted for as OFFROAD equipment. Hauling trips are based on the assumption that a truck can handle 20 tons (or 16 cubic yards) of material per load. Assuming one load of material, CalEEMod considers a haul truck importing material will have a return trip with an empty truck (2 trips). Similarly, the haul truck to take material away will have an arrival trip in an empty truck (2 trips). Thus, each trip to import and export material is considered as two separate round trips (4 trips) unless the “phase” box is clicked. Then, a haul truck trip to import material will be the same haul truck to export material (2 trips).

#### **4.3.6 On-Road Fugitive Dust**

This subscreen defines the variables that will be used to determine the fugitive dust emissions from construction on-road vehicles over paved and unpaved roads. The emission calculations are based on USEPA's AP-42 January 2011 paved road and November 2006 unpaved roads emission factors. The variables in this datagrid are the same as those defined in the appropriate AP-42 sections.

#### **4.3.7 Architectural Coatings**

This subscreen allows the user to override any of the default interior and exterior surface area estimated for residential and non-residential buildings. In addition, each of these surface types has a different emission factor indicating the VOC content of the paint in grams per liter. See Appendix A for the method of estimating surface areas to be coated from building square footage.

### **4.4 Operational Mobile**

The operational mobile screen is made up of 3 subscreens: Vehicle Trips, Vehicle Emissions, and Road Dust. These screens are used in defining the information necessary to calculate the emissions associated with operational on-road vehicles.



#### 4.4.1 Vehicle Trips

This subscreen's datagrid lists the trip rate, trip lengths, trip purpose, and trip type percentages for each land use subtype in the project. The user can edit any of this information by entering a new value in the appropriate cell. Trip rates are in terms of the size metric (square footage or dwelling unit) defined on the land use screen and are listed for weekday, Saturday and Sunday if available. Trip lengths are for primary trips. Trip purposes are primary, diverted, or pass-by trips. Diverted trips are assumed to take a slightly different path than a primary trip and are assumed to be 25% of the primary trip lengths. Pass-by trips are assumed to be 0.1 miles in length and are a result of no diversion from the primary route. Residential trip types are defined as home-work (H-W), home-shop (H-S), and home-other (H-O). Non-residential trip types are defined as commercial –customer (C-C), commercial-work (C-W), and commercial-nonwork (C-NW) such as delivery trips. See Appendix A for the equations and methodology used to calculate motor vehicle emissions from the operation of a project.

In most cases the trip rate is based on ITE's average trip rate for the respective land use category. For warehouses, SCAQMD evaluated the primary data from ITE along with other recent studies regarding warehouses and concluded that it was more appropriate to break out the warehouses based on access to a rail spur and refrigeration. In addition, they concluded that it was more appropriate to use the maximum values from the studies. A detail memorandum describing the justification for these values is contained in Appendix E.

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☒ Cascade Defaults

**Operational - Mobile**

Vehicle Trips | Vehicle Emissions | Road Dust

Import csv Default Undo

| Land Use SubType   | Size Metric   | WkDy Trip Rate (/size /day) | Sat Trip Rate (/size /day) | Sun Trip Rate (/size /day) | Res H-W Trip Length (miles) | Res H-S Trip Length (miles) | Res H-O Trip Length (miles) | Non Res C-C Trip Length (miles) | Non Res C-W Trip Length (miles) | Non Res C-NW Trip Length (miles) | Prima Trip (%) | Divert Trip (%) | Pass-Trip (%) | Res H-W Trip (%) | Res H-S Trip (%) | Res H-O Trip (%) | Non Res C-C Trip (%) | Non Res C-W Trip (%) | Non Res C-NW Trip (%) |
|--------------------|---------------|-----------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------------------|---------------------------------|----------------------------------|----------------|-----------------|---------------|------------------|------------------|------------------|----------------------|----------------------|-----------------------|
| Apartments Lo...   | Dwelling Unit | 6.59                        | 7.16                       | 6.07                       | 14.7                        | 5.9                         | 8.7                         | 0                               | 0                               | 0                                | 86             | 11              | 3             | 40.2             | 19.2             | 40.6             | 0                    | 0                    | 0                     |
| Parking Lot        | 1000sqft      | 0                           | 0                          | 0                          | 0                           | 0                           | 0                           | 8.4                             | 16.6                            | 6.9                              | 0              | 0               | 0             | 0                | 0                | 0                | 0                    | 0                    | 0                     |
| Quality Restaur... | 1000sqft      | 89....                      | 94....                     | 72....                     | 0                           | 0                           | 0                           | 8.4                             | 16.6                            | 6.9                              | 38             | 18              | 44            | 0                | 0                | 0                | 69                   | 12                   | 19                    |
| Supermarket        | 1000sqft      | 10...                       | 17...                      | 16...                      | 0                           | 0                           | 0                           | 8.4                             | 16.6                            | 6.9                              | 34             | 30              | 36            | 0                | 0                | 0                | 74.5                 | 6.5                  | 19                    |

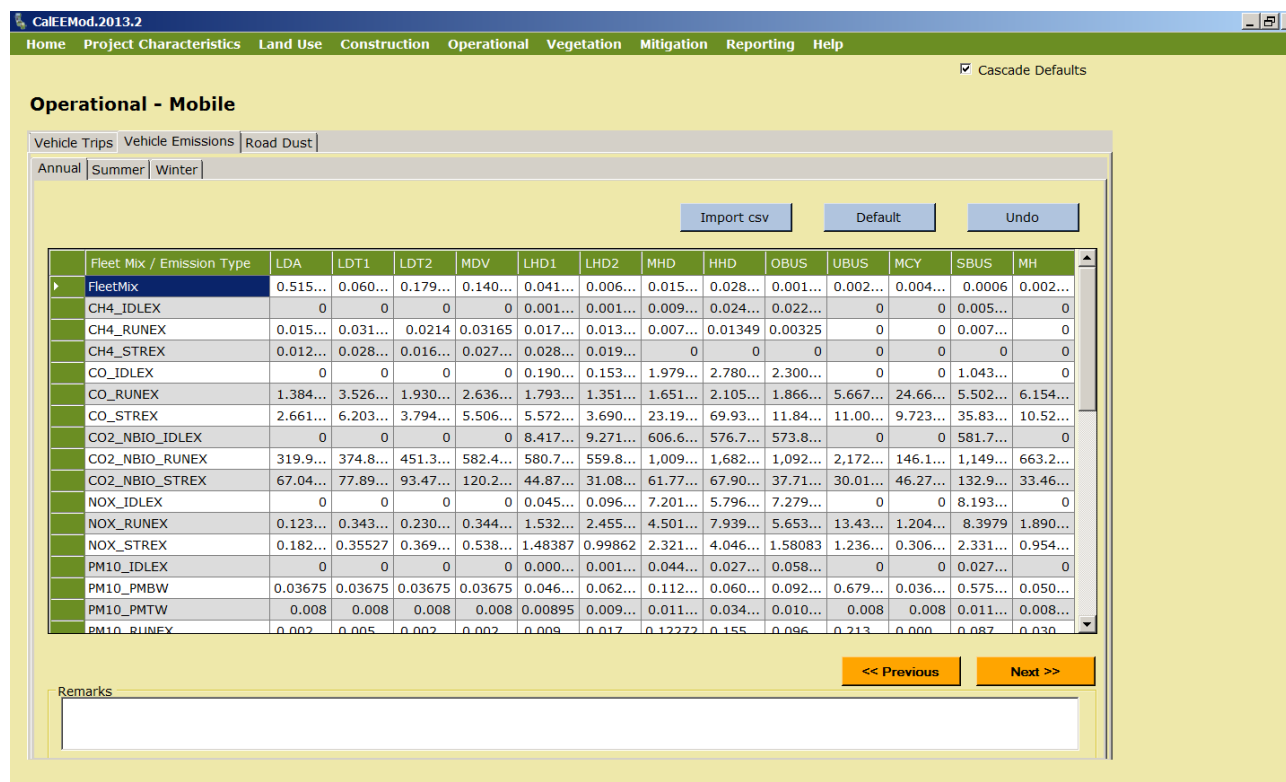
Remarks

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## 4.4.2 Vehicle Emissions

This subscreen is a large datagrid containing the detailed vehicle emission factors and fleet mix based on EMFAC2011. See Appendix A for information on how these emission factors were developed based on burden mode EMFAC runs including effects from Pavley (Clean Car Standards) and Low Carbon Fuel Standards. Pavley and Low Carbon Fuel Standards are applicable for future years and do not impact EMFAC values prior to these regulations implementations (i.e, 1990, 2000, 2005, etc). It is anticipated that most users will not edit data in this subscreen. There is a separate tab for annual, summer, and winter emission values. If the user wants to alter the breakdown of fuel types (catalytic, non-catalytic, other) within a vehicle class, they will have to provide their own data as this will likely be an infrequent change due to CEQA enforceability requirements. For details on how EMFAC data was processed see Appendix A.

This screen along with the previous screen (Vehicle Trips) will calculate the emissions associated with on-road motor vehicle use. It does not include the fugitive dust emissions from travel over roads as these are associated with the next screen (Road Dust).



**Operational - Mobile**

Vehicle Trips | Vehicle Emissions | Road Dust

Annual | Summer | Winter

Import csv | Default | Undo

| Fleet Mix / Emission Type | LDA      | LDT1     | LDT2     | MDV      | LHD1     | LHD2     | MHD      | HHD      | OBUS     | UBUS     | MCY      | SBUS     | MH       |
|---------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| FleetMix                  | 0.515... | 0.060... | 0.179... | 0.140... | 0.041... | 0.006... | 0.015... | 0.028... | 0.001... | 0.002... | 0.004... | 0.0006   | 0.002... |
| CH4_IDLEX                 | 0        | 0        | 0        | 0        | 0.001... | 0.001... | 0.009... | 0.024... | 0.022... | 0        | 0        | 0.005... | 0        |
| CH4_RUNEX                 | 0.015... | 0.031... | 0.0214   | 0.03165  | 0.017... | 0.013... | 0.007... | 0.01349  | 0.00325  | 0        | 0        | 0.007... | 0        |
| CH4_STREX                 | 0.012... | 0.028... | 0.016... | 0.027... | 0.028... | 0.019... |          | 0        | 0        | 0        | 0        | 0        | 0        |
| CO_IDLEX                  | 0        | 0        | 0        | 0        | 0.190... | 0.153... | 1.979... | 2.780... | 2.300... | 0        | 0        | 1.043... | 0        |
| CO_RUNEX                  | 1.384... | 3.526... | 1.930... | 2.636... | 1.793... | 1.351... | 1.651... | 2.105... | 1.866... | 5.667... | 24.66... | 5.502... | 6.154... |
| CO_STREX                  | 2.661... | 6.203... | 3.794... | 5.506... | 5.572... | 3.690... | 23.19... | 69.93... | 11.84... | 11.00... | 9.723... | 35.83... | 10.52... |
| CO2_NBIO_IDLEX            | 0        | 0        | 0        | 0        | 8.417... | 9.271... | 606.6... | 576.7... | 573.8... | 0        | 0        | 581.7... | 0        |
| CO2_NBIO_RUNEX            | 319.9... | 374.8... | 451.3... | 582.4... | 580.7... | 559.8... | 1,009... | 1,682... | 1,092... | 2,172... | 146.1... | 1,149... | 663.2... |
| CO2_NBIO_STREX            | 67.04... | 77.89... | 93.47... | 120.2... | 44.87... | 31.08... | 61.77... | 67.90... | 37.71... | 30.01... | 46.27... | 132.9... | 33.46... |
| NOX_IDLEX                 | 0        | 0        | 0        | 0        | 0.045... | 0.096... | 7.201... | 5.796... | 7.279... | 0        | 0        | 8.193... | 0        |
| NOX_RUNEX                 | 0.123... | 0.343... | 0.230... | 0.344... | 1.532... | 2.455... | 4.501... | 7.939... | 5.653... | 13.43... | 1.204... | 8.3979   | 1.890... |
| NOX_STREX                 | 0.182... | 0.35527  | 0.369... | 0.538... | 1.48387  | 0.99862  | 2.321... | 4.046... | 1.58083  | 1.236... | 0.306... | 2.331... | 0.954... |
| PM10_IDLEX                | 0        | 0        | 0        | 0        | 0.000... | 0.001... | 0.044... | 0.027... | 0.058... | 0        | 0        | 0.027... | 0        |
| PM10_PMBW                 | 0.03675  | 0.03675  | 0.03675  | 0.03675  | 0.046... | 0.062... | 0.112... | 0.060... | 0.092... | 0.679... | 0.036... | 0.575... | 0.050... |
| PM10_PMTW                 | 0.008    | 0.008    | 0.008    | 0.008    | 0.00895  | 0.009... | 0.011... | 0.034... | 0.010... | 0.008    | 0.008    | 0.011... | 0.008... |
| PM10_RUNEX                | 0.002    | 0.005    | 0.002    | 0.002    | 0.009    | 0.017    | 0.12372  | 0.155    | 0.096    | 0.213    | 0.000    | 0.087    | 0.030... |

Remarks

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### 4.4.3 Road Dust

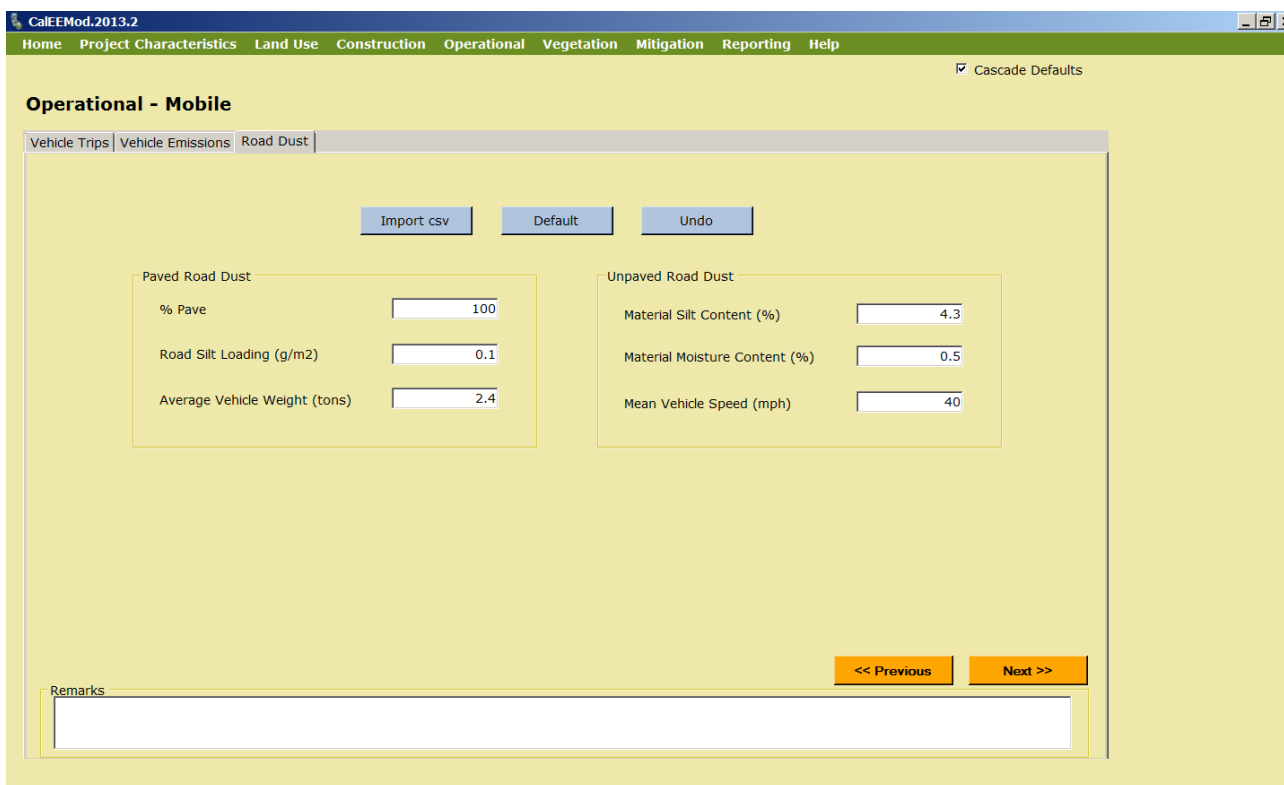
This subscreen is used to change any of the default values that are used in the USEPA's AP-42 methods for calculating fugitive emissions from paved and unpaved roads. The defaults for the road dust (e.g., material silt content, material moisture content, ) are statewide averages, but the user has the ability to override the defaults if data specific to the project is known. Local jurisdictions can also provide guidance to users as to what default properly reflects known regional road dust parameters.

For the San Luis Obispo region, users are recommended to provide the following road dust parameters overriding the statewide defaults:

9.3 for "Material Silt Content (%)" (*instead of 4.3 statewide default*)

0.1 for "Material Moisture Content (%)" (*instead of 0.5 statewide default*)

32.4 for "Mean Vehicle Speed (mph)" (*instead of 40 statewide default*)



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☒ Cascade Defaults

**Operational - Mobile**

Vehicle Trips | Vehicle Emissions | Road Dust

Import csv Default Undo

**Paved Road Dust**

|                               |     |
|-------------------------------|-----|
| % Pave                        | 100 |
| Road Silt Loading (g/m2)      | 0.1 |
| Average Vehicle Weight (tons) | 2.4 |

**Unpaved Road Dust**

|                               |     |
|-------------------------------|-----|
| Material Silt Content (%)     | 4.3 |
| Material Moisture Content (%) | 0.5 |
| Mean Vehicle Speed (mph)      | 40  |

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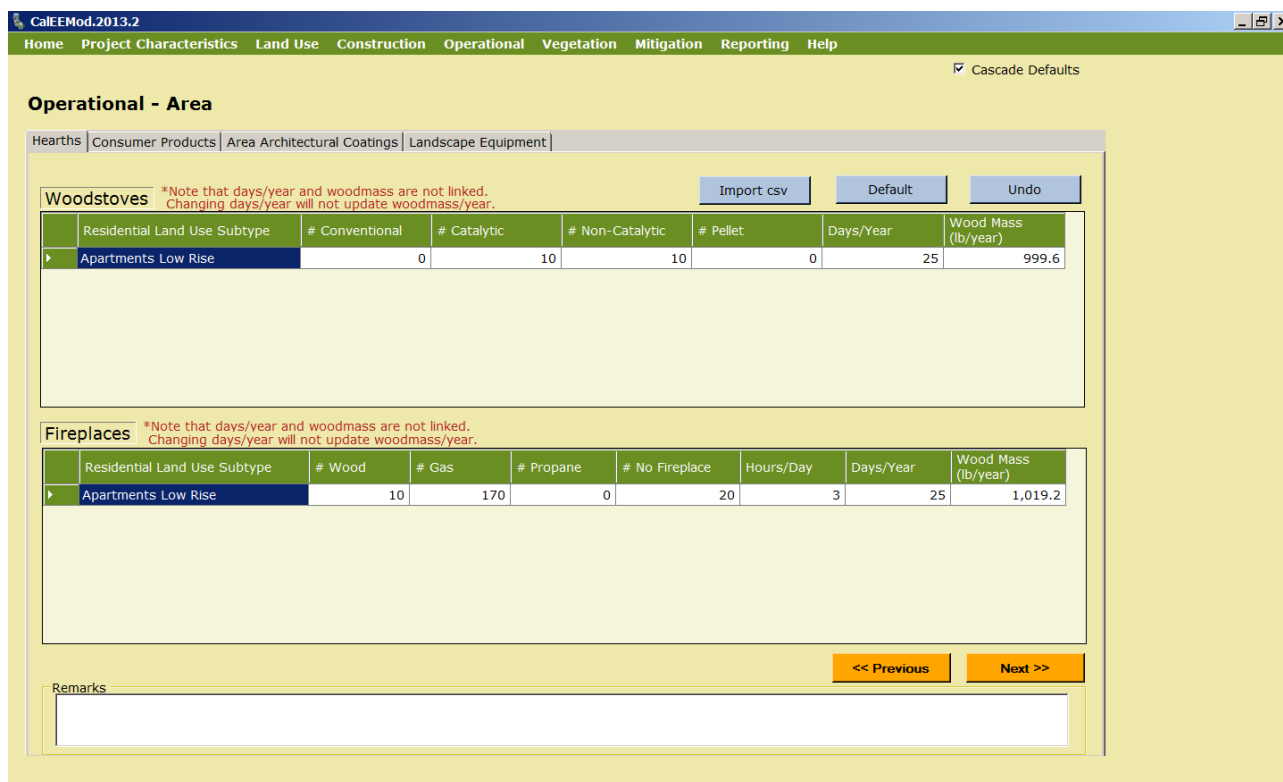
Remarks

### 4.5 Area

The area source screen consists of four subscreens: Hearths, Consumer Products, Area Architectural Coatings, and Landscaping Equipment. Natural gas emission variables from all uses except hearths are included in the energy use screen.

### 4.5.1 Hearths and Woodstoves

This subscreen allows the user to enter the number of woodstoves and hearths of various types as well as the usage of these devices. Woodstoves are separate from fireplaces since a home may have both and these devices may have different use patterns. The number of devices that is entered for each device type represents the total number of devices installed in the dwelling units for a particular land use. See Appendix A for emissions calculation methodology and details of variables that the user can not override. Some of these emissions may be classified as biogenic and are therefore reported as CO<sub>2</sub>-Biogenic. For most locations a default percent of hearths and stoves was provided by districts and is multiplied through. The number was chosen for CalEEMod instead of a percentage to allow for incorporation of various districts rules regarding hearths and woodstoves in new residences without having specialized screens. Commercial land uses by default do not have any hearths or woodstoves in CalEEMod. These are included for those cases where they may occur such as in restaurants or hotels.



**Operational - Area**

Hearths | Consumer Products | Area Architectural Coatings | Landscape Equipment

**Woodstoves** \*Note that days/year and woodmass are not linked. Changing days/year will not update woodmass/year.

Import csv Default Undo

| Residential Land Use Subtype | # Conventional | # Catalytic | # Non-Catalytic | # Pellet | Days/Year | Wood Mass (lb/year) |
|------------------------------|----------------|-------------|-----------------|----------|-----------|---------------------|
| ▶ Apartments Low Rise        | 0              | 10          | 10              | 0        | 25        | 999.6               |

**Fireplaces** \*Note that days/year and woodmass are not linked. Changing days/year will not update woodmass/year.

| Residential Land Use Subtype | # Wood | # Gas | # Propane | # No Fireplace | Hours/Day | Days/Year | Wood Mass (lb/year) |
|------------------------------|--------|-------|-----------|----------------|-----------|-----------|---------------------|
| ▶ Apartments Low Rise        | 10     | 170   | 0         | 20             | 3         | 25        | 1,019.2             |

Remarks

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The San Joaquin Valley jurisdiction has a regulatory limit on the number of hearths depending upon the type and number of residential development. The regulatory limit is generated by CalEEMod but all the input parameters (e.g., unit density, etc.) are necessary to determine the value. Thus, the regulatory limit is disclosed during the reporting stage under the “Default Value” box in the report. The model, however, calculates emission impacts from the number of hearths inputted on the Area source screen (listed under the “New Value” column in the report). Therefore, if the user wants to calculate emissions from regulatory limit, the report needs to be run to determine the regulatory limit and the user needs to go back to the Area source screen to

input that value and re-run the report. If the user chooses to calculate emissions from a different number of hearths (e.g., a number of hearths less than the regulatory limit), then that number needs to be inputted on the Area source screen to properly calculate emissions. Again, the report will provide the regulatory limit under the “Default Value” column and the user input value under “New Value” column.

#### **4.5.2 Consumer Products**

Consumer products are various solvents used in non-industrial applications which emit VOCs during their product use. These typically include cleaning supplies, kitchen aerosols, cosmetics and toiletries. SCAQMD has developed an emission factor based on the total of all building square footage for both residential and non-residential buildings. Details of how this emission factor was developed can be found in Appendix E. The user can change this emission factor if they have more relevant data.

#### **4.5.3 Area Architectural Coating**

This subscreen has text boxes for the reapplication rate and paint VOC content for each building surface type. The reapplication rate is the frequency at which surfaces get repainted every year. A default of 10% is used which means that 10% of the surface area is repainted each year so all surfaces are completely repainted once every 10 years. Daily emissions divide the annual rate by 365 days per year. This is based on assumptions used by SCAQMD in their district rules regarding architectural coatings. Some districts provided details on their coating regulations that phase in over time which have been incorporated to the extent feasible given the general classifications of paint (interior or exterior for residential and non-residential). As not all districts submitted their architectural coating regulations, consult your local agency for any suggested values that may be lower than the state regulations.

If changing the operational architectural coating VOC content (e.g., lower VOC content limit), the User is advised to change the architectural coating VOC content under the Area Mitigation screen where the operational coating VOC content defaults will not change unless prompted. If not, the model assumes the value on the mitigation screen is the “New Value” (as listed in report). In the case of applying a lower VOC content limit on the operational architectural coating screen, the unchanged mitigation value (“New Value”) will be higher. However, unless the box is checked on the Area Mitigation screen next to the coating type, the model will not calculate a mitigated emissions value.

#### **4.5.4 Landscape Equipment**

This subscreen has two text boxes to show the number of snow days or summer days. In addition, the defaults consider a realistic number of days which the landscaping equipment would be operated. For example, landscaping at commercial facilities typically do not take place during a weekend or during the summer at educational facilities that are not open. The number of days are applied to the appropriate landscape equipment types available in OFFROAD2011 using the average horsepower and load factors of the population mode. The

derivation of emission factors used for each equipment type from OFFROAD2011 is described in Appendix A.

## 4.6 Energy Use

The energy use screen is used to gather the information necessary to estimate the emissions associated with building electricity and natural gas usage (non-hearth). The electricity energy use is in kilowatt hours per size metric for each land use subtype and natural gas use is in kiloBritish Thermal Units (kBTU) per size metric for each land use subtype. The California Energy Code contains energy conservation standards applicable to all residential and non-residential buildings throughout California, including schools. The electricity use is split into three areas: Title-24, non-Title 24, and lighting. The Title 24 of the California Code of Regulations, known as the California Building Standards Code (or "Title 24"), uses are defined as the major building envelope systems covered by Part 6 (California Energy Code) of Title 24 such as space heating, space cooling, water heating, and ventilation. Lighting was separated out since it can be both part and not part of Title-24. Since lighting is not considered as part of the building envelope energy budget, CalEEMod does not consider lighting to have any further association with Title 24 references in the program. Non-Title 24 is everything else such as appliances and electronics. Natural gas is just distinguished as Title 24 or Non-Title 24. The default values are based on the CEC sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies<sup>9</sup>. For climate zones not included in these surveys a data from the closest climate zone was used as a surrogate. Since these studies are based on older buildings, adjustments have been made to account for changes to Title 24 building codes as described in Appendix A. A user should select the use historical box if they only want an adjustment to the 2005 standards which were in effect when ARB developed its Scoping Plan 2020 No Action Taken predictions. After selecting the historical button, the user must also click the default button to load the historical default values.

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9 CEC. October 2010. Residential Appliance Saturation Survey. Available online at:

<http://www.energy.ca.gov/appliances/rass>

CEC. 2006. Commercial End-Use Survey. Available online at: <http://www.energy.ca.gov/ceus/>

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☒ Cascade Defaults

### Operational - Energy Use

☐ Using Historical Data

Import csv Default Undo

| Land Use Subtype   | Title-24 Electricity Energy Intensity (KWhr/size/yr) | Nontitle-24 Electricity Energy Intensity (KWhr/size/yr) | Lighting Energy Intensity (KWhr/size/yr) | Title-24 Natural Gas Energy Intensity (KBTU/size/yr) | Nontitle-24 Natural Gas Energy Intensity (KBTU/size/yr) |
|--------------------|------------------------------------------------------|---------------------------------------------------------|------------------------------------------|------------------------------------------------------|---------------------------------------------------------|
| Apartment Low Rise | 636.58                                               | 2,630.88                                                | 810.36                                   | 11,224.2                                             | 2,498                                                   |
| Parking Lot        | 0                                                    | 0                                                       | 0.88                                     | 0                                                    | 0                                                       |
| Quality Restaurant | 15.13                                                | 28.48                                                   | 8.79                                     | 81.74                                                | 195.77                                                  |
| Supermarket        | 7.42                                                 | 22.82                                                   | 9.1                                      | 13.31                                                | 6.61                                                    |

Remarks

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## 4.7 Water and Wastewater Use

This module only estimates the land uses contribution of GHG emissions associated with supplying and treating the water and wastewater. This screen is used to enter the amount of water in gallons used indoors and outdoors for each land use subtype<sup>10</sup>. The indoor water is also used to estimate the amount of wastewater. The electricity intensity for various phases of providing water is broken out. Depending on the specific water supply used or treatment method used these numbers can vary over a wide range. Supplying water is bringing the water from its primary source such as the ground, river, or snowpack to the treatment plant. Distributing the water is bringing the water from the treatment plant to the end users. The electricity intensities are multiplied by the utility intensity factors for the GHGs and are classified as indirect emissions. The default electricity intensity is from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and

10 Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A. 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Published by the Pacific Institute for Studies in Development, Environment, and Security. Full report available online at: [http://www.pacinst.org/reports/urban\\_usage/waste\\_not\\_want\\_not\\_full\\_report.pdf](http://www.pacinst.org/reports/urban_usage/waste_not_want_not_full_report.pdf). Appendices available online at: [http://www.pacinst.org/reports/urban\\_usage/appendices.htm](http://www.pacinst.org/reports/urban_usage/appendices.htm)

Dziegielewski, B.; Kiefer, J.C.; Optiz, E.M.; Porter, G.A.; Lantz, G.L.; DeOreo, W.B.; Mayer, P.W.; Nelson, J.O. 2000. Commercial and Institutional End Uses of Water. Published by the American Water Works Association Research Foundation.

Northern California Golf Association. Improving California Golf Course Water Efficiency. <http://www.owue.water.ca.gov/docs/2004Apps/2004-079.pdf>

Southern California<sup>11</sup>. The location will automatically select the appropriate values if using these defaults. Since the electricity can vary greatly based on locations, the user should override these values if they have more specific information regarding their specific water supply and treatment.

Wastewater may also have direct emissions of GHGs. These depend on the type of wastewater treatment system (e.g., septic, aerobic or lagoons) used and therefore the wastewater treatment type percentages are variables. In addition, the model calculates impacts if the solids are digested either through an anaerobic digester or with co-generation from combustion of digester gas. Each type has associated GHG emission factors. Some of these may be classified as biogenic. Not all of the biogenic emissions are accounted for since there are not adequate emissions factors at this time. Refer to Appendix A on how to properly change the defaults, if necessary, and the methodology used to calculate impacts from wastewater treatment.

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☒ Cascade Defaults

**Operational - Water and Wastewater**

Import csv Default Undo

|   | Land Use Subtype    | Size Metric   | Indoor Water Use (gals/year) | Outdoor Water Use (gals/year) | Electricity Intensity Factor To Supply (kWhr/Mgal) | Electricity Intensity Factor To Treat (kWhr/Mgal) | Electricity Intensity Factor To Distribute (kWhr/Mgal) | Electricity Intensity Factor For Wastewater Treatment (kWhr/Mgal) | Septic Tank (%) | Aerobic (%) | Facultative Lagoons (%) | Anaerobic Digester with Combustion of Digester Gas (%) | Anaerobic Digestion with Cogeneration from Combustion of Digester Gas (%) |
|---|---------------------|---------------|------------------------------|-------------------------------|----------------------------------------------------|---------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------|-----------------|-------------|-------------------------|--------------------------------------------------------|---------------------------------------------------------------------------|
| ▶ | Apartments Low Rise | Dwelling Unit | 13,030...                    | 8,215,...                     | 9,727                                              | 111                                               | 1,272                                                  | 1,911                                                             | 10.33           | 87.46       | 2.21                    | 100                                                    | 0                                                                         |
|   | Parking Lot         | 1000sqft      | 0                            | 0                             | 9,727                                              | 111                                               | 1,272                                                  | 1,911                                                             | 10.33           | 87.46       | 2.21                    | 100                                                    | 0                                                                         |
|   | Quality Restaurant  | 1000sqft      | 1,517,...                    | 96,872...                     | 9,727                                              | 111                                               | 1,272                                                  | 1,911                                                             | 10.33           | 87.46       | 2.21                    | 100                                                    | 0                                                                         |
|   | Supermarket         | 1000sqft      | 5,547,...                    | 171,55...                     | 9,727                                              | 111                                               | 1,272                                                  | 1,911                                                             | 10.33           | 87.46       | 2.21                    | 100                                                    | 0                                                                         |

Remarks

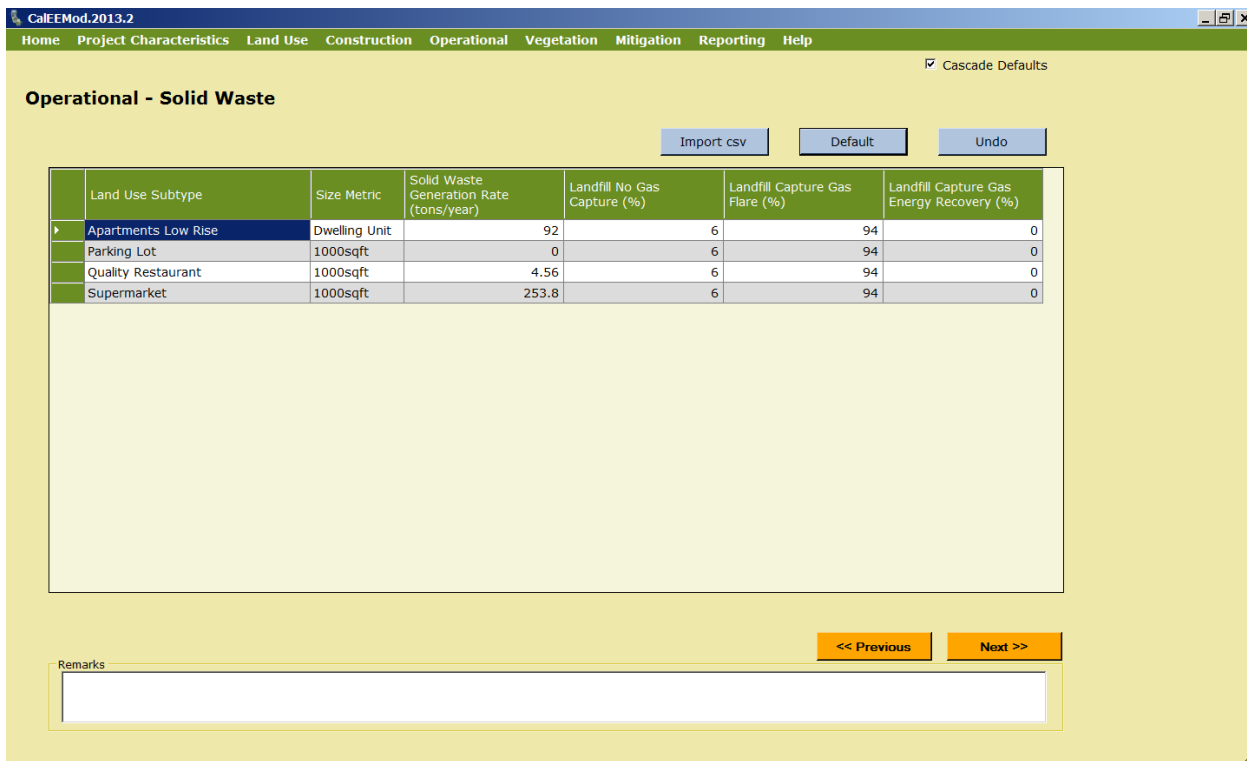
<< Previous Next >>

<sup>11</sup> CEC-500-2006-118.



## 4.8 Solid Waste

The solid waste module determines the GHG emissions associated with disposal of solid waste into landfills. In order to estimate the eventual contribution of GHG emissions from solid waste for the waste disposed by a land use annually, the total amount of carbon dioxide and methane that would be evolved over the span of many years is calculated. This is based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste<sup>12</sup>. Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on Calrecycle data. The amount of methane emitted depends on characteristics of the landfill, and therefore the default percentage is based on the types of landfills assumed by ARB in their GHG emission inventories. Portions of these emissions are biogenic. The defaults for the gas capture (e.g., no capture, flaring, energy recovery) are statewide averages, but the user has the ability to override the defaults if the gas capture is known. Local jurisdictions can also provide guidance to users as to what default properly reflects known regional solid waste gas capture. Users in the Santa Barbara region are recommended to apply 100% landfill capture gas flare overriding the statewide default to reflect a more accurate regional solid waste activity.



CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

☒ Cascade Defaults

**Operational - Solid Waste**

Import csv Default Undo

| Land Use Subtype      | Size Metric   | Solid Waste Generation Rate (tons/year) | Landfill No Gas Capture (%) | Landfill Capture Gas Flare (%) | Landfill Capture Gas Energy Recovery (%) |
|-----------------------|---------------|-----------------------------------------|-----------------------------|--------------------------------|------------------------------------------|
| ► Apartments Low Rise | Dwelling Unit | 92                                      | 6                           | 94                             | 0                                        |
| Parking Lot           | 1000sqft      | 0                                       | 6                           | 94                             | 0                                        |
| Quality Restaurant    | 1000sqft      | 4.56                                    | 6                           | 94                             | 0                                        |
| Supermarket           | 1000sqft      | 253.8                                   | 6                           | 94                             | 0                                        |

Remarks

<< Previous Next >>

12 IPCC. 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 5 Waste.

## 4.9 Off-Road Equipment

A new sub-screen under Operational allows the user to identify any off-road equipment used during operational activities (e.g., forklifts, cranes, loaders, generator sets, pumps, pressure washers, etc.) at the project site. Because such equipment cannot be assumed to be needed for a particular land use project, a user needs to provide the input in order for CalEEMod to calculate the resulting emissions from equipment operation. A dropdown list of off-road equipment is provided for the user to identify each piece of equipment. The model requires the following specific information per equipment type. The user would need to provide the number of pieces for each equipment type. The model assumes an operation activity of 8 hours per day and 260 days per year, as well as the horsepower and load factor of the equipment type, but the user has the ability to override the default assumptions with project specific information. Finally, the model assumes diesel fuel, but a dropdown menu is provided to allow the user to choose bio-diesel or compressed natural gas (CNG) if known to power the equipment.

CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

☒ Cascade Defaults

### Operational - Off-Road Equipment

Import csv Default Undo

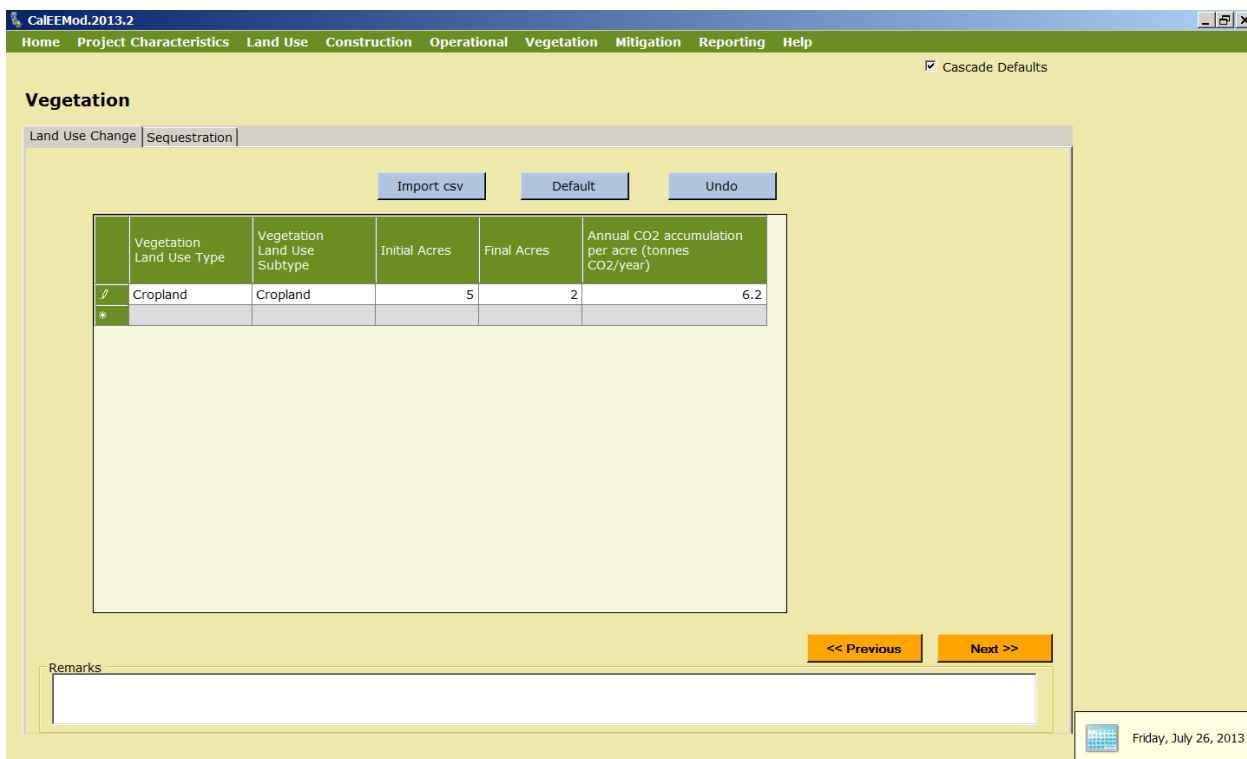
|   | Equipment Type | Number of Equipment | Hours/Day | Days/Year | HorsePower (HP) | Load Factor | Fuel Type |
|---|----------------|---------------------|-----------|-----------|-----------------|-------------|-----------|
| ? | Forklifts      | 1                   | 8         | 260       | 89              | 0.201       | Diesel    |
| * |                |                     |           |           |                 |             |           |

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Remarks

## 4.10 Vegetation

The vegetation module is used to estimate the one-time change in carbon sequestration capacity of a vegetation land use type. The methods used are based on IPCC<sup>13</sup>. The user enters the vegetation land use type, the initial and final acreage of the vegetation land use type, and the annual carbon dioxide equivalent accumulation per acre if the user chooses to over ride the default value. Settlement land use acreage is not considered since it is a net zero at steady state unless trees are added.



CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

☒ Cascade Defaults

**Vegetation**

Land Use Change | Sequestration

Import csv Default Undo

|   | Vegetation Land Use Type | Vegetation Land Use Subtype | Initial Acres | Final Acres | Annual CO2 accumulation per acre (tonnes CO2/year) |
|---|--------------------------|-----------------------------|---------------|-------------|----------------------------------------------------|
|   | Cropland                 | Cropland                    | 5             | 2           | 6.2                                                |
| * |                          |                             |               |             |                                                    |

Remarks

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Friday, July 26, 2013

### 4.10.1 Sequestration

This subscreen to vegetation is used to estimate the GHG emissions associated with the sequestration of net new trees added to the project site. Consistent with IPCC recommendations a 20 year active growth period is assumed. The user enters the tree type or miscellaneous if it is not known, and the total number of trees. The user can override the default carbon sequestration rate.

## 4.11 Mitigation

The mitigation module screen consists of six subscreens that the user can indicate and supply the necessary information to estimate the emissions after mitigation measures have been implemented. The mitigation measures included in CalEEMod are largely based on the recent

<sup>13</sup> IPCC. 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4.

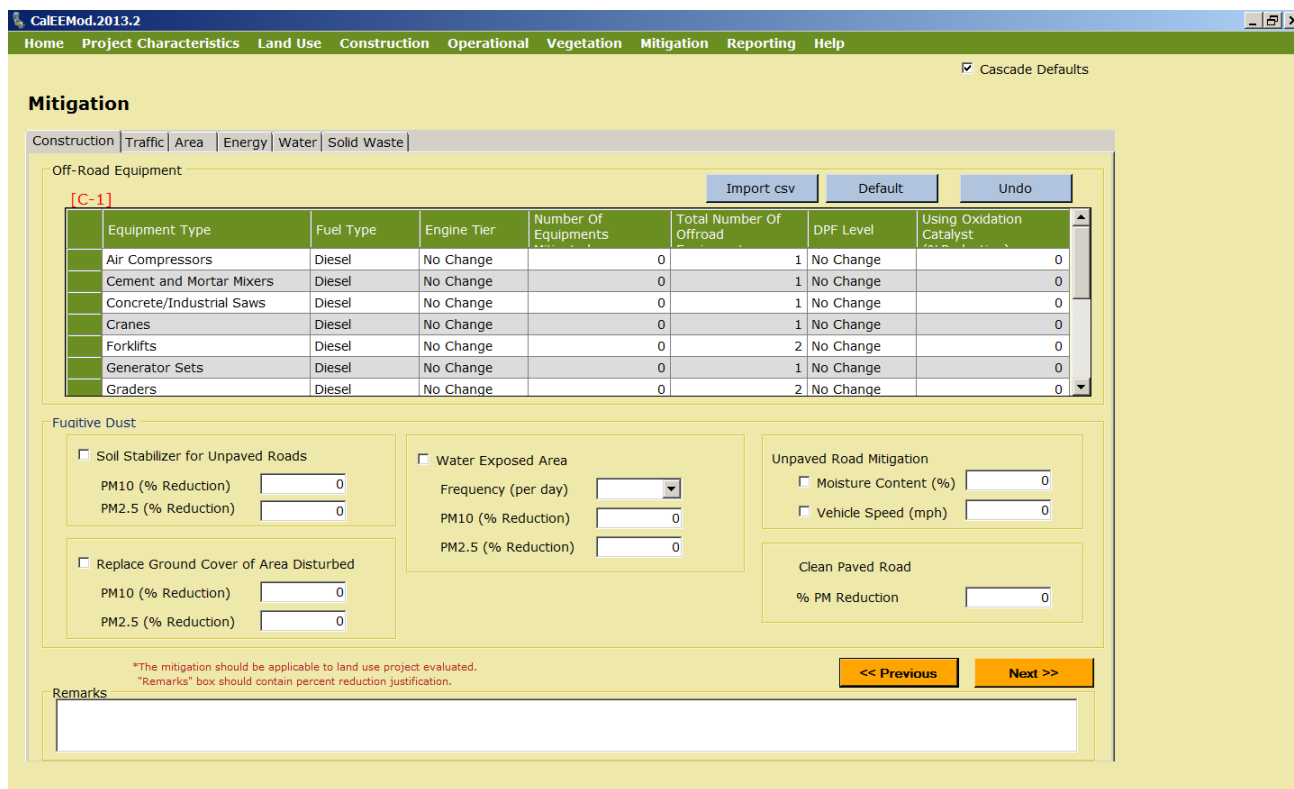
CAPCOA Quantifying Greenhouse Gas Mitigation Measures (<http://www.capcoa.org/wp-content/uploads/downloads/2010/09/CAPCOA-Quantification-Report-9-14-Final.pdf>) document.

To assist the user in understanding each measure by referencing back to the CAPCOA document, the CAPCOA measure numbers are provided next to the listed measures in CalEEMod. Therefore, this user's guide focuses on key aspects of the program screens that user's should pay attention to.

#### 4.11.1 Construction Mitigation

This screen consists of a datagrid to apply mitigation to off-road construction equipment and check boxes with supplemental information for fugitive dust emissions.

To apply mitigation to construction equipment, the user selects the equipment type the number of equipment noting the total number displayed based on construction equipment lists, and type of mitigation to apply. If substantial evidence supporting reductions was available at the time of development, options include fuel type (diesel, CNG, electric, hybrid, biodiesel), engine tier (typically will select Tier 4), diesel particulate filter tiers (Tier 3 being the best), and oxidative catalyst reduction. The program estimates how much if any increase or decrease in emissions to apply for each pollutant. Some mitigation measures have trade-offs in pollutant reductions and therefore may result in increases of some pollutants.



CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

✓ Cascade Defaults

### Mitigation

Construction Traffic Area Energy Water Solid Waste

Off-Road Equipment

[C-1]

Import csv Default Undo

| Equipment Type           | Fuel Type | Engine Tier | Number Of Equipments | Total Number Of Offroad | DPF Level | Using Oxidation Catalyst |
|--------------------------|-----------|-------------|----------------------|-------------------------|-----------|--------------------------|
| Air Compressors          | Diesel    | No Change   | 0                    | 1                       | No Change | 0                        |
| Cement and Mortar Mixers | Diesel    | No Change   | 0                    | 1                       | No Change | 0                        |
| Concrete/Industrial Saws | Diesel    | No Change   | 0                    | 1                       | No Change | 0                        |
| Cranes                   | Diesel    | No Change   | 0                    | 1                       | No Change | 0                        |
| Forklifts                | Diesel    | No Change   | 0                    | 2                       | No Change | 0                        |
| Generator Sets           | Diesel    | No Change   | 0                    | 1                       | No Change | 0                        |
| Graders                  | Diesel    | No Change   | 0                    | 2                       | No Change | 0                        |

Fugitive Dust

☐ Soil Stabilizer for Unpaved Roads

PM10 (% Reduction)

PM2.5 (% Reduction)

☐ Water Exposed Area

Frequency (per day)

PM10 (% Reduction)

PM2.5 (% Reduction)

Unpaved Road Mitigation

☐ Moisture Content (%)

☐ Vehicle Speed (mph)

Clean Paved Road

% PM Reduction

\*The mitigation should be applicable to land use project evaluated.  
\*Remarks" box should contain percent reduction justification.

Remarks

<< Previous Next >>

To apply mitigation to fugitive dust from construction, the user selects the check box in front of the mitigation measure name, and enters in the appropriate information in the drop down or text

boxes. Some fugitive dust mitigation required by some districts do not appear here since the fugitive dust source they mitigate is not quantified by CalEEMod in particular this includes fugitive dust generated by wind over land and storage piles. Since they are not quantified it is not appropriate to apply the reduction. The construction mitigation to use alternative fuel for construction equipment is consistent with the mitigation number C-1 in the CAPCOA Quantifying GHG Mitigation document.

#### 4.11.2 Traffic Mitigation

There are two traffic mitigation subscreens that the user can select from. First the user must select the Project Setting as defined in the CAPCOA document (pages 59-60).

- Low Density Suburban: An area characterized by dispersed, low-density, single-use, automobile dependent land use patterns, usually outside of the central city (a suburb).
- Suburban Center: serves the population of the suburb with office, retail and housing which is denser than the surrounding suburb.
- Urban: an area which is located within the central city with higher density of land uses than you would find in the suburbs. It may be characterized by multi-family housing and located near office and retail.
- Urban Center (*known as "Compact Infill" in CAPCOA document*) : A project which is located within or contiguous with the central city. Examples may include redevelopment areas, abandoned sites, or underutilized older buildings/sites.

If the CAPCOA measure did not distinguish between suburban center and low density suburban, values for low density suburban were used. Similarly, if urban center and urban values were not distinguished urban values were used.

The user checks the box next to each mitigation measure and fills in the appropriate information as required. The maximum reduction caps defined in the CAPCOA Quantifying GHG Mitigation document are integrated into these calculations. The CAPCOA traffic mitigation measure numbers included in CalEEMod are the following: LUT-1, LUT-3, LUT-9, LUT-4, LUT-5, LUT-6, SDT-1, SDT-2, SDT-3, PDT-1, PDT-2, PDT-3, TST-1, TST-3, TST-4, TRT-1, TRT-2, TRT-4, TRT-15, TRT-14, TRT-6, TRT-7, TRT-11, TRT-3, and TRT-13. The NEV network mitigation measure assumes the low end of the CAPCOA recommendations.

CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

✓ Cascade Defaults

### Mitigation

Construction Traffic Area Energy Water Solid Waste

Land Use & Site Enhancement Commute

Project Setting

\*The mitigation should be applicable to land use project evaluated.  
\*Remarks\* box should contain percent reduction justification.

Import csv

Land Use

☐ Increase Density [LUT-1]  Dwelling Units/acre

☐ Increase Diversity [LUT-3]  Jobs/Job acre

☐ Improve Walkability Design [LUT-9]  Intersections/Square Miles

☐ Improve Destination Accessibility [LUT-4]  Distance to Downtwn/Job Ctr (Miles)

☐ Increase Transit Accessibility [LUT-5]  Distance to Transit Station (Miles)

☐ Integrate Below Market Rate Housing [LUT-6]  #Dwelling Units Below Market Rate

Parking Policy/Pricing

☐ Limit Parking Supply [PDT-1]  % Reduction in Spaces

☐ Unbundle Parking Costs [PDT-2]  Monthly Parking Cost (\$)

☐ On-Street Market Pricing [PDT-3]  % Increase in Price

Transit Improvement

☐ Provide BRT System [TST-1]  % Lines BRT

☐ Expand Transit Network [TST-3]  % Increase Transit Coverage

☐ Increase Transit Frequency [TST-4]  Level of Implementation

☐ % Reduction in Headways

Neighborhood Enhancements

☐ Improve Pedestrian Network [SDT-1]

☐ Provide Traffic Calming Measures [SDT-2]

% Streets with Improvement

% Intersections with Improvement

☐ Implement NEV Network [SDT-3]

Remarks

<< Previous Next >>

CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

✓ Cascade Defaults

### Mitigation

Construction Traffic Area Energy Water Solid Waste

Land Use & Site Enhancement Commute

Commute Trip

☐ Implement Trip Reduction Program [TRT-1, TRT-2]  % employee eligible

☐ Transit Subsidy [TRT-4]  % employee eligible

☐ Implement Employee Parking "Cash-Out" [TRT-15]  % employee eligible

☐ Workplace Parking Charge [TRT-14]  % employee eligible

☐ Encourage Telecommuting and Alternative Work schedules [TRT-6]  % employee work 9/80

☐ Market Commute Trip Reduction Option [TRT-7]  % employee eligible

☐ Employee Vanpool/Shuttle [TRT-11]  % employee eligible

☐ Provide Ride Sharing Program [TRT-3]  % employee eligible

School Trip

☐ Implement School Bus Program [TRT-13]  % family using

Remarks

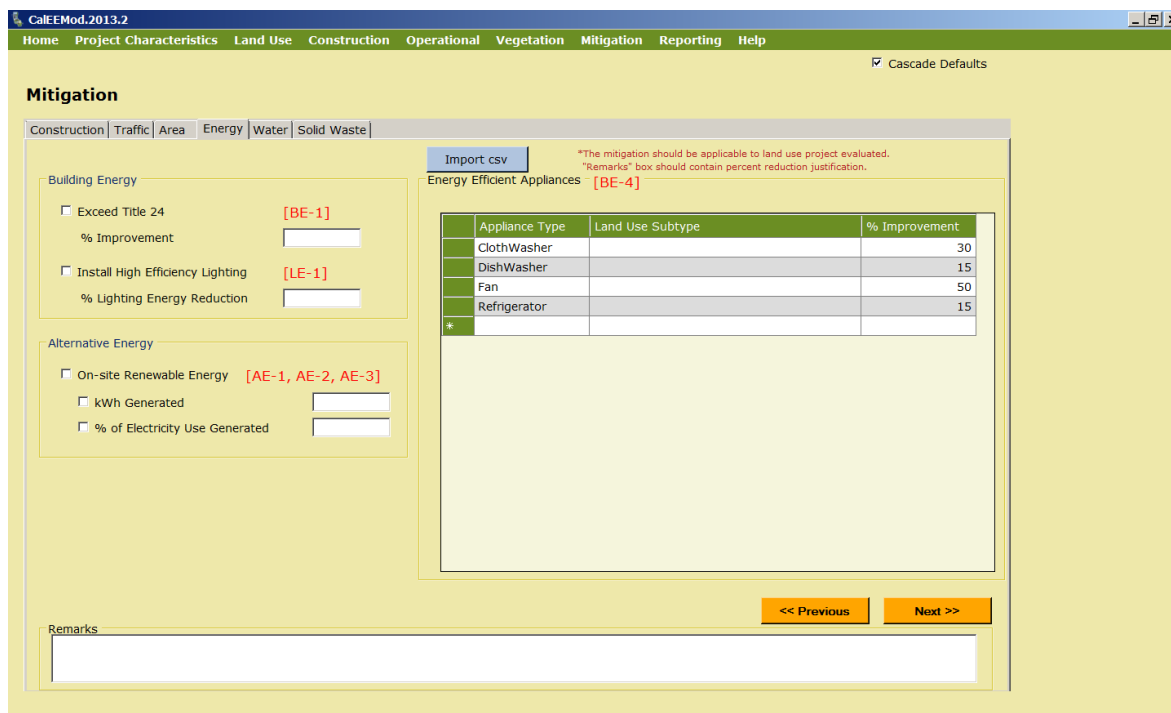
Import csv << Previous Next >>

### 4.11.3 Area Mitigation

The user can select from a few area source mitigation measures by checking the appropriate box and supplying any additional information in the text boxes. These measures include all natural gas hearths, no hearths, electric landscaping equipment use, reduced VOC coatings, and reduced consumer product VOC content. The area landscaping mitigation to prohibit gas powered landscape equipment is consistent with the mitigation number A-1 in the CAPCOA Quantifying GHG Mitigation document.

### 4.11.4 Energy Mitigation

The user selects energy mitigation measures by using check boxes or a datagrid. These correspond to CAPCOA Mitigation Measures LE-1, BE-1, AE-1, AE-2, AE-3 and BE-4 as listed in the CAPCOA Quantifying GHG Mitigation document. The lighting is a percentage reduction in lighting as supplied by the user. The datagrid is used to enter the land use subtypes that will use energy efficient appliances. The percent improvement is the typical percent improvement above standard appliances according to the 2008 Energy Star Annual Report<sup>14</sup>. Alternative Energy has two methods to enter the amount of alternative energy. The first is the amount of kWh generated. The second is the percentage of the total electricity use by buildings that is generated. At this time alternative energy methods that are not carbon neutral are not quantified. To apply the amount of alternative energy only one of the two methods (kWhr or percentage) needs to be entered for CalEEMod to calculate emission reductions.



CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

☒ Cascade Defaults

### Mitigation

Construction Traffic Area Energy Water Solid Waste

**Building Energy**

☐ Exceed Title 24 [BE-1]  
% Improvement

☐ Install High Efficiency Lighting [LE-1]  
% Lighting Energy Reduction

**Alternative Energy**

☐ On-site Renewable Energy [AE-1, AE-2, AE-3]  
☐ kWh Generated   
☐ % of Electricity Use Generated

**Energy Efficient Appliances [BE-4]**

\*\*The mitigation should be applicable to land use project evaluated.  
"Remarks" box should contain percent reduction justification.

| Appliance Type | Land Use Subtype | % Improvement |
|----------------|------------------|---------------|
| ClothWasher    |                  | 30            |
| DishWasher     |                  | 15            |
| Fan            |                  | 50            |
| Refrigerator   |                  | 15            |
| *              |                  |               |

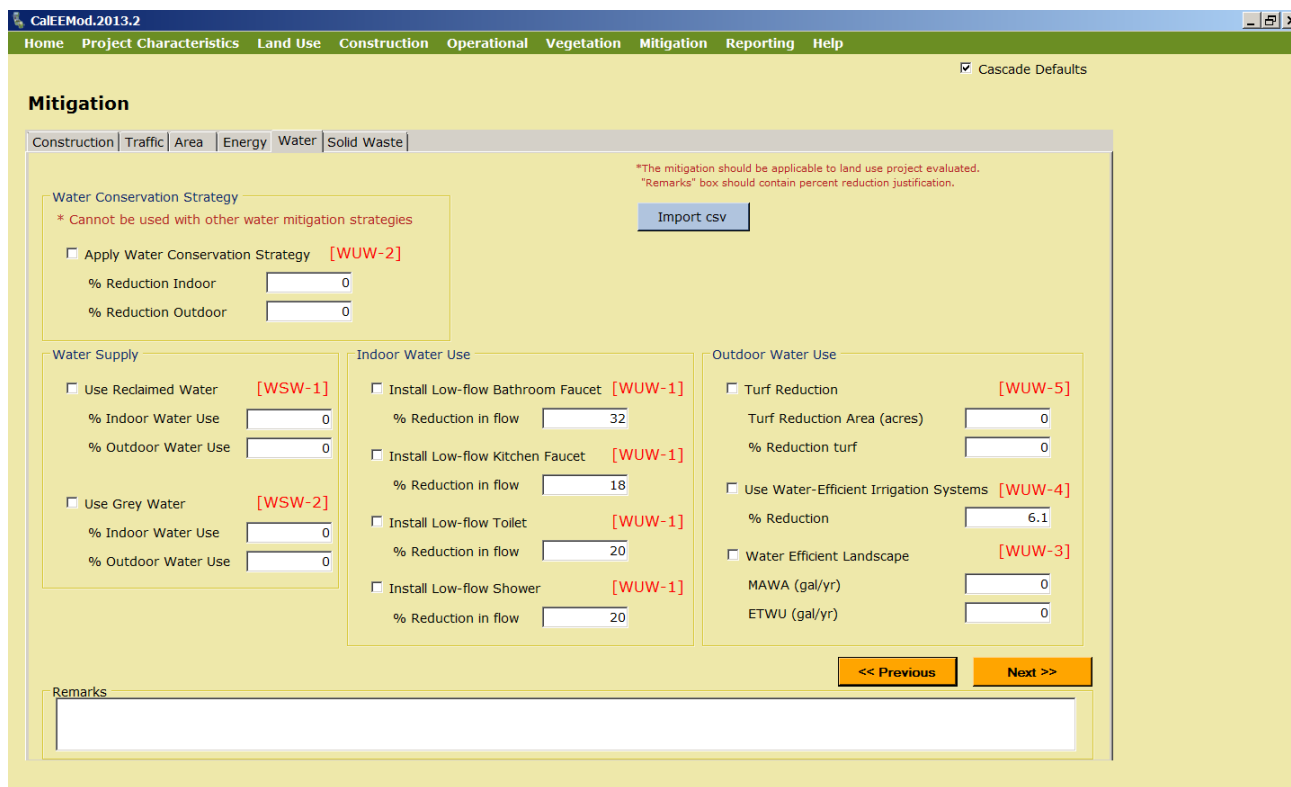
Remarks

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14 Available at <http://www.epa.gov/cpd/annualreports/annualreports.htm>

### 4.11.5 Water Mitigation

Water mitigation can either be estimated as the percent reduction based on a water conservation strategy or the other individual mitigation measures. The CAPCOA Quantifying GHG Mitigation document includes water supply and use measures WSW-1 & 2, WUW-1 through 5. For CAPCOA Mitigation Measure WSW- 3 (Use Locally Sourced Water Supply), using locally-sourced water or water from less energy-intensive sources reduces the electricity and indirect CO<sub>2</sub> emissions associated with water supply and transport because water from local or nearby groundwater basins, nearby surface water and gravity-dominated systems have smaller energy-intensity factors. Therefore, for WSW-3, the user should alter the energy intensity values in water and run a separate CalEEMod run to accommodate these values.



CalEEMod.2013.2

Home Project Characteristics Land Use Construction Operational Vegetation Mitigation Reporting Help

☒ Cascade Defaults

### Mitigation

Construction Traffic Area Energy Water Solid Waste

\*The mitigation should be applicable to land use project evaluated.  
"Remarks" box should contain percent reduction justification.

Import csv

**Water Conservation Strategy**

\* Cannot be used with other water mitigation strategies

☐ Apply Water Conservation Strategy [WUW-2]

% Reduction Indoor 0

% Reduction Outdoor 0

**Water Supply**

☐ Use Reclaimed Water [WSW-1]

% Indoor Water Use 0

% Outdoor Water Use 0

☐ Use Grey Water [WSW-2]

% Indoor Water Use 0

% Outdoor Water Use 0

**Indoor Water Use**

☐ Install Low-flow Bathroom Faucet [WUW-1]

% Reduction in flow 32

☐ Install Low-flow Kitchen Faucet [WUW-1]

% Reduction in flow 18

☐ Install Low-flow Toilet [WUW-1]

% Reduction in flow 20

☐ Install Low-flow Shower [WUW-1]

% Reduction in flow 20

**Outdoor Water Use**

☐ Turf Reduction [WUW-5]

Turf Reduction Area (acres) 0

% Reduction turf 0

☐ Use Water-Efficient Irrigation Systems [WUW-4]

% Reduction 6.1

☐ Water Efficient Landscape [WUW-3]

MAWA (gal/yr) 0

ETWU (gal/yr) 0

Remarks

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### 4.11.6 Solid Waste Mitigation

The user can get a reduction for recycling waste. This mitigation measure corresponds to CAPCOA Mitigation Measure: SW-1.



## 4.12 Reporting

The user initiates final calculations by selecting the report and clicking on the button. The available reports include: Annual, Summer (peak) Daily, Winter (peak) Daily and Mitigation. A separate report viewer will come up. From this report viewer, the user can view their report on-screen, print reports, save as Microsoft excel file or save as a pdf file, or in the case of the Mitigation report, a Microsoft doc file. The data in the excel file has already been calculated and placed in the grids as text, thus, for example, one cannot change an emission value and expect the report to change the summed total value. These values, however, can be copied to new excel spreadsheet for any further desired calculation with the data.





**California Emissions Estimator Model®**

## Appendix A Calculation Details for CalEEMod

Prepared for:  
**California Air Pollution Control Officers  
Association (CAPCOA)**

Prepared by:  
**ENVIRON International Corporation  
San Francisco, California  
and  
California Air Districts**

Revised:  
**July 2013  
CalEEMod v.2013.2  
(Previous version February 2011)**

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# 1 Overview of Program

In 2010, ENVIRON International Corporation (ENVIRON) worked with the South Coast Air Quality Management District (SCAQMD), in collaboration with the other air districts in California, to create a new software program, California Emissions Estimator Model (CalEEMod), that calculates air and greenhouse gas (GHG) emissions associated with land use projects. This document provides the detailed methodologies and data source references that are used in the software program. CalEEMod calculates both the criteria emissions and greenhouse gas emissions associated with construction and operational sources as part of development projects. In addition it calculates GHG emissions associated with one-time changes in vegetation land use. These emission estimates can be used for quantification and reporting as part of the California Environmental Quality Act (CEQA) environmental impact reports and other environmental documentation.

This Appendix A serves as the basis for all methods and assumptions for calculating all emission categories. These category modules include construction, operational energy use, operational mobile sources, operational landscape maintenance, operational consumer product use, operational architectural coating use, operational hearth use, indirect emissions from water and wastewater use, vegetation carbon sequestration, and emissions associated with solid waste disposal.

## 1.1 Structure of this document

This Appendix will discuss each major module in detail with appropriate subdivisions. These major modules include the following:

- Project Characteristics
- Land Use
- Construction
- Operational Mobile
- Operational Area Sources
- Energy Use
- Water and Wastewater
- Solid Waste
- Vegetation
- Mitigation
- Results

# 2 Project Characteristics

The Project Characteristics screen has no calculations associated with it. It is used to provide information on appropriate default values in subsequent screens. A detailed description of this

screen and the areas requiring user input is given in the User's Guide main text. Some further information regarding some of the inputs are below.

- Mendocino County requested county subdivisions as follows:
  - Inland
  - Coastal
  - Rural Inland North
  - Rural Inland South
- Santa Barbara County requested county subdivisions as follows:
  - North Santa Barbara County: North of Santa Ynez range
  - South Santa Barbara County: South of Santa Ynez range
- Wind speeds are from District supplied information, nearby weather stations if easily identifiable<sup>1</sup>, or a default of 2.2 m/s.
- Precipitation Frequency was based on data from the Western Regional Climate Center (WRCC)<sup>2</sup> which is an average of all of the stations found in that county, air basin, or district.

## 2.1 Utility Information

Several of the modules require an estimation of the indirect GHG emissions associated with supplying electricity to the Project site. The end user will need to specify the utility company that will be providing electricity to the Project. The default carbon intensities for the major utility companies as well as a state-wide default are based on Table G6 of the California Air Resources Board (ARB) Local Government Operation Protocol version 1.1 or the latest public utilities inventory reports. This is consistent with recommendations in the California Air Pollution Control Officer Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures document. The complete list of the utilities powering California and the reporting year from which the CO<sub>2</sub> intensity factor currently used in CalEEMod can be found in Table 1.2 in Appendix D. The CH<sub>4</sub> and N<sub>2</sub>O values are based on E-grid values for the region since more refined data is not readily available. The end user will also be able to provide an alternative value that is recommended by the local agency, if applicable.

## 2.2 Criteria Pollutants

The criteria pollutants are those pollutants or precursor pollutants to the chemicals that have National Ambient Air Quality Standards (NAAQS) or California Ambient Air Quality Standards (CAAQS). These pollutants are listed below:

- Particulate Matter: The program will define both Particulate Matter with aerodynamic radius less than 10 microns (PM<sub>10</sub>) and Particulate Matter with aerodynamic radius less than 2.5

<sup>1</sup> <http://www.wrcc.dri.edu/htmlfiles/westwind.final.html>

<sup>2</sup> <http://www.wrcc.dri.edu/htmlfiles/ca/ca.01.html>

microns (PM<sub>2.5</sub>). Since emission factors for PM<sub>2.5</sub> have not been fully defined, the conversion assumption for each generating source will be described in more detail with the specific modules. Particulate matter will be tracked by subtype which will include fugitive dust and equipment exhaust.

- Carbon Monoxide: The emissions from carbon monoxide (CO) will be calculated for all direct combustion sources associated with the project.
- Lead: The emissions from lead (Pb) will be calculated for all direct combustion sources associated with the project.
- Sulfur Dioxide: The emissions associated with sulfur dioxide (SO<sub>2</sub>) will be calculated for all direct combustion sources associated with the project.
- Nitrogen Oxides: The emissions associated with nitrogen oxides (NO<sub>x</sub>) will be calculated for all direct combustion sources associated with the project or direct emissions associated with area sources. Note that there may be some nitrous oxide (N<sub>2</sub>O) emissions that are calculated under the GHG module indirect sources that will not be incorporated into the nitrogen oxide emission tally for criteria pollutants since these emissions may be out of basin.
- Ozone: The ozone (O<sub>3</sub>) emissions are not calculated directly in this program. Instead the emissions associated with ozone precursors are calculated.
- Ozone Precursors: Ozone precursors will be quantified as reactive organic gases (ROG). ROGs when released will interact in the atmosphere and produce ozone.

By definition, a Volatile Organic Compound (VOC) is an organic compound that can evaporate into an organic gas. VOCs can be either reactive or non-reactive. Over the years, non-reactive VOCs have been exempt from regulation. CalEEMod calculates the VOC emissions from the application of architectural coatings based on the locally required VOC content limit of the coatings. ROG is an organic gas that undergoes a photochemical reaction, thus, is reactive. ROG emissions are generated from the exhaust of mobile sources and these combustion emissions are calculated in CalEEMod based on ARB's ROG emission factors. Both VOC and ROGs are precursors to ozone so they are summed in the CalEEMod report under the header ROG. For the purposes of comparing the ROG value to a VOC significance threshold, the terms can be used interchangeably.

### 2.3 Greenhouse Gas Pollutants

The greenhouse gas (GHG) pollutants are those recognized by the state of California under Assembly Bill 32 (AB32). The most common GHGs emitted in association with land use developments include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). All GHGs will be reported on a common currency of carbon dioxide equivalent (CO<sub>2</sub>e). In order to obtain the CO<sub>2</sub>e, an individual GHG is multiplied by its global warming potential (GWP). The GWP designates on a pound for pound basis the potency of the GHG compared to CO<sub>2</sub>. The program

will use GWP from the IPCC Second Assessment Report (SAR)<sup>3</sup>. GWPs from the SAR were selected instead of more recent GWPs since it is the basis used in regulations and international protocols at this time (e.g., California and Federal GHG Reporting Programs, The Climate Registry).

### 3 Land Use

The primary project description data that needs to be entered by the user is a listing of all land use types and size of the land use types that make up the project. CalEEMod contains several land use categories that are mainly based on ITE land use classifications. Some further division of some land uses (mainly warehouses) has been added. The land use subtype is the basis to define several default values used by the modules. The user-defined land use does not have any default information and the end user is required to enter all of the necessary information. The program currently places a value of 0 for all areas where user defined values would be required for a blank land use.

The land use size has several different size metrics that the end user can choose from. In order for the information to be cross-compatible, the user can enter all of the metrics for a given land use or default conversions between the metrics will be used. The cross-comparison data generally came from the following sources:

- The value for average dwelling unit square footage is rounded based on the average square footage reported in the Residential Appliance Saturation Survey (RASS). Retirement communities and congregate care facilities are assumed to be similar in size to multifamily units.
- The conversion value is based on taking the ratios of different metrics reported in the Institute of Transportation Engineers (ITE) trip rate manual.
- Equivalent commercial building metrics as noted in Table B1 of the Energy Information Administration (EIA) Commercial Building Energy Consumption Survey (CBECS).
- South Coast Air Basin land use statistics (see Appendix E for this reference data).

Unlike other programs, CalEEMod does not account for additional acreage associated with commercial buildings. This was deemed unnecessary since parking lots have been separated out as a separate land use and multi-story buildings should have their lot acreage known.

#### 3.1 Population

The population is used to estimate some metrics. The population per dwelling unit is based on the statewide default or information supplied by individual air districts.

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<sup>3</sup> IPCC. 1995. Second Assessment Report. Available at [http://www.ipcc.ch/ipccreports/sar/wg\\_i/ipcc\\_sar\\_wg\\_i\\_full\\_report.pdf](http://www.ipcc.ch/ipccreports/sar/wg_i/ipcc_sar_wg_i_full_report.pdf)



## 4 Construction

The construction module is used to calculate the emissions associated with the construction of the project. Construction emissions have several different types of sources which contribute to emissions of pollutants. These source types include off-road equipment usage, on-road vehicle travel, fugitive dust, architectural coating, and paving off-gassing. Each of these source types is discussed in more detail in the subsequent sections. These emission sources are associated with various types of construction phases. Typical construction phases include demolition, site preparation, grading, trenching, building construction, paving, and architectural coating. The extent to which these phases occur depends on the specific project. For instance, a demolition phase would only occur if demolition of existing structures was required. Similarly, trenching only occurs if the project requires trenching generally associated with underground utilities. Unique aspects and default assumptions associated with these phases is discussed below in the context of the different emission source calculations.

### 4.1 Construction Phase

No emission calculations are associated with this subscreen. The SCAQMD construction survey is used to estimate default phase lengths based on total project acreage as calculated from the acreage entered on the land use screen. If the acreage is in between the acreage in the survey, the next highest acreage tier is used. If the project size defined by the user is between the sizes of two surveyed projects, CalEEMod conservatively uses the phase duration for the larger project. For instance, if the given project is 7 acres, the program will use the phase duration for the 10-acre project rather than that for the 5-acre project. For large acreage sites, the survey was extrapolated by adding additional phase time equivalent to adding phase time from two acreage ranges in the survey. This occurs for sites with acreage larger than 34 acres. In these situations, the user should consider the accuracy of the equipment and phase duration estimations or using site-specific construction schedules and equipment lists.

The date range, work days per week and total days are dynamically linked to each other and will influence one another if the user changes these values.

### 4.2 Off-road Equipment

Construction consists of several types of off-road equipment. Since the majority of the off-road construction equipment used for construction projects are diesel fueled, CalEEMod assumes all of the equipment operates on diesel fuel. However, there are mitigation measures that can be implemented that will allow for use of alternative fueled equipment.

The SCAQMD construction survey is used to estimate default equipment lists based on total project acreage as calculated from the acreage entered on the land use screen. If the acreage is in between the acreage in the survey, the next highest acreage tier is used. For large acreage sites, the survey was extrapolated by adding additional phase time equivalent to adding phase time from two acreage ranges in the survey. This occurs for sites with acreage larger than 34 acres. In these situations, the user should consider the accuracy of the equipment and phase duration estimations or using site-specific construction schedules and equipment lists.

The calculations associated with this screen include the running exhaust emissions from off-road equipment. Since the equipment is assumed to be diesel, there are no starting or evaporative emissions associated with the equipment as these are *de minimis* for diesel-fueled equipment<sup>4</sup>. The software program calculates the exhaust emissions based on California Air Resources Board (ARB) OFFROAD2011 methodology using the equation presented below.<sup>5</sup>

$$\text{Emission}_{\text{DieselEx}} = \sum_i (\text{EF}_i \times \text{Pop}_i \times \text{AvgHp}_i \times \text{Load}_i \times \text{Activity}_i)$$

Where:

*EF* = Emission factor in grams per horsepower-hour (g/bhp-hr) as processed from OFFROAD2011

*Pop* = Population, or the number of pieces of equipment

*AvgHp* = Maximum rated average horsepower

*Load* = Load factor

*Activity* = Hours of operation

*i* = equipment type

The program allows the end user to enter the number of pieces of equipment, horsepower, load factor, and daily hours of operation for each selected equipment type. CalEEMod assigns default parameters for the construction equipment as explained below:

### **Emission Factor**

OFFROAD2011 was run for statewide with averaging days of MON-SUN for 22 scenario years each. All scenarios were run for three seasons – Annual, Summer, and Winter. The exhaust emission factors for each equipment at each horsepower range were back calculated from total daily emissions reported in the model output files using the following formula:

$$\text{Emission Factor [g/hp-hr]} = \frac{\text{Total Daily Exhaust} \times 907,184.74}{\text{Activity} \times \text{AvgHP} \times \text{LF}}$$

Where:

|                     |                                                                  |
|---------------------|------------------------------------------------------------------|
| Total Daily Exhaust | = Total pollutant emissions [tons/day]                           |
| Activity            | = Total daily statewide usage of equipment [hours/day]           |
| AvgHP               | = Average HP of equipment within the horsepower range [HP]       |
| LF                  | = Load Factor of equipment [unitless]                            |
| 907,184.74          | = Conversion factor tons to grams (2000 lbs/ton x 453.5924 g/lb) |

<sup>4</sup> ARB. 2006. Program Structure of the OFFROAD2007. Dec. Available at [http://www.arb.ca.gov/msei/offroad/pubs/offroad\\_overview.pdf](http://www.arb.ca.gov/msei/offroad/pubs/offroad_overview.pdf)

<sup>5</sup> California Air Resource Board (ARB). 2006. Overview: OFFROAD Model Available at [http://www.arb.ca.gov/msei/offroad/pubs/offroad\\_overview.pdf](http://www.arb.ca.gov/msei/offroad/pubs/offroad_overview.pdf)

Total Daily Exhaust and Activity were obtained from OFFROAD2011 model output, while AvgHP and LF were obtained from input files to the model.

### ***AvgHP***

The default average equipment horsepower is from OFFROAD2011. OFFROAD2011 has an average horsepower for each engine tier which was used in developing the emission factor (from equip.csv). This is different than the default horsepower used for default data which is based on the average horsepower of the mode of populations for the various engine horsepower tiers in OFFROAD.

### ***Load***

The load factor is the ratio of the actual output to the maximum output of a piece of equipment. The program uses the OFFROAD2011 load factor as default. Based on OFFROAD2011, the load factor is equipment type-specific and does not vary with horsepower (hp) (e.g., the load factors of a 125-hp dozer and a 500-hp dozer are the same).

### ***Activity***

The default hours of operation are 8 hours a day and 5 days a week over the construction phase duration unless specified otherwise in the equipment list. The construction phase length is used from the construction phase screen.

### ***i (Equipment Type) and Pop***

The default equipment list and number of pieces of equipment for each equipment type is determined based on the size (i.e., acreage) of the construction project based on the construction activity survey performed by the SCAQMD (Appendix E). If the project size defined by the user is between the sizes of two surveyed projects, the program will use the equipment list and number for the larger project. All equipment in the construction category of OFFROAD2011 is included in CalEEMod.

## **Trenching Emissions**

There is no default equipment list associated with trenching emissions at this time. The user can enter site-specific equipment lists for these situations.

## **4.3 Dust From Material Movement**

Fugitive dust is generated by the various source activities occurring at a construction site. This dust contributes PM<sub>10</sub> and PM<sub>2.5</sub> emissions and for detailed emission breakdowns are distinguished from exhaust particulate matter emissions. The program calculates fugitive dust associated with the site preparation and grading phases from three major activities: haul road grading, earth bulldozing, and truck loading. As recommended by SCAQMD, the fugitive dust emissions from the grading phase are calculated using the methodology described in USEPA AP-42.

## Grading Equipment Passes

Fugitive dust emissions from grading equipment passes are estimated using the methodology described in Section 11.9, Western Surface Coal Mining, of the USEPA AP-42.<sup>6</sup> AP-42 estimates the emission factor of PM<sub>10</sub> applying a scaling factor to that of PM<sub>15</sub>. Similarly, the emission factor of PM<sub>2.5</sub> is scaled from that of total suspended particulates (TSP). The equations used to calculate the emission factors for PM<sub>15</sub> and TSP and the scaling factor for those of PM<sub>10</sub> and PM<sub>2.5</sub> are presented below:

$$EF_{PM15} = 0.051 \times (S)^{2.0}, \text{ and } EF_{PM10} = EF_{PM15} \times F_{PM10}$$

$$EF_{TSP} = 0.04 \times (S)^{2.5}, \text{ and } EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$$

Where:

$EF$  = emission factor (lb/VMT)

$S$  = mean vehicle speed (mph). The AP-42 default value is 7.1 mph.

$F_{PM2.5}$  = PM<sub>2.5</sub> scaling factor. The AP-42 default value is 0.031.

$F_{PM10}$  = PM<sub>10</sub> scaling factor. The AP-42 default value is 0.6.

The grading dust emissions are calculated by multiplying the emission factors with the total vehicle miles traveled (VMT) for the grading equipment (i.e., grader). The VMT are estimated based on the dimensions of the grading area and the blade width of the grading equipment.

$$E = EF \times VMT, \text{ and}$$

$$VMT = A_s / W_b \times 43,560(\text{sqft} / \text{acre}) / 5,280(\text{ft} / \text{mile})$$

Where:

$E$ : emissions (lb)

$EF$ : emission factor (lb/VMT)

VMT: vehicle miles traveled (mile)

$A_s$ : the acreage of the grading site (acre)

$W_b$ : Blade width of the grading equipment. The program uses a default blade width of 12 ft based on Caterpillar's 140 Motor Grader.<sup>7</sup>

Note that the dimensions (i.e., length and width) of the grading site have no impact on the calculation, only the total area to be graded. In order to properly grade a piece of land multiple passes with equipment may be required. The acres is based on the equipment list and days in grading or site preparation phase according to the anticipated maximum number of acres a given piece of equipment can pass over in an 8-hour workday. The equipment specific grading rates are given in the table below as determined by SCAQMD in consultation with building estimator references.

<sup>6</sup> Available at: <http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf>

<sup>7</sup> <http://www.cat.com/cmms/16897760?x=7>

| Equipment Type      | Acres/8hr-day |
|---------------------|---------------|
| Crawler Tractors    | 0.5           |
| Graders             | 0.5           |
| Rubber Tired Dozers | 0.5           |
| Scrapers            | 1             |

## Bulldozing

Similar to the grading equipment passes emission estimation, the bulldozing emission factors for PM<sub>10</sub> and PM<sub>2.5</sub> are scaled from those of PM<sub>15</sub> and TSP. Based on Section 11.9 of AP-42, the dust emission factor for bulldozing is calculated using the following equations:

$$EF_{TSP} = \frac{C_{TSP} \times S^{1.2}}{M^{1.3}}, \text{ and } EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$$

$$EF_{PM15} = \frac{C_{PM15} \times S^{1.5}}{M^{1.4}}, \text{ and } EF_{PM10} = EF_{PM15} \times F_{PM10}$$

Where:

$EF$  = emission factor (lb/hr)

$C$  = arbitrary coefficient used by AP-42

$M$  = material moisture content (%)

$S$  = material silt content (%)

$F$  = scaling factor

$C$ ,  $M$ ,  $s$ , and  $F$  vary depending on the bulldozed material. The table below summarizes the constants for overburden<sup>8</sup> presented in AP-42<sup>9</sup>.

### Bulldozing Fugitive Emission Factors

| Constant    | Overburden |
|-------------|------------|
| $C_{TSP}$   | 5.7        |
| $C_{PM15}$  | 1.0        |
| $M$         | 7.9%       |
| $S$         | 6.9%       |
| $F_{PM10}$  | 0.75       |
| $F_{PM2.5}$ | 0.105      |

<sup>8</sup> The earth that is between the topsoil and the coal seam (USEPA AP-42).

<sup>9</sup> Tables 11.9-1 and 11.9-3 of USEPA AP-42.

The program uses the constants associated with overburden as default for calculation of bulldozing dust emissions since overburden more closely models the bulldozed materials during the development construction. The dust emissions are calculated by multiplying the emission factor with the hours of operation for the dozers listed in the equipment list using the formula below:

$$E = EF \times Hr$$

Where:

$E$  = emissions (lb)

$EF$  = emission factor (lb/hr)

$Hr$  = hours of operation

### Truck Loading

Processes such as truck dumping on the pile or loading out from the pile to a truck with a front-end loader also cause fugitive dust emissions. The program calculates these emissions using the methodology described in Section 13.2, Introduction to Fugitive Dust Sources, of USEPA AP-42. The emission factor that is based on the material moisture content and mean wind speed is calculated using the following formula:

$$EF_D = k \times (0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Where:

$EF$  = emission factor (lb/ton)

$K$  = particle size multiplier. The AP-42 default value for  $PM_{10}$  is 0.35 and that for  $PM_{2.5}$  is 0.053

$U$  = mean wind speed. The program selects wind speed based on the value listed on the Project Characteristics screen. It has been converted internally to miles per hour.

$M$  = material moisture content (%). The moisture contents of different materials are listed in Table 13.2.4-1 of AP-42. The program uses the moisture content of cover (12%) as default.

The fugitive dust emissions are calculated by multiplying the emission factor with the throughput of loaded and unloaded material that is entered by the end user.

$$E = EF \times TP$$

Where:

$E$  = emissions (lb)

$EF$  = emission factor (lb/ton)

$TP$  = throughput of loaded and unloaded materials (ton)

CalEEMod assumes that 1.2641662 tons per cubic yard based on a bulk density of 1.5 grams per cubic centimeter. Typical soil densities range from about 1.25 to about 1.6. 1.5 is the approximate density of a silty loam soil which is relatively common in most other parts of the state. The density reported above does not account for watering to suppress dust, it only accounts for natural moisture. This is supported by the several references<sup>10</sup>.

#### 4.4 Demolition

The program calculates the demolition dust emissions using the methodology described in the report prepared for the USEPA by Midwest Research Institute (MRI).<sup>11</sup> The three primary operations that generate dust emission during the demolition phase are mechanical or explosive dismemberment, site removal of debris, and on-site truck traffic on paved and unpaved road. The truck traffic on roads is described with the trips and VMT information.

##### Mechanical or Explosive Dismemberment

Based on the MRI report, there is no AP-42 emission factor data available for this mechanical or explosive dismemberment. Thus, the emission factor for dismemberment and collapse of a structure is calculated using the following AP-42 equation for batch drop operations:

$$EF_D = k \times (0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Where:

$EF_D$  = emission factor (lb PM/ton of debris)

$EF_{D-PM_{10}}$  = 0.0011 lb PM<sub>10</sub>/ton of debris

$EF_{D-PM_{2.5}}$  = 0.00017 lb PM<sub>2.5</sub>/ton of debris

$k$  = particle size multiplier. The AP-42 default value for PM<sub>10</sub> is 0.35 and that for PM<sub>2.5</sub> is 0.053.

<sup>10</sup> <http://www.pedosphere.com/resources/bulkdensity/triangle.cfm?>

Saxton et al., 1986 <http://ddr.nal.usda.gov/bitstream/10113/35/1/IND86070586.pdf>

<sup>11</sup> Midwest Research Institute. 1988. Gap Filling PM10 Emission Factors for Selected Open Area Dust Sources.

$U$  = mean wind speed. The program selects the default mean wind speed based on the wind speed (m/s) provided on the project characteristics screen.

$M$  = material moisture content. The program uses 2% as the default based on the MRI report.

The dust emissions are calculated by multiplying the above emission factors with the total weight of building waste using the following equation:

$$E_D = EF_D \times W$$

Where:

$E_D$  = emissions (lb of PM)

$EF_D$  = emission factor (lb of PM/ton of debris)

$W$  = building waste (ton of debris)

If the total building waste weight is not known, the program will estimate the tonnage using the *building waste tonnage – structural floor space* relationship determined from a 1976 analysis by Murphy and Chatterjee of the demolition of 12 commercial brick, concrete, and steel buildings. The following data are cited directly from the MRI report:

1 ft<sup>2</sup> floor space = 10 ft<sup>3</sup> original building volume,

1 ft<sup>3</sup> building volume = 0.25 ft<sup>3</sup> waste volume,

1 yd<sup>3</sup> building waste = 0.5 ton weight,

Mean truck capacity = 20 yd<sup>3</sup> haulage volume, and therefore

1 ft<sup>2</sup> represents 0.046 ton of waste material.

The total building waste is then calculated using the following equation:

$$E_D = EF_D \times SF \times 0.046(\text{ton} / \text{ft}^2)$$

Where:

$E_D$  = emissions (lb of PM)

$EF_D$  = emission factor (lb of PM/ton of debris)

$SF$  = building square footage (ft<sup>2</sup>)

## Debris Loading

The dust emission factor of PM<sub>10</sub> and PM<sub>2.5</sub> in pounds per ton building waste is estimated based on the measured total suspended particulates (TSP) emission factor using the following equation:

$$EF_L = k \times EF_{L-TSP}$$

Where:

$EF_L$  = emission factor (lb/ton)

$k$  = particle size multiplier. The AP-42 default value for PM<sub>10</sub> is 0.35 and that for PM<sub>2.5</sub> is 0.053.



The default value for  $EF_{L-TSP}$  is 0.058 lb/ton, the average of the two TSP factor (i.e. 0.053 and 0.063 lb/ton) measured from two tests of the filling of trucks with crushed limestone using a front-end loader.

The dust emissions from debris loading are then calculated following the same methodology used for mechanical and or explosive dismemberment:

$$E_L = EF_L \times SF \times 0.046(\text{ton} / \text{ft}^2)$$

Where:

$E_L$  = emissions (lb)

$EF_L$  = emission factor (lb/ton)

$SF$  = building square footage (ft<sup>2</sup>)

#### 4.5 Trips and VMT

The number of worker, vendor, and hauling trips and associated vehicle miles traveled (VMT) are used to determine both the exhaust emissions associated with on-road vehicle use and fugitive dust emissions.

##### Trips

Worker trips for all construction phases except building construction and architectural coating is based on 1.25 workers per equipment in that phase resulting in one roundtrip per worker. For building construction workers, the trip number is estimated using the trip generation rate from a survey conducted by SMAQMD. This has been reanalyzed and results in slightly different numbers than used by other programs and that was previously reported in some agency documents. The analysis and data supporting these values can be found in Appendix E. The land types selected for the project are grouped into four categories presented in the following table which also presents the associated SMAQMD trip generation rates.

**Building Construction Worker and Vendor Trip Rates**

| Land Use SubType                                                                                            | Rate Metric               | Worker Trip Rate | Vendor Trip Rate |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------|------------------|
| Single Family                                                                                               | Daily Trips per DU        | 0.36             | 0.1069           |
| Multi-Family                                                                                                | Daily Trips per DU        | 0.72             | 0.1069           |
| Commercial/Retail                                                                                           | Daily Trips per 1000 sqft | 0.32             | 0.1639           |
| Office/Industrial                                                                                           | Daily Trips per 1000 sqft | 0.42             | 0.1639           |
| Source: SCAQMD's analysis of SMAQMD Building Construction Worker and Vendor trip rates found in Appendix E. |                           |                  |                  |

Architectural coating worker trips are 20% of building construction phase trips. Vendor trips are only associated with building construction and is based on the land uses and trip rate indicated in the table above.

Haul trips are based on the amount of material that is demolished, imported or exported assuming a truck can handle 16 cubic yards of material. For phased trips, the truck is assumed

to be full both ways. For non-phased trips, the truck is assumed to be empty one direction and thus results in more haul trips calculated.

## VMT

The VMT is estimated from the trip lengths input in this screen. The default trip length for workers is based on the location H-W trip length. The default trip length for vendors is the C-NW trip length. The hauling trip length default is set at 20 miles.

## On-Road Vehicle Emissions

Construction generates on-road vehicle exhaust, evaporative, and dust emissions from personal vehicles for worker and vendor commuting, and trucks for soil and material hauling. These emissions are based on the number of trips and VMT along with emission factors from EMFAC2011.

EMFAC2011 was run in Burden mode with model year breakdown for all counties, air basins, air districts and statewide average with default settings for 22 scenario years each.<sup>12</sup> All scenarios were run for three seasons – Annual, Summer, and Winter.

Running emissions for all pollutants and PM emissions from tire and brake wear were divided by the VMT of each respective vehicle class from each scenario year and adjusted for unit conversions to derive emission factors in units of grams per VMT. All other emissions (including evaporative) were divided by the number of trips to derive emission factors in units of grams per trip.

For all CO<sub>2</sub> emissions (running, startup, and idling), emission reductions due to Pavley I were applied to LDA, LDT1, LDT2, and MDV for each vehicle model year, and summed to arrive at the total CO<sub>2</sub> emissions for each scenario year. Reductions from Low Carbon Fuel Standards and Pavley I are reflected in CO<sub>2</sub> emissions for scenario years 2011 and after. VMT fractions, calculated as the ratio of VMT for each vehicle class to total VMT for all vehicles were also derived for each scenario year. These values are based on ARB's EMFAC post processor. The emissions from mobile sources were calculated with the trip rates, trip lengths and emission factors for running from EMFAC2011 as follows:

$$\text{Emissions}_{\text{pollutant}} = \text{VMT} * \text{EF}_{\text{running,pollutant}}$$

Where:

$\text{Emissions}_{\text{pollutant}}$  = emissions from vehicle running for each pollutant

VMT = vehicle miles traveled

$\text{EF}_{\text{running,pollutant}}$  = emission factor for running emissions

<sup>12</sup> 1990, 2000, 2005, 2010 to 2025 inclusive, 2030, 2035, and 2040

Evaporative emissions, starting and idling emissions are multiplied by the number of trips times the respective emission factor for each pollutant.

### Brake Wear and Tire Wear Emissions

As vehicles are driven, particulate matter is generated from degradation of brakes and tires. This is calculated based on the EMFAC emission factors for each vehicle class and the total VMT traveled by that vehicle class according to the following equation:

$$\text{Emission}_{\text{brakewear, tirewear}} = \sum_{\text{class}} (\text{E.F.}_{\text{brakewear, tirewear, class}} \times \text{VMT}_{\text{class}})$$

### Vehicle Mix

The user can select the type of vehicle mix. The EMFAC mix is the total mix of all vehicles provided by EMFAC. The program can also assume that the workers' personal vehicles consist of 50% light-duty auto (or passenger car), 25% light-duty truck type 1 (LDT1), and 25% light-duty truck type 2 (LDT2). The gross vehicle weight (GVW) from EMFAC2011 for each type of vehicle is presented below<sup>13</sup>:

Gross Vehicle Weights

| Vehicle Type | GVW (lb)      |
|--------------|---------------|
| LDA          | All           |
| LDT1         | 0 - 3,750     |
| LDT2         | 3,751 - 5,750 |

For vendor trips, CalEEMod has the option to choose the EMFAC mix or also choose all HHDT or all MHDT vehicles. The program default assumes that all vendors' vehicles are heavy heavy-duty trucks (HHDT) with GVW between 33,000 and 60,000 lb based on EMFAC2011.

For hauling trips, CalEEMod has the option to choose the EMFAC mix, all MHDT, all HHDT or a 50% mix of MHDT and HHDT vehicles.

## 4.6 On-Road Fugitive Dust

CalEEMod calculates all on-road fugitive dust associated with paved and unpaved roads consistent with the method discussed in the traffic section. All vehicle miles traveled from worker commuting, vendor commutes, soil hauling, and demolition hauling are accounted for. The same equations described in section 5.3 are used here with the variables coming from this screen.

<sup>13</sup> ARB. EMFAC2007 version 2.30 User's Guide.

Available at: [http://www.arb.ca.gov/msei/onroad/downloads/docs/user\\_guide\\_emfac2007.pdf](http://www.arb.ca.gov/msei/onroad/downloads/docs/user_guide_emfac2007.pdf)

## 4.7 Architectural Coatings

Volatile organic compounds<sup>14</sup> (VOC) off-gassing emissions result from evaporation of solvents contained in surface coatings. The program calculates the VOC evaporative emissions from application of residential and non-residential surface coatings using the following equation:

$$E_{AC} = EF_{AC} \times F \cdot A_{\text{paint}}$$

Where:

$E$  = emissions (lb VOC)

$EF$  = emission factor (lb/sqft)

$A$  = building surface area (sqft). The program assumes the total surface for painting equals 2.7 times the floor square footage for residential and 2 times that for nonresidential square footage defined by the user.<sup>15</sup> All of the land use information provided by a metric other than square footage will be converted to square footage using the default conversions or user defined equivalence.

$F$  = fraction of surface area. The default values based on SCAQMD methods used in their coating rules are 75% for the interior surfaces and 25% for the exterior shell.

The emission factor ( $EF$ ) is based on the VOC content of the surface coatings and is calculated estimated using the equation below:

$$EF_{AC} = C_{VOC} / 454(\text{g/lb}) \times 3.785(\text{L/Gal}) / 180(\text{sqft})$$

Where:

$EF$  = emission factor (lb/sqft)

$C$  = VOC content (g/L). This varies by location and year

The emission factors for coating categories are calculated using the equation above based on default VOC content provided by the air districts or ARB's statewide limits<sup>16</sup>.

CalEEMod also calculates the VOC emissions from the painting of stripes, handicap symbols, directional arrows and car space descriptions in parking lots. Please refer to Appendix E for the studies conducted to determine a default percent of parking lot square footage that is painted. The equation for striping emission is the same as that for  $E_{AC}$  above, but  $A_{\text{paint}}$  is:

$$A_{\text{paint}} = A_{PL} \times P\%$$

<sup>14</sup> This program will assume that all VOCs are represented by reactive organic gases (ROGs)

<sup>15</sup> The factors 2.7 and 2 are based on page A9-124 of SCAQMD's 1993 CEQA Guide.

<sup>16</sup> Received via email from James Koizumi dated April 27, 2010.

Where:

$A_{PL}$  = Parking lot area (sqft)

$P\%$  = Default percent of parking lot area that is painted

The VOC content limit is based on the exterior coating of the region where the project is located. If the user has more specific VOC content limit on the coating being applied the default can be overridden but the user is expected to explain and justify the change in the “Remarks” box at the bottom of the screen.

#### 4.8 Asphalt Paving Off-Gassing Emissions

While there is no specific screen associated with asphalt paving emissions, CalEEMod estimates VOC off-gassing emissions associated with asphalt paving of parking lots using the following equation:

$$E_{AP} = EF_{AP} \times A_{Parking}$$

Where:

$E$  = emissions (lb)

$EF$  = emission factor (lb/acre). The SMAQMD default emission factor is 2.62 lb/acre.<sup>17</sup>

$A$  = area of the parking lot (acre)

The size (acre) of the parking lot is calculated by multiplying the paved area associated with each parking stall with the capacity of the parking lot, or the number of parking stalls.

$$A_{Parking\_lot} = A_{Parking\_Stall} \times Capacity$$

Where the paved area associated with parking stall includes the area of the parking stall and that of the immediate access road, or aisle.

$$A_{Parking\_Stall} = W_{Stall} \times D_{Stall} + W_{Stall} \times W_{Aisle}$$

Where:

$A$  = area (sqft)

$W$  = width (ft)

$D$  = depth (ft)

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<sup>17</sup> Sacramento Metropolitan Air Quality Management District. 1994. Air quality thresholds of significance, first edition. Sacramento, CA.

The dimensions (i.e., width and depth) of a parking stall and the aisle width vary depending on the local government planning guidance. The program conservatively assumes 400 square feet (0.009 acre) of paved area per parking stall as default based on the city guidance or municipal code of the following cities in the State of California and a one-way aisle:

Table 4.4 Parking Stall Size Estimate

| Location                               | Dimensions |            |                  |                       |                       |           |       |       |                       |                       |
|----------------------------------------|------------|------------|------------------|-----------------------|-----------------------|-----------|-------|-------|-----------------------|-----------------------|
|                                        | Compact    |            |                  |                       |                       | Full Size |       |       |                       |                       |
|                                        | Width (ft) | Depth (ft) | Aisle Width (ft) | Area (two-way) (sqft) | Area (one-way) (sqft) | Width     | Depth | Aisle | Area (two-way) (sqft) | Area (one-way) (sqft) |
| City of San Jose <sup>18</sup>         | 8          | 16         | 20               | 208                   | 288                   | 9         | 18    | 26    | 279                   | 396                   |
| Menlo Park <sup>19</sup>               | 8          | 16.5       | 23               | 224                   | 316                   | 9         | 18    | 23    | 265.5                 | 369                   |
| Escondido Municipal Code <sup>20</sup> | 8.5        | 16         | 24               | 238                   | 340                   | 8.5       | 18    | 24    | 255                   | 357                   |
| Davis <sup>21</sup>                    | 8          | 16         | 20               | 208                   | 288                   | 9         | 18    | 20    | 252                   | 342                   |

The program allows the end user to override the total acres assumed in the land use screen.

## 4.9 Maximum Daily Construction Emissions

Since construction phases may or may not overlap in time, the maximum daily construction emissions will not necessarily be the sum of all possible daily emissions. CalEEMod therefore calculates the maximum daily emissions for each construction phase. The program will then add together the maximum daily emissions for each construction phase that overlaps in time. Finally the program will report the highest of these combined overlapping phases as a daily maximum. For fugitive dust calculations during grading, the maximum amount of acres graded in a day is determined by the number of grading equipment which is assumed to operate for 8 hours.

<sup>18</sup> Available at: [http://www.sanjoseca.gov/planning/pdf/Off-Street\\_Parking\\_Design\\_Standards.pdf](http://www.sanjoseca.gov/planning/pdf/Off-Street_Parking_Design_Standards.pdf)

<sup>19</sup> Available at: [http://www.ci.menlo-park.ca.us/departments/trn/park\\_guide.pdf](http://www.ci.menlo-park.ca.us/departments/trn/park_guide.pdf)

<sup>20</sup> Available at: [http://www.qcode.us/codes/escondido/view.php?topic=33-39-33\\_768&frames=on](http://www.qcode.us/codes/escondido/view.php?topic=33-39-33_768&frames=on)

<sup>21</sup> Available at: <http://cityofdavis.org/cmo/citycode/detail.cfm?p=40&q=1890>

## 5 Operational Mobile

CalEEMod calculates the emissions associated with on-road mobile sources. These are associated with residents, workers, customers, and delivery vehicles visiting the land use types in the project. The emissions associated with on-road mobile sources includes running and starting exhaust emissions, evaporative emissions, brake and tire wear, and fugitive dust from paved and unpaved roads. Starting and evaporative emissions are associated with the number of starts or time between vehicle uses and the assumptions used in determining these values are described below. All of the other emissions are dependent on vehicle miles traveled (VMT). The methods and assumptions used by the program are described in the following sections.

### 5.1 Vehicle Trips

The first step in determining the number of starts and vehicle miles traveled is to determine the number of trips associated with the various project land uses. These trips are calculated based on either an average daily or a peak daily. The average daily is used when calculating annual emissions from a project, and peak daily is used when calculating peak daily summer or winter emissions. Since CalEEMod has different trip rates for different days of the week, the daily maximum will be determined based on the highest total of either weekday, Saturday, or Sunday trip emissions. To calculate average daily trips, the weekday trips are multiplied by five and added to the Saturday and Sunday trips, then divided by 7. The average daily trip rates for the individual land uses being modeled are used by CalEEMod in the calculation of a project's annual vehicle miles traveled and as just described are determined from the following equation:

Average Daily Trip Rate  $_i$  =

$$(Triprate_{Weekday} \times 5 + Triprate_{Sat} + Triprate_{Sun})_i / 7 \times LandUse_i$$

Where

Trip Rate            = Weekday, Saturday, or Sunday daily trip generation rate

Land Use            = Size metric for a land use type (e.g., number of dwelling units)

$_i$                       = Land use type

For peak daily trips, CalEEMod chooses the highest trip rate amongst weekday, Saturday and Sunday data, and multiplies by the size metric to get total peak daily trips.

Trip rate describes the amount of trips generated by each land use. Multiplying trip rate per unit size of land use (e.g., per dwelling unit, per 1,000 sqft, etc.) by land use size yields total daily trips generated by each land use. The Institute of Transportation Engineers (ITE) trip

generation rate<sup>22</sup> are used as default in the program except for an interim warehouse trip rate which is based on an analysis by SCAQMD staff presented in Appendix E. Like all standard references, it should be noted that ITE has guidance about how their trip rates should be used. For example, some land uses (e.g., electronic superstore, fast food without drive-thru, general heavy industrial, government (civic center), hardware/paint store, movie theater without a matinee) are based on a limited number of survey samples so the user might consider gaining more refined trip rate information for their project. If the user needs more specific information than the default trip rates provided by CalEEMod, they are encouraged to consult with licensed traffic engineers. If more accurate trip rate information is available, the user has the ability to override the default Trip Rate. The end user will be required to provide justification from alternative sources of data (e.g., project-specific traffic study) that demonstrate that a different trip rate is appropriate for their project. Metropolitan Planning Organizations (MPOs) may be another source of trip generation rates specific for the given region.

### Trip Type

Once the total number of trips for a land use type is determined, the next step is to determine the trip type. The trip type breakdown describes the purpose of the trip generated at each land use. For example, the trip type breakdown indicates the percentage of trips generated at single family home for work, for shopping, and for other purposes. Multiplying the total trips for a land use by trip type breakdown percentage yields trips of a given trip type. Two sets of trip type breakdown are used in CalEEMod— residential breakdown and commercial breakdown.

**Residential trip type:** These include home-work (H-W), home-shop (H-S), or home-other (H-O). A home-work trip represents the trip from the home to the workplace. A home-shop trip represents the trip from the home to a land use where shopping takes place (generally retail). A home-other represents all other types of trips generated from the resident such as school, entertainment, etc. The trip type breakdown is from district supplied information or the 1999 Caltrans Statewide Travel Survey is used as default or specific information obtained from the various Districts. It is recommended that the District or Project Applicant go to accredited sources such as the regional Metropolitan Planning Organization (MPO) to obtain trip type breakdown specific for the given region. The trip type breakdown can be overwritten if users can provide sufficient justification for alternative sources of data (e.g., project-specific traffic study) that demonstrate a different breakdown.

**Commercial trip type:** These include commercial-customer (C-C), commercial-work (C-W) and commercial-nonwork (C-NW). A commercial-customer trip represents a trip made by someone who is visiting the commercial land use to partake in the services offered by the site. The commercial-work trip represents a trip made by someone who is employed by the commercial land use sector. The commercial-nonwork trip represents a trip associated with the commercial land use other than by customers or workers. An example of C-NW trips includes trips made by delivery vehicles of goods associated with the land use. The trip type breakdown from the

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<sup>22</sup> ITE. 2008. Trip Generation 8<sup>th</sup> Edition. In September 2012, ITE published the 9<sup>th</sup> edition that updated some of the trip rates from the 8<sup>th</sup> edition. The updates are not yet incorporated into CalEEMod but the user has the ability to override the trip rate default.



number of workers and or truck trips from ITE and an analysis of information provided for the SCAB was used as default to assign the trip type breakdowns for all land uses. If an exact match to a land use was not available, data from a similar land use was used as a surrogate. Trip type breakdown can be overwritten if users can provide justification for alternative sources of data (e.g., project-specific traffic study) that demonstrates different breakdown.

### Primary Trip Lengths

Each trip type has a primary trip length associated with it. These trip lengths are based on the location and urbanization selected on the project characteristic screen. These values were supplied by the districts or use a default average for the state. Each district (or county) also assigns trip lengths for urban and rural settings. For residential projects, average primary trip lengths of all trip types are determined with the below equation. Commercial and industrial land use types use a similar equation based on their trip types.

Average Primary Trip Length  $_i$  =

$$H - W_{miles} \times H - W_{trip\%} + H - S_{miles} \times H - S_{trip\%} + H - O_{miles} \times H - O_{trip\%}$$

Where

|                  |                                                                |
|------------------|----------------------------------------------------------------|
| $H - W_{miles}$  | = Home to Work trip length                                     |
| $H - W_{trip\%}$ | = % of the total primary trips that are Home to Work trips     |
| $H - S_{miles}$  | = Home to Shopping trip length                                 |
| $H - S_{trip\%}$ | = % of the total primary trips that are Home to Shopping trips |
| $H - O_{miles}$  | = Home to Other trip length                                    |
| $H - O_{trip\%}$ | = % of the total primary trips that are Home to Other trips    |
| $i$              | = land use type.                                               |

### Primary, Pass-by and Diverted Trip Links

Trip link types further describe the characteristics of the trip attracted to each land use, whether it's a primary trip, a diverted link trip, or a pass-by trip. For example, a commercial customer pass-by trip could be a person going from home to shop on his/her way to work. In addition, a commercial customer diverted-link trip could be a person going from home to work, and on its way making a diversion to shop. Pass-by trips generate virtually no additional running emissions but could generate additional resting and startup emissions. Diverted trips generate less running emissions compared to primary trips, and can also generate additional resting and startup emissions. The average VMT associated with a trip is adjusted by modifying the primary

trip length to account for reductions from pass-by and diverted trips. The trip lengths mentioned above are for primary trip links. For pass-by trip links the trip length will be 0.1 miles and diverted trip links the trip length will be 25% of the primary trip length.

An average overall trip length can be calculated as follows:

$$\text{Average Overall Trip Length}_i = \text{Link\%}_{\text{primary}} \times \text{TripLength}_{\text{Avg Primary}} + \text{Link\%}_{\text{diverted}} \times 0.25 \times \text{TripLength}_{\text{Avg Primary}} + \text{Link\%}_{\text{passby}} \times 0.1 \text{ mile}$$

Where

Link % = percentage of link types

Trip Length<sub>AvgPrimary</sub> = Average primary trip length for each trip type

i = land use type

The trip link percentage from the ITE Generation book and SANDAG are used as default. The trip link percentage can be overwritten if users can provide justification for alternative sources of data (e.g., project-specific traffic study) that demonstrate different breakdown. If diverted or pass-by trips are not desired, the end user can change the default percentages to zero for these and have primary equal 100%.

### Vehicle Miles Traveled

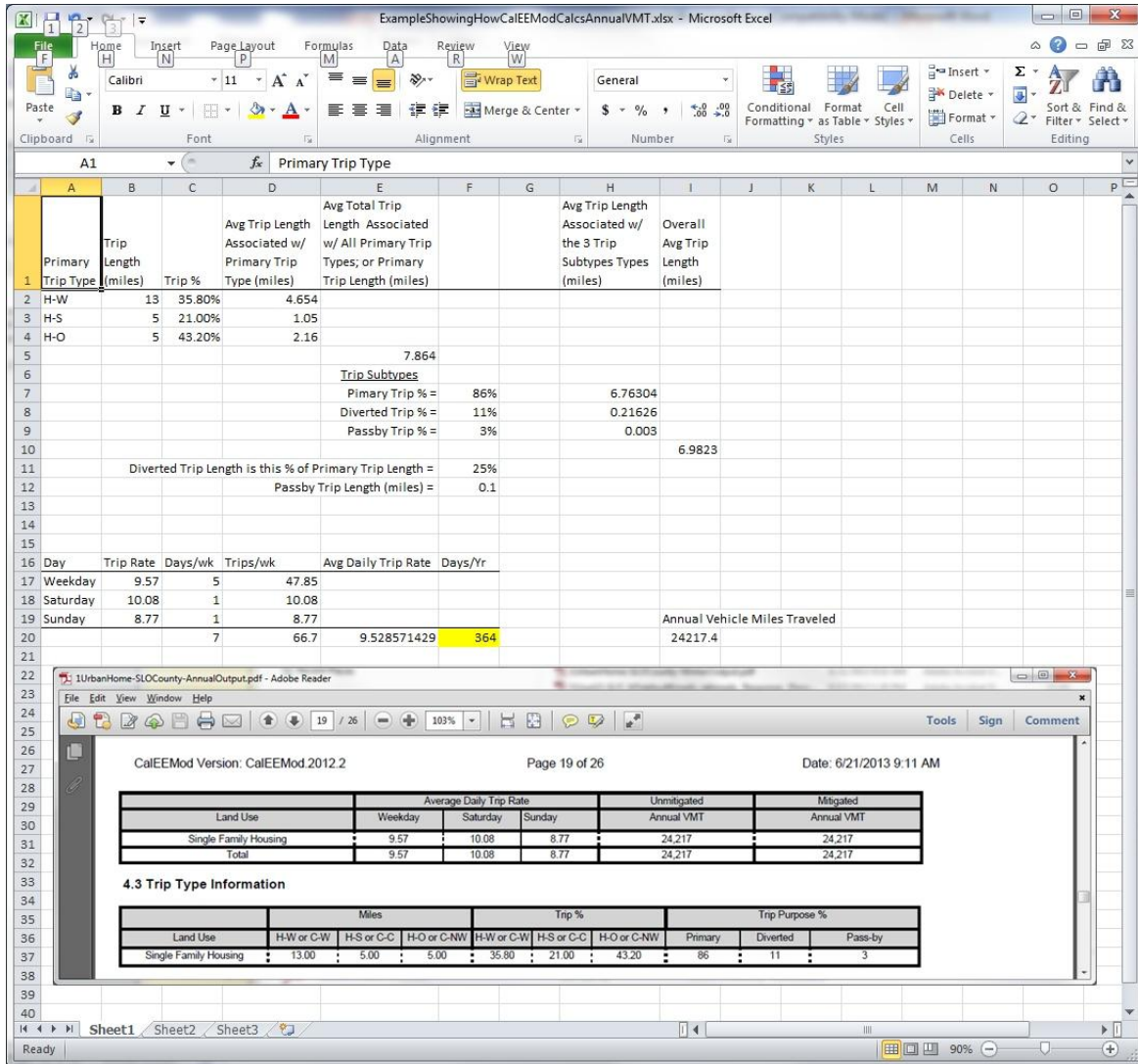
The daily vehicle miles traveled (VMT<sub>d</sub>) for a modeled project is calculated with the below equation using average daily trip rates and lengths calculated from equations above. CalEEMod calculates Annual VMT by multiplying VMT<sub>d</sub> by 365 days/year.

$$\text{VMT}_d = \sum (\text{Average Daily Trip Rate}_i * \text{Average Overall Trip Length}_i)_n$$

Where:

n = Number of land uses being modeled.

The following screen shot shows an example of how CalEEMod calculated the Annual VMT for a single residential dwelling in an urban setting.



## 5.2 Vehicle Emissions

The emissions from mobile sources were calculated with the trip rates, trip lengths and emission factors for running from EMFAC2011 as follows:

$$\text{Emissions}_{\text{pollutant}} = \text{VMT} * \text{EF}_{\text{running, pollutant}}$$

Where:

$\text{Emissions}_{\text{pollutant}}$  = emissions from vehicle running for each pollutant

VMT = vehicle miles traveled

$\text{EF}_{\text{running, pollutant}}$  = emission factor for running emissions

In order to obtain the emission factor for running emissions, EMFAC2011 was run in Burden mode with model year breakdown for all counties, air basins, air districts and statewide average

with default settings for 22 scenario years each.<sup>23</sup> All scenarios were run for three seasons – Annual, Summer, and Winter. Running emissions for all pollutants and PM emissions from tire and brake wear were divided by the VMT of each respective vehicle class from each scenario year and adjusted for unit conversion to derive emission factors in units of grams per VMT. For all CO<sub>2</sub> emissions (running, startup, and idling), emission reductions due to Pavley I were applied to LDA, LDT1, LDT2, and MDV for each vehicle model year, and summed to arrive at the total CO<sub>2</sub> emissions for each scenario year. Reductions from Low Carbon Fuel Standards and Pavley I are reflected in CO<sub>2</sub> emissions for scenario years 2011 and after. VMT fractions, calculated as the ratio of VMT for each vehicle class to total VMT for all vehicles were also derived for each scenario year.

Similarly, evaporative, starting, and idling emissions were divided by the number of trips to derive emission factors in units of grams per trip. Evaporative emissions, starting and idling emissions are multiplied by the number of trips times the respective emission factor for each pollutant.

### Brake Wear and Tire Wear Emissions

As vehicles are driven, particulate matter is generated from degradation of brakes and tires. This is calculated based on the EMFAC emission factors for each vehicle class and the total VMT traveled by that vehicle class according to the following equation:

$$\text{Emission}_{\text{brakewear, tirewear}} = \sum_{\text{class}} (\text{E.F.}_{\text{brakewear, tirewear, class}} \times \text{VMT}_{\text{class}})$$

### 5.3 Road Dust

Vehicles that drive on both paved and unpaved roads generate fugitive dust by dispersing the silt from the roads. The following equation is used to calculate the fugitive dust emissions associated with paved roads:

$$E_{\text{ext}} = [k (sL)^{0.91} \times (W)^{1.02}] (1 - P/4N)$$

Where:

$E_{\text{ext}}$  = annual or other long-term average emission factor in the same units as  $k$ ,

$k$  = particle size multiplier for particle size range and units of interest (see below),

$sL$  = road surface silt loading (grams per square meter) (g/m<sup>2</sup>),

$W$  = average weight (tons) of *all the vehicles* traveling the road (2.4 tons)

<sup>23</sup> 1990, 2000, 2005, 2010 to 2025 inclusive, 2030, 2035, and 2040

$P$  = number of “wet” days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and

$N$  = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

The above is the average emission factor by land use for paved roads. The default values for the required parameters are based on recommendations in AP-42. For daily emissions it is assumed to have no precipitation.

The following equation is used to calculate the fugitive dust emissions associated with unpaved roads:

$$E.F._{dust,i} = \left( \frac{k(s/12)^1(S/30)^{0.5}}{(M/0.5)^{0.2}} - C \right) \left( 1 - \frac{P}{365} \right)$$

Where:

$k$  = particle size multiplier for particle size range and units of interest (see below)

$s$  = surface material silt content (%)

$M$  = surface material moisture content (%)

$S$  = mean vehicle speed (mph)

$C$  = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear, and

$P$  = number of days in a year with at least 0.254 mm (0.01 in) of precipitation

The above is the average emission factor by land use for unpaved roads. For daily emissions it is assumed to have no precipitation.

By default, CalEEMod assumes the percentage of paved and unpaved roads for each district as provided by the district. The end user is allowed to modify the percentage of unpaved roads if specific information is available.

Once emission factors are determined, dust emissions can be calculated by

$$Emissions_{dust} = \sum_i (E.F._{dust,i} \times VMT)$$

The VMT is the same used in vehicle trips.

## 5.4 Operational Off-Road Equipment

CalEEMod also calculates emissions from off-road equipment (e.g., forklifts, cranes, loaders, generator sets, etc.) used during the operation of the land use being analyzed. This is an optional calculation so the user would need to provide the type and number of off-road equipment being used during operation. From that information, CalEEMod provides horsepower, load factor, hours of operation and fuel type. The user has the ability to override the defaults. The emission factors are from OFFROAD2011. Please refer to section 4.2 for the equations in calculating emissions from off-road equipment.

# 6 Area Sources

The area source module is used to calculate direct sources of air emissions located at the project site. This includes hearths, consumer product use, architectural coatings, and landscape maintenance equipment. This does not include the emissions associated with natural gas usage in space heating, water heating, and stoves as these are calculated in the building energy use module.

## 6.1 Hearths

GHG emissions from the combustion of wood or biomass are calculated and are considered biogenic emissions of CO<sub>2</sub>. Some protocols do not consider these emissions to be a part of the emission inventory. Therefore, these CO<sub>2</sub> emissions will be kept distinct from the anthropogenic GHG emissions. The method to calculate the criteria and biogenic GHG emissions associated with wood stoves is shown. Emissions from wood stoves are calculated using the formula below for each wood stove type:

$$\text{Wood hearth emissions (MT/year)} = \text{Emission Rate (g CO}_2 \text{ per kg wood burned)} \times \text{Wood Burned (tons per year)} \times \frac{907,185 \text{ g/ton}}{1} \times \text{number of stoves} \times \frac{1 \text{ MT CO}_2}{1 \times 10^6 \text{ g CO}_2}$$

where:

Emission Rate = Based on AP-42<sup>24</sup>.

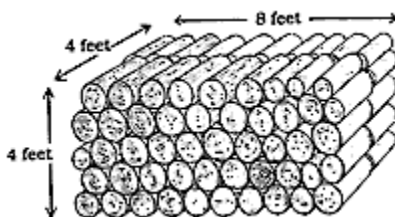
Wood Burned = Weight of wood burned per year per residential unit.

Number of stoves = Number of this type of stove in the project.

Using the formula above and the number of residential units with wood stoves, it is possible to estimate the GHG emissions from wood stoves. Default values for the emission factors and the amount of wood burned by different hearth types and the percentage of different hearths in various areas of California are based on ARB, USEPA, and district supplied emission factor values for hearths and woodstoves. The number of wood stoves or hearths is based on percentages supplied by districts or state defaults. If applicable, CalEEMod incorporates the restrictions on the number of wood burning fireplaces and stoves from SJVUAPCD Rule 4901

<sup>24</sup> US EPA AP-42, Chapter 1.9 (<http://www.epa.gov/ttnchie1/ap42/ch01/bgddocs/b01s09.pdf>) and Chapter 1.10 (<http://www.epa.gov/ttnchie1/ap42/ch01/bgddocs/b01s10.pdf>)

Amended 10/16/2008. For projects in the San Luis Obispo region, the wood burned per year is 2,016.5 lbs/year (3,081 lbs/cord X 0.6545 cords/year). For visual clarification, a standard cord of wood is defined as a stack of wood with a volume of 128 cubic feet (4 ft. x 4 ft. x 8 ft.)



Criteria pollutant emissions from wood stoves or hearths are computed by CalEEMod in a similar manner with emission factors also coming from AP-42<sup>25</sup>.

#### 6.1.1.1 Natural Gas Fireplaces/Stoves

GHG emissions associated with natural gas fired fireplaces are calculated using emission factors from the California Climate Action Registry (CCAR). The criteria pollutant emission factors are based on AP-42. The average heating rate in British Thermal Units (BTU) per hour for fireplaces in homes is 60,000 BTU/hr<sup>26</sup>. Default values for annual fireplace usage needs to be determined for each county. Natural gas is assumed to have 1,020 BTU per standard cubic foot<sup>27</sup>. Criteria pollutant emissions from natural gas fireplaces/stoves are computed by CalEEMod in a similar manner with emission factors also coming from AP-42<sup>27</sup>.

## 6.2 Consumer Products

Consumer products are chemically formulated products used by household and institutional consumers, including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products; but does not include other paint products, furniture coatings, or architectural coatings. SCAQMD did an evaluation of consumer product use compared to the total square footage of buildings using data from ARB consumer product Emission Inventory. This analysis can be found in Appendix E. To calculate the ROG emissions from consumer product use, the following equation is used:

$$\text{Emissions} = \text{EF} \cdot \text{BuildingArea}$$

Where:

EF = pounds of VOC per building square foot per day

<sup>25</sup> US EPA AP-42, Chapter 1.9. Page 3, Table 1.9-1 (<http://www.epa.gov/ttnchie1/ap42/ch01/bgdocs/b01s09.pdf>) and Chapter 1.10 (<http://www.epa.gov/ttnchie1/ap42/ch01/bgdocs/b01s10.pdf>)

<sup>26</sup> SCAQMD Rule 445 Staff Report - <http://www.aqmd.gov/hb/2008/March/080337a.html> and SCAQMD Final EA - <http://www.aqmd.gov/ceqa/documents/2008/aqmd/finalEA/FEA445.pdf>.

<sup>27</sup> USEPA. 1998. AP-42 Emission Factors. Chapter 1.4 Natural Gas Combustion, Pages 5-6, Tables 1.4-1 and 1.4-2, <http://www.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf>.



The factor is  $2.14 \times 10^{-5}$  lbs/sqft/day for everyplace except SCAQMD

The factor is  $2.04 \times 10^{-5}$  lbs/sqft/day for SCAQMD areas.

Building Area = The total square footage of all buildings including residential square footage.

### 6.3 Architectural Coatings

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers. The program calculates the VOC evaporative emissions from application of residential and non-residential surface coatings using the following equation:

$$E_{AC} = EF_{AC} \times F \cdot A_{\text{paint}} \times \text{Reapplication}$$

Where:

$E$  = emissions (lb)

$EF$  = emission factor (lb/sqft)

$F$  = fraction of surface area. The default values based on SCAQMD are 25% for the exterior surface and 75% for the interior.

$A$  = building surface area (sqft). The program assumes the total surface area for painting equals 2.7 times the floor square footage for residential land use and 2 times the floor square footage for nonresidential land use.<sup>28</sup> All land use information provided by a metric other than square footage will be converted to square footage using the default conversions or user-defined equivalence.

Reapplication = Rate at which surfaces are repainted.

The emission factor is based on the VOC content of the surface coatings and is calculated estimated using the equation below:

$$EF_{AC} = C_{\text{VOC}} / 454(\text{g/lb}) \times 3.785(\text{L/Gal}) / 180(\text{sqft})$$

Where:

$EF$  = emission factor (lb/sqft)

$C$  = VOC content (g/L). This is anticipated to vary by district and year.

### Reapplication rate

All land use buildings are assumed to be repainted at a rate of 10% of area per year. This is based on the assumptions used by SCAQMD.

### 6.4 Landscape Equipment

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, roto tillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers, as

<sup>28</sup> The factors 2.7 and 2 are based on page A9-124 of SCAQMD's 1993 CEQA Guide.



well as air compressors, generators, and pumps. The emissions associated from landscape equipment use were processed using OFFROAD 2011 and ARB's Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment (6/13/2003<sup>29</sup>). The information was used along with the total building square footage and dwelling units in California to determine two emission factors. The first is for the commercial landscape equipment which is in terms of grams per square foot of non-residential building space per day. The second is the for the residential landscape equipment which is in terms of grams per dwelling unit per day. These emission factors are multiplied by the number of summer days or winter days that represent the number of operational days. For example, pieces of equipment that would typically be used in snow conditions were used with winter days this includes equipment such as snow blowers while all others were used with summer days. For those regions with 365 or 330 summer days (South Coast, Sacramento, San Joaquin Valley), it is assumed non-residential (e.g., commercial land uses) landscaping equipment would likely only operate during the week (not weekends) so operational days are 250 days per year.

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<sup>29</sup> [http://www.arb.ca.gov/msei/offroad/techmemo/Lawn\\_and\\_Garden\\_Activity.doc](http://www.arb.ca.gov/msei/offroad/techmemo/Lawn_and_Garden_Activity.doc)

## 7 Energy Use

GHGs are emitted as a result of activities in buildings for which electricity and natural gas are used as energy sources. Combustion of any type of fuel emits criteria pollutants and GHGs directly into the atmosphere; when this occurs in a building this is a direct emission source<sup>30</sup> associated with that building and the program will include all of the criteria and GHG pollutants. GHGs are also emitted during the generation of electricity from fossil fuels. When electricity is used in a non-residential building, the electricity generation typically takes place offsite at the power plant; electricity use in a non-residential building generally causes emissions in an indirect manner and therefore only GHG emissions will be calculated from electricity generation.

Fuel oil, kerosene, liquefied petroleum gas, and wood can also be used as fuels, but generally contribute only in small amounts as combustion sources within buildings. As such, these minor emissions are not accounted for in the program.

Energy use in buildings is divided into energy consumed by the built environment and energy consumed by uses that are independent of the construction of the building such as in plug-in appliances. In California, Title 24 governs energy consumed by the built environment, mechanical systems, and some types of fixed lighting.<sup>31</sup> Non-building energy use, or “plug-in” energy use can be further subdivided by specific end-use (refrigeration, cooking, office equipment, etc.). The program will calculate the non-residential energy use by:

1. Calculating energy use from systems covered by Title 24 (HVAC system, water heating system, and the lighting system).
2. Calculating energy use from lighting.
3. Calculating energy use from office equipment, appliances, plug-ins, and other sources not covered by Title 24 or lighting.

The program will convert the resulting energy use quantities to GHG emissions by multiplying by the appropriate emission factors obtained by incorporating information on local electricity production. The following sections describe the methodologies employed to estimate GHG emissions.

### Estimate of Non-residential Energy Use Intensity

The program uses the California Commercial End Use Survey (CEUS)<sup>32</sup> database to develop energy intensity values (electricity or natural gas usage per square foot per year) for non-residential buildings. The methods used to estimate energy use are described below.

<sup>30</sup> California Climate Action Registry (CCAR) General Reporting Protocol (GRP), Version 3.1 (January). Available at: [http://www.climateregistry.org/resources/docs/protocols/grp/GRP\\_3.1\\_January2009.pdf](http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf) Chapter 8

<sup>31</sup> Title 24, Part 6, of the California Code of Regulations: California's Energy Efficiency Standards for Residential and Nonresidential Buildings. <http://www.energy.ca.gov/title24/>

<sup>32</sup> California Energy Commission (CEC). California Commercial End-Use Survey Results. Data available from Itron Inc. at <http://capabilities.itron.com/CeusWeb/Chart.aspx>

### 7.1.1.1 CEUS Database

The CEUS data from the CEC<sup>33</sup> lists energy use intensity by CEUS building type, CEUS end-use, and CEC forecasting climate zone<sup>34</sup>. Each default land use in the program is mapped to an appropriate CEUS building type. The list of end uses from CEUS was grouped to some general end-use categories and distinguishes if the end use is related to Title-24 building systems.

Since 1978, the CEC has established building energy efficiency standards to conserve electricity and natural gas and prevent the state from having to build more power plants. The standards are updated periodically. As noted in User's Guide, the 2005 standards were used in CARB's Scoping Plan and are based on average savings for improvements from 2002 to 2005 ("Impact Analysis for 2005 Energy Efficiency Standards"). More recently, the 2008 standards<sup>35</sup> are based on improvements from 2005 to 2008 ("Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings"). The energy efficiency standards (part 6) are currently being considered in 2013 but not yet approved<sup>36</sup>. Thus, the 2013 standards are yet to be included in CalEEMod. Because the CEUS data uses 2002 survey data, the tool adjusts CEUS baseline Title 24 usage rates to reflect the 2008 Title 24 improvements. The default energy intensities reported are adjusted to 2008 Title 24 part 6. Adjustments for 2005 Title 24 part 6 are available by checking the "using historical data" box to incorporate Title 24 2005 in calculations. The 2005 Title 24 standard (part 6) were in effect when CARB developed its Scoping Plan 2020 No Action Taken predictions. Once the box is clicked, hit the "Default" button to download the historical (2005) data. Appendix E describes in detail the method used to analyze the CEUS data.

### 7.1.1.2 Residential Energy Use

The energy use from residential land uses is calculated based on the Residential Appliance Saturation Survey (RASS). Similar to CEUS, this is a comprehensive energy use assessment that includes the end use for various climate zones in California. Detailed discussions of processing the RASS data to obtain the lookup tables is described in Appendix E.

### 7.1.1.3 Other Land Use Energy Use

There are a few remaining land use categories that have not been included in the CEUS or RASS data. These include golf courses, parks, and recreational pools. These do not currently have default energy use values listed in the program. However, there have been published studies regarding the energy use from lighting, ventilation and elevators in parking lots and structures. From the parking lot land use category, the user has the option to choose parking lot, unenclosed parking structure, unenclosed parking structure with elevators, enclosed parking structure, or enclosed parking structure with elevators. CalEEMod calculates the energy use from lighting in open parking lots and unenclosed (no walls) parking structures; lighting and

<sup>33</sup> Workbooks downloaded from <http://capabilities.itron.com/CeusWeb/Chart.aspx> for all building categories

<sup>34</sup> A few climate zones were not included in the CEUS study. These climate zones will be mapped to another related climate zone that was included in the study.

<sup>35</sup> <http://www.energy.ca.gov/2008publications/CEC-400-2008-001/CEC-400-2008-001-CMF.PDF>

<sup>36</sup> <http://www.energy.ca.gov/title24/2013standards/index.html>

ventilation in enclosed parking structures; and elevators in those parking structures with them. With the energy use (kWh) amount, CalEEMod is able to calculate the corresponding criteria and GHG emissions. Refer to Appendix E for the details on the assessment of the various studies conducted on energy use rates and energy consumption from operation of car parking facilities in California. In addition, Appendix E provides the reasoning as to which references are used as default values in determining energy use. Appendix E also provides guidance if the user wants to override the default (e.g., the number of elevators is known). The following table provides a summary of the energy use factors included in CalEEMod. Depending on the type of parking land use description, the model uses the appropriate factor (or factors if structure with elevator).

| Type of Parking                  | Energy Use            | Total Annual (kWh per sq ft) |
|----------------------------------|-----------------------|------------------------------|
| Open parking lot                 | Lighting              | 0.876                        |
| Unenclosed parking structure     | Lighting              | 2.63                         |
| Enclosed parking structure       | Lighting, ventilation | 6.55                         |
| Parking structure with elevators | Elevators             | 0.19                         |

## 7.2 Emissions from Energy use

The natural gas energy use will contribute both criteria and GHG emissions. The emission factors for natural gas combustion are based on AP-42 and CCAR. Electricity use will also contribute to both criteria and GHG emissions. However, the emissions from electricity use are only quantified for GHGs since criteria pollutant emissions occur at the site of the power plant which is likely to be offsite. Emissions are calculated by multiplying the energy use times the carbon intensity and other GHGs of the utility district per kilowatt hour. See section 8.2 for the electricity carbon intensity. In general:

$$\text{Emissions} = \sum_i (\text{EF} \times \text{Energy Intensity} \times \text{Size})$$

Where:

|                  |                                                               |
|------------------|---------------------------------------------------------------|
| EF               | = emission factor based on AP-42 or CCAR (kW-hr/sq ft or /DU) |
| Energy Intensity | = energy intensity for a land use (CO <sub>2</sub> e/kW-hr)   |
| Size             | = size of the building or Dwelling units (sq ft or DU)        |
| i                | = land use type                                               |

## 8 Water and Wastewater

The amount of water used and wastewater generated by a project has indirect GHG emissions associated with it. These emissions are a result of the energy used to supply, distribute, and treat the water and wastewater. It will often be the case that the water treatment and wastewater treatment occur outside of the project area. In this case, it is still important to quantify the energy and associated GHG emissions attributable to the water use. In addition to the indirect GHG emissions associated with energy use, wastewater treatment can directly emit both methane and nitrous oxide.

### 8.1 Annual Indoor and Outdoor Water Use by Land Use Category

Total residential indoor and outdoor water use for all of California for the year 2000 is reported in Table ES-1 of the Pacific Institute “Waste Not Want Not” report.<sup>37</sup> These values were divided by the total number of occupied households in California in the year 2000<sup>38</sup> to give water demand per dwelling unit. It is assumed that these water use values are representative of all residential dwelling unit types (single-family, apartment, condo, etc.) and will be used unless alternate values are supplied by the air districts or the end user.

Data for most commercial and industrial land uses was obtained from Appendices E and F of the Pacific Institute’s “Waste Not Want Not” report.<sup>39</sup> Total gallons of water used per day per metric were reported, where the metric is employee, student, room, acre, or square foot, depending on the land use. For example, water use at office and retail land uses was reported in a metric of gallons per employee per day, while water use at hotels and motels was reported in a metric of gallons per room per day. The total daily water use was converted to annual water use based on the number of days of operation for that land use. For example, it was assumed that schools operate for 180 days per year while offices operate for 225 days per year (excluding weekends and holidays). Figures in Appendices E and F of the Pacific Institute report shows the percent of water use dedicated to landscape irrigation; this percent was multiplied by the total water use to obtain the outdoor water use. The remainder was assigned to indoor water use.

For a few land uses (library, place of worship, movie theater, arena, and civic center), The Pacific Institute report did not provide sufficient data and so the American Water Works Association Research Foundation’s Commercial and Institutional End Uses of Water report<sup>40</sup>

<sup>37</sup> Gleick, P.H.; Haasz, D.; Henges-Jeck, C.; Srinivasan, V.; Cushing, K.K.; Mann, A. 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California. Published by the Pacific Institute for Studies in Development, Environment, and Security. Full report available online at: [http://www.pacinst.org/reports/urban\\_usage/waste\\_not\\_want\\_not\\_full\\_report.pdf](http://www.pacinst.org/reports/urban_usage/waste_not_want_not_full_report.pdf). Appendices available online at: [http://www.pacinst.org/reports/urban\\_usage/appendices.htm](http://www.pacinst.org/reports/urban_usage/appendices.htm)

<sup>38</sup> US Census Bureau. 2000 Census. Table QT-H1: General Housing Characteristics 2000. Available online at: [http://factfinder.census.gov/servlet/QTTable?\\_bm=y&-geo\\_id=04000US06&-qr\\_name=DEC\\_2000\\_SF1\\_U\\_QTH1&-ds\\_name=DEC\\_2000\\_SF1\\_U&-redoLog=false](http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=04000US06&-qr_name=DEC_2000_SF1_U_QTH1&-ds_name=DEC_2000_SF1_U&-redoLog=false).

<sup>39</sup> Gleick et al. 2003. Appendices E and F.

<sup>40</sup> Dziegielewski, B.; Kiefer, J.C.; Optiz, E.M.; Porter, G.A.; Lantz, G.L.; DeOreo, W.B.; Mayer, P.W.; Nelson, J.O. 2000. Commercial and Institutional End Uses of Water. Published by the American Water Works Association Research Foundation.

was used. This data is specific to Southern California and was obtained from sample sizes ranging from 1 to 26. In all cases, the total gallons of water used per employee per day was reported.

Specifically for industrial land use categories, the default indoor water use rate is 231,250 gallons/work-year/ thousand square feet. This value was computed by dividing the annual water use in California industry (Table ES-6 in Gleick et al. 2002; 963,071,916 gallons/industrial work day) by the industrial work area in California (Dun & Bradstreet, Business Population Report aggregated by Standard Industrial Classification (SIC) and Census Block, May 2002; 1,041,386 thousand square feet). This yields 925 gallons/work-day/thousand square feet and the annual value is derived using 250 workdays in a year. For those industrial projects where the anticipated water use rate is known or can be estimated from similar projects, the project specific indoor water use rate should overwrite the default value and specific rationale needs to be entered in the Remarks section of the Water and Wastewater CalEEMod input page.

Indoor water end-use intensities were also obtained from the Pacific Institute report.<sup>41</sup> End-use categories include toilets, showerheads, bathroom faucets, kitchen faucets, dishwashers, clothes washers, and leaks. End-use intensity is given in terms of percent of total indoor water use. For example, The Pacific Institute estimates that toilets contribute to 33% of indoor residential water use. Water end-use intensity must be known in order to calculate the expected water and GHG savings from installing low-flow or high-efficiency water fixtures.

## 8.2 Electricity Intensity Factors

Electricity intensity factors were obtained from the 2006 CEC report, “Refining Estimates of Water-Related Energy Use in California.” The electricity intensity factors are reported in units of kWh per million gallons (MG) of water used, and represent the amount of electricity needed to (1) supply and convey the water from the source, (2) treat the water to usable standards, and (3) distribute the water to individual users. The sum of these factors gives the total electricity required to supply, treat, and distribute water for outdoor uses. For indoor uses, the electricity needed to process the resulting wastewater is also included. The program will allow the end user to specify project specific electricity intensity factors if they are available for the project.

CO<sub>2</sub>e emissions associated with *indoor water use* are calculated according to the following equation:

$$\text{GHG emissions} = \text{Water}_{\text{indoor}} \times \text{Electricity}_{\text{indoor}} \times \text{Utility}$$

Where:

GHG emissions = Tonnes CO<sub>2</sub>e

Water<sub>indoor</sub> = Total volume of water used indoors (million gallons)

Electricity<sub>indoor</sub> = Electricity required to supply, treat, and distribute water and the resulting wastewater (kWh/million gallons)

This is assigned for each location.

<sup>41</sup> Gleick et al. 2003. Residential end-use intensities found in Figure 2-4c of main report. Commercial end-use intensities found in Appendix E.

$$\text{Utility} = \text{Carbon intensity of Local Utility (CO}_2\text{e/kWh)}$$

CO<sub>2</sub>e emissions associated with *outdoor water use* are calculated according to the following equation:

$$\text{GHG emissions} = \text{Water}_{\text{outdoor}} \times \text{Electricity}_{\text{outdoor}} \times \text{Utility}$$

Where:

GHG emissions = Tonnes CO<sub>2</sub>e

Water<sub>outdoor</sub> = Total volume of water used outdoors (million gallons)

Electricity<sub>outdoor</sub> = Electricity required to supply, treat, and distribute water (kWh/million gallons)

This is assigned for each location.

Utility = Carbon intensity of Local Utility (CO<sub>2</sub>e/kWh)

The sum of emissions from indoor and outdoor water use for each land use category gives the total CO<sub>2</sub>e emissions associated with water use at the Project.

### 8.3 Wastewater Treatment Methods by County and Air District

Depending on the method, the treatment of wastewater can produce methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and carbon dioxide (CO<sub>2</sub>) emissions, which are all greenhouse gases. Methane and nitrous oxide emissions are converted to carbon dioxide equivalent (CO<sub>2</sub>e) emissions based on their GWP. When a development generates waste and wastewater, the waste is typically either treated on-site in septic tanks or sent to a centralized wastewater treatment plant to be treated by one of several possible methods. The various wastewater treatment methods employed by each county or air district and the percent of total wastewater treated by each method was used if provided, otherwise the default percentage used in ARB's GHG emission inventories was used. Wastewater treatment methods include on-site septic tanks and centralized wastewater treatment plants which may be composed of aerobic processes, or facultative lagoons. The solids from the latter two treatments could be digested anaerobically to produce digester gas. In some cases, the combusted digester gas may be part of a cogeneration system which recovers the heat generated from combustion and generates electricity which is used for on-site processes. Thus, for aerobic and facultative lagoons wastewater treatment, digestion (*listed in the last two column on the wastewater screen*) should equal 100% percent. For septic systems, the digestion could be zero percent or 100 percent.

The majority of nitrous oxide emissions are generated when treated wastewater is discharged to water bodies as effluent. The default assumption is for non-recycled water. The program calculates total GHG emissions from wastewater treatment based on the region-specific distribution of wastewater treatment methods which the end user can modify with project specific data.



## 8.4 Wastewater Treatment Methods – Calculation of Greenhouse Gas Emissions

The GHGs emitted from each type of wastewater treatment are based on the ARB's Local Government Operations Protocol (LGOP)<sup>42</sup>, which are in turn based on USEPA methodologies.<sup>43</sup> The methodologies are summarized below.

Wastewater (or sewage) treatment can occur one of three ways - aerobically, in septic tanks or in facultative lagoons, specifically described below. In CalEEMod, the following defaults for sewage treatment options were used unless an air district provided an alternative percentage of treatment appropriate to the particular project region. The user has the ability to override the defaults but the total percentage must equal 100% and must justify the reason for the change in the "Remarks" box at the bottom of the screen.

| Statewide Default Treatment Distribution |             |                         |
|------------------------------------------|-------------|-------------------------|
| Septic Tank (%)                          | Aerobic (%) | Facultative Lagoons (%) |
| 10.33                                    | 87.46       | 2.21                    |

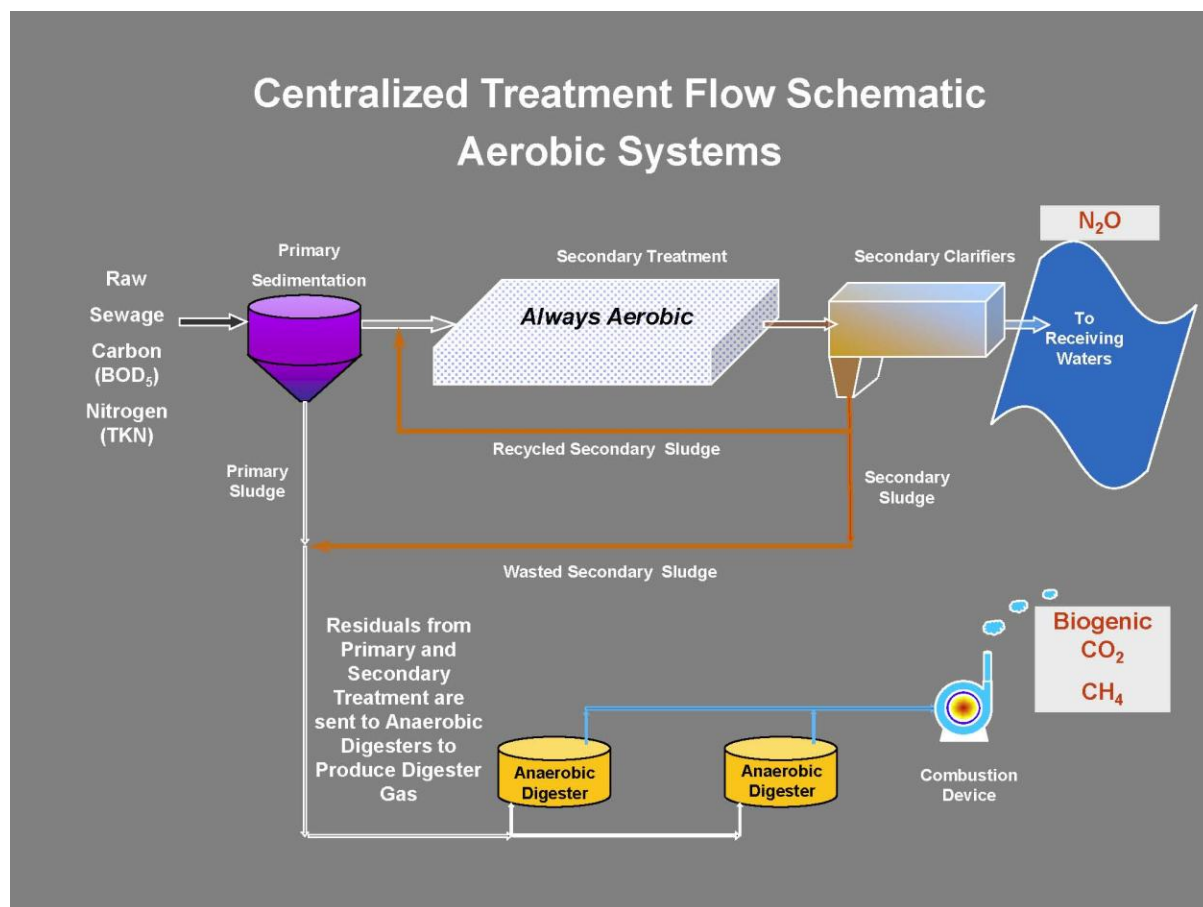
Solids produced from primary treatment, aerobic processes, or facultative lagoons are typically digested in anaerobic digesters. The gas produced by these digesters may be flared or burned in some other simple device, or sent to a cogeneration process for heat recovery and/or electrical generation. The default condition is to assume no cogeneration; however, the user has the ability to input an estimate of the percentage of the digester gas combusted in such systems ranging from 0% to 100%.

Anaerobic decomposition in septic tanks and facultative lagoons can produce fugitive emissions of methane. The following figure provides an example of the process flow for a centralized wastewater treatment facility that treats the sewage aerobically, produces digester gas in anaerobic digesters and combusts the gas. The figure also shows where the GHG emissions are occurring in the process.

<sup>42</sup> CARB. 2008. Local Government Operations Protocol. Chapter 10: Wastewater Treatment Facilities. Available online at: [http://www.arb.ca.gov/cc/protocols/localgov/pubs/final\\_lgo\\_protocol\\_2008-09-25.pdf](http://www.arb.ca.gov/cc/protocols/localgov/pubs/final_lgo_protocol_2008-09-25.pdf)

<sup>43</sup> USEPA. 2008. Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006. Chapter 8: Waste. Available online at: [http://www.epa.gov/climatechange/emissions/downloads/08\\_CR.pdf](http://www.epa.gov/climatechange/emissions/downloads/08_CR.pdf)





As depicted in the figure above, nitrous oxide is produced when treated wastewater is released as effluent into aquatic environments such as rivers and estuaries. Although nitrification/denitrification processes within the wastewater treatment plant may also produce nitrous oxide, the USEPA estimated that this contributed to less than 3% of national  $N_2O$  emissions associated with wastewater in 2005.<sup>44</sup> Therefore, the program assumes that all  $N_2O$  emissions are generated from effluent discharged into aquatic environments.

$CO_2$  emissions are generated from both aerobic and anaerobic processes, as well as from the combustion of digester gas, but CalEEMod only calculates combustion emissions because there are currently no authoritative emission factors for process  $CO_2$  emissions. When digester gas is combusted to generate electricity, fossil fuel emissions are offset by this renewable power generation. CalEEMod allows the user to provide an estimate of how much renewable power is expected from the project and will debit the biogenic combustion  $CO_2$  with the  $CO_2$  that would otherwise have been sourced from fossil fuel combustion.

<sup>44</sup> USEPA. 2008. Page 8-7.

## Septic Systems

Developments may use *septic systems* to treat wastewater on-site. These systems utilize microbes to decompose wastewater anaerobically. A by-product of this anaerobic decomposition is methane, which is quantified using **Equation 10.5** from LGOP:

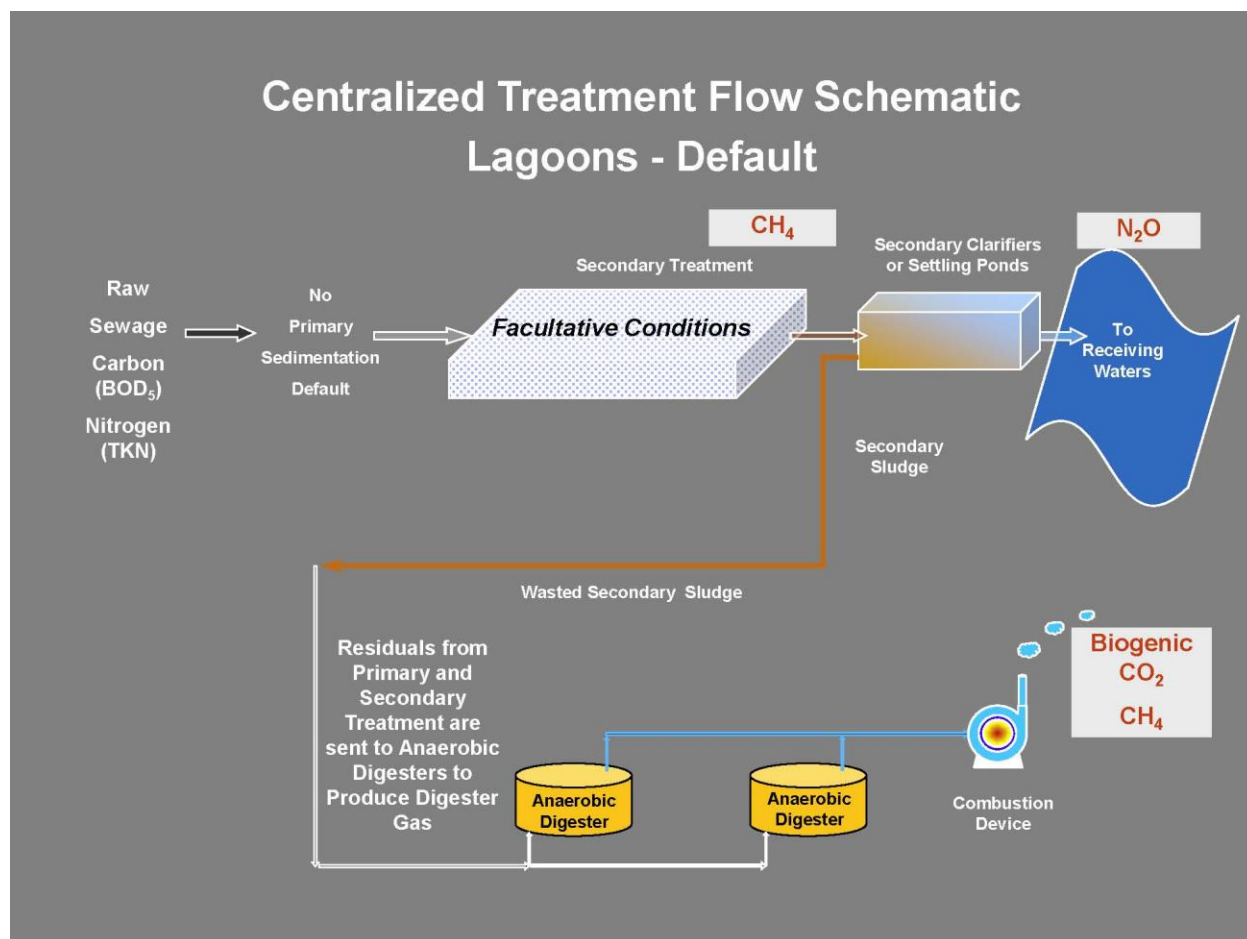
$$\text{CH}_4 \text{ emissions (MT)} = \text{Wastewater} \times \text{BOD}_5 \text{ load} \times 10^{-6} \times \text{Bo} \times \text{MCF}_{\text{septic}} \times 10^{-3}$$

| Term                  |   | Description                                                         | Value | Unit                                             | Reference    |
|-----------------------|---|---------------------------------------------------------------------|-------|--------------------------------------------------|--------------|
| Wastewater            | = | volume of wastewater                                                | INPUT | liters                                           | User         |
| BOD <sub>5</sub> load | = | concentration of BOD <sub>5</sub> in wastewater                     | 200   | mg / liter wastewater                            |              |
| 10 <sup>-6</sup>      | = | conversion factor                                                   | --    | kg / mg                                          | --           |
| Bo                    | = | maximum CH <sub>4</sub> -producing capacity for domestic wastewater | 0.6   | kg CH <sub>4</sub> / kg BOD <sub>5</sub> removed | LGOP default |
| MCF <sub>septic</sub> | = | CH <sub>4</sub> correction factor for septic systems                | 0.5   | --                                               | LGOP default |
| 10 <sup>-3</sup>      | = | conversion factor                                                   | --    | MT / kg                                          | --           |

The LGOP provides default values for all terms in the equation except BOD<sub>5</sub> load, which is the amount of BOD<sub>5</sub> sent to these decentralized systems per day. BOD, or Biochemical Oxygen Demand, measures the degradable organic component of the wastewater that could deplete dissolved oxygen in receiving waters if left untreated (BOD<sub>5</sub> is the measurement of dissolved oxygen depletion from a liquid sample held for a 5-day test). The program assumes a default BOD<sub>5</sub> load value of 200 mg per liter of wastewater. This value is typical for residential and commercial wastewater. A higher value is typically associated with certain types of industrial wastewater.

## Facultative Lagoons

Centralized wastewater treatment facilities may use *facultative lagoons* to treat wastewater. The following figure is an example of the treatment process if facultative lagoons provide the secondary treatment assuming process solids are sent to anaerobic digesters and the digester gas is combusted. In addition, the figure shows where the GHG emissions are occurring in the process.



The methane emissions expected from facultative lagoons are calculated using **Equation 10.3** from LGOP:

$$\text{CH}_4 \text{ emissions (MT)} = \text{Wastewater} \times \text{BOD}_5 \text{ load} \times 10^{-6} \times (1-F_P) \times B_o \times \text{MCF}_{\text{anaerobic}} \times F_{\text{removed}} \times 10^{-3}$$

| Term                     | Description                                                           | Value | Unit                                             | Reference            |
|--------------------------|-----------------------------------------------------------------------|-------|--------------------------------------------------|----------------------|
| Wastewater               | = volume of wastewater                                                | INPUT | liters                                           | User                 |
| BOD <sub>5</sub> load    | = concentration of BOD <sub>5</sub> in wastewater                     | 200   | mg / liter wastewater                            |                      |
| 10 <sup>-6</sup>         | = conversion factor                                                   | --    | kg / mg                                          | --                   |
| F <sub>P</sub>           | = fraction of BOD <sub>5</sub> removed in primary treatment           | 0     | --                                               | no primary treatment |
| B <sub>o</sub>           | = maximum CH <sub>4</sub> -producing capacity for domestic wastewater | 0.6   | kg CH <sub>4</sub> / kg BOD <sub>5</sub> removed | LGOP default         |
| MCF <sub>anaerobic</sub> | = CH <sub>4</sub> correction factor for anaerobic systems             | 0.8   | --                                               | LGOP default         |

|                      |   |                                                                 |    |         |                             |
|----------------------|---|-----------------------------------------------------------------|----|---------|-----------------------------|
| $F_{\text{removed}}$ | = | fraction of overall lagoon BOD <sub>5</sub> removal performance | 1  | --      | LGOP default (see Eq. 10.4) |
| $10^{-3}$            | = | conversion factor                                               | -- | MT / kg | --                          |

The LGOP provides default values for all terms in the equation except BOD<sub>5</sub> load and  $F_p$ , the fraction of BOD<sub>5</sub> removed in primary treatment, if present. As before, the program assumes a default BOD<sub>5</sub> load value of 200 mg per liter of wastewater. The program assumes  $F_p = 0$ , indicating no primary treatment.

## Anaerobic Digestion

*Anaerobic digesters* produce methane-rich biogas which is typically combusted on-site. In some cases the biogas is combusted simply for the purpose of converting methane to CO<sub>2</sub>, which has a lower global warming potential than methane. In many cases, a cogeneration system is used to harvest the heat from combustion and use it to generate electricity for on-site energy needs. In both cases, inherent inefficiencies in the system result in incomplete combustion of the biogas, which results in remaining methane emissions. The methane emissions from incomplete combustion of digester gas are quantified using **Equation 10.1** from LGOP:

$$\text{CH}_4 \text{ emissions (MT)} = \text{Wastewater} \times \text{Digester Gas} \times F_{\text{CH}_4} \times \rho_{\text{CH}_4} \times (1 - \text{DE}) \times 0.0283 \times 10^{-3} \times 10^{-3}$$

| Term                 | Description                                                   | Value  | Unit                                       | Reference    |
|----------------------|---------------------------------------------------------------|--------|--------------------------------------------|--------------|
| Wastewater           | = volume of wastewater                                        | INPUT  | gallons                                    | User         |
| Digester Gas         | = volume of biogas generated per volume of wastewater treated | 0.01   | ft <sup>3</sup> biogas / gallon wastewater | USEPA 2008   |
| $F_{\text{CH}_4}$    | = fraction of CH <sub>4</sub> in biogas                       | 0.65   | --                                         | USEPA 2008   |
| $\rho_{\text{CH}_4}$ | = density of CH <sub>4</sub> at standard conditions           | 662.00 | g / m <sup>3</sup>                         | LGOP default |
| DE                   | = CH <sub>4</sub> destruction efficiency                      | 0.99   | --                                         | LGOP default |
| 0.0283               | = conversion factor                                           | --     | m <sup>3</sup> / ft <sup>3</sup>           | LGOP default |
| $10^{-3}$            | = conversion factor                                           | --     | MT / kg                                    | --           |
| $10^{-3}$            | = conversion factor                                           | --     | kg / g                                     | --           |

The LGOP provides default values for all terms in the equation except the volume of digester gas produced per day (Digester Gas), and the fraction of methane in the biogas ( $F_{\text{CH}_4}$ ). The program assumes a digester gas production of 0.01 cubic feet of biogas per gallon of

wastewater treated based on USEPA methodology.<sup>45,46</sup> The program assumes  $F_{CH_4} = 0.65$  based on the USEPA methodology.<sup>47</sup>

The amount of biogenic  $CO_2$  produced from the combustion of biogas is calculated using the following equation based on flow sent to centralized systems (i.e., not sent to septic tanks):

$$\text{Biogenic } CO_2 \text{ emissions (MT } CO_2) = \text{Wastewater} \times \text{Digester Gas} \times F_{CH_4} \times EF / 2204.623$$

Where:

|              |   |                                                                                                                |
|--------------|---|----------------------------------------------------------------------------------------------------------------|
| Wastewater   | = | Volume of Wastewater sent to centralized systems (gallons)                                                     |
| Digester Gas | = | Volume of biogas produced from wastewater treatment<br>0.01 ft <sup>3</sup> biogas / gallon wastewater treated |
| $F_{CH_4}$   | = | Fraction of $CH_4$ in biogas<br>0.65                                                                           |
| EF           | = | Emission factor for methane combustion <sup>48</sup><br>0.120 lb $CO_2$ / ft <sup>3</sup> $CH_4$               |
| 2204.623     | = | Conversion factor from lb $CO_2$ to MT $CO_2$                                                                  |

If a *cogeneration system* is used to generate electricity from the combusted biogas, the following equation derived from USEPA's Solid Waste Management and Greenhouse Gases report<sup>49</sup> is used to calculate the amount of electricity generated based on flow sent to centralized systems.

$$\text{Electricity Generated (kWh)} = \text{Wastewater} \times \text{Digester Gas} \times F_{CH_4} \times HHV_{CH_4} \times ECF \times EFF$$

Where:

|              |   |                                                            |
|--------------|---|------------------------------------------------------------|
| Wastewater   | = | Volume of Wastewater sent to centralized systems (gallons) |
| Digester Gas | = | Volume of biogas produced from wastewater treatment        |

<sup>45</sup> USEPA 2008. Page 8-9. USEPA estimates 1.0 cubic feet of digester gas per person per day and 100 gallons of wastewater per person per day.

<sup>46</sup> USEPA reports 1.0 cubic feet of digester gas per person per day based on Metcalf & Eddy, Inc., 1991, "Wastewater Engineering: Treatment, Disposal, and Reuse," 3<sup>rd</sup> Ed. McGraw Hill Publishing. USEPA reports 100 gallons of wastewater per person per day based on Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 2004, "Recommended Standards for Wastewater Facilities (Ten-State Standards)." USEPA also reports 100 gallons of wastewater per person per day on the USEPA Water & Wastewater Pricing website, based on the U.S. Geological Survey Circular 1200, 1995, "Estimated Use of Water in the United States in 1995." Available online at: <http://www.epa.gov/waterinfrastructure/pricing/>. Accessed May 2010.

<sup>47</sup> USEPA. 2008. Page 8-9. USEPA cites Metcalf & Eddy, Inc., 1991, "Wastewater Engineering: Treatment, Disposal, and Reuse," 3<sup>rd</sup> Ed. McGraw Hill Publishing.

<sup>48</sup> USDOE. 2005. Form EIA-1605: Long Form for Voluntary Reporting of Greenhouse Gases. Available online at: [ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/FormEIA-1605\\_2004\\_Instructions.pdf](ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/FormEIA-1605_2004_Instructions.pdf)

<sup>49</sup> USEPA. 2006. Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks, 3rd Ed. Sections 6.2-6.5. Available online at: <http://www.epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf>

0.01 ft<sup>3</sup> biogas / gallon wastewater treated

|            |   |                                                                         |
|------------|---|-------------------------------------------------------------------------|
| $F_{CH_4}$ | = | Fraction of CH <sub>4</sub> in biogas<br>0.65                           |
| HHV        | = | Heating value of methane<br>1,012 BTU / ft <sup>3</sup> CH <sub>4</sub> |
| ECF        | = | Energy conversion factor<br>0.00009 kWh/BTU                             |
| EFF        | = | Efficiency Factor <sup>50</sup><br>0.85                                 |

Since this amount of electricity is generated on-site and no longer needs to be supplied by the local electricity utility, the indirect CO<sub>2</sub>e emissions associated with that utility electricity generation are also avoided. The avoided CO<sub>2</sub>e emissions are calculated by multiplying the amount of electricity generated (in kWh) by the local utility carbon-intensity factor from Table 2.8.

Net CO<sub>2</sub> emissions are then the difference between the CO<sub>2</sub> produced from the combustion of digester gas and the CO<sub>2</sub> avoided by generating renewable energy, thus:

$$\text{Net CO}_2 \text{ Emissions} = \text{CO}_2 \text{ (digester gas combustion)} - \text{CO}_2 \text{ (avoided emissions)}$$

Nitrous oxide is produced when treated wastewater is discharged to aquatic environments such as rivers or estuaries. The nitrogen which remains in treated wastewater effluent is converted to nitrous oxide in a multi-step process accomplished by bacteria which is present in soil and aquatic environments. The nitrous oxide emissions are quantified using **Equation 10.9** from the LGOP:

$$\text{N}_2\text{O emissions (MT)} = \text{Wastewater} \times 10^{-6} \times \text{N Load} \times 44/28 \times \text{EF effluent} \times 10^{-3}$$

| Term             | Description                                                          | Value | Unit                     | Reference                         |
|------------------|----------------------------------------------------------------------|-------|--------------------------|-----------------------------------|
| Wastewater       | = volume of wastewater                                               | INPUT | liters                   | User                              |
| 10 <sup>-6</sup> | = conversion factor                                                  | --    | kg / mg                  | --                                |
| N Load           | = mass of nitrogen discharged per volume of wastewater               | 26    | mg / liter of wastewater | USEPA 2013 (CA Statewide Average) |
| 44/28            | = Ratio of molecular weights for N <sub>2</sub> O and N <sub>2</sub> |       |                          | USEPA 2008                        |

<sup>50</sup> Ibid. USEPA assumes a 15% system efficiency loss, to account for system down-time. USEPA assumes that methane is flared during down-time.

|                  |   |                                           |       |                            |              |
|------------------|---|-------------------------------------------|-------|----------------------------|--------------|
| EF effluent      | = | N <sub>2</sub> O effluent emission factor | 0.005 | kg N <sub>2</sub> O / kg N | LGOP default |
| 10 <sup>-3</sup> | = | conversion factor                         | --    | MT / kg                    | --           |

The LGOP provides default values for all terms in the equation except N Load, the total mass of nitrogen discharged in the wastewater effluent per day. CalEEMod assumes N Load = 26 mg N per liter of wastewater effluent based on the USEPA methodology.<sup>51</sup> This value is appropriate for residential and commercial wastewater. A higher value may be more appropriate for certain types of industrial wastewater.

Methane and nitrous oxide emissions are converted to carbon dioxide equivalent emissions by multiplying by their GWPs. The GWPs for methane and nitrous oxide are 21 and 310, respectively.<sup>52</sup>

## 9 Solid Waste

Municipal solid waste (MSW) is the amount of material that is disposed of by land filling, recycling, or composting. CalEEMod calculates the indirect GHG emissions associated with waste that is disposed of at a landfill. The program uses annual waste disposal rates from the California Department of Resources Recycling and Recovery (CalRecycle) data for individual land uses. If waste disposal information was not available, waste generation data was used. CalEEMod uses the overall California Waste Stream composition to generate the necessary types of different waste disposed into landfills. The program quantifies the GHG emissions associated with the decomposition of the waste which generates methane based on the total amount of degradable organic carbon.<sup>53</sup> The program will also quantify the CO<sub>2</sub> emissions associated with the combustion of methane, if applicable. Default landfill gas concentrations were used as reported in Section 2.4 of AP-42. The IPCC has a similar method to calculate GHG emissions from MSW in its 2006 Guidelines for National Greenhouse Gas Inventories.

The amount of methane and CO<sub>2</sub> generated is calculated as:

$$Gen = DOC \cdot DANF \cdot 0.5$$

Where:

<sup>51</sup> USEPA. 2013. California Statewide average. USEPA Database at [http://cfpub.epa.gov/dmr/ez\\_search.cfm](http://cfpub.epa.gov/dmr/ez_search.cfm)

<sup>52</sup> Provided in Appendix E, Table E.1 of CARB's LGOP. As specified in Appendix E, Second Assessment Report (SAR) GWPs are still used by international convention and the United States.

<sup>53</sup> Landfill gas generation is dependent upon the amount, type, age and moisture content of the disposed waste. The United States Environmental Protection Agency (USEPA) has developed emission factors for landfill gas as specified in Section 2.4 of AP-42 which are incorporated in the LANDGEM model. This model uses a first order decay equation that will vary with time. However, there is no need to use a time-varying emissions model, as we are interested in total emissions of gases that could be emitted from a ton of waste. Therefore, instead of using the LANDGEM model, the volume of landfill gas from solid waste will be based on the total amount of degradable organic carbon.

Gen = Amount of CO<sub>2</sub> or methane generated

DOC = Degradable organic carbon

DANF = Degradable anaerobic fraction (0.5)

0.5 = Assumes half anaerobic carbon is methane and other half is CO<sub>2</sub>.

IPCC lists default values for the DOC in its 2006 Guidelines in Table 2.4.

The amount of methane and CO<sub>2</sub> emitted is calculated by assuming collection and destruction efficiencies. The end user will be able to select if the landfill the waste is sent to has a landfill gas collection system. The collection efficiency will be assumed to be 75% if this is selected otherwise it will be 0%. The destruction efficiency is assumed to be 98%. The calculations take into account the oxidation of methane to CO<sub>2</sub> as it rises through the landfill. The methane and CO<sub>2</sub> emitted are described as:

$$Emit_{methane} = Gen \cdot [Collect \cdot (1 - destruct) + (1 - Collect) \cdot (1 - ox)]$$

$$Emit_{CO_2} = Gen \cdot [Collect \cdot destruct + (1 - Collect) \cdot (ox) + 1]$$

Where

Emit<sub>methane</sub> = Methane emitted per ton of green waste

Emit<sub>CO2</sub> = Carbon dioxide emitted per ton of green waste

Gen = Amount of CO<sub>2</sub> or methane generated

Collect = Collection efficiency of landfill gas (75%)

Destruct = Destruction efficiency of landfill gas (98%)

Ox = Oxidation efficiency of methane (10%)

The CO<sub>2</sub> emissions will be classified as biogenic emissions. The amount of methane emitted will be multiplied by its GWP to convert to CO<sub>2</sub>e.



## 10 Vegetation

The program calculates GHG emissions associated with the vegetation activities of land use change and the planting of new trees.

The program calculates GHG emissions from vegetation activities according to the IPCC protocol for vegetation since it has default values that work well with the information typically available for development projects. This method is similar to the CAR Forest Protocol<sup>54</sup> and the Center for Urban Forest Research Tree Carbon Calculator<sup>55</sup>, but it has more general default values available that will generally apply to all areas of California without requiring detailed site-specific information<sup>56</sup>.

### 10.1 Land Use Change

A development which changes land use type results in changes in CO<sub>2</sub> sequestration from the atmosphere which would not have been captured had there been no land-type change.

Overall Change in Sequestered CO<sub>2</sub> [MT CO<sub>2</sub>]

$$= \sum_i (SeqCO_2)_i \times (area)_i - \sum_j (SeqCO_2)_j \times (area)_j$$

Where:

|                    |   |                                                                              |
|--------------------|---|------------------------------------------------------------------------------|
| SeqCO <sub>2</sub> | = | mass of sequestered CO <sub>2</sub> per unit area [MT CO <sub>2</sub> /acre] |
| area               | = | area of land for specific land use type [acre]                               |
| i                  | = | index for final land use type                                                |
| j                  | = | index for initial land use type                                              |

Overall change in sequestered CO<sub>2</sub> is the summation of sequestered CO<sub>2</sub> from initial land use type multiplied by area of land for initial land use type subtracted by the summation of sequestered CO<sub>2</sub> from final land use type multiplied by area of land for final land use type.

There is no reduction in GHG emissions associated with preservation of a land.

#### SeqCO<sub>2</sub>

The mass of sequestered CO<sub>2</sub> per unit area [MT CO<sub>2</sub>/acre] is dependent on the specific land use type. The program uses default CO<sub>2</sub> sequestration values from CCAR for each land use that will be preserved or created:

<sup>54</sup> CCAR. 2007. Forest Sector Protocol Version 2.1. September. Available at: [http://www.climateregistry.org/resources/docs/protocols/industry/forest/forest\\_sector\\_protocol\\_version\\_2.1\\_sept2007.pdf](http://www.climateregistry.org/resources/docs/protocols/industry/forest/forest_sector_protocol_version_2.1_sept2007.pdf)

<sup>55</sup> Available at: <http://www.fs.fed.us/ccrc/topics/urban-forests/ctcc/>

<sup>56</sup> The CAR Forest Protocol and Urban Forest Research Tree Carbon Calculator are not used since their main focus is annual emissions for carbon offset considerations. As such they are designed to work with very specific details of the vegetation that is not available at a CEQA level of analysis.

| Land Use    | Sub-Category | Default CO <sub>2</sub> accumulation per acre (MT CO <sub>2</sub> / acre) |
|-------------|--------------|---------------------------------------------------------------------------|
| Forest Land | Scrub        | 14.3                                                                      |
|             | Trees        | 111                                                                       |
| Cropland    | --           | 6.20                                                                      |
| Grassland   | --           | 4.31                                                                      |
| Wetlands    | --           | 0                                                                         |

The default annual CO<sub>2</sub> is calculated by multiplying total biomass (MT dry matter/acre) from IPCC data by the carbon fraction in plant material (0.47), then using the ratio of molecular weights (44/12) to convert from MT of carbon (C) to MT of carbon dioxide (CO<sub>2</sub>).

#### Vegetation Type

Vegetation types are defined by IPCC as follows:

##### **(i) Forest Land**

This category includes all land with woody vegetation consistent with thresholds used to define Forest Land in the national greenhouse gas inventory. It also includes systems with a vegetation structure that currently fall below, but *in situ* could potentially reach the threshold values used by a country to define the Forest Land category.

##### **(ii) Cropland**

This category includes cropped land, including rice fields, and agro-forestry systems where the vegetation structure falls below the thresholds used for the Forest Land category.

##### **(iii) Grassland**

This category includes rangelands and pasture land that are not considered Cropland. It also includes systems with woody vegetation and other non-grass vegetation such as herbs and brushes that fall below the threshold values used in the Forest Land category. The category also includes all grassland from wild lands to recreational areas as well as agricultural and silvi-pastoral systems, consistent with national definitions.

##### **(iv) Wetlands**

This category includes areas of peat extraction and land that is covered or saturated by water for all or part of the year (e.g., peatlands) and that does not fall into the Forest Land, Cropland, Grassland or Settlements categories. It includes reservoirs as a managed sub-division and natural rivers and lakes as unmanaged sub-divisions.

#### Area

The user must specify area of land in acres for specific final and initial land use types. These area changes include not only the area of land that will be converted to buildings, but also areas disrupted by the construction of utility corridors, water tank sites, and associated borrow and

grading areas. Areas temporarily disturbed that will eventually recover to become vegetated will not be counted as vegetation removed as there is no net change in vegetation or land use.<sup>57</sup>

## 10.2 Sequestration

Planting trees will sequester CO<sub>2</sub> and is considered to result in a one-time carbon-stock change. Trees sequester CO<sub>2</sub> while they are actively growing. The amount of CO<sub>2</sub> sequestered depends on the type of tree.

$$\text{Total Sequestered CO}_2 = (\text{Growing Period} \times \sum_{i=1}^n [\text{Sequestration } i \times \text{Trees } i])$$

Where:

Growing Period = Growing period for all trees, expressed in years (20).

$n$  = Number of broad species classes.

Sequestration  $i$  = Default annual CO<sub>2</sub> accumulation per tree for broad species class  $i$ .

Trees  $i$  = Number of net new trees of broad species class  $i$ .

Total Sequestered CO<sub>2</sub> is the growing period for all trees multiplied by the summation of annual CO<sub>2</sub> accumulation multiplied by the number of new trees per broad species class.

### Growing Period

The program assumes the IPCC active growing period of 20 years. Thereafter, the accumulation of carbon in biomass slows with age, and will be completely offset by losses from clipping, pruning, and occasional death. Actual active growing periods are subject to, among other things, species, climate regime, and planting density. Note that trees may also be replaced at the end of the 20-year cycle, which would result in additional years of carbon sequestration. However, this would be offset by the potential net release of carbon from the removal of the replaced tree.

<sup>57</sup> This assumption facilitates the calculation as a yearly growth rate and CO<sub>2</sub> removal rate does not have to be calculated. As long as the disturbed land will indeed return to its original state, this assumption is valid for time periods over 20 years.

Sequestration

The program uses default annual CO<sub>2</sub> accumulation per tree for broad species class as follows:

| Broad species class        | Default annual CO <sub>2</sub> accumulation per tree <sup>1</sup><br>(MT CO <sub>2</sub> / year) |
|----------------------------|--------------------------------------------------------------------------------------------------|
| Aspen                      | 0.0352                                                                                           |
| Soft maple                 | 0.0433                                                                                           |
| Mixed hardwood             | 0.0367                                                                                           |
| Hardwood maple             | 0.0521                                                                                           |
| Juniper                    | 0.0121                                                                                           |
| Cedar/larch                | 0.0264                                                                                           |
| Douglas fir                | 0.0447                                                                                           |
| True fir/Hemlock           | 0.0381                                                                                           |
| Pine                       | 0.0319                                                                                           |
| Spruce                     | 0.0337                                                                                           |
| Miscellaneous <sup>2</sup> | 0.0354                                                                                           |

1. IPCC's carbon (C) values converted to carbon dioxide (CO<sub>2</sub>) using ratio of molecular weights (44/12).
2. Average of all other broad species classes. To be assumed if tree type is not known.

## 11 Mitigation

### 11.1 Construction Mitigation Measures and Regulatory Adjustments

The section below describes the types of reduction in emissions that CalEEMod incorporates. All end user information required in this section will require the end user to supply a source to support the parameter they select. This source will be displayed in the result output to enhance the communication of the assumptions used in determining the final mitigated emissions reported.

#### Mitigation Measures for Onsite Off-Road Construction Diesel Equipment

The emissions mitigation measures for onsite off-road construction diesel equipment include use of alternative fuel, electric equipment, diesel particulate filter (DPF), oxidant catalyst, newer tier engines, and dust suppression. The program has options allowing the user to apply mitigation measures to single piece of equipment or the entire fleet.

##### Exhaust Emissions Reduction

**Alternative Fuel:** The use of alternative fuels (i.e., biodiesel, compressed natural gas, propane, etc.) can change the emissions for both criteria and GHG emissions. Alternative fuels can change emissions (increase or decrease) for each pollutant. These values are based on values for alternative fuels in OFFROAD2011. Therefore they may not be available for all pieces of equipment. The biodiesel emissions are based on a report from NREL<sup>58</sup>. Biodiesel emissions are separated into both biogenic and non-biogenic CO<sub>2</sub> emissions. These values may be a slight under estimation since no starting or evaporative emissions are calculated in the program.

**Electric Equipment:** The use of electric equipment reduces emissions by 100% for all criteria pollutants. However, there are indirect GHG emissions associated with the electricity use. This is calculated by converting the horsepower to kilowatts and multiplying by the electricity carbon intensity factor. This is only available for those pieces of equipment where values have been identified as listed in the CAPCOA's Quantification of Greenhouse Gas Mitigation Measures.

**DPF:** The use of DPFs reduces the emissions of PM<sub>10</sub> and PM<sub>2.5</sub>. The program allows the end user to choose filters that meet different ARB standardized abatement and certification levels as needed<sup>59</sup>. The program also allows the end user to enter filter specification in case a filter with higher abatement level becomes available.

**Diesel Oxidation Catalyst:** The use of an oxidation catalyst assumes the combination operation of a selective catalytic reduction (SCR) that reduces NOx emissions by 0 to 40% percent<sup>60</sup>. Minor PM emissions reductions are also achieved.

**Newer Tier Engines:** The program allows the end user to choose newer engines that meet more stringent USEPA tier emissions standards than is anticipated from the statewide fleet mix.

<sup>58</sup> <http://www.nrel.gov/docs/fy06osti/37508.pdf> (see Table 2)

<sup>59</sup> <http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>

<sup>60</sup> [www.aqmd.gov/ceqa/handbook/mitigation/offroad/TableIII.doc](http://www.aqmd.gov/ceqa/handbook/mitigation/offroad/TableIII.doc)

If this option is checked, user will be required to enter the expected tier level, and CalEEMod will use the emission standard of the selected tier for the emissions calculation<sup>61</sup>.

The mitigation measure-pollutant applicability matrix presented in the table below:

| Mitigation Measure            | Applicability |     |     |                  |                   |                   |              |
|-------------------------------|---------------|-----|-----|------------------|-------------------|-------------------|--------------|
|                               | VOC           | SOx | NOx | PM <sub>10</sub> | PM <sub>2.5</sub> | GHG Anthropogenic | GHG Biogenic |
| Alternative Fuel              |               | x   | x   | x                | x                 | x                 | x            |
| Electric Equipment            | x             | x   | x   | x                | x                 | x                 | x            |
| DPF                           |               |     |     | x                | x                 |                   |              |
| Diesel Oxidation Catalyst/SCR |               |     | x   | x                | x                 |                   |              |
| Newer Tier Engines            | x             | x   | x   | x                | x                 |                   |              |
| User Input                    | x             | x   | x   | x                | x                 | x                 | x            |

## Fugitive Dust Emissions Reduction

The mitigation measures in this section apply the specified percent reduction in PM<sub>10</sub> or PM<sub>2.5</sub> to the applicable fugitive dust calculations. Watering of unpaved roads recalculates the unpaved road equations using the updated values supplied by the user in this section. These are based on mitigation measures described by SCAQMD<sup>62</sup>.

### 11.2 Mobile Mitigation

All mitigation associated with mobile sources is consistent with the methods described in CAPCOA's Quantification of GHG Mitigation Measures.

### 11.3 Hearths Mitigation Measures

The end user will be able to change the default percentage of hearths including no hearths or all natural gas hearths. This will recalculate the number of hearths and the corresponding emissions.

### 11.4 Architectural Coating Mitigation

The end user can select lower VOC content in paints than required by regulation. This value will be used instead of the usual emission factor.

### 11.5 Landscape Equipment Mitigation

The end user will be able to specify the percentage of landscape equipment that will be electric. This will be incorporated consistent with CAPCOA Mitigation Measures methodology.

<sup>61</sup> ARB and USEPA Off-Road Compression-Ignition (Diesel) Engine Standard available here:

[http://www.arb.ca.gov/msprog/ordiesel/documents/Off-Road\\_Diesel\\_Std.xls](http://www.arb.ca.gov/msprog/ordiesel/documents/Off-Road_Diesel_Std.xls)

<sup>62</sup> [http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM\\_fugitive.html](http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html)

**11.6 Improve Building Envelope Beyond Title 24 part 6**

The end user will enter their commitment to improve building envelope related systems (space heating, space cooling, water heating, and ventilation) beyond current Title 24 regulations. The end user will enter the percentage improvement.

**11.7 Install Energy Efficient Appliances**

The end user can designate the appliances that they will install that meet USEPAs Energy Star criteria. In order to meet CEQA enforceability criteria, these appliances need to be supplied by the builder. The program will use the average savings for an Energy Star appliance as reported in the Energy Star's most recent annual report. The following appliances will be available: refrigerators, dish washers, fans, and clothes washers. The reduction will only apply to these end uses.

**11.8 Install Renewable or Alternative Energy systems**

The end user will be able to specify the percentage of the electricity use that will be supplied from renewable or alternative energy systems. This includes energy from sources such as photovoltaic cells, wind turbines, geothermal sources, and fuel cells. The end user will enter the total annual kilowatt-hours anticipated to be generated or the percentage of the annual building energy that will be supplied by the alternative energy systems. Information on how to calculate these can be found in CAPCOA's Quantification of Greenhouse Gas Mitigation Measures.

**11.9 Water Mitigation**

All water mitigation methods are consistent with those described in the CAPCOA Quantifying GHG Mitigation Measures document.

**11.10 Waste Mitigation**

The amount of waste disposed will be reduced by the percentage entered by the user. There is no reallocation of the type of material disposed.



## Appendix B Glossary

Prepared for:  
**South Coast Air Quality Management District**  
**Diamond Bar, California**

Prepared by:  
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Date:  
**February 2011**



**Alternative Calculation Method**

Software used to demonstrate compliance with the California Building Energy Efficiency Standards (Title 24). The software must comply with the requirements listed in the Alternative Calculation Method Approval Manual.

**Additionality<sup>a</sup>**

The reduction in emissions by sources or enhancement of removals by sinks that is additional to any that would occur in the absence of the Project. The Project should not subsidize or take credit for emissions reductions which would have occurred regardless of the Project.

**Albedo<sup>a</sup>**

The fraction of solar radiation reflected by a surface or object, often expressed as a ratio or fraction. Snow covered surfaces have a high albedo; the albedo of soils ranges from high to low; vegetation covered surfaces and oceans have a low albedo. The Earth's albedo varies mainly through varying cloudiness, snow, ice, leaf area, and land cover changes. Paved surfaces with high albedos reflect solar radiation and can help reduce the urban heat island effect.

**Below Market Rate Housing**

Housing rented at rates lower than the market rate. Below market rate housing is designed to assist lower-income families. When below market rate housing is provided near job centers or transit, it provides lower income families with desirable job/housing match or greater opportunities for commuting to work through public transit.

**Biochemical Oxygen Demand**

Represents the amount of oxygen that would be required to completely consume the organic matter contained in wastewater through aerobic decomposition processes. Under the same conditions, wastewater with higher biochemical oxygen demand (BOD) concentrations will generally yield more methane than wastewater with lower BOD concentrations. BOD<sub>5</sub> is a measure of BOD after five days of decomposition.

**Biogenic Emissions<sup>b</sup>**

Carbon dioxide emissions produced from combusting a variety of biofuels, such as biodiesel, ethanol, wood, wood waste and landfill gas.

**Carbon Dioxide Equivalent**

A measure for comparing carbon dioxide with other greenhouse gases. Tonnes carbon dioxide equivalent is calculated by multiplying the tonnes of a greenhouse gas by its associated global warming potential.

**California Environmental Quality Act**

A statute passed in 1970 that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

**Combined Heat and Power**

Also known as cogeneration. Combined heat and power is the generation of both heat and electricity from the same process, such as combustion of fuel, with the purpose of utilizing or selling both simultaneously. In combined heat and power systems, the thermal energy byproducts of a process are captured and used, where they would be wasted in a separate heat

and power system. Examples of combined heat and power systems include gas turbines, reciprocating engines, and fuel cells.

### **Compact Infill**

Project which is located on an existing site within the central city or inner-ring suburb with high-frequency transit service. Examples may be community redevelopment areas, reusing abandoned sites, intensification of land use at established transit stations, or converting underutilized or older industrial buildings.

### **Climate Zone**

Geographic area of similar climatic characteristics, including temperature, weather, and other factors which affect building energy use. The California Energy Commission identified 16 Forecasting Climate Zones (FCZs) for use in the CEUS and RASS analyses. The designation of these FCZs was based in part on the utility service area.

### **Criteria Pollutant**

Pollutants for which National Ambient Air Quality Standards (NAAQS) or the California Ambient Air Quality Standards (CAAQS) have been established.

### **Density**

The amount of persons, jobs, or dwellings per unit area. This is an important metric for determining transportation-related parameters.

### **Destination Accessibility**

A measure of the number of jobs or other attractions reachable within a given travel time. Destination accessibility tends to be highest at central locations and lowest at peripheral ones.

### **Efficacy**

The capacity to produce a desired effect.

### **ENERGY STAR**

A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy which sets national standards for energy efficient consumer products. ENERGY STAR certified products are guaranteed to meet the efficiency standards specified by the program.

### **Elasticity**

The percentage change of one variable in response to a percentage change in another variable. Elasticity = percent change in variable A / percent change in variable B (where the change in B leads to the change in A). For example, if the elasticity of VMT with respect to density is -0.12, this means a 100% increase in density leads to a 12% decrease in VMT.

### **Evapotranspiration<sup>c</sup>**

Water lost to the atmosphere due to evaporation from soil and transpiration from plant leaves.

### **Fugitive Dust**

Dust particles that are introduced [or resuspended] into the air through certain activities such as soil cultivation, or vehicles operating on open fields or dirt roadways.

### **General Plan**

A set of long-term goals and policies that guide local land use decisions. The 2003 *General Plan Guidelines* developed by the California Office of Planning and Research provides advice on how

to write a general plan that expresses a community's long-term vision, fulfills statutory requirements, and contributes to creating a great community.

### **Global Warming Potential<sup>b</sup>**

The ratio of radiative forcing that would result from the emission of one kilogram of a greenhouse gas to that from the emission of one kilogram of carbon dioxide over a fixed period of time.

### **Graywater**

Untreated wastewater generated from bathtubs, showers, bathroom wash basins, and clothes washing machines which is collected and redistributed onsite for irrigation of landscape and mulch.

### **Greenhouse Gas**

For the purposes of this report, greenhouse gases are the six gases identified in the Kyoto Protocol: carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

### **Headway**

The amount of time (in minutes) that elapses between two public transit vehicles (on a given route and given line). Headways for buses and rail are generally shorter during peak periods and longer during off-peak periods. Headway is the inverse of frequency (headway = 1/frequency), where frequency is the number of arrivals over a given time period (i.e. buses per hour).

### **Job Center**

An area with a high degree and density of employment.

### **Kilowatt Hour**

A unit of energy. In the U.S., the kilowatt hour is the unit of measure used by utilities to bill consumers for energy use.

### **Land Use Index**

Measures the degree of land use mix of a development. An index of 0 indicates a single land use while 1 indicates a full mix of uses.

### **Lumen**

A unit of luminous flux. A measure of the brilliance of a source of visible light, or the power of light perceived by the human eye.

### **Master Planned Community**

Large communities developed specifically incorporating housing, office parks, recreational area, and commercial centers within the community. Master planned communities tend to encompass a large land area yet with the intent of being self-sustaining. Many master planned communities may have lakes, golf courses, and large parks.

### **Mixed Use**

A development that incorporates more than one type of land use. For example, a small block mixed use development may have buildings with ground-floor retail and housing on the floors above. A larger mixed use development will locate a variety of land uses within a short proximity of each other. This may include integrating office space, shopping, parks, and schools

with residential development. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial/institutional locations (and vice versa).

### **Ordinance**

A local law usually found in municipal code.

### **Photovoltaic<sup>c</sup>**

A system that converts sunlight directly into electricity using cells made of silicon or other conductive materials (solar cells). When sunlight hits the cells, a chemical reaction occurs, resulting in the release of electricity.

### **Ride Sharing**

Any form of carpooling or vanpooling where additional passengers are carried on the trip. Ride-sharing can be casual and formed independently or be part of an employer program where assistance is provided to employees to match up commuters who live in close proximity of one another.

### **Renewable Energy<sup>a</sup>**

Energy sources that are, within a short time frame relative to the Earth's natural cycles, sustainable, and include non-carbon technologies such as solar energy, hydropower, and wind, as well as carbon-neutral technologies such as biomass.

### **Sequestration<sup>a</sup>**

The process of increasing the carbon content of a carbon reservoir other than the atmosphere. Biological approaches to sequestration include direct removal of carbon dioxide from the atmosphere through land-use change, afforestation, reforestation, and practices that enhance soil carbon in agriculture. Physical approaches include separation and disposal of carbon dioxide from flue gases or from processing fossil fuels to produce hydrogen- and carbon dioxide-rich fractions and longterm storage in underground in depleted oil and gas reservoirs, coal seams, and saline aquifers.

### **Suburban**

An area characterized by dispersed, low-density, single-use, automobile dependent land use patterns, usually outside of the central city (a suburb).

### **Suburban Center**

A cluster of multi-use development within dispersed, low-density, automobile dependent land use patterns (a suburb). May be an historic downtown of a smaller community that has become surrounded by its region's suburban growth pattern in the later half of the 20<sup>th</sup> century. The suburban center serves the population of the suburb with office, retail and housing which is denser than the surrounding suburb.

### **Title 24**

Title 24 Part 6 is also known as the California Building Energy Efficiency Standard, which regulates building energy efficiency standards. Regulated energy uses include space heating and cooling, ventilation, domestic hot water heating, and some hard-wired lighting. Title 24 determines compliance by comparing the modeled energy use of a 'proposed home' to that of a minimally Title 24 compliant 'standard home' of equal dimensions. Title 24 focuses on building

energy efficiency per square foot; it places no limits upon the size of the house or the actual energy used per dwelling unit. The current Title 24 standards were published in 2008.

**Transit-Oriented Development**

A development located near and specifically designed around a rail or bus station. Proximity alone does not characterize a development as transit-oriented. The development and surrounding neighborhood should be designed for walking and bicycling and parking management strategies should be implemented. The development should be located within a short walking distance to a high-quality, high frequency, and reliable bus or rail service.

**Transportation Demand Management**

Any transportation strategy which has an intent to increase the transportation system efficiency and reduce demand on the system by discouraging single-occupancy vehicle travel, encourage alternative modes of transportation such as walking, bicycling, and public transit, encouraging ridesharing, encouraging more efficient travel patterns, shifting travel from peak to off-peak hours, and shifting travel from further to closer destinations.

**Transit Ridership**

The number of passengers who ride in a public transportation system, such as buses and subways.

**Tree and Grid Network**

Describes the layout of streets within and surrounding a project. Streets that are characterized as a tree network actually look like a tree and its branches. Streets are not laid out in any uniform pattern, intersection density is low, and the streets are less connected. In a grid network, streets are laid out in a perpendicular and parallel grid pattern. Streets tend to intersect more frequently, intersection density is higher, and the streets are more connected.

**Urban**

Project which is located within the central city, may be characterized by multi-family housing, located near office and retail.

**Urban Heat Island Effect**

The phenomenon in which a metropolitan area is warmer than its surrounding rural areas due to increased land surface which retains heat, such as concrete, asphalt, metal, and other materials found in buildings and pavements.

**Vehicle Miles Traveled**

The number of miles driven by vehicles. This is an important traffic parameter and the basis for most traffic-related greenhouse gas emissions calculations.

**Vehicle Occupancy**

The number of persons in a vehicle during a trip, including the driver and passengers.

Notes:

- <sup>a</sup> Definition adapted from: IPCC. 2001. Third Assessment Report: Climate Change 2001 (TAR). Annex B: Glossary of Terms. Available online at: <http://www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf>
- <sup>b</sup> Definition adapted from: CCAR. 2009. General Reporting Protocol, Version 3.1. Available online at: [http://www.climateregistry.org/resources/docs/protocols/grp/GRP\\_3.1\\_January2009.pdf](http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf)
- <sup>c</sup> Definition adapted from: USEPA. 2010. Greening EPA Glossary. Available online at: <http://www.epa.gov/oaintrnt/glossary.htm>



## Appendix C Acronym List

Prepared for:  
**South Coast Air Quality Management District**  
**Diamond Bar, California**

Prepared by:  
**ENVIRON International Corporation**  
**San Francisco, California**

Date:  
**February 2011**

## List of Acronyms

|                   |                                                       |
|-------------------|-------------------------------------------------------|
| ACM               | alternative calculation method                        |
| AF                | acre feet                                             |
| ARB               | California Air Resources Board                        |
| B20               | biodiesel (20%)                                       |
| BOD               | biochemical oxygen demand                             |
| BMP               | best management practice                              |
| BTU               | British thermal unit                                  |
| C                 | carbon                                                |
| CAFE              | corporate average fuel economy                        |
| CalEEMod          | California Emissions Estimator Model                  |
| CAPCOA            | California Air Pollution Control Officers Association |
| CAR               | Climate Action Registry                               |
| CCAR              | California Climate Action Registry                    |
| CDWR              | California Department of Water Resources              |
| CEC               | California Energy Commission                          |
| CEQA              | California Environmental Quality Act                  |
| CEUS              | California Commercial End-Use Survey                  |
| CGBSC             | California Green Building Standards Code              |
| CH <sub>4</sub>   | methane                                               |
| CHP               | combined heat and power                               |
| CIWMB             | California Integrated Waste Management Board          |
| CNG               | compressed natural gas                                |
| CO                | carbon monoxide                                       |
| CO <sub>2</sub>   | carbon dioxide                                        |
| CO <sub>2</sub> e | carbon dioxide equivalent                             |
| DE                | destruction efficiency                                |
| DEIR              | Draft Environmental Impact Report                     |
| DPF               | diesel particulate filter                             |
| DU                | dwelling unit                                         |
| EF                | emission factor                                       |
| EIA               | United States Energy Information Administration       |
| EIR               | Environmental Impact Report                           |
| EMFAC             | on-road vehicle emission factors model                |
| ET <sub>0</sub>   | reference evapotranspiration                          |
| ETWU              | estimated total water use                             |
| FCZ               | forecasting climate zone                              |
| g                 | gram                                                  |
| gal               | gallon                                                |
| GHG               | greenhouse gas                                        |
| GP                | General Plan                                          |
| GRP               | General Reporting Protocol                            |
| GUI               | graphical user interface                              |
| GWP               | global warming potential                              |
| HA                | hydrozone area                                        |
| HFC               | hydrofluorocarbons                                    |
| HHV               | higher heating value                                  |
| hp                | horsepower                                            |
| HVAC              | heating, ventilating, and air conditioning            |



|                  |                                                         |
|------------------|---------------------------------------------------------|
| IE               | irrigation efficiency                                   |
| IPCC             | Intergovernmental Panel on Climate Change               |
| ITE              | Institute of Transportation Engineers                   |
| ITS              | intelligent transportation systems                      |
| kBTU             | thousand British thermal units                          |
| kW               | kilowatt                                                |
| kWh              | kilowatt-hour                                           |
| kWh/yr           | kilowatt-hours/year                                     |
| lbs              | pounds                                                  |
| LA               | landscape area                                          |
| LADWP            | Los Angeles Department of Water and Power               |
| LCA              | life cycle assessment                                   |
| LDA              | light-duty auto                                         |
| LDT              | light-duty truck                                        |
| LED              | light-emitting diode                                    |
| Lf               | Load factor                                             |
| LFM              | landfill methane                                        |
| LGO              | Local Government Operation Protocol                     |
| LNG              | liquefied natural gas                                   |
| LPG              | liquefied petroleum gas                                 |
| MAWA             | maximum applied water allowance                         |
| MG               | million gallons                                         |
| MMBTU            | million British thermal units                           |
| Mph              | miles per hour                                          |
| m                | meter                                                   |
| MSW              | mixed solid waste                                       |
| MT               | metric tonnes; 1,000 kilograms                          |
| MTCE             | metric tonnes carbon equivalent                         |
| NCDC             | National Climatic Data Center                           |
| N <sub>2</sub> O | nitrous oxide                                           |
| NO <sub>x</sub>  | nitrogen oxides                                         |
| NRDC             | Natural Resources Defense Council                       |
| NREL             | National Renewable Energy Laboratory                    |
| OLED             | organic light-emitting diode                            |
| OFFROAD          | off-road vehicle emission factors model                 |
| PF               | plant factor                                            |
| PG&E             | Pacific Gas and Electric                                |
| PM               | particulate matter                                      |
| PUP              | Power/Utility Protocol                                  |
| RASS             | Residential Appliance Saturation Survey                 |
| ROG              | reactive organic gases                                  |
| SCAQMD           | South Coast Air Quality Management District             |
| SCE              | Southern California Edison                              |
| SDGE             | San Diego Gas and Electric                              |
| SLA              | special landscape area                                  |
| SMAQMD           | Sacramento Metropolitan Air Quality Management District |
| SMUD             | Sacramento Municipal Utility District                   |
| scf              | standard cubic feet                                     |
| SHP              | separate heat and power                                 |
| SO <sub>2</sub>  | sulfur dioxide                                          |
| SO <sub>x</sub>  | sulfur oxides                                           |

|                 |                                               |
|-----------------|-----------------------------------------------|
| sqft            | square feet                                   |
| TDM             | transportation demand management              |
| TDV             | time dependent valuation                      |
| TOD             | transit-oriented development                  |
| TOG             | total organic gases                           |
| Ton             | short ton                                     |
| TRU             | truck refrigeration unit                      |
| TSP             | total suspended particulate                   |
| URBEMIS         | Urban Emissions Model                         |
| US              | United States                                 |
| USDOE           | United States Department of Energy            |
| USEPA           | United States Environmental Protection Agency |
| VCAPD           | Ventura County Air Pollution Control District |
| VOC             | volatile organic compound                     |
| VMT             | vehicle miles traveled                        |
| VTR             | vehicle trip reduction                        |
| WARM            | Waste Reduction Model                         |
| WMO             | World Meteorological Organization             |
| WRCC            | Western Regional Climate Center               |
| Yd <sup>3</sup> | cubic yards                                   |
| yr              | year                                          |



**California Emissions Estimator Model<sup>®</sup>**

## Appendix D Default Data Tables

Prepared for:  
**California Air Pollution Control Officers  
Association (CAPCOA)**

Prepared by:  
**ENVIRON International Corporation  
San Francisco, California  
and  
California Air Districts**

Revised:  
**Sept 2013  
CalEEMod v.2013.2  
(Previous version February 2011)**

Table 1.1: Weather Data

| LocationType | DisplayName                             | Number Precipitation Days >0.1 inches |        | WindSpeed    |                         | Evapotranspiration |        |
|--------------|-----------------------------------------|---------------------------------------|--------|--------------|-------------------------|--------------------|--------|
|              |                                         | Days                                  | Source | meter/second | Source                  | inches/year        | Source |
| Counties     | Alameda                                 | 63                                    | 1      | 2.2          | 4                       | 44.33              | 5      |
|              | Alpine                                  | 74                                    | 1      | 2.2          | 4                       | 40.60              | 5      |
|              | Amador                                  | 63                                    | 1      | 2.2          | 4                       | 48.85              | 5      |
|              | Butte                                   | 71                                    | 1      | 2.2          | 4                       | 51.55              | 5      |
|              | Calaveras                               | 61                                    | 1      | 2.2          | 4                       | 48.80              | 5      |
|              | Colusa                                  | 56                                    | 1      | 2.2          | 4                       | 51.80              | 5      |
|              | Contra Costa                            | 58                                    | 1      | 2.2          | 4                       | 44.79              | 5      |
|              | Del Norte                               | 113                                   | 1      | 2.2          | 4                       | 27.70              | 5      |
|              | El Dorado-Lake Tahoe                    | 70                                    | 1      | 2.7          | 3. South Lake Tahoe     | 47.30              | 5      |
|              | El Dorado-Mountain County               | 70                                    | 1      | 2.7          | 3. South Lake Tahoe     | 47.30              | 5      |
|              | Fresno                                  | 45                                    | 1      | 2.2          | 4                       | 54.31              | 5      |
|              | Glenn                                   | 61                                    | 1      | 2.2          | 4                       | 51.70              | 5      |
|              | Humboldt                                | 103                                   | 1      | 2.2          | 4                       | 31.38              | 5      |
|              | Imperial                                | 12                                    | 1      | 3.4          | 2                       | 75.50              | 5      |
|              | Inyo                                    | 34                                    | 1      | 2.2          | 4                       | 72.66              | 5      |
|              | Kern-Mojave Desert                      | 32                                    | 1      | 2.7          | 3. Bakersfield          | 55.91              | 5      |
|              | Kern-San Joaquin                        | 32                                    | 1      | 2.7          | 3. Bakersfield          | 55.91              | 5      |
|              | Kings                                   | 37                                    | 1      | 2.2          | 4                       | 56.98              | 5      |
|              | Lake                                    | 67                                    | 1      | 2.2          | 4                       | 44.10              | 5      |
|              | Lassen                                  | 56                                    | 1      | 2.2          | 4                       | 46.90              | 5      |
|              | Los Angeles-Mojave Desert               | 33                                    | 1      | 2.2          | 4                       | 52.03              | 5      |
|              | Los Angeles-South Coast                 | 33                                    | 1      | 2.2          | 4                       | 52.03              | 5      |
|              | Madera                                  | 51                                    | 1      | 2.9          | 3. Madera               | 51.13              | 5      |
|              | Marin                                   | 69                                    | 1      | 2.2          | 4                       | 40.40              | 5      |
|              | Mariposa                                | 58                                    | 1      | 2.2          | 4                       | 46.40              | 5      |
|              | Mendocino-Coastal                       | 86                                    | 1      | 2.7          | 2                       | 37.90              | 5      |
|              | Mendocino-Inland                        | 86                                    | 1      | 2.2          | 2                       | 37.90              | 5      |
|              | Mendocino-Rural Inland North            | 86                                    | 1      | 2.2          | 2                       | 37.90              | 5      |
|              | Mendocino-Rural Inland South            | 86                                    | 1      | 2.2          | 2                       | 37.90              | 5      |
|              | Merced                                  | 49                                    | 1      | 2.2          | 4                       | 52.20              | 5      |
|              | Modoc                                   | 78                                    | 1      | 2.5          | 3. Alturas              | 43.20              | 5      |
|              | Mono                                    | 54                                    | 1      | 2.2          | 4                       | 43.00              | 5      |
|              | Monterey                                | 55                                    | 2      | 2.8          | 3. Monterey             | 45.31              | 5      |
|              | Napa                                    | 64                                    | 1      | 3.6          | 3. Napa                 | 47.36              | 5      |
|              | Nevada                                  | 80                                    | 1      | 2.2          | 4                       | 47.70              | 5      |
|              | Orange                                  | 30                                    | 1      | 2.2          | 4                       | 47.00              | 5      |
|              | Placer-Lake Tahoe                       | 74                                    | 1      | 2.2          | 4                       | 42.61              | 5      |
|              | Placer-Mountain Counties                | 74                                    | 1      | 2.2          | 4                       | 42.61              | 5      |
|              | Placer-San Joaquin                      | 74                                    | 1      | 2.2          | 4                       | 42.61              | 5      |
|              | Plumas                                  | 73                                    | 1      | 2.2          | 4                       | 39.80              | 5      |
|              | Riverside-Mojave Desert MDAQMD          | 28                                    | 1      | 2.6          | 3. Riverside            | 68.49              | 5      |
|              | Riverside-Mojave Desert SCAQMD          | 28                                    | 1      | 2.6          | 3. Riverside            | 68.49              | 5      |
|              | Riverside-Salton Sea                    | 28                                    | 1      | 2.4          | 3. Riverside            | 68.49              | 5      |
|              | Riverside-South Coast                   | 28                                    | 1      | 2.4          | 3. Riverside            | 68.49              | 5      |
|              | Sacramento                              | 58                                    | 1      | 3.5          | 2                       | 53.43              | 5      |
|              | San Benito                              | 50                                    | 2      | 2.2          | 4                       | 47.13              | 5      |
|              | San Bernardino-Mojave Desert            | 32                                    | 1      | 2.6          | 2                       | 69.27              | 5      |
|              | San Bernardino-South Coast              | 32                                    | 1      | 2.2          | 4                       | 69.27              | 5      |
|              | San Diego                               | 40                                    | 1      | 2.6          | 3. San Diego            | 48.96              | 5      |
|              | San Francisco                           | 64                                    | 1      | 4.6          | 3. San Francisco        | 35.10              | 5      |
|              | San Joaquin                             | 51                                    | 1      | 2.7          | 3. Fresno               | 49.44              | 5      |
|              | San Luis Obispo                         | 44                                    | 1      | 3.2          | 3. San Luis Obispo      | 44.45              | 5      |
|              | San Mateo                               | 70                                    | 1      | 2.2          | 4                       | 42.00              | 5      |
|              | Santa Barbara-North of Santa Ynez       | 37                                    | 1      | 3.13         | 2                       | 46.90              | 5      |
|              | Santa Barbara-South of Santa Ynez Range | 37                                    | 1      | 2.73         | 2                       | 46.90              | 5      |
|              | Santa Clara                             | 58                                    | 1      | 2.2          | 4                       | 44.86              | 5      |
|              | Santa Cruz                              | 61                                    | 1      | 2.2          | 4                       | 40.38              | 5      |
|              | Shasta                                  | 82                                    | 1      | 2.7          | 3. Redding              | 44.08              | 5      |
|              | Sierra                                  | 64                                    | 1      | 2.2          | 4                       | 40.45              | 5      |
|              | Siskiyou                                | 85                                    | 1      | 2.2          | 4                       | 39.52              | 5      |
|              | Solano-San Francisco                    | 56                                    | 1      | 2.2          | 4                       | 50.24              | 5      |
|              | Solano-San Joaquin                      | 56                                    | 1      | 6.8          | 2                       | 50.24              | 5      |
|              | Sonoma-North Coast                      | 75                                    | 1      | 2.2          | 4                       | 42.40              | 5      |
|              | Sonoma-San Francisco                    | 75                                    | 1      | 2.2          | 4                       | 42.40              | 5      |
|              | Stanislaus                              | 46                                    | 1      | 2.2          | 4                       | 51.34              | 5      |
|              | Sutter                                  | 61                                    | 1      | 2.2          | 4                       | 48.45              | 5      |
|              | Tehama                                  | 68                                    | 1      | 3.13         | 2                       | 53.00              | 5      |
|              | Trinity                                 | 88                                    | 1      | 2.2          | 4                       | 40.05              | 5      |
|              | Tulare                                  | 51                                    | 1      | 2.2          | 4                       | 50.99              | 5      |
|              | Tuolumne                                | 66                                    | 1      | 2.2          | 4                       | 47.55              | 5      |
|              | Ventura                                 | 31                                    | 1      | 2.6          | 2                       | 47.98              | 5      |
|              | Yolo                                    | 54                                    | 1      | 6.8          | 2                       | 52.18              | 5      |
|              | Yuba                                    | 72                                    | 1      | 3.4          | 3. Marysville-Yuba City | 50.15              | 5      |

Table 1.1: Weather Data

| LocationType  | DisplayName                     | Number Precipitation Days >0.1 inches |        | WindSpeed    |                     | Evapotranspiration |        |
|---------------|---------------------------------|---------------------------------------|--------|--------------|---------------------|--------------------|--------|
|               |                                 | Days                                  | Source | meter/second | Source              | inches/year        | Source |
| Air Basins    | Great Basin Valleys             | 54                                    | 1      | 2.2          | 4                   | 52.09              | 5      |
|               | Lake County                     | 67                                    | 1      | 2.2          | 4                   | 44.10              | 5      |
|               | Lake Tahoe                      | 72                                    | 1      | 2.7          | 3. South Lake Tahoe | 44.96              | 5      |
|               | Mojave Desert                   | 31                                    | 1      | 2.6          | 2                   | 61.42              | 5      |
|               | Mountain Counties               | 8                                     | 1      | 2.2          | 4                   | 45.50              | 5      |
|               | North Central Coast             | 53                                    | 1      | 2.8          | 3 average           | 44.28              | 5      |
|               | North Coast                     | 93                                    | 1      | 2.2          | 4                   | 35.89              | 5      |
|               | Northeast Plateau               | 73                                    | 1      | 2.5          | 3 average           | 43.21              | 5      |
|               | Sacramento Valley               | 65                                    | 1      | 3.5          | 2                   | 49.93              | 5      |
|               | Salton Sea                      | 20                                    | 1      | 3.4          | 3 average           | 71.99              | 5      |
|               | San Diego                       | 40                                    | 1      | 2.6          | 3. San Diego        | 48.96              | 5      |
|               | San Francisco Bay Area          | 64                                    | 1      | 2.2          | 4                   | 43.64              | 5      |
|               | San Joaquin Valley              | 45                                    | 1      | 2.7          | 3 average           | 53.05              | 5      |
|               | South Central Coast             | 37                                    | 1      | 2.9          | 3 average           | 46.44              | 5      |
|               | South Coast                     | 31                                    | 1      | 2.2          | 4                   | 59.20              | 5      |
|               | Amador County APCD              | 63                                    | 1      | 2.2          | 4                   | 48.85              | 5      |
|               | Antelope Valley APCD            | 33                                    | 1      | 2.2          | 4                   | 52.03              | 5      |
|               | Bay Area AQMD                   | 64                                    | 1      | 2.2          | 4                   | 43.64              | 5      |
| Air Districts | Butte County AQMD               | 71                                    | 1      | 2.2          | 4                   | 51.55              | 5      |
|               | Calaveras County AQMD           | 61                                    | 1      | 2.2          | 4                   | 48.80              | 5      |
|               | Colusa County APCD              | 56                                    | 1      | 2.2          | 4                   | 51.80              | 5      |
|               | El Dorado County APCD           | 70                                    | 1      | 2.7          | 3 average           | 47.30              | 5      |
|               | Feather River AQMD              | 67                                    | 1      | 3.4          | 3 average           | 49.30              | 5      |
|               | Glenn County APCD               | 61                                    | 1      | 2.2          | 4                   | 51.70              | 5      |
|               | Great Basin UAPCD               | 54                                    | 1      | 2.2          | 4                   | 52.09              | 5      |
|               | Imperial County APCD            | 12                                    | 1      | 3.4          | 2                   | 75.50              | 5      |
|               | Kern County APCD                | 32                                    | 1      | 2.7          | 3. Bakersfield      | 55.91              | 5      |
|               | Lake County AQMD                | 67                                    | 1      | 2.2          | 4                   | 44.10              | 5      |
|               | Lassen County APCD              | 56                                    | 1      | 2.2          | 4                   | 46.90              | 5      |
|               | Mariposa County APCD            | 58                                    | 1      | 2.2          | 4                   | 46.40              | 5      |
|               | Mendocino County AQMD           | 86                                    | 1      | 2.2          | 4                   | 37.90              | 5      |
|               | Modoc County APCD               | 78                                    | 1      | 2.5          | 3 average           | 43.20              | 5      |
|               | Mojave Desert AQMD              | 30                                    | 1      | 2.6          | 2                   | 68.88              | 5      |
|               | Monterey Bay Unified APCD       | 53                                    | 1      | 2.8          | 3 average           | 44.28              | 5      |
|               | North Coast Unified APCD        | 101                                   | 1      | 2.2          | 4                   | 33.04              | 5      |
|               | Northern Sierra AQMD            | 72                                    | 1      | 2.2          | 4                   | 42.65              | 5      |
|               | Northern Sonoma County APCD     | 75                                    | 1      | 2.2          | 4                   | 42.40              | 5      |
|               | Placer County APCD              | 74                                    | 1      | 2.2          | 4                   | 42.61              | 5      |
|               | Sacramento Metropolitan AQMD    | 58                                    | 1      | 3.5          | 2                   | 53.43              | 5      |
|               | San Diego County APCD           | 40                                    | 1      | 2.6          | 3. San Diego        | 48.96              | 5      |
|               | San Joaquin Valley Unified APCD | 45                                    | 1      | 2.7          | 3 average           | 53.05              | 5      |
|               | San Luis Obispo County APCD     | 44                                    | 1      | 3.2          | 3. San Luis Obispo  | 44.45              | 5      |
|               | Santa Barbara County APCD       | 37                                    | 1      | 2.9          | 3 average           | 46.90              | 5      |
|               | Shasta County AQMD              | 82                                    | 1      | 2.7          | 3 average           | 44.08              | 5      |
|               | Siskiyou County APCD            | 85                                    | 1      | 2.2          | 4                   | 39.52              | 5      |
|               | South Coast AQMD                | 31                                    | 1      | 2.2          | 4                   | 59.20              | 5      |
|               | Tehama County APCD              | 68                                    | 1      | 3.13         | 2                   | 53.00              | 5      |
|               | Tuolumne County APCD            | 66                                    | 1      | 2.2          | 4                   | 47.55              | 5      |
|               | Ventura County APCD             | 31                                    | 1      | 2.6          | 2                   | 47.98              | 5      |
|               | Yolo/Solano AQMD                | 55                                    | 1      | 6.8          | 2                   | 51.21              | 5      |
| State         | Statewide                       | 54                                    | 1      | 2.2          | 4                   | 47.93              | 5      |

**Notes:**

1. Precipitation Data based on the average of locations in this area according to data from the Western Regional Climate Center available at <http://www.wrcc.dri.edu/htmlfiles/ca/ca.01.html>
2. Data based on District provided information.
3. Wind speed data based on information from the Western Regional Climate Center available at: <http://www.wrcc.dri.edu/htmlfiles/westwind.final.html>
4. The statewide default windspeed is 2.2 meters per second.
5. Evapotranspiration rates from Appendix A of Model Water Efficient Landscape Ordinance from the California Department of Water Resources Available online at: <http://www.water.ca.gov/wateruseefficiency/docs/MWELO09-10-09.pdf>

Table 1.2: Electrical Utility Emission Factors of Greenhouse Gases

| Utility Company                         | CO <sub>2</sub> Intensity Factor | CH <sub>4</sub> Intensity Factor <sup>a</sup> | N <sub>2</sub> O Intensity Factor <sup>a</sup> | Reporting<br>Year for<br>CO <sub>2</sub> <sup>b</sup> EF |
|-----------------------------------------|----------------------------------|-----------------------------------------------|------------------------------------------------|----------------------------------------------------------|
|                                         | lb/MWhr                          |                                               |                                                |                                                          |
| Statewide Average                       | 1,002                            | 0.029                                         | 0.00617                                        | 2009                                                     |
| Anaheim Public Utilities                | 1,543                            | 0.029                                         | 0.00617                                        | 2007                                                     |
| Austin Energy                           | 1,083                            | 0.029                                         | 0.00617                                        | 2008                                                     |
| Burbank Water & Power                   | 1,096                            | 0.029                                         | 0.00617                                        | 2007                                                     |
| City and County of San Francisco        | 76                               | 0.029                                         | 0.00617                                        | 2005                                                     |
| City of Palo Alto Public Utilities      | 354                              | 0.029                                         | 0.00617                                        | 2009                                                     |
| Glendale Water & Power                  | 1,115                            | 0.029                                         | 0.00617                                        | 2009                                                     |
| Imperial Irrigation District            | 1,271                            | 0.029                                         | 0.00617                                        | 2008                                                     |
| Los Angeles Department of Water & Power | 1,228                            | 0.029                                         | 0.00617                                        | 2007                                                     |
| Martines Cogen Ltd. Partnership         | 945                              | 0.029                                         | 0.00617                                        | 2008                                                     |
| Modesto Irrigation District             | 833                              | 0.029                                         | 0.00617                                        | 2007                                                     |
| Pacific Gas & Electric Company          | 641                              | 0.029                                         | 0.00617                                        | 2008                                                     |
| PacifiCorp                              | 1,656                            | 0.029                                         | 0.00617                                        | 2009                                                     |
| Pasadena Water & Power                  | 1,664                            | 0.029                                         | 0.00617                                        | 2006                                                     |
| Platte River Power Authority            | 1,848                            | 0.029                                         | 0.00617                                        | 2007                                                     |
| Riverside Public Utilities              | 1,326                            | 0.029                                         | 0.00617                                        | 2007                                                     |
| Roseville Electric                      | 794                              | 0.029                                         | 0.00617                                        | 2007                                                     |
| Sacramento Municipal Utility District   | 590                              | 0.029                                         | 0.00617                                        | 2009                                                     |
| Salt River Project                      | 1,470                            | 0.029                                         | 0.00617                                        | 2007                                                     |
| San Diego Gas & Electric                | 720                              | 0.029                                         | 0.00617                                        | 2009                                                     |
| Seattle City Light                      | 31                               | 0.029                                         | 0.00617                                        | 2009                                                     |
| Sierra Pacific Resources                | 1,328                            | 0.029                                         | 0.00617                                        | 2008                                                     |
| Southern California Edison              | 631                              | 0.029                                         | 0.00617                                        | 2007                                                     |
| Turlock Irrigation District             | 790                              | 0.029                                         | 0.00617                                        | 2008                                                     |

**Notes:**

- a. Methane and Nitrous Oxide Intensity Factors based on 2012 E-Grid for California (2009 inventory)  
b. Emission Factors from May 2010 Local Government Operations Protocol

Table 2.1 Land Use Size Comparisons

| LandUseType | LandUseSubType                    | Acres Per Dwelling Unit <sup>1</sup> | Square Feet Per Dwelling Unit <sup>2</sup> |
|-------------|-----------------------------------|--------------------------------------|--------------------------------------------|
| Residential | Single Family Housing             | 0.32                                 | 1800                                       |
|             | Apartments low rise               | 0.063                                | 1000                                       |
|             | Apartments mid rise               | 0.026                                | 1000                                       |
|             | Apartments high rise              | 0.016                                | 1000                                       |
|             | Condo/townhouse                   | 0.063                                | 1000                                       |
|             | Condo/townhouse high rise         | 0.016                                | 1000                                       |
|             | Mobile Home Park                  | 0.13                                 | 1200                                       |
|             | Retirement Community              | 0.20                                 | 1000                                       |
|             | Congregate care (Assisted Living) | 0.063                                | 1000                                       |

| LandUseType  | LandUseSubType                       | LandUseSizeMetric | Acres Per Size Metric | SquareFeet | Other Per 1000 SQFT |                       |
|--------------|--------------------------------------|-------------------|-----------------------|------------|---------------------|-----------------------|
|              |                                      |                   |                       |            | Value               | Metric                |
| Educational  | Day-Care Center                      | 1000sqft          | 0.023                 | 1000       | 18                  | Student               |
|              |                                      |                   |                       |            | 2.8                 | Employee <sup>3</sup> |
| Educational  | Elementary School                    | 1000sqft          | 0.023                 | 1000       | 12                  | Student               |
|              |                                      |                   |                       |            | 1.0                 | Employee <sup>3</sup> |
| Educational  | Junior High School                   | 1000sqft          | 0.023                 | 1000       | 8.5                 | Student               |
|              |                                      |                   |                       |            | 0.8                 | Employee <sup>3</sup> |
| Educational  | High School                          | 1000sqft          | 0.023                 | 1000       | 7.5                 | Student               |
|              |                                      |                   |                       |            | 0.8                 | Employee <sup>3</sup> |
| Educational  | Junior College (2yr)                 | 1000sqft          | 0.023                 | 1000       | 23                  | Student               |
|              |                                      |                   |                       |            | 0.8                 | Employee <sup>3</sup> |
| Educational  | University/College (4yr)             | Student           | 0.0042                | 184        | 1.4                 | Employee <sup>3</sup> |
| Educational  | Library                              | 1000sqft          | 0.023                 | 1000       | 1.1                 | Employee <sup>3</sup> |
| Educational  | Place of Worship                     | 1000sqft          | 0.023                 | 1000       | 20                  | Seat                  |
| Recreational | City Park                            | Acre              | 1                     | 43560      |                     |                       |
| Recreational | Golf Course                          | Acre              | 1                     | 43560      |                     |                       |
| Recreational | Recreational Swimming Pool           | 1000sqft          | 0.023                 | 1000       | 143                 | Hole                  |
| Recreational | Racquet Club                         | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Recreational | Health Club                          | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Recreational | Movie Theater (No Matinee)           | 1000sqft          | 0.023                 | 1000       | 0.36                | Screen                |
|              |                                      |                   |                       |            | 44                  | Seat                  |
| Recreational | Arena                                | 1000sqft          | 0.32                  | 1000       | 0.023               | Acre                  |
| Recreational | Quality Restaurant                   | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Recreational | High Turnover (Sit Down Restaurant)  | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Recreational | Fast Food Restaurant with Drive Thru | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Recreational | Fast Food Restaurant w/o Drive Thru  | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Recreational | Hotel                                | Room              | 0.033                 | 1452       |                     |                       |
| Recreational | Motel                                | Room              | 0.045                 | 1960       |                     |                       |
| Parking      | Parking Lot                          | 1000sqft          | 0.023                 | 1000       | 0.023               | Acre                  |
|              |                                      |                   |                       |            | 2.5                 | Space                 |
| Parking      | Unenclosed Parking Structure         | 1000sqft          | 0.023                 | 1000       | 0.02                | Acre                  |
|              |                                      |                   |                       |            | 2.5                 | Space                 |
| Parking      | Enclosed Parking Structure           | 1000sqft          | 0.023                 | 1000       | 0.02                | Acre                  |
|              |                                      |                   |                       |            | 2.5                 | Space                 |
| Parking      | Unenclosed Parking with Elevator     | 1000sqft          | 0.023                 | 1000       | 0.02                | Acre                  |
|              |                                      |                   |                       |            | 2.5                 | Space                 |
| Parking      | Enclosed Parking with Elevator       | 1000sqft          | 0.023                 | 1000       | 0.02                | Acre                  |
|              |                                      |                   |                       |            | 2.5                 | Space                 |
| Parking      | Other Non-Asphalt Surfaces           | 1000sqft          | 0.023                 | 1000       | 0.02                | Acre                  |
| Parking      | Other Asphalt Surfaces               | 1000sqft          | 0.023                 | 1000       | 0.02                | Acre                  |
| Retail       | Free-Standing Discount store         | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Free-Standing Discount Superstore    | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Discount Club                        | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Regional Shopping Center             | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Electronic Superstore                | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Home Improvement Superstore          | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Strip Mall                           | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Hardware/Paint Store                 | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Supermarket                          | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Convenience Market (24 hour)         | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Convenience Market with Gas Pumps    | 1000sqft          | 0.023                 | 1000       | 7.1                 | Pump                  |
| Retail       | Automobile Care Center               | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Retail       | Gasoline/Service Station             | Pump              | 0.003                 | 141        |                     |                       |
| Commercial   | Bank (with Drive-Through)            | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | General Office Building              | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | Office Park                          | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | Research & Development               | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | Government Office Building           | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | Government (Civic Center)            | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | Pharmacy/Drugstore with Drive Thru   | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | Pharmacy/Drugstore w/o Drive Thru    | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | Medical Office Building              | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Commercial   | Hospital                             | 1000sqft          | 0.023                 | 1000       | 1.40                | Bed                   |
| Industrial   | Unrefrigerated Warehouse-No Rail     | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Industrial   | Unrefrigerated Warehouse-Rail        | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Industrial   | Refrigerated Warehouse-No Rail       | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Industrial   | Refrigerated Warehouse-Rail          | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Industrial   | General Light Industry               | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Industrial   | General Heavy Industry               | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Industrial   | Industrial Park                      | 1000sqft          | 0.023                 | 1000       |                     |                       |
| Industrial   | Manufacturing                        | 1000sqft          | 0.023                 | 1000       |                     |                       |

Notes:

1. Based on ratio of trip rates for the same land uses in the ITE Trip Generation Manual.
2. The value for average dwelling unit square footage is rounded based on the average square footage reported in the RASS.
3. Values based on SCAB survey information of employees per square foot of buildings.

Table 2.2 Population per Dwelling Unit

| LocationType | DisplayName                             | Single Family Homes | Multi-Family Homes | Source |
|--------------|-----------------------------------------|---------------------|--------------------|--------|
| Counties     | Alameda                                 | 2.86                | 2.86               | 1      |
|              | Alpine                                  | 2.86                | 2.86               | 1      |
|              | Amador                                  | 2.86                | 2.86               | 1      |
|              | Butte                                   | 2.86                | 2.86               | 1      |
|              | Calaveras                               | 2.86                | 2.86               | 1      |
|              | Colusa                                  | 2.86                | 2.86               | 1      |
|              | Contra Costa                            | 2.86                | 2.86               | 1      |
|              | Del Norte                               | 2.86                | 2.86               | 1      |
|              | El Dorado-Lake Tahoe                    | 2.86                | 2.86               | 1      |
|              | El Dorado-Mountain County               | 2.86                | 2.86               | 1      |
|              | Fresno                                  | 2.86                | 2.86               | 1      |
|              | Glenn                                   | 2.86                | 2.86               | 1      |
|              | Humboldt                                | 2.86                | 2.86               | 1      |
|              | Imperial                                | 3.23                | 3.23               | 2      |
|              | Inyo                                    | 2.86                | 2.86               | 1      |
|              | Kern-Mojave Desert                      | 2.86                | 2.86               | 1      |
|              | Kern-San Joaquin                        | 2.86                | 2.86               | 1      |
|              | Kings                                   | 2.86                | 2.86               | 1      |
|              | Lake                                    | 2.86                | 2.86               | 1      |
|              | Lassen                                  | 2.86                | 2.86               | 1      |
|              | Los Angeles-Mojave Desert               | 2.86                | 2.86               | 1      |
|              | Los Angeles-South Coast                 | 2.86                | 2.86               | 1      |
|              | Madera                                  | 2.86                | 2.86               | 1      |
|              | Marin                                   | 2.86                | 2.86               | 1      |
|              | Mariposa                                | 2.86                | 2.86               | 1      |
|              | Mendocino-Coastal                       | 2.86                | 2.86               | 1      |
|              | Mendocino-Inland                        | 2.86                | 2.86               | 1      |
|              | Mendocino-Rural Inland North            | 2.86                | 2.86               | 1      |
|              | Mendocino-Rural Inland South            | 2.86                | 2.86               | 1      |
|              | Merced                                  | 2.86                | 2.86               | 1      |
|              | Modoc                                   | 2.86                | 2.86               | 1      |
|              | Mono                                    | 2.86                | 2.86               | 1      |
|              | Monterey                                | 2.86                | 2.86               | 1      |
|              | Napa                                    | 2.86                | 2.86               | 1      |
|              | Nevada                                  | 2.86                | 2.86               | 1      |
|              | Orange                                  | 2.86                | 2.86               | 1      |
|              | Placer-Lake Tahoe                       | 2.86                | 2.86               | 1      |
|              | Placer-Mountain Counties                | 2.86                | 2.86               | 1      |
|              | Placer-Sacramento                       | 2.86                | 2.86               | 1      |
|              | Plumas                                  | 2.86                | 2.86               | 1      |
|              | Riverside-Mojave Desert MDAQMD          | 2.86                | 2.86               | 1      |
|              | Riverside-Mojave Desert SCAQMD          | 2.86                | 2.86               | 1      |
|              | Riverside-Salton Sea                    | 2.86                | 2.86               | 1      |
|              | Riverside-South Coast                   | 2.86                | 2.86               | 1      |
|              | Sacramento                              | 2.67                | 2.67               | 2      |
|              | San Benito                              | 2.86                | 2.86               | 1      |
|              | San Bernardino-Mojave Desert            | 2.86                | 2.86               | 1      |
|              | San Bernardino-South Coast              | 2.86                | 2.86               | 1      |
|              | San Diego                               | 2.86                | 2.86               | 1      |
|              | San Francisco                           | 2.86                | 2.86               | 1      |
|              | San Joaquin                             | 3.172               | 3.172              | 2      |
|              | San Luis Obispo                         | 2.86                | 2.86               | 1      |
|              | San Mateo                               | 2.86                | 2.86               | 1      |
|              | Santa Barbara-North of Santa Ynez       | 2.72                | 2.72               | 2      |
|              | Santa Barbara-South of Santa Ynez Range | 2.72                | 2.72               | 2      |
|              | Santa Clara                             | 2.86                | 2.86               | 1      |
|              | Santa Cruz                              | 2.86                | 2.86               | 1      |
|              | Shasta                                  | 2.86                | 2.86               | 1      |
|              | Sierra                                  | 2.86                | 2.86               | 1      |
|              | Siskiyou                                | 2.86                | 2.86               | 1      |
|              | Solano-San Francisco                    | 2.86                | 2.86               | 1      |
|              | Solano-San Joaquin                      | 2.86                | 2.86               | 1      |
|              | Sonoma-North Coast                      | 2.86                | 2.86               | 1      |
|              | Sonoma-San Francisco                    | 2.86                | 2.86               | 1      |
|              | Stanislaus                              | 2.86                | 2.86               | 1      |
|              | Sutter                                  | 2.86                | 2.86               | 1      |
|              | Tehama                                  | 2.6                 | 2.6                | 2      |
|              | Trinity                                 | 2.86                | 2.86               | 1      |
|              | Tulare                                  | 2.86                | 2.86               | 1      |
|              | Tuolumne                                | 2.86                | 2.86               | 1      |
|              | Ventura                                 | 3.06                | 3.06               | 2      |
|              | Yolo                                    | 2.86                | 2.86               | 1      |
|              | Yuba                                    | 2.86                | 2.86               | 1      |



Table 2.2 Population per Dwelling Unit

| LocationType | DisplayName                     | Single Family Homes | Multi-Family Homes | Source |
|--------------|---------------------------------|---------------------|--------------------|--------|
| Air Basin    | Great Basin Valleys             | 2.86                | 2.86               | 1      |
|              | Lake County                     | 2.86                | 2.86               | 1      |
|              | Lake Tahoe                      | 2.86                | 2.86               | 1      |
|              | Mojave Desert                   | 2.86                | 2.86               | 1      |
|              | Mountain Counties               | 2.86                | 2.86               | 1      |
|              | North Central Coast             | 2.86                | 2.86               | 1      |
|              | North Coast                     | 2.86                | 2.86               | 1      |
|              | Northeast Plateau               | 2.86                | 2.86               | 1      |
|              | Sacramento Valley               | 2.86                | 2.86               | 1      |
|              | Salton Sea                      | 3.23                | 3.23               | 2      |
|              | San Diego                       | 2.86                | 2.86               | 1      |
|              | San Francisco Bay Area          | 2.86                | 2.86               | 1      |
|              | San Joaquin Valley              | 2.86                | 2.86               | 1      |
|              | South Central Coast             | 2.86                | 2.86               | 1      |
|              | South Coast                     | 2.86                | 2.86               | 1      |
| Air District | Amador County APCD              | 2.86                | 2.86               | 1      |
|              | Antelope Valley APCD            | 2.86                | 2.86               | 1      |
|              | Bay Area AQMD                   | 2.86                | 2.86               | 1      |
|              | Butte County AQMD               | 2.86                | 2.86               | 1      |
|              | Calaveras County AQMD           | 2.86                | 2.86               | 1      |
|              | Colusa County APCD              | 2.86                | 2.86               | 1      |
|              | El Dorado County APCD           | 2.86                | 2.86               | 1      |
|              | Feather River AQMD              | 2.86                | 2.86               | 1      |
|              | Glenn County APCD               | 2.86                | 2.86               | 1      |
|              | Great Basin UAPCD               | 2.86                | 2.86               | 1      |
|              | Imperial County APCD            | 3.23                | 3.23               | 2      |
|              | Kern County APCD                | 2.86                | 2.86               | 1      |
|              | Lake County AQMD                | 2.86                | 2.86               | 1      |
|              | Lassen County APCD              | 2.86                | 2.86               | 1      |
|              | Mariposa County APCD            | 2.86                | 2.86               | 1      |
|              | Mendocino County AQMD           | 2.86                | 2.86               | 1      |
|              | Modoc County APCD               | 2.86                | 2.86               | 1      |
|              | Mojave Desert AQMD              | 2.86                | 2.86               | 1      |
|              | Monterey Bay Unified APCD       | 2.86                | 2.86               | 1      |
|              | North Coast Unified APCD        | 2.86                | 2.86               | 1      |
|              | Northern Sierra AQMD            | 2.86                | 2.86               | 1      |
|              | Northern Sonoma County APCD     | 2.86                | 2.86               | 1      |
|              | Placer County APCD              | 2.86                | 2.86               | 1      |
|              | Sacramento Metropolitan AQMD    | 2.67                | 2.67               | 2      |
|              | San Diego County APCD           | 2.86                | 2.86               | 1      |
|              | San Joaquin Valley Unified APCD | 3.172               | 3.172              | 2      |
|              | San Luis Obispo County APCD     | 2.86                | 2.86               | 1      |
|              | Santa Barbara County APCD       | 2.72                | 2.72               | 2      |
|              | Shasta County AQMD              | 2.86                | 2.86               | 1      |
|              | Siskiyou County APCD            | 2.86                | 2.86               | 1      |
|              | South Coast AQMD                | 2.86                | 2.86               | 1      |
|              | Tehama County APCD              | 2.6                 | 2.6                | 2      |
|              | Tuolumne County APCD            | 2.86                | 2.86               | 1      |
|              | Ventura County APCD             | 3.06                | 3.06               | 2      |
|              | Yolo/Solano AQMD                | 2.86                | 2.86               | 1      |
| Statewide    | Statewide                       | 2.86                | 2.86               | 1      |

**Notes:**

1. Based on statewide default of 2.86 people per dwelling unit.
2. Based on district supplied information.

**Table 3.1 Phase Length**

| <b>Project Acres</b> | <b>Demolition Days</b> | <b>Grading Days</b> | <b>Building Construction Days</b> | <b>Architectural Coating Days</b> | <b>Site Preparation Days</b> | <b>Paving Days</b> |
|----------------------|------------------------|---------------------|-----------------------------------|-----------------------------------|------------------------------|--------------------|
| ≥ 0                  | 10                     | 2                   | 100                               | 5                                 | 1                            | 5                  |
| ≥ 1                  | 20                     | 4                   | 200                               | 10                                | 2                            | 10                 |
| ≥ 2                  | 20                     | 6                   | 220                               | 10                                | 3                            | 10                 |
| ≥ 3                  | 20                     | 8                   | 230                               | 18                                | 5                            | 18                 |
| ≥ 5                  | 20                     | 20                  | 230                               | 20                                | 10                           | 20                 |
| ≥ 10                 | 20                     | 30                  | 300                               | 20                                | 10                           | 20                 |
| ≥ 15                 | 20                     | 30                  | 300                               | 20                                | 10                           | 20                 |
| ≥ 20                 | 20                     | 35                  | 370                               | 20                                | 10                           | 20                 |
| ≥ 25                 | 30                     | 45                  | 440                               | 35                                | 20                           | 35                 |
| ≥ 30                 | 30                     | 45                  | 500                               | 35                                | 20                           | 35                 |
| ≥ 34                 | 50                     | 75                  | 740                               | 55                                | 30                           | 55                 |
| ≥ 50                 | 70                     | 110                 | 1110                              | 75                                | 40                           | 75                 |
| ≥ 75                 | 100                    | 155                 | 1550                              | 110                               | 60                           | 110                |
| ≥ 100                | 200                    | 310                 | 3100                              | 220                               | 120                          | 220                |
| ≥ 200                | 300                    | 465                 | 4650                              | 330                               | 180                          | 330                |
| ≥ 300                | 400                    | 620                 | 6200                              | 440                               | 240                          | 440                |
| ≥ 400                | 500                    | 775                 | 7750                              | 550                               | 300                          | 550                |
| ≥ 500                | 600                    | 930                 | 9300                              | 660                               | 360                          | 660                |
| ≥ 600                | 700                    | 1085                | 10850                             | 770                               | 420                          | 770                |
| ≥ 700                | 800                    | 1240                | 12400                             | 880                               | 480                          | 880                |
| ≥ 800                | 900                    | 1395                | 13950                             | 990                               | 540                          | 990                |
| ≥ 900                | 1000                   | 1550                | 15500                             | 1100                              | 600                          | 1100               |
| ≥ 1000               | 10000                  | 15500               | 155000                            | 11000                             | 6000                         | 11000              |

**Notes:**

1. Based on construction survey performed by SCAQMD and included in Appendix E. For larger sites beyond the survey size, the number of days from several sites were added together.

### Table 3.2 Equipment Lists Based on Project Acreage

[illegible]

**Table 3.2 Equipment Lists Based on Project Acreage**

| PhaseType             | EquipmentType             | Hours per Day per Equipment |    |    |    |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |       |        |  |
|-----------------------|---------------------------|-----------------------------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|-------|--------|--|
|                       |                           | ≥1                          | ≥2 | ≥3 | ≥5 | ≥10 | ≥15 | ≥20 | ≥25 | ≥30 | ≥34 | ≥50 | ≥75 | ≥100 | ≥200 | ≥300 | ≥400 | ≥500 | ≥600 | ≥700 | ≥800 | ≥900 | ≥1000 | ≥10000 |  |
| Demolition            | Excavators                |                             |    |    | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Rubber Tired Dozers       | 1                           | 8  | 8  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Concrete/Industrial Saws  | 8                           | 8  | 8  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Tractors/Loaders/Backhoes | 6                           | 8  | 8  |    |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |       |        |  |
| Site Preparation      | Graders                   | 8                           | 8  | 8  |    |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |       |        |  |
|                       | Tractors/Loaders/Backhoes | 8                           | 8  | 7  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Rubber Tired Dozers       |                             | 7  |    | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Scrapers                  |                             |    | 8  |    |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |       |        |  |
| Grading               | Rubber Tired Dozers       | 1                           | 6  | 8  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Concrete/Industrial Saws  | 8                           |    |    |    |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |       |        |  |
|                       | Tractors/Loaders/Backhoes | 6                           | 7  | 7  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Graders                   |                             | 6  | 8  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Excavators                |                             |    |    | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Scrapers                  |                             |    |    |    |     | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
| Building Construction | Cranes                    | 4                           | 6  | 8  | 7  | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7     | 7      |  |
|                       | Forklifts                 | 6                           | 6  | 7  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Tractors/Loaders/Backhoes | 8                           | 6  | 6  | 7  | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7     | 7      |  |
|                       | Welders                   |                             | 8  | 8  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Generator Sets            |                             | 8  | 8  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
| Architectural Coating | Air Compressors           | 6                           | 6  | 6  | 6  | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6    | 6    | 6    | 6    | 6    | 6    | 6    | 6    | 6    | 6     | 6      |  |
| Paving                | Pavers                    | 7                           | 6  | 8  | 8  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Cement and Mortar Mixers  | 6                           | 6  | 8  | 6  |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |       |        |  |
|                       | Rollers                   | 7                           | 7  | 8  | 6  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       | Tractors/Loaders/Backhoes | 7                           | 8  | 8  | 8  |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |       |        |  |
|                       | Paving Equipment          |                             | 8  | 8  | 6  | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8     | 8      |  |
|                       |                           |                             |    |    |    |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |       |        |  |

**Notes:**

1. Based on construction survey performed by SCAQMD and included in Appendix E. For acreage beyond the survey size, equipment lists were kept the same.
2. An air compressor for architectural coating phases has been added to reflect the use of such equipment in many architectural coating operations.

**Table 3.3 OFFROAD Default Horsepower and Load Factors**

| <b>OFFROAD Equipment Type</b>      | <b>Horsepower</b> | <b>Load Factor</b> |
|------------------------------------|-------------------|--------------------|
| Aerial Lifts                       | 63                | 0.31               |
| Air Compressors                    | 78                | 0.48               |
| Bore/Drill Rigs                    | 206               | 0.50               |
| Cement and Mortar Mixers           | 9                 | 0.56               |
| Concrete/Industrial Saws           | 81                | 0.73               |
| Cranes                             | 226               | 0.29               |
| Crawler Tractors                   | 208               | 0.43               |
| Crushing/Proc. Equipment           | 85                | 0.78               |
| Dumpers/Tenders                    | 16                | 0.38               |
| Excavators                         | 163               | 0.38               |
| Forklifts                          | 89                | 0.20               |
| Generator Sets                     | 84                | 0.74               |
| Graders                            | 175               | 0.41               |
| Off-Highway Tractors               | 123               | 0.44               |
| Off-Highway Trucks                 | 400               | 0.38               |
| Other Construction Equipment       | 172               | 0.42               |
| Other General Industrial Equipment | 88                | 0.34               |
| Other Material Handling Equipment  | 167               | 0.40               |
| Pavers                             | 126               | 0.42               |
| Paving Equipment                   | 131               | 0.36               |
| Plate Compactors                   | 8                 | 0.43               |
| Pressure Washers                   | 13                | 0.30               |
| Pumps                              | 84                | 0.74               |
| Rollers                            | 81                | 0.38               |
| Rough Terrain Forklifts            | 100               | 0.40               |
| Rubber Tired Dozers                | 255               | 0.40               |
| Rubber Tired Loaders               | 200               | 0.36               |
| Scrapers                           | 362               | 0.48               |
| Signal Boards                      | 6                 | 0.82               |
| Skid Steer Loaders                 | 65                | 0.37               |
| Surfacing Equipment                | 254               | 0.30               |
| Sweepers/Scrubbers                 | 64                | 0.46               |
| Tractors/Loaders/Backhoes          | 98                | 0.37               |
| Trenchers                          | 81                | 0.50               |
| Welders                            | 46                | 0.45               |

Notes:

1. Based on the weighted average horsepower (by equipment population) and load factors for the mode of the engine groupings in 2011 OFFROAD

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Aerial Lifts   | 1990 | 6      | 15      | 5.436    | 1.804  | 4.999   | 9.999   | 0.833  | 0.968  | 0.968  | 568.299  | 0.162  |
| Aerial Lifts   | 1990 | 16     | 25      | 8.446    | 2.213  | 5       | 6.92    | 0.679  | 0.735  | 0.735  | 568.299  | 0.199  |
| Aerial Lifts   | 1990 | 26     | 50      | 22.237   | 3.256  | 6.91    | 7.372   | 0.692  | 0.948  | 0.948  | 568.299  | 0.293  |
| Aerial Lifts   | 1990 | 51     | 120     | 25.547   | 1.927  | 5.026   | 13.323  | 0.628  | 1.005  | 1.005  | 568.299  | 0.173  |
| Aerial Lifts   | 1990 | 251    | 500     | 90.051   | 1.214  | 6.888   | 11.7    | 0.525  | 0.605  | 0.605  | 568.299  | 0.109  |
| Aerial Lifts   | 1990 | 501    | 750     | 162.768  | 1.214  | 6.887   | 11.7    | 0.538  | 0.605  | 0.605  | 568.299  | 0.109  |
| Aerial Lifts   | 2000 | 6      | 15      | 4.911    | 1.629  | 4.729   | 8.804   | 0.079  | 0.737  | 0.737  | 568.299  | 0.147  |
| Aerial Lifts   | 2000 | 16     | 25      | 7.927    | 2.077  | 4.749   | 6.401   | 0.064  | 0.569  | 0.569  | 568.299  | 0.187  |
| Aerial Lifts   | 2000 | 26     | 50      | 21.066   | 3.084  | 6.643   | 6.596   | 0.065  | 0.711  | 0.711  | 568.3    | 0.278  |
| Aerial Lifts   | 2000 | 51     | 120     | 20.809   | 1.569  | 4.216   | 9.602   | 0.059  | 0.705  | 0.705  | 568.299  | 0.141  |
| Aerial Lifts   | 2000 | 251    | 500     | 60.706   | 0.819  | 3.931   | 8.191   | 0.049  | 0.31   | 0.31   | 568.3    | 0.073  |
| Aerial Lifts   | 2000 | 501    | 750     | 109.732  | 0.819  | 3.931   | 8.191   | 0.051  | 0.31   | 0.31   | 568.299  | 0.073  |
| Aerial Lifts   | 2005 | 6      | 15      | 2.733    | 0.907  | 3.649   | 5.927   | 0.079  | 0.424  | 0.424  | 568.3    | 0.081  |
| Aerial Lifts   | 2005 | 16     | 25      | 5.948    | 1.558  | 3.804   | 5.978   | 0.064  | 0.474  | 0.474  | 568.299  | 0.14   |
| Aerial Lifts   | 2005 | 26     | 50      | 18.56    | 2.717  | 6.122   | 6.139   | 0.065  | 0.657  | 0.657  | 568.299  | 0.245  |
| Aerial Lifts   | 2005 | 51     | 120     | 17.765   | 1.34   | 3.898   | 8.079   | 0.059  | 0.651  | 0.651  | 568.299  | 0.12   |
| Aerial Lifts   | 2005 | 251    | 500     | 41.275   | 0.556  | 2.307   | 6.521   | 0.049  | 0.217  | 0.217  | 568.299  | 0.05   |
| Aerial Lifts   | 2005 | 501    | 750     | 76.693   | 0.572  | 2.307   | 6.666   | 0.051  | 0.219  | 0.219  | 568.299  | 0.051  |
| Aerial Lifts   | 2010 | 6      | 15      | 0.646663 | 0.5434 | 3.62771 | 4.927   | 0.0054 | 0.3219 | 0.2961 | 583.4159 | 0.1698 |
| Aerial Lifts   | 2010 | 16     | 25      | 0.646663 | 0.5434 | 3.62771 | 4.927   | 0.0054 | 0.3219 | 0.2961 | 583.4159 | 0.1698 |
| Aerial Lifts   | 2010 | 26     | 50      | 0.646663 | 0.5434 | 3.62771 | 4.927   | 0.0054 | 0.3219 | 0.2961 | 583.4159 | 0.1698 |
| Aerial Lifts   | 2010 | 51     | 120     | 0.478206 | 0.4018 | 3.35167 | 5.13121 | 0.0049 | 0.3293 | 0.303  | 524.5713 | 0.1527 |
| Aerial Lifts   | 2010 | 251    | 500     | 0.542967 | 0.4562 | 1.70527 | 7.02372 | 0.0049 | 0.2198 | 0.2022 | 524.505  | 0.1527 |
| Aerial Lifts   | 2010 | 501    | 750     | 54.853   | 0.409  | 1.535   | 5.216   | 0.005  | 0.16   | 0.16   | 568.299  | 0.036  |
| Aerial Lifts   | 2011 | 6      | 15      | 0.492997 | 0.4143 | 3.43961 | 4.84101 | 0.0054 | 0.2745 | 0.2525 | 581.9574 | 0.1698 |
| Aerial Lifts   | 2011 | 16     | 25      | 0.492997 | 0.4143 | 3.43961 | 4.84101 | 0.0054 | 0.2745 | 0.2525 | 581.9574 | 0.1698 |
| Aerial Lifts   | 2011 | 26     | 50      | 0.492997 | 0.4143 | 3.43961 | 4.84101 | 0.0054 | 0.2745 | 0.2525 | 581.9574 | 0.1698 |
| Aerial Lifts   | 2011 | 51     | 120     | 0.406188 | 0.3413 | 3.31532 | 4.72007 | 0.0049 | 0.2874 | 0.2644 | 523.2599 | 0.1527 |
| Aerial Lifts   | 2011 | 251    | 500     | 0.547278 | 0.4599 | 1.71344 | 7.05257 | 0.0049 | 0.2223 | 0.2045 | 523.1938 | 0.1527 |
| Aerial Lifts   | 2011 | 501    | 750     | 50.06    | 0.373  | 1.402   | 4.839   | 0.005  | 0.144  | 0.144  | 568.299  | 0.033  |
| Aerial Lifts   | 2012 | 6      | 15      | 0.448839 | 0.3771 | 3.41137 | 4.66755 | 0.0054 | 0.2468 | 0.2271 | 580.4989 | 0.1698 |
| Aerial Lifts   | 2012 | 16     | 25      | 0.448839 | 0.3771 | 3.41137 | 4.66755 | 0.0054 | 0.2468 | 0.2271 | 580.4989 | 0.1698 |
| Aerial Lifts   | 2012 | 26     | 50      | 0.448839 | 0.3771 | 3.41137 | 4.66755 | 0.0054 | 0.2468 | 0.2271 | 580.4989 | 0.1698 |
| Aerial Lifts   | 2012 | 51     | 120     | 0.348327 | 0.2927 | 3.28979 | 4.38748 | 0.0049 | 0.2511 | 0.231  | 521.9485 | 0.1527 |
| Aerial Lifts   | 2012 | 251    | 500     | 0.551589 | 0.4635 | 1.72161 | 7.08141 | 0.0049 | 0.2247 | 0.2067 | 521.8825 | 0.1527 |
| Aerial Lifts   | 2012 | 501    | 750     | 46.364   | 0.346  | 1.307   | 4.488   | 0.005  | 0.131  | 0.131  | 568.299  | 0.031  |
| Aerial Lifts   | 2013 | 6      | 15      | 0.365114 | 0.3068 | 3.29997 | 4.33199 | 0.0054 | 0.1958 | 0.1801 | 577.5818 | 0.1698 |
| Aerial Lifts   | 2013 | 16     | 25      | 0.365114 | 0.3068 | 3.29997 | 4.33199 | 0.0054 | 0.1958 | 0.1801 | 577.5818 | 0.1698 |
| Aerial Lifts   | 2013 | 26     | 50      | 0.365114 | 0.3068 | 3.29997 | 4.33199 | 0.0054 | 0.1958 | 0.1801 | 577.5818 | 0.1698 |
| Aerial Lifts   | 2013 | 51     | 120     | 0.288639 | 0.2425 | 3.25075 | 3.92887 | 0.0049 | 0.2017 | 0.1856 | 519.3256 | 0.1527 |
| Aerial Lifts   | 2013 | 251    | 500     | 0.277309 | 0.233  | 0.97787 | 4.58384 | 0.0049 | 0.1001 | 0.0921 | 519.26   | 0.1527 |
| Aerial Lifts   | 2013 | 501    | 750     | 43.268   | 0.322  | 1.237   | 4.155   | 0.005  | 0.119  | 0.119  | 568.299  | 0.029  |
| Aerial Lifts   | 2014 | 6      | 15      | 0.309966 | 0.2605 | 3.23337 | 4.09559 | 0.0054 | 0.1577 | 0.1451 | 574.6647 | 0.1698 |
| Aerial Lifts   | 2014 | 16     | 25      | 0.309966 | 0.2605 | 3.23337 | 4.09559 | 0.0054 | 0.1577 | 0.1451 | 574.6647 | 0.1698 |
| Aerial Lifts   | 2014 | 26     | 50      | 0.309966 | 0.2605 | 3.23337 | 4.09559 | 0.0054 | 0.1577 | 0.1451 | 574.6647 | 0.1698 |
| Aerial Lifts   | 2014 | 51     | 120     | 0.240786 | 0.2023 | 3.2195  | 3.37278 | 0.0049 | 0.1608 | 0.1479 | 516.7028 | 0.1527 |
| Aerial Lifts   | 2014 | 251    | 500     | 0.281092 | 0.2362 | 0.98271 | 4.60231 | 0.0049 | 0.1012 | 0.0931 | 516.6375 | 0.1527 |
| Aerial Lifts   | 2014 | 501    | 750     | 40.165   | 0.299  | 1.178   | 3.761   | 0.005  | 0.109  | 0.109  | 568.299  | 0.027  |
| Aerial Lifts   | 2015 | 6      | 15      | 0.295589 | 0.2484 | 3.23342 | 3.93284 | 0.0054 | 0.136  | 0.1251 | 568.8305 | 0.1698 |
| Aerial Lifts   | 2015 | 16     | 25      | 0.295589 | 0.2484 | 3.23342 | 3.93284 | 0.0054 | 0.136  | 0.1251 | 568.8305 | 0.1698 |
| Aerial Lifts   | 2015 | 26     | 50      | 0.295589 | 0.2484 | 3.23342 | 3.93284 | 0.0054 | 0.136  | 0.1251 | 568.8305 | 0.1698 |
| Aerial Lifts   | 2015 | 51     | 120     | 0.226785 | 0.1906 | 3.21782 | 3.1134  | 0.0049 | 0.1431 | 0.1316 | 511.457  | 0.1527 |
| Aerial Lifts   | 2015 | 251    | 500     | 0.284874 | 0.2394 | 0.98755 | 4.62077 | 0.0049 | 0.1023 | 0.0941 | 511.3924 | 0.1527 |
| Aerial Lifts   | 2015 | 501    | 750     | 37.246   | 0.278  | 1.13    | 3.38    | 0.005  | 0.098  | 0.098  | 568.299  | 0.025  |
| Aerial Lifts   | 2016 | 6      | 15      | 0.271111 | 0.2278 | 3.19737 | 3.67571 | 0.0054 | 0.1046 | 0.0963 | 562.9964 | 0.1698 |
| Aerial Lifts   | 2016 | 16     | 25      | 0.271111 | 0.2278 | 3.19737 | 3.67571 | 0.0054 | 0.1046 | 0.0963 | 562.9964 | 0.1698 |
| Aerial Lifts   | 2016 | 26     | 50      | 0.271111 | 0.2278 | 3.19737 | 3.67571 | 0.0054 | 0.1046 | 0.0963 | 562.9964 | 0.1698 |
| Aerial Lifts   | 2016 | 51     | 120     | 0.196986 | 0.1655 | 3.20103 | 2.72218 | 0.0049 | 0.1119 | 0.103  | 506.2113 | 0.1527 |
| Aerial Lifts   | 2016 | 251    | 500     | 0.288656 | 0.2426 | 0.99238 | 4.63924 | 0.0049 | 0.1034 | 0.0952 | 506.1474 | 0.1527 |
| Aerial Lifts   | 2016 | 501    | 750     | 34.529   | 0.257  | 1.089   | 3.015   | 0.005  | 0.088  | 0.088  | 568.299  | 0.023  |
| Aerial Lifts   | 2017 | 6      | 15      | 0.248829 | 0.2091 | 3.16913 | 3.46956 | 0.0054 | 0.0789 | 0.0726 | 554.2451 | 0.1698 |
| Aerial Lifts   | 2017 | 16     | 25      | 0.248829 | 0.2091 | 3.16913 | 3.46956 | 0.0054 | 0.0789 | 0.0726 | 554.2451 | 0.1698 |
| Aerial Lifts   | 2017 | 26     | 50      | 0.248829 | 0.2091 | 3.16913 | 3.46956 | 0.0054 | 0.0789 | 0.0726 | 554.2451 | 0.1698 |
| Aerial Lifts   | 2017 | 51     | 120     | 0.169799 | 0.1427 | 3.18429 | 2.36368 | 0.0049 | 0.0834 | 0.0768 | 498.3428 | 0.1527 |
| Aerial Lifts   | 2017 | 251    | 500     | 0.292438 | 0.2457 | 0.99722 | 4.6577  | 0.0049 | 0.1046 | 0.0962 | 498.2798 | 0.1527 |
| Aerial Lifts   | 2017 | 501    | 750     | 32.148   | 0.239  | 1.059   | 2.68    | 0.005  | 0.079  | 0.079  | 568.299  | 0.021  |
| Aerial Lifts   | 2018 | 6      | 15      | 0.216292 | 0.1817 | 3.11639 | 3.2101  | 0.0054 | 0.0542 | 0.0499 | 545.4939 | 0.1698 |
| Aerial Lifts   | 2018 | 16     | 25      | 0.216292 | 0.1817 | 3.11639 | 3.2101  | 0.0054 | 0.0542 | 0.0499 | 545.4939 | 0.1698 |
| Aerial Lifts   | 2018 | 26     | 50      | 0.216292 | 0.1817 | 3.11639 | 3.2101  | 0.0054 | 0.0542 | 0.0499 | 545.4939 | 0.1698 |
| Aerial Lifts   | 2018 | 51     | 120     | 0.145088 | 0.1219 | 3.16685 | 2.0636  | 0.0049 | 0.0571 | 0.0525 | 490.4742 | 0.1527 |
| Aerial Lifts   | 2018 | 251    | 500     | 0.074117 | 0.0623 | 0.93655 | 0.63368 | 0.0049 | 0.0088 | 0.0081 | 490.4122 | 0.1527 |
| Aerial Lifts   | 2018 | 501    | 750     | 30.169   | 0.225  | 1.037   | 2.385   | 0.005  | 0.071  | 0.071  | 568.299  | 0.02   |
| Aerial Lifts   | 2019 | 6      | 15      | 0.204518 | 0.1719 | 3.11451 | 3.07945 | 0.0054 | 0.0417 | 0.0384 | 536.7427 | 0.1698 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type  | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|-----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Aerial Lifts    | 2019 | 16     | 25      | 0.204518 | 0.1719 | 3.11451 | 3.07945 | 0.0054 | 0.0417 | 0.0384 | 536.7427 | 0.1698 |
| Aerial Lifts    | 2019 | 26     | 50      | 0.204518 | 0.1719 | 3.11451 | 3.07945 | 0.0054 | 0.0417 | 0.0384 | 536.7427 | 0.1698 |
| Aerial Lifts    | 2019 | 51     | 120     | 0.14071  | 0.1182 | 3.17254 | 1.97658 | 0.0049 | 0.0485 | 0.0446 | 482.6056 | 0.1527 |
| Aerial Lifts    | 2019 | 251    | 500     | 0.077988 | 0.0655 | 0.94139 | 0.63586 | 0.0049 | 0.0089 | 0.0082 | 482.5446 | 0.1527 |
| Aerial Lifts    | 2019 | 501    | 750     | 28.429   | 0.212  | 1.023   | 2.117   | 0.005  | 0.064  | 0.064  | 568.299  | 0.019  |
| Aerial Lifts    | 2020 | 6      | 15      | 0.199447 | 0.1676 | 3.09942 | 2.95486 | 0.0054 | 0.0309 | 0.0284 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2020 | 16     | 25      | 0.199447 | 0.1676 | 3.09942 | 2.95486 | 0.0054 | 0.0309 | 0.0284 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2020 | 26     | 50      | 0.199447 | 0.1676 | 3.09942 | 2.95486 | 0.0054 | 0.0309 | 0.0284 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2020 | 51     | 120     | 0.136778 | 0.1149 | 3.1768  | 1.86859 | 0.0049 | 0.0416 | 0.0382 | 472.1142 | 0.1527 |
| Aerial Lifts    | 2020 | 251    | 500     | 0.081859 | 0.0688 | 0.94623 | 0.63803 | 0.0049 | 0.009  | 0.0083 | 472.0545 | 0.1527 |
| Aerial Lifts    | 2020 | 501    | 750     | 26.846   | 0.2    | 1.013   | 1.868   | 0.005  | 0.057  | 0.057  | 568.299  | 0.018  |
| Aerial Lifts    | 2021 | 6      | 15      | 0.196174 | 0.1648 | 3.11369 | 2.92238 | 0.0054 | 0.0265 | 0.0244 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2021 | 16     | 25      | 0.196174 | 0.1648 | 3.11369 | 2.92238 | 0.0054 | 0.0265 | 0.0244 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2021 | 26     | 50      | 0.196174 | 0.1648 | 3.11369 | 2.92238 | 0.0054 | 0.0265 | 0.0244 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2021 | 51     | 120     | 0.129509 | 0.1088 | 3.17624 | 1.74368 | 0.0049 | 0.0333 | 0.0306 | 472.1142 | 0.1527 |
| Aerial Lifts    | 2021 | 251    | 500     | 0.08573  | 0.072  | 0.95107 | 0.64021 | 0.0049 | 0.0091 | 0.0083 | 472.0545 | 0.1527 |
| Aerial Lifts    | 2021 | 501    | 750     | 25.065   | 0.187  | 1.004   | 1.61    | 0.005  | 0.05   | 0.05   | 568.299  | 0.016  |
| Aerial Lifts    | 2022 | 6      | 15      | 0.192664 | 0.1619 | 3.11231 | 2.90676 | 0.0054 | 0.0243 | 0.0223 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2022 | 16     | 25      | 0.192664 | 0.1619 | 3.11231 | 2.90676 | 0.0054 | 0.0243 | 0.0223 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2022 | 26     | 50      | 0.192664 | 0.1619 | 3.11231 | 2.90676 | 0.0054 | 0.0243 | 0.0223 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2022 | 51     | 120     | 0.124613 | 0.1047 | 3.17602 | 1.62659 | 0.0049 | 0.0302 | 0.0278 | 472.1142 | 0.1527 |
| Aerial Lifts    | 2022 | 251    | 500     | 0.089601 | 0.0753 | 0.95591 | 0.64238 | 0.0049 | 0.0092 | 0.0084 | 472.0545 | 0.1527 |
| Aerial Lifts    | 2022 | 501    | 750     | 23.788   | 0.177  | 0.998   | 1.424   | 0.005  | 0.044  | 0.044  | 568.299  | 0.016  |
| Aerial Lifts    | 2023 | 6      | 15      | 0.19346  | 0.1626 | 3.12196 | 2.89722 | 0.0054 | 0.0231 | 0.0213 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2023 | 16     | 25      | 0.19346  | 0.1626 | 3.12196 | 2.89722 | 0.0054 | 0.0231 | 0.0213 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2023 | 26     | 50      | 0.19346  | 0.1626 | 3.12196 | 2.89722 | 0.0054 | 0.0231 | 0.0213 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2023 | 51     | 120     | 0.119594 | 0.1005 | 3.17029 | 1.5481  | 0.0049 | 0.0267 | 0.0246 | 472.1142 | 0.1527 |
| Aerial Lifts    | 2023 | 251    | 500     | 0.093472 | 0.0785 | 0.96074 | 0.64456 | 0.0049 | 0.0092 | 0.0085 | 472.0545 | 0.1527 |
| Aerial Lifts    | 2023 | 501    | 750     | 22.675   | 0.169  | 0.995   | 1.265   | 0.005  | 0.038  | 0.038  | 568.299  | 0.015  |
| Aerial Lifts    | 2024 | 6      | 15      | 0.188737 | 0.1586 | 3.11285 | 2.88821 | 0.0054 | 0.0217 | 0.0199 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2024 | 16     | 25      | 0.188737 | 0.1586 | 3.11285 | 2.88821 | 0.0054 | 0.0217 | 0.0199 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2024 | 26     | 50      | 0.188737 | 0.1586 | 3.11285 | 2.88821 | 0.0054 | 0.0217 | 0.0199 | 525.0743 | 0.1698 |
| Aerial Lifts    | 2024 | 51     | 120     | 0.119572 | 0.1005 | 3.17255 | 1.52789 | 0.0049 | 0.0265 | 0.0244 | 472.1142 | 0.1527 |
| Aerial Lifts    | 2024 | 251    | 500     | 0.097343 | 0.0818 | 0.96558 | 0.64674 | 0.0049 | 0.0093 | 0.0086 | 472.0545 | 0.1527 |
| Aerial Lifts    | 2024 | 501    | 750     | 21.618   | 0.161  | 0.991   | 1.115   | 0.005  | 0.033  | 0.033  | 568.299  | 0.014  |
| Aerial Lifts    | 2025 | 6      | 15      | 0.182854 | 0.1536 | 3.08837 | 2.87882 | 0.0054 | 0.0207 | 0.019  | 525.0743 | 0.1698 |
| Aerial Lifts    | 2025 | 16     | 25      | 0.182854 | 0.1536 | 3.08837 | 2.87882 | 0.0054 | 0.0207 | 0.019  | 525.0743 | 0.1698 |
| Aerial Lifts    | 2025 | 26     | 50      | 0.182854 | 0.1536 | 3.08837 | 2.87882 | 0.0054 | 0.0207 | 0.019  | 525.0743 | 0.1698 |
| Aerial Lifts    | 2025 | 51     | 120     | 0.117586 | 0.0988 | 3.16742 | 1.51077 | 0.0049 | 0.0259 | 0.0238 | 472.1142 | 0.1527 |
| Aerial Lifts    | 2025 | 251    | 500     | 0.101214 | 0.085  | 0.97042 | 0.64891 | 0.0049 | 0.0094 | 0.0087 | 472.0545 | 0.1527 |
| Aerial Lifts    | 2025 | 501    | 750     | 20.597   | 0.153  | 0.989   | 0.974   | 0.005  | 0.028  | 0.028  | 568.299  | 0.013  |
| Aerial Lifts    | 2030 | 6      | 15      | 1.993    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Aerial Lifts    | 2030 | 16     | 25      | 2.616    | 0.685  | 2.339   | 4.332   | 0.007  | 0.162  | 0.162  | 568.299  | 0.061  |
| Aerial Lifts    | 2030 | 26     | 50      | 2.317    | 0.339  | 3.764   | 3.135   | 0.007  | 0.04   | 0.04   | 568.3    | 0.03   |
| Aerial Lifts    | 2030 | 51     | 120     | 2.504    | 0.188  | 3.352   | 1.657   | 0.006  | 0.036  | 0.036  | 568.299  | 0.017  |
| Aerial Lifts    | 2030 | 251    | 500     | 9.37     | 0.126  | 0.986   | 0.479   | 0.005  | 0.016  | 0.016  | 568.299  | 0.011  |
| Aerial Lifts    | 2030 | 501    | 750     | 16.962   | 0.126  | 0.986   | 0.485   | 0.005  | 0.016  | 0.016  | 568.299  | 0.011  |
| Aerial Lifts    | 2035 | 6      | 15      | 1.993    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Aerial Lifts    | 2035 | 16     | 25      | 2.616    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Aerial Lifts    | 2035 | 26     | 50      | 2.033    | 0.297  | 3.726   | 3.017   | 0.007  | 0.019  | 0.019  | 568.299  | 0.026  |
| Aerial Lifts    | 2035 | 51     | 120     | 2.202    | 0.166  | 3.345   | 1.466   | 0.006  | 0.017  | 0.017  | 568.299  | 0.014  |
| Aerial Lifts    | 2035 | 251    | 500     | 8.659    | 0.116  | 0.986   | 0.33    | 0.005  | 0.011  | 0.011  | 568.299  | 0.01   |
| Aerial Lifts    | 2035 | 501    | 750     | 15.653   | 0.116  | 0.986   | 0.33    | 0.005  | 0.011  | 0.011  | 568.299  | 0.01   |
| Aerial Lifts    | 2040 | 6      | 15      | 1.993    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Aerial Lifts    | 2040 | 16     | 25      | 2.616    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Aerial Lifts    | 2040 | 26     | 50      | 2.015    | 0.295  | 3.723   | 2.966   | 0.007  | 0.013  | 0.013  | 568.299  | 0.026  |
| Aerial Lifts    | 2040 | 51     | 120     | 2.141    | 0.161  | 3.344   | 1.407   | 0.006  | 0.012  | 0.012  | 568.299  | 0.014  |
| Aerial Lifts    | 2040 | 251    | 500     | 8.324    | 0.112  | 0.986   | 0.279   | 0.005  | 0.009  | 0.009  | 568.299  | 0.01   |
| Aerial Lifts    | 2040 | 501    | 750     | 15.046   | 0.112  | 0.986   | 0.279   | 0.005  | 0.009  | 0.009  | 568.299  | 0.01   |
| Air Compressors | 1990 | 6      | 15      | 4.702    | 1.804  | 4.999   | 9.999   | 1.018  | 0.974  | 0.974  | 568.299  | 0.162  |
| Air Compressors | 1990 | 16     | 25      | 11.537   | 2.213  | 4.999   | 6.919   | 0.83   | 0.74   | 0.74   | 568.299  | 0.199  |
| Air Compressors | 1990 | 26     | 50      | 34.016   | 4.232  | 8.684   | 7.735   | 0.846  | 1.152  | 1.152  | 568.3    | 0.381  |
| Air Compressors | 1990 | 51     | 120     | 37.275   | 2.2    | 5.46    | 14.348  | 0.768  | 1.216  | 1.216  | 568.299  | 0.198  |
| Air Compressors | 1990 | 121    | 175     | 48.032   | 1.504  | 4.835   | 12.906  | 0.736  | 0.806  | 0.806  | 568.299  | 0.135  |
| Air Compressors | 1990 | 176    | 250     | 71.231   | 1.504  | 4.835   | 12.906  | 0.736  | 0.806  | 0.806  | 568.299  | 0.135  |
| Air Compressors | 1990 | 251    | 500     | 112.803  | 1.348  | 9.633   | 12.363  | 0.642  | 0.704  | 0.704  | 568.299  | 0.121  |
| Air Compressors | 1990 | 501    | 750     | 174.334  | 1.348  | 9.633   | 12.363  | 0.658  | 0.704  | 0.704  | 568.299  | 0.121  |
| Air Compressors | 1990 | 751    | 1000    | 235.953  | 1.344  | 9.633   | 12.363  | 0.658  | 0.699  | 0.699  | 568.3    | 0.121  |
| Air Compressors | 2000 | 6      | 15      | 4.493    | 1.723  | 4.875   | 9.08    | 0.079  | 0.747  | 0.747  | 568.299  | 0.155  |
| Air Compressors | 2000 | 16     | 25      | 10.924   | 2.095  | 4.783   | 6.405   | 0.065  | 0.569  | 0.569  | 568.299  | 0.189  |
| Air Compressors | 2000 | 26     | 50      | 31.858   | 3.963  | 8.261   | 6.902   | 0.066  | 0.851  | 0.851  | 568.299  | 0.357  |
| Air Compressors | 2000 | 51     | 120     | 30.02    | 1.771  | 4.544   | 10.276  | 0.06   | 0.835  | 0.835  | 568.3    | 0.159  |
| Air Compressors | 2000 | 121    | 175     | 37.86    | 1.185  | 3.7     | 9.332   | 0.057  | 0.494  | 0.494  | 568.299  | 0.106  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type  | Year | Low HP | High HP | TOG     | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|-----------------|------|--------|---------|---------|-------|-------|-------|-------|-------|-------|---------|-------|
| Air Compressors | 2000 | 176    | 250     | 47.101  | 0.994 | 2.949 | 8.985 | 0.057 | 0.406 | 0.406 | 568.299 | 0.089 |
| Air Compressors | 2000 | 251    | 500     | 76.009  | 0.908 | 5.008 | 8.611 | 0.05  | 0.36  | 0.36  | 568.299 | 0.082 |
| Air Compressors | 2000 | 501    | 750     | 117.469 | 0.908 | 5.008 | 8.611 | 0.051 | 0.36  | 0.36  | 568.299 | 0.082 |
| Air Compressors | 2000 | 751    | 1000    | 176.359 | 1.004 | 5.6   | 9.212 | 0.051 | 0.379 | 0.379 | 568.299 | 0.09  |
| Air Compressors | 2005 | 6      | 15      | 3.634   | 1.394 | 4.38  | 7.817 | 0.079 | 0.621 | 0.621 | 568.299 | 0.125 |
| Air Compressors | 2005 | 16     | 25      | 8.461   | 1.622 | 3.922 | 6.014 | 0.065 | 0.483 | 0.483 | 568.299 | 0.146 |
| Air Compressors | 2005 | 26     | 50      | 28.493  | 3.545 | 7.671 | 6.447 | 0.066 | 0.792 | 0.792 | 568.299 | 0.319 |
| Air Compressors | 2005 | 51     | 120     | 25.731  | 1.518 | 4.196 | 8.646 | 0.06  | 0.775 | 0.775 | 568.299 | 0.137 |
| Air Compressors | 2005 | 121    | 175     | 31.762  | 0.994 | 3.339 | 7.911 | 0.057 | 0.428 | 0.428 | 568.299 | 0.089 |
| Air Compressors | 2005 | 176    | 250     | 33.701  | 0.711 | 1.989 | 7.465 | 0.057 | 0.281 | 0.281 | 568.299 | 0.064 |
| Air Compressors | 2005 | 251    | 500     | 52.734  | 0.63  | 2.602 | 6.868 | 0.05  | 0.252 | 0.252 | 568.299 | 0.056 |
| Air Compressors | 2005 | 501    | 750     | 83.252  | 0.644 | 2.602 | 7.019 | 0.051 | 0.255 | 0.255 | 568.299 | 0.058 |
| Air Compressors | 2005 | 751    | 1000    | 135.834 | 0.773 | 3.154 | 8.036 | 0.051 | 0.271 | 0.271 | 568.299 | 0.069 |
| Air Compressors | 2010 | 6      | 15      | 2.931   | 1.124 | 4.027 | 6.554 | 0.008 | 0.473 | 0.473 | 568.299 | 0.101 |
| Air Compressors | 2010 | 16     | 25      | 6.607   | 1.267 | 3.309 | 5.477 | 0.007 | 0.384 | 0.384 | 568.299 | 0.114 |
| Air Compressors | 2010 | 26     | 50      | 23.546  | 2.929 | 7.121 | 6.067 | 0.007 | 0.669 | 0.669 | 568.299 | 0.264 |
| Air Compressors | 2010 | 51     | 120     | 20.566  | 1.213 | 4.044 | 7.183 | 0.006 | 0.653 | 0.653 | 568.299 | 0.109 |
| Air Compressors | 2010 | 121    | 175     | 25.827  | 0.808 | 3.277 | 6.422 | 0.006 | 0.361 | 0.361 | 568.299 | 0.072 |
| Air Compressors | 2010 | 176    | 250     | 24.871  | 0.525 | 1.468 | 6.008 | 0.006 | 0.198 | 0.198 | 568.299 | 0.047 |
| Air Compressors | 2010 | 251    | 500     | 39.447  | 0.471 | 1.648 | 5.363 | 0.005 | 0.182 | 0.182 | 568.299 | 0.042 |
| Air Compressors | 2010 | 501    | 750     | 62.011  | 0.479 | 1.648 | 5.507 | 0.005 | 0.185 | 0.185 | 568.299 | 0.043 |
| Air Compressors | 2010 | 751    | 1000    | 105.623 | 0.601 | 2.147 | 6.994 | 0.005 | 0.209 | 0.209 | 568.299 | 0.054 |
| Air Compressors | 2011 | 6      | 15      | 2.782   | 1.067 | 3.952 | 6.283 | 0.008 | 0.441 | 0.441 | 568.299 | 0.096 |
| Air Compressors | 2011 | 16     | 25      | 6.215   | 1.192 | 3.179 | 5.36  | 0.007 | 0.361 | 0.361 | 568.299 | 0.107 |
| Air Compressors | 2011 | 26     | 50      | 22.03   | 2.741 | 6.919 | 5.972 | 0.007 | 0.636 | 0.636 | 568.299 | 0.247 |
| Air Compressors | 2011 | 51     | 120     | 19.321  | 1.14  | 4.005 | 6.805 | 0.006 | 0.626 | 0.626 | 568.299 | 0.102 |
| Air Compressors | 2011 | 121    | 175     | 24.432  | 0.765 | 3.264 | 6.065 | 0.006 | 0.347 | 0.347 | 568.299 | 0.069 |
| Air Compressors | 2011 | 176    | 250     | 22.999  | 0.485 | 1.372 | 5.603 | 0.006 | 0.177 | 0.177 | 568.299 | 0.043 |
| Air Compressors | 2011 | 251    | 500     | 36.661  | 0.438 | 1.497 | 4.981 | 0.005 | 0.165 | 0.165 | 568.299 | 0.039 |
| Air Compressors | 2011 | 501    | 750     | 57.58   | 0.445 | 1.497 | 5.123 | 0.005 | 0.167 | 0.167 | 568.299 | 0.04  |
| Air Compressors | 2011 | 751    | 1000    | 98.738  | 0.562 | 1.971 | 6.637 | 0.005 | 0.196 | 0.196 | 568.299 | 0.05  |
| Air Compressors | 2012 | 6      | 15      | 2.626   | 1.007 | 3.874 | 5.999 | 0.008 | 0.407 | 0.407 | 568.299 | 0.09  |
| Air Compressors | 2012 | 16     | 25      | 5.803   | 1.113 | 3.043 | 5.239 | 0.007 | 0.337 | 0.337 | 568.299 | 0.1   |
| Air Compressors | 2012 | 26     | 50      | 20.318  | 2.527 | 6.682 | 5.869 | 0.007 | 0.6   | 0.6   | 568.299 | 0.228 |
| Air Compressors | 2012 | 51     | 120     | 17.991  | 1.061 | 3.964 | 6.39  | 0.006 | 0.587 | 0.587 | 568.299 | 0.095 |
| Air Compressors | 2012 | 121    | 175     | 22.92   | 0.717 | 3.251 | 5.684 | 0.006 | 0.324 | 0.324 | 568.299 | 0.064 |
| Air Compressors | 2012 | 176    | 250     | 21.576  | 0.455 | 1.312 | 5.216 | 0.006 | 0.161 | 0.161 | 568.299 | 0.041 |
| Air Compressors | 2012 | 251    | 500     | 34.608  | 0.413 | 1.392 | 4.618 | 0.005 | 0.15  | 0.15  | 568.299 | 0.037 |
| Air Compressors | 2012 | 501    | 750     | 54.283  | 0.419 | 1.392 | 4.758 | 0.005 | 0.153 | 0.153 | 568.299 | 0.037 |
| Air Compressors | 2012 | 751    | 1000    | 91.671  | 0.522 | 1.8   | 6.263 | 0.005 | 0.183 | 0.183 | 568.299 | 0.047 |
| Air Compressors | 2013 | 6      | 15      | 2.471   | 0.948 | 3.796 | 5.716 | 0.008 | 0.373 | 0.373 | 568.299 | 0.085 |
| Air Compressors | 2013 | 16     | 25      | 5.393   | 1.034 | 2.907 | 5.117 | 0.007 | 0.314 | 0.314 | 568.299 | 0.093 |
| Air Compressors | 2013 | 26     | 50      | 18.508  | 2.302 | 6.43  | 5.643 | 0.007 | 0.553 | 0.553 | 568.299 | 0.207 |
| Air Compressors | 2013 | 51     | 120     | 16.632  | 0.981 | 3.921 | 5.978 | 0.006 | 0.543 | 0.543 | 568.299 | 0.088 |
| Air Compressors | 2013 | 121    | 175     | 21.377  | 0.669 | 3.238 | 5.321 | 0.006 | 0.298 | 0.298 | 568.299 | 0.06  |
| Air Compressors | 2013 | 176    | 250     | 20.386  | 0.43  | 1.271 | 4.839 | 0.006 | 0.147 | 0.147 | 568.299 | 0.038 |
| Air Compressors | 2013 | 251    | 500     | 32.936  | 0.393 | 1.313 | 4.268 | 0.005 | 0.137 | 0.137 | 568.3   | 0.035 |
| Air Compressors | 2013 | 501    | 750     | 51.584  | 0.399 | 1.313 | 4.406 | 0.005 | 0.14  | 0.14  | 568.299 | 0.036 |
| Air Compressors | 2013 | 751    | 1000    | 84.725  | 0.482 | 1.639 | 5.883 | 0.005 | 0.17  | 0.17  | 568.299 | 0.043 |
| Air Compressors | 2014 | 6      | 15      | 2.324   | 0.891 | 3.723 | 5.445 | 0.008 | 0.341 | 0.341 | 568.3   | 0.08  |
| Air Compressors | 2014 | 16     | 25      | 5.008   | 0.96  | 2.78  | 5     | 0.007 | 0.291 | 0.291 | 568.299 | 0.086 |
| Air Compressors | 2014 | 26     | 50      | 16.691  | 2.076 | 6.181 | 5.421 | 0.007 | 0.505 | 0.505 | 568.299 | 0.187 |
| Air Compressors | 2014 | 51     | 120     | 15.28   | 0.901 | 3.88  | 5.608 | 0.006 | 0.495 | 0.495 | 568.299 | 0.081 |
| Air Compressors | 2014 | 121    | 175     | 19.856  | 0.621 | 3.227 | 4.973 | 0.006 | 0.272 | 0.272 | 568.299 | 0.056 |
| Air Compressors | 2014 | 176    | 250     | 19.194  | 0.405 | 1.237 | 4.399 | 0.006 | 0.134 | 0.134 | 568.299 | 0.036 |
| Air Compressors | 2014 | 251    | 500     | 31.25   | 0.373 | 1.249 | 3.855 | 0.005 | 0.125 | 0.125 | 568.299 | 0.033 |
| Air Compressors | 2014 | 501    | 750     | 48.868  | 0.378 | 1.249 | 3.991 | 0.005 | 0.128 | 0.128 | 568.299 | 0.034 |
| Air Compressors | 2014 | 751    | 1000    | 78.19   | 0.445 | 1.493 | 5.512 | 0.005 | 0.157 | 0.157 | 568.3   | 0.04  |
| Air Compressors | 2015 | 6      | 15      | 2.191   | 0.84  | 3.658 | 5.196 | 0.008 | 0.311 | 0.311 | 568.299 | 0.075 |
| Air Compressors | 2015 | 16     | 25      | 4.662   | 0.894 | 2.666 | 4.89  | 0.007 | 0.27  | 0.27  | 568.299 | 0.08  |
| Air Compressors | 2015 | 26     | 50      | 15.015  | 1.868 | 5.968 | 5.223 | 0.007 | 0.459 | 0.459 | 568.299 | 0.168 |
| Air Compressors | 2015 | 51     | 120     | 13.925  | 0.821 | 3.84  | 5.19  | 0.006 | 0.446 | 0.446 | 568.299 | 0.074 |
| Air Compressors | 2015 | 121    | 175     | 18.243  | 0.571 | 3.218 | 4.504 | 0.006 | 0.245 | 0.245 | 568.299 | 0.051 |
| Air Compressors | 2015 | 176    | 250     | 18.067  | 0.381 | 1.207 | 3.967 | 0.006 | 0.121 | 0.121 | 568.299 | 0.034 |
| Air Compressors | 2015 | 251    | 500     | 29.662  | 0.354 | 1.198 | 3.455 | 0.005 | 0.113 | 0.113 | 568.3   | 0.032 |
| Air Compressors | 2015 | 501    | 750     | 46.316  | 0.358 | 1.198 | 3.586 | 0.005 | 0.116 | 0.116 | 568.299 | 0.032 |
| Air Compressors | 2015 | 751    | 1000    | 71.885  | 0.409 | 1.37  | 5.157 | 0.005 | 0.142 | 0.142 | 568.299 | 0.036 |
| Air Compressors | 2016 | 6      | 15      | 2.109   | 0.809 | 3.622 | 5.023 | 0.008 | 0.289 | 0.289 | 568.299 | 0.073 |
| Air Compressors | 2016 | 16     | 25      | 4.462   | 0.855 | 2.604 | 4.803 | 0.007 | 0.255 | 0.255 | 568.299 | 0.077 |
| Air Compressors | 2016 | 26     | 50      | 13.429  | 1.67  | 5.779 | 5.042 | 0.007 | 0.415 | 0.415 | 568.299 | 0.15  |
| Air Compressors | 2016 | 51     | 120     | 12.618  | 0.744 | 3.804 | 4.79  | 0.006 | 0.397 | 0.397 | 568.299 | 0.067 |
| Air Compressors | 2016 | 121    | 175     | 16.69   | 0.522 | 3.211 | 4.052 | 0.006 | 0.219 | 0.219 | 568.299 | 0.047 |
| Air Compressors | 2016 | 176    | 250     | 17.023  | 0.359 | 1.182 | 3.553 | 0.006 | 0.109 | 0.109 | 568.299 | 0.032 |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type  | Year | Low HP | High HP | TOG    | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|-----------------|------|--------|---------|--------|-------|-------|-------|-------|-------|-------|---------|-------|
| Air Compressors | 2016 | 251    | 500     | 28.188 | 0.337 | 1.155 | 3.08  | 0.005 | 0.102 | 0.102 | 568.299 | 0.03  |
| Air Compressors | 2016 | 501    | 750     | 43.972 | 0.34  | 1.155 | 3.201 | 0.005 | 0.104 | 0.104 | 568.299 | 0.03  |
| Air Compressors | 2016 | 751    | 1000    | 67.278 | 0.383 | 1.295 | 4.854 | 0.005 | 0.131 | 0.131 | 568.299 | 0.034 |
| Air Compressors | 2017 | 6      | 15      | 2.05   | 0.786 | 3.599 | 4.887 | 0.008 | 0.272 | 0.272 | 568.299 | 0.07  |
| Air Compressors | 2017 | 16     | 25      | 4.327  | 0.83  | 2.564 | 4.729 | 0.007 | 0.243 | 0.243 | 568.299 | 0.074 |
| Air Compressors | 2017 | 26     | 50      | 11.908 | 1.481 | 5.604 | 4.871 | 0.007 | 0.371 | 0.371 | 568.299 | 0.133 |
| Air Compressors | 2017 | 51     | 120     | 11.385 | 0.671 | 3.772 | 4.412 | 0.006 | 0.35  | 0.35  | 568.299 | 0.06  |
| Air Compressors | 2017 | 121    | 175     | 15.244 | 0.477 | 3.207 | 3.627 | 0.006 | 0.194 | 0.194 | 568.299 | 0.043 |
| Air Compressors | 2017 | 176    | 250     | 16.09  | 0.339 | 1.162 | 3.163 | 0.006 | 0.098 | 0.098 | 568.299 | 0.03  |
| Air Compressors | 2017 | 251    | 500     | 26.901 | 0.321 | 1.123 | 2.755 | 0.005 | 0.092 | 0.092 | 568.299 | 0.029 |
| Air Compressors | 2017 | 501    | 750     | 41.87  | 0.323 | 1.123 | 2.845 | 0.005 | 0.094 | 0.094 | 568.299 | 0.029 |
| Air Compressors | 2017 | 751    | 1000    | 63.572 | 0.362 | 1.246 | 4.583 | 0.005 | 0.121 | 0.121 | 568.299 | 0.032 |
| Air Compressors | 2018 | 6      | 15      | 1.998  | 0.766 | 3.58  | 4.762 | 0.008 | 0.256 | 0.256 | 568.299 | 0.069 |
| Air Compressors | 2018 | 16     | 25      | 4.211  | 0.807 | 2.531 | 4.661 | 0.007 | 0.232 | 0.232 | 568.3   | 0.072 |
| Air Compressors | 2018 | 26     | 50      | 10.449 | 1.3   | 5.439 | 4.707 | 0.007 | 0.329 | 0.329 | 568.299 | 0.117 |
| Air Compressors | 2018 | 51     | 120     | 10.218 | 0.603 | 3.744 | 4.05  | 0.006 | 0.304 | 0.304 | 568.3   | 0.054 |
| Air Compressors | 2018 | 121    | 175     | 13.906 | 0.435 | 3.205 | 3.228 | 0.006 | 0.17  | 0.17  | 568.299 | 0.039 |
| Air Compressors | 2018 | 176    | 250     | 15.223 | 0.321 | 1.146 | 2.797 | 0.006 | 0.087 | 0.087 | 568.3   | 0.029 |
| Air Compressors | 2018 | 251    | 500     | 25.723 | 0.307 | 1.101 | 2.465 | 0.005 | 0.083 | 0.083 | 568.299 | 0.027 |
| Air Compressors | 2018 | 501    | 750     | 39.953 | 0.309 | 1.101 | 2.533 | 0.005 | 0.084 | 0.084 | 568.299 | 0.027 |
| Air Compressors | 2018 | 751    | 1000    | 60.205 | 0.343 | 1.21  | 4.325 | 0.005 | 0.111 | 0.111 | 568.299 | 0.03  |
| Air Compressors | 2019 | 6      | 15      | 1.951  | 0.748 | 3.562 | 4.647 | 0.008 | 0.241 | 0.241 | 568.299 | 0.067 |
| Air Compressors | 2019 | 16     | 25      | 4.106  | 0.787 | 2.501 | 4.596 | 0.007 | 0.222 | 0.222 | 568.299 | 0.071 |
| Air Compressors | 2019 | 26     | 50      | 9.076  | 1.129 | 5.283 | 4.546 | 0.007 | 0.287 | 0.287 | 568.299 | 0.101 |
| Air Compressors | 2019 | 51     | 120     | 9.123  | 0.538 | 3.718 | 3.706 | 0.006 | 0.26  | 0.26  | 568.299 | 0.048 |
| Air Compressors | 2019 | 121    | 175     | 12.833 | 0.401 | 3.204 | 2.874 | 0.006 | 0.15  | 0.15  | 568.299 | 0.036 |
| Air Compressors | 2019 | 176    | 250     | 14.416 | 0.304 | 1.132 | 2.469 | 0.006 | 0.078 | 0.078 | 568.299 | 0.027 |
| Air Compressors | 2019 | 251    | 500     | 24.559 | 0.293 | 1.086 | 2.193 | 0.005 | 0.075 | 0.075 | 568.299 | 0.026 |
| Air Compressors | 2019 | 501    | 750     | 38.104 | 0.294 | 1.086 | 2.247 | 0.005 | 0.076 | 0.076 | 568.299 | 0.026 |
| Air Compressors | 2019 | 751    | 1000    | 56.984 | 0.324 | 1.182 | 4.073 | 0.005 | 0.102 | 0.102 | 568.299 | 0.029 |
| Air Compressors | 2020 | 6      | 15      | 1.907  | 0.731 | 3.546 | 4.542 | 0.008 | 0.227 | 0.227 | 568.299 | 0.066 |
| Air Compressors | 2020 | 16     | 25      | 4.009  | 0.769 | 2.473 | 4.538 | 0.007 | 0.212 | 0.212 | 568.3   | 0.069 |
| Air Compressors | 2020 | 26     | 50      | 8.048  | 1.001 | 5.164 | 4.397 | 0.007 | 0.25  | 0.25  | 568.299 | 0.09  |
| Air Compressors | 2020 | 51     | 120     | 8.287  | 0.489 | 3.698 | 3.4   | 0.006 | 0.224 | 0.224 | 568.299 | 0.044 |
| Air Compressors | 2020 | 121    | 175     | 11.957 | 0.374 | 3.203 | 2.558 | 0.006 | 0.133 | 0.133 | 568.299 | 0.033 |
| Air Compressors | 2020 | 176    | 250     | 13.668 | 0.288 | 1.121 | 2.172 | 0.006 | 0.069 | 0.069 | 568.299 | 0.026 |
| Air Compressors | 2020 | 251    | 500     | 23.406 | 0.279 | 1.076 | 1.935 | 0.005 | 0.067 | 0.067 | 568.299 | 0.025 |
| Air Compressors | 2020 | 501    | 750     | 36.303 | 0.28  | 1.076 | 1.982 | 0.005 | 0.067 | 0.067 | 568.299 | 0.025 |
| Air Compressors | 2020 | 751    | 1000    | 53.87  | 0.306 | 1.158 | 3.828 | 0.005 | 0.093 | 0.093 | 568.3   | 0.027 |
| Air Compressors | 2021 | 6      | 15      | 1.87   | 0.717 | 3.531 | 4.462 | 0.008 | 0.214 | 0.214 | 568.299 | 0.064 |
| Air Compressors | 2021 | 16     | 25      | 3.923  | 0.752 | 2.446 | 4.497 | 0.007 | 0.201 | 0.201 | 568.299 | 0.067 |
| Air Compressors | 2021 | 26     | 50      | 7.136  | 0.887 | 5.021 | 4.221 | 0.007 | 0.212 | 0.212 | 568.299 | 0.08  |
| Air Compressors | 2021 | 51     | 120     | 7.502  | 0.442 | 3.67  | 3.083 | 0.006 | 0.19  | 0.19  | 568.299 | 0.039 |
| Air Compressors | 2021 | 121    | 175     | 10.967 | 0.343 | 3.192 | 2.218 | 0.006 | 0.115 | 0.115 | 568.299 | 0.03  |
| Air Compressors | 2021 | 176    | 250     | 12.728 | 0.268 | 1.108 | 1.859 | 0.006 | 0.06  | 0.06  | 568.299 | 0.024 |
| Air Compressors | 2021 | 251    | 500     | 21.887 | 0.261 | 1.064 | 1.663 | 0.005 | 0.058 | 0.058 | 568.299 | 0.023 |
| Air Compressors | 2021 | 501    | 750     | 33.933 | 0.262 | 1.064 | 1.699 | 0.005 | 0.058 | 0.058 | 568.299 | 0.023 |
| Air Compressors | 2021 | 751    | 1000    | 49.951 | 0.284 | 1.134 | 3.565 | 0.005 | 0.082 | 0.082 | 568.3   | 0.025 |
| Air Compressors | 2022 | 6      | 15      | 1.844  | 0.707 | 3.519 | 4.408 | 0.008 | 0.203 | 0.203 | 568.299 | 0.063 |
| Air Compressors | 2022 | 16     | 25      | 3.857  | 0.739 | 2.426 | 4.47  | 0.007 | 0.193 | 0.193 | 568.299 | 0.066 |
| Air Compressors | 2022 | 26     | 50      | 6.549  | 0.814 | 4.959 | 4.093 | 0.007 | 0.183 | 0.183 | 568.299 | 0.073 |
| Air Compressors | 2022 | 51     | 120     | 7.001  | 0.413 | 3.662 | 2.844 | 0.006 | 0.165 | 0.165 | 568.299 | 0.037 |
| Air Compressors | 2022 | 121    | 175     | 10.29  | 0.322 | 3.194 | 1.959 | 0.006 | 0.101 | 0.101 | 568.299 | 0.029 |
| Air Compressors | 2022 | 176    | 250     | 12.099 | 0.255 | 1.102 | 1.617 | 0.006 | 0.052 | 0.052 | 568.3   | 0.023 |
| Air Compressors | 2022 | 251    | 500     | 20.881 | 0.249 | 1.059 | 1.472 | 0.005 | 0.051 | 0.051 | 568.299 | 0.022 |
| Air Compressors | 2022 | 501    | 750     | 32.363 | 0.25  | 1.059 | 1.502 | 0.005 | 0.051 | 0.051 | 568.299 | 0.022 |
| Air Compressors | 2022 | 751    | 1000    | 47.338 | 0.269 | 1.117 | 3.378 | 0.005 | 0.075 | 0.075 | 568.3   | 0.024 |
| Air Compressors | 2023 | 6      | 15      | 1.82   | 0.698 | 3.508 | 4.359 | 0.008 | 0.194 | 0.194 | 568.299 | 0.063 |
| Air Compressors | 2023 | 16     | 25      | 3.798  | 0.728 | 2.407 | 4.447 | 0.007 | 0.186 | 0.186 | 568.299 | 0.065 |
| Air Compressors | 2023 | 26     | 50      | 6.056  | 0.753 | 4.913 | 3.975 | 0.007 | 0.156 | 0.156 | 568.299 | 0.067 |
| Air Compressors | 2023 | 51     | 120     | 6.568  | 0.387 | 3.657 | 2.631 | 0.006 | 0.143 | 0.143 | 568.299 | 0.034 |
| Air Compressors | 2023 | 121    | 175     | 9.693  | 0.303 | 3.197 | 1.748 | 0.006 | 0.089 | 0.089 | 568.299 | 0.027 |
| Air Compressors | 2023 | 176    | 250     | 11.532 | 0.243 | 1.099 | 1.42  | 0.006 | 0.045 | 0.045 | 568.299 | 0.021 |
| Air Compressors | 2023 | 251    | 500     | 19.964 | 0.238 | 1.055 | 1.305 | 0.005 | 0.044 | 0.044 | 568.299 | 0.021 |
| Air Compressors | 2023 | 501    | 750     | 30.933 | 0.239 | 1.055 | 1.331 | 0.005 | 0.044 | 0.044 | 568.299 | 0.021 |
| Air Compressors | 2023 | 751    | 1000    | 44.985 | 0.256 | 1.102 | 3.221 | 0.005 | 0.068 | 0.068 | 568.299 | 0.023 |
| Air Compressors | 2024 | 6      | 15      | 1.799  | 0.69  | 3.499 | 4.316 | 0.008 | 0.188 | 0.188 | 568.3   | 0.062 |
| Air Compressors | 2024 | 16     | 25      | 3.746  | 0.718 | 2.39  | 4.426 | 0.007 | 0.181 | 0.181 | 568.3   | 0.064 |
| Air Compressors | 2024 | 26     | 50      | 5.647  | 0.702 | 4.88  | 3.864 | 0.007 | 0.135 | 0.135 | 568.299 | 0.063 |
| Air Compressors | 2024 | 51     | 120     | 6.194  | 0.365 | 3.655 | 2.461 | 0.006 | 0.123 | 0.123 | 568.299 | 0.032 |
| Air Compressors | 2024 | 121    | 175     | 9.143  | 0.286 | 3.202 | 1.561 | 0.006 | 0.077 | 0.077 | 568.299 | 0.025 |
| Air Compressors | 2024 | 176    | 250     | 10.986 | 0.232 | 1.096 | 1.247 | 0.006 | 0.039 | 0.039 | 568.299 | 0.02  |
| Air Compressors | 2024 | 251    | 500     | 19.07  | 0.228 | 1.053 | 1.148 | 0.005 | 0.038 | 0.038 | 568.299 | 0.02  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type  | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|-----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Air Compressors | 2024 | 501    | 750     | 29.542   | 0.228  | 1.053   | 1.171   | 0.005  | 0.038  | 0.038  | 568.299  | 0.02   |
| Air Compressors | 2024 | 751    | 1000    | 42.762   | 0.243  | 1.09    | 3.082   | 0.005  | 0.061  | 0.061  | 568.299  | 0.021  |
| Air Compressors | 2025 | 6      | 15      | 1.781    | 0.683  | 3.491   | 4.278   | 0.008  | 0.183  | 0.183  | 568.3    | 0.061  |
| Air Compressors | 2025 | 16     | 25      | 3.701    | 0.709  | 2.376   | 4.407   | 0.007  | 0.177  | 0.177  | 568.299  | 0.064  |
| Air Compressors | 2025 | 26     | 50      | 5.297    | 0.659  | 4.851   | 3.755   | 0.007  | 0.116  | 0.116  | 568.299  | 0.059  |
| Air Compressors | 2025 | 51     | 120     | 5.855    | 0.345  | 3.653   | 2.313   | 0.006  | 0.104  | 0.104  | 568.299  | 0.031  |
| Air Compressors | 2025 | 121    | 175     | 8.602    | 0.269  | 3.205   | 1.383   | 0.006  | 0.065  | 0.065  | 568.299  | 0.024  |
| Air Compressors | 2025 | 176    | 250     | 10.451   | 0.22   | 1.094   | 1.086   | 0.006  | 0.033  | 0.033  | 568.299  | 0.019  |
| Air Compressors | 2025 | 251    | 500     | 18.188   | 0.217  | 1.051   | 1.001   | 0.005  | 0.032  | 0.032  | 568.299  | 0.019  |
| Air Compressors | 2025 | 501    | 750     | 28.169   | 0.217  | 1.051   | 1.021   | 0.005  | 0.032  | 0.032  | 568.299  | 0.019  |
| Air Compressors | 2025 | 751    | 1000    | 40.592   | 0.231  | 1.079   | 2.954   | 0.005  | 0.055  | 0.055  | 568.299  | 0.02   |
| Air Compressors | 2030 | 6      | 15      | 1.73     | 0.663  | 3.47    | 4.164   | 0.008  | 0.166  | 0.166  | 568.299  | 0.059  |
| Air Compressors | 2030 | 16     | 25      | 3.582    | 0.687  | 2.34    | 4.347   | 0.007  | 0.165  | 0.165  | 568.299  | 0.061  |
| Air Compressors | 2030 | 26     | 50      | 4.073    | 0.506  | 4.712   | 3.34    | 0.007  | 0.046  | 0.046  | 568.299  | 0.045  |
| Air Compressors | 2030 | 51     | 120     | 4.485    | 0.264  | 3.63    | 1.729   | 0.006  | 0.041  | 0.041  | 568.299  | 0.023  |
| Air Compressors | 2030 | 121    | 175     | 6.186    | 0.193  | 3.205   | 0.633   | 0.006  | 0.027  | 0.027  | 568.299  | 0.017  |
| Air Compressors | 2030 | 176    | 250     | 8.495    | 0.179  | 1.092   | 0.529   | 0.006  | 0.018  | 0.018  | 568.299  | 0.016  |
| Air Compressors | 2030 | 251    | 500     | 14.937   | 0.178  | 1.048   | 0.499   | 0.005  | 0.017  | 0.017  | 568.299  | 0.016  |
| Air Compressors | 2030 | 501    | 750     | 23.104   | 0.178  | 1.048   | 0.505   | 0.005  | 0.017  | 0.017  | 568.3    | 0.016  |
| Air Compressors | 2030 | 751    | 1000    | 32.103   | 0.182  | 1.049   | 2.6     | 0.005  | 0.033  | 0.033  | 568.299  | 0.016  |
| Air Compressors | 2035 | 6      | 15      | 1.724    | 0.661  | 3.469   | 4.143   | 0.008  | 0.162  | 0.162  | 568.3    | 0.059  |
| Air Compressors | 2035 | 16     | 25      | 3.574    | 0.685  | 2.339   | 4.332   | 0.007  | 0.162  | 0.162  | 568.299  | 0.061  |
| Air Compressors | 2035 | 26     | 50      | 3.722    | 0.463  | 4.674   | 3.215   | 0.007  | 0.023  | 0.023  | 568.299  | 0.041  |
| Air Compressors | 2035 | 51     | 120     | 4.047    | 0.238  | 3.623   | 1.53    | 0.006  | 0.02   | 0.02   | 568.299  | 0.021  |
| Air Compressors | 2035 | 121    | 175     | 5.429    | 0.17   | 3.205   | 0.391   | 0.006  | 0.015  | 0.015  | 568.3    | 0.015  |
| Air Compressors | 2035 | 176    | 250     | 7.862    | 0.166  | 1.091   | 0.347   | 0.006  | 0.012  | 0.012  | 568.299  | 0.014  |
| Air Compressors | 2035 | 251    | 500     | 13.882   | 0.166  | 1.048   | 0.343   | 0.005  | 0.012  | 0.012  | 568.299  | 0.014  |
| Air Compressors | 2035 | 501    | 750     | 21.455   | 0.166  | 1.048   | 0.344   | 0.005  | 0.012  | 0.012  | 568.299  | 0.014  |
| Air Compressors | 2035 | 751    | 1000    | 29.363   | 0.167  | 1.048   | 2.473   | 0.005  | 0.026  | 0.026  | 568.299  | 0.015  |
| Air Compressors | 2040 | 6      | 15      | 1.724    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Air Compressors | 2040 | 16     | 25      | 3.574    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.3    | 0.061  |
| Air Compressors | 2040 | 26     | 50      | 3.683    | 0.458  | 4.659   | 3.159   | 0.007  | 0.016  | 0.016  | 568.3    | 0.041  |
| Air Compressors | 2040 | 51     | 120     | 3.94     | 0.232  | 3.619   | 1.468   | 0.006  | 0.015  | 0.015  | 568.299  | 0.02   |
| Air Compressors | 2040 | 121    | 175     | 5.155    | 0.161  | 3.201   | 0.307   | 0.006  | 0.012  | 0.012  | 568.299  | 0.014  |
| Air Compressors | 2040 | 176    | 250     | 7.58     | 0.16   | 1.09    | 0.291   | 0.006  | 0.01   | 0.01   | 568.299  | 0.014  |
| Air Compressors | 2040 | 251    | 500     | 13.386   | 0.16   | 1.047   | 0.291   | 0.005  | 0.01   | 0.01   | 568.3    | 0.014  |
| Air Compressors | 2040 | 501    | 750     | 20.688   | 0.16   | 1.047   | 0.291   | 0.005  | 0.01   | 0.01   | 568.299  | 0.014  |
| Air Compressors | 2040 | 751    | 1000    | 28.179   | 0.16   | 1.047   | 2.439   | 0.005  | 0.023  | 0.023  | 568.299  | 0.014  |
| Bore/Drill Rigs | 1990 | 6      | 15      | 4.968    | 1.804  | 4.999   | 9.999   | 1.049  | 0.975  | 0.975  | 568.299  | 0.162  |
| Bore/Drill Rigs | 1990 | 16     | 25      | 9.418    | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Bore/Drill Rigs | 1990 | 26     | 50      | 34.076   | 4.124  | 8.505   | 7.685   | 0.871  | 1.134  | 1.134  | 568.299  | 0.372  |
| Bore/Drill Rigs | 1990 | 51     | 120     | 42.911   | 2.09   | 5.23    | 13.647  | 0.791  | 1.172  | 1.172  | 568.299  | 0.188  |
| Bore/Drill Rigs | 1990 | 121    | 175     | 53.24    | 1.417  | 4.578   | 12.365  | 0.758  | 0.749  | 0.749  | 568.299  | 0.127  |
| Bore/Drill Rigs | 1990 | 176    | 250     | 70.987   | 1.417  | 4.578   | 12.365  | 0.758  | 0.749  | 0.749  | 568.299  | 0.127  |
| Bore/Drill Rigs | 1990 | 251    | 500     | 105.966  | 1.278  | 8.788   | 11.861  | 0.662  | 0.658  | 0.658  | 568.299  | 0.115  |
| Bore/Drill Rigs | 1990 | 501    | 750     | 209.372  | 1.278  | 8.788   | 11.861  | 1.018  | 0.67   | 0.67   | 568.3    | 0.115  |
| Bore/Drill Rigs | 1990 | 751    | 1000    | 313.129  | 1.267  | 8.788   | 11.861  | 1.018  | 0.656  | 0.656  | 568.3    | 0.114  |
| Bore/Drill Rigs | 2000 | 6      | 15      | 4.063    | 1.475  | 4.49    | 8.242   | 0.079  | 0.676  | 0.676  | 568.299  | 0.133  |
| Bore/Drill Rigs | 2000 | 16     | 25      | 8.334    | 1.958  | 4.53    | 6.358   | 0.065  | 0.563  | 0.563  | 568.299  | 0.176  |
| Bore/Drill Rigs | 2000 | 26     | 50      | 27.226   | 3.295  | 7.058   | 6.48    | 0.066  | 0.748  | 0.748  | 568.299  | 0.297  |
| Bore/Drill Rigs | 2000 | 51     | 120     | 30.002   | 1.461  | 3.947   | 8.27    | 0.06   | 0.726  | 0.726  | 568.299  | 0.131  |
| Bore/Drill Rigs | 2000 | 121    | 175     | 37.634   | 1.002  | 3.062   | 7.789   | 0.057  | 0.405  | 0.405  | 568.3    | 0.09   |
| Bore/Drill Rigs | 2000 | 176    | 250     | 32.523   | 0.649  | 1.698   | 7.203   | 0.057  | 0.238  | 0.238  | 568.3    | 0.058  |
| Bore/Drill Rigs | 2000 | 251    | 500     | 51.06    | 0.616  | 1.728   | 6.993   | 0.05   | 0.224  | 0.224  | 568.299  | 0.055  |
| Bore/Drill Rigs | 2000 | 501    | 750     | 100.887  | 0.616  | 1.728   | 6.993   | 0.052  | 0.224  | 0.224  | 568.299  | 0.055  |
| Bore/Drill Rigs | 2000 | 751    | 1000    | 199.748  | 0.808  | 2.73    | 8.005   | 0.052  | 0.282  | 0.282  | 568.299  | 0.072  |
| Bore/Drill Rigs | 2005 | 6      | 15      | 2.109    | 0.766  | 3.469   | 5.228   | 0.079  | 0.361  | 0.361  | 568.299  | 0.069  |
| Bore/Drill Rigs | 2005 | 16     | 25      | 3.913    | 0.919  | 2.642   | 5.412   | 0.065  | 0.347  | 0.347  | 568.299  | 0.082  |
| Bore/Drill Rigs | 2005 | 26     | 50      | 20.086   | 2.431  | 5.897   | 5.697   | 0.066  | 0.625  | 0.625  | 568.299  | 0.219  |
| Bore/Drill Rigs | 2005 | 51     | 120     | 24.211   | 1.179  | 3.812   | 6.895   | 0.06   | 0.64   | 0.64   | 568.3    | 0.106  |
| Bore/Drill Rigs | 2005 | 121    | 175     | 27.251   | 0.725  | 3.035   | 6.246   | 0.057  | 0.328  | 0.328  | 568.299  | 0.065  |
| Bore/Drill Rigs | 2005 | 176    | 250     | 19.806   | 0.395  | 1.094   | 5.8     | 0.057  | 0.145  | 0.145  | 568.299  | 0.035  |
| Bore/Drill Rigs | 2005 | 251    | 500     | 27.527   | 0.332  | 1.068   | 5.051   | 0.05   | 0.133  | 0.133  | 568.299  | 0.029  |
| Bore/Drill Rigs | 2005 | 501    | 750     | 58.103   | 0.354  | 1.068   | 5.347   | 0.052  | 0.138  | 0.138  | 568.299  | 0.032  |
| Bore/Drill Rigs | 2005 | 751    | 1000    | 132.307  | 0.535  | 1.427   | 6.8     | 0.052  | 0.183  | 0.183  | 568.299  | 0.048  |
| Bore/Drill Rigs | 2010 | 6      | 15      | 1.052412 | 0.8843 | 4.58435 | 5.42137 | 0.0056 | 0.4064 | 0.3739 | 604.3903 | 0.1759 |
| Bore/Drill Rigs | 2010 | 16     | 25      | 1.052412 | 0.8843 | 4.58435 | 5.42137 | 0.0056 | 0.4064 | 0.3739 | 604.3903 | 0.1759 |
| Bore/Drill Rigs | 2010 | 26     | 50      | 1.052412 | 0.8843 | 4.58435 | 5.42137 | 0.0056 | 0.4064 | 0.3739 | 604.3903 | 0.1759 |
| Bore/Drill Rigs | 2010 | 51     | 120     | 0.45108  | 0.379  | 3.31487 | 4.84273 | 0.0047 | 0.3132 | 0.2881 | 505.1218 | 0.147  |
| Bore/Drill Rigs | 2010 | 121    | 175     | 0.420915 | 0.3537 | 3.03422 | 4.77962 | 0.005  | 0.2313 | 0.2128 | 533.3654 | 0.1553 |
| Bore/Drill Rigs | 2010 | 176    | 250     | 0.301395 | 0.2533 | 1.2308  | 4.60173 | 0.0049 | 0.1386 | 0.1275 | 525.165  | 0.1529 |
| Bore/Drill Rigs | 2010 | 251    | 500     | 0.270831 | 0.2276 | 1.39755 | 3.90774 | 0.0048 | 0.1306 | 0.1201 | 517.3193 | 0.1506 |
| Bore/Drill Rigs | 2010 | 501    | 750     | 0.19905  | 0.1673 | 1.08296 | 3.03556 | 0.005  | 0.1076 | 0.099  | 533.5969 | 0.1553 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type  | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|-----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Bore/Drill Rigs | 2010 | 751    | 1000    | 0.189693 | 0.1594 | 0.96001 | 4.32965 | 0.0049 | 0.0985 | 0.0906 | 524.3394 | 0.1526 |
| Bore/Drill Rigs | 2011 | 6      | 15      | 1.019273 | 0.8565 | 4.60411 | 5.41672 | 0.0056 | 0.4003 | 0.3683 | 602.9382 | 0.1759 |
| Bore/Drill Rigs | 2011 | 16     | 25      | 1.019273 | 0.8565 | 4.60411 | 5.41672 | 0.0056 | 0.4003 | 0.3683 | 602.9382 | 0.1759 |
| Bore/Drill Rigs | 2011 | 26     | 50      | 1.019273 | 0.8565 | 4.60411 | 5.41672 | 0.0056 | 0.4003 | 0.3683 | 602.9382 | 0.1759 |
| Bore/Drill Rigs | 2011 | 51     | 120     | 0.435142 | 0.3656 | 3.32121 | 4.72727 | 0.0047 | 0.3033 | 0.2791 | 504.2171 | 0.1471 |
| Bore/Drill Rigs | 2011 | 121    | 175     | 0.404145 | 0.3396 | 3.03462 | 4.59259 | 0.005  | 0.2191 | 0.2016 | 531.8097 | 0.1552 |
| Bore/Drill Rigs | 2011 | 176    | 250     | 0.289986 | 0.2437 | 1.21102 | 4.34748 | 0.0049 | 0.1323 | 0.1217 | 522.3643 | 0.1524 |
| Bore/Drill Rigs | 2011 | 251    | 500     | 0.264468 | 0.2222 | 1.36917 | 3.72448 | 0.0048 | 0.1251 | 0.1151 | 512.0559 | 0.1494 |
| Bore/Drill Rigs | 2011 | 501    | 750     | 0.195451 | 0.1642 | 1.06361 | 2.89424 | 0.005  | 0.098  | 0.0901 | 532.4717 | 0.1554 |
| Bore/Drill Rigs | 2011 | 751    | 1000    | 0.200744 | 0.1687 | 0.96855 | 4.35634 | 0.0049 | 0.1008 | 0.0927 | 523.0129 | 0.1526 |
| Bore/Drill Rigs | 2012 | 6      | 15      | 1.043679 | 0.877  | 4.70758 | 5.45218 | 0.0056 | 0.4064 | 0.3738 | 601.7336 | 0.176  |
| Bore/Drill Rigs | 2012 | 16     | 25      | 1.043679 | 0.877  | 4.70758 | 5.45218 | 0.0056 | 0.4064 | 0.3738 | 601.7336 | 0.176  |
| Bore/Drill Rigs | 2012 | 26     | 50      | 1.043679 | 0.877  | 4.70758 | 5.45218 | 0.0056 | 0.4064 | 0.3738 | 601.7336 | 0.176  |
| Bore/Drill Rigs | 2012 | 51     | 120     | 0.439737 | 0.3695 | 3.34211 | 4.70854 | 0.0047 | 0.3017 | 0.2775 | 503.4212 | 0.1473 |
| Bore/Drill Rigs | 2012 | 121    | 175     | 0.401496 | 0.3374 | 3.05178 | 4.52801 | 0.005  | 0.2153 | 0.1981 | 531.6414 | 0.1555 |
| Bore/Drill Rigs | 2012 | 176    | 250     | 0.299105 | 0.2513 | 1.23628 | 4.31574 | 0.0049 | 0.1335 | 0.1228 | 520.9621 | 0.1524 |
| Bore/Drill Rigs | 2012 | 251    | 500     | 0.271498 | 0.2281 | 1.3973  | 3.71268 | 0.0048 | 0.1245 | 0.1145 | 511.0099 | 0.1495 |
| Bore/Drill Rigs | 2012 | 501    | 750     | 0.195855 | 0.1646 | 1.06675 | 2.78397 | 0.005  | 0.0938 | 0.0863 | 530.0759 | 0.1551 |
| Bore/Drill Rigs | 2012 | 751    | 1000    | 0.210392 | 0.1768 | 0.976   | 4.3794  | 0.0049 | 0.1027 | 0.0945 | 521.6821 | 0.1526 |
| Bore/Drill Rigs | 2013 | 6      | 15      | 1.019153 | 0.8564 | 4.71588 | 5.44353 | 0.0056 | 0.3981 | 0.3662 | 598.6307 | 0.176  |
| Bore/Drill Rigs | 2013 | 16     | 25      | 1.019153 | 0.8564 | 4.71588 | 5.44353 | 0.0056 | 0.3981 | 0.3662 | 598.6307 | 0.176  |
| Bore/Drill Rigs | 2013 | 26     | 50      | 1.019153 | 0.8564 | 4.71588 | 5.44353 | 0.0056 | 0.3981 | 0.3662 | 598.6307 | 0.176  |
| Bore/Drill Rigs | 2013 | 51     | 120     | 0.417421 | 0.3507 | 3.33685 | 4.52552 | 0.0047 | 0.2788 | 0.2565 | 501.3795 | 0.1474 |
| Bore/Drill Rigs | 2013 | 121    | 175     | 0.380511 | 0.3197 | 3.04123 | 4.3027  | 0.005  | 0.1988 | 0.1829 | 527.5089 | 0.1551 |
| Bore/Drill Rigs | 2013 | 176    | 250     | 0.286183 | 0.2405 | 1.21872 | 4.0183  | 0.0049 | 0.1236 | 0.1137 | 517.8225 | 0.1522 |
| Bore/Drill Rigs | 2013 | 251    | 500     | 0.260559 | 0.2189 | 1.35236 | 3.49492 | 0.0048 | 0.1149 | 0.1057 | 507.7707 | 0.1493 |
| Bore/Drill Rigs | 2013 | 501    | 750     | 0.192576 | 0.1618 | 1.07935 | 2.57636 | 0.005  | 0.0878 | 0.0807 | 527.7286 | 0.1552 |
| Bore/Drill Rigs | 2013 | 751    | 1000    | 0.160352 | 0.1347 | 0.96188 | 3.46658 | 0.0049 | 0.082  | 0.0754 | 519.8525 | 0.1528 |
| Bore/Drill Rigs | 2014 | 6      | 15      | 0.992547 | 0.834  | 4.69064 | 5.33236 | 0.0056 | 0.3818 | 0.3513 | 591.4418 | 0.1748 |
| Bore/Drill Rigs | 2014 | 16     | 25      | 0.992547 | 0.834  | 4.69064 | 5.33236 | 0.0056 | 0.3818 | 0.3513 | 591.4418 | 0.1748 |
| Bore/Drill Rigs | 2014 | 26     | 50      | 0.992547 | 0.834  | 4.69064 | 5.33236 | 0.0056 | 0.3818 | 0.3513 | 591.4418 | 0.1748 |
| Bore/Drill Rigs | 2014 | 51     | 120     | 0.379477 | 0.3189 | 3.32686 | 4.19515 | 0.0047 | 0.2491 | 0.2292 | 501.365  | 0.1482 |
| Bore/Drill Rigs | 2014 | 121    | 175     | 0.366384 | 0.3079 | 3.04026 | 4.06571 | 0.0049 | 0.186  | 0.1711 | 524.0522 | 0.1549 |
| Bore/Drill Rigs | 2014 | 176    | 250     | 0.258607 | 0.2173 | 1.17442 | 3.52453 | 0.0048 | 0.1049 | 0.0965 | 512.3362 | 0.1514 |
| Bore/Drill Rigs | 2014 | 251    | 500     | 0.240166 | 0.2018 | 1.239   | 3.18617 | 0.0048 | 0.1009 | 0.0929 | 506.1536 | 0.1496 |
| Bore/Drill Rigs | 2014 | 501    | 750     | 0.186731 | 0.1569 | 1.08678 | 2.37324 | 0.005  | 0.0805 | 0.074  | 525.2397 | 0.1552 |
| Bore/Drill Rigs | 2014 | 751    | 1000    | 0.12496  | 0.105  | 0.95104 | 2.98435 | 0.0049 | 0.0583 | 0.0536 | 516.5998 | 0.1527 |
| Bore/Drill Rigs | 2015 | 6      | 15      | 1.007942 | 0.847  | 4.73461 | 5.30345 | 0.0056 | 0.3792 | 0.3489 | 585.1707 | 0.1747 |
| Bore/Drill Rigs | 2015 | 16     | 25      | 1.007942 | 0.847  | 4.73461 | 5.30345 | 0.0056 | 0.3792 | 0.3489 | 585.1707 | 0.1747 |
| Bore/Drill Rigs | 2015 | 26     | 50      | 1.007942 | 0.847  | 4.73461 | 5.30345 | 0.0056 | 0.3792 | 0.3489 | 585.1707 | 0.1747 |
| Bore/Drill Rigs | 2015 | 51     | 120     | 0.378573 | 0.3181 | 3.3349  | 4.02775 | 0.0047 | 0.2393 | 0.2201 | 496.9494 | 0.1484 |
| Bore/Drill Rigs | 2015 | 121    | 175     | 0.359562 | 0.3021 | 3.03526 | 3.90422 | 0.0049 | 0.1756 | 0.1615 | 517.2068 | 0.1544 |
| Bore/Drill Rigs | 2015 | 176    | 250     | 0.253803 | 0.2133 | 1.17834 | 3.3245  | 0.0048 | 0.0996 | 0.0916 | 506.5047 | 0.1512 |
| Bore/Drill Rigs | 2015 | 251    | 500     | 0.237097 | 0.1992 | 1.25564 | 3.00307 | 0.0048 | 0.0959 | 0.0882 | 499.9023 | 0.1492 |
| Bore/Drill Rigs | 2015 | 501    | 750     | 0.19253  | 0.1618 | 1.10541 | 2.37558 | 0.005  | 0.0807 | 0.0743 | 520.4733 | 0.1554 |
| Bore/Drill Rigs | 2015 | 751    | 1000    | 0.130029 | 0.1093 | 0.95583 | 2.99386 | 0.0049 | 0.0585 | 0.0538 | 511.2533 | 0.1526 |
| Bore/Drill Rigs | 2016 | 6      | 15      | 1.034535 | 0.8693 | 4.79659 | 5.29821 | 0.0056 | 0.3826 | 0.352  | 579.3262 | 0.1747 |
| Bore/Drill Rigs | 2016 | 16     | 25      | 1.034535 | 0.8693 | 4.79659 | 5.29821 | 0.0056 | 0.3826 | 0.352  | 579.3262 | 0.1747 |
| Bore/Drill Rigs | 2016 | 26     | 50      | 1.034535 | 0.8693 | 4.79659 | 5.29821 | 0.0056 | 0.3826 | 0.352  | 579.3262 | 0.1747 |
| Bore/Drill Rigs | 2016 | 51     | 120     | 0.365397 | 0.307  | 3.32648 | 3.82088 | 0.0047 | 0.2214 | 0.2037 | 491.6548 | 0.1483 |
| Bore/Drill Rigs | 2016 | 121    | 175     | 0.33987  | 0.2856 | 3.02337 | 3.61582 | 0.0049 | 0.1619 | 0.1489 | 511.4327 | 0.1543 |
| Bore/Drill Rigs | 2016 | 176    | 250     | 0.229144 | 0.1925 | 1.13299 | 2.9021  | 0.0048 | 0.0852 | 0.0784 | 502.128  | 0.1515 |
| Bore/Drill Rigs | 2016 | 251    | 500     | 0.203588 | 0.1711 | 1.13338 | 2.50955 | 0.0048 | 0.0774 | 0.0713 | 494.7606 | 0.1492 |
| Bore/Drill Rigs | 2016 | 501    | 750     | 0.182018 | 0.1529 | 1.11952 | 2.16636 | 0.005  | 0.0719 | 0.0661 | 514.8829 | 0.1553 |
| Bore/Drill Rigs | 2016 | 751    | 1000    | 0.137307 | 0.1154 | 0.96409 | 3.00833 | 0.0049 | 0.0593 | 0.0545 | 505.9997 | 0.1526 |
| Bore/Drill Rigs | 2017 | 6      | 15      | 0.957137 | 0.8043 | 4.65158 | 5.06335 | 0.0055 | 0.3508 | 0.3227 | 563.9173 | 0.1728 |
| Bore/Drill Rigs | 2017 | 16     | 25      | 0.957137 | 0.8043 | 4.65158 | 5.06335 | 0.0055 | 0.3508 | 0.3227 | 563.9173 | 0.1728 |
| Bore/Drill Rigs | 2017 | 26     | 50      | 0.957137 | 0.8043 | 4.65158 | 5.06335 | 0.0055 | 0.3508 | 0.3227 | 563.9173 | 0.1728 |
| Bore/Drill Rigs | 2017 | 51     | 120     | 0.354597 | 0.298  | 3.33142 | 3.68536 | 0.0047 | 0.2111 | 0.1942 | 485.322  | 0.1487 |
| Bore/Drill Rigs | 2017 | 121    | 175     | 0.290928 | 0.2445 | 3.0013  | 2.98245 | 0.0049 | 0.1313 | 0.1208 | 503.7704 | 0.1544 |
| Bore/Drill Rigs | 2017 | 176    | 250     | 0.20647  | 0.1735 | 1.1021  | 2.5215  | 0.0048 | 0.0725 | 0.0667 | 494.1381 | 0.1514 |
| Bore/Drill Rigs | 2017 | 251    | 500     | 0.197407 | 0.1659 | 1.11891 | 2.36747 | 0.0048 | 0.0723 | 0.0665 | 489.4612 | 0.15   |
| Bore/Drill Rigs | 2017 | 501    | 750     | 0.184153 | 0.1547 | 1.13653 | 2.15656 | 0.0049 | 0.0715 | 0.0658 | 505.1248 | 0.1548 |
| Bore/Drill Rigs | 2017 | 751    | 1000    | 0.143503 | 0.1206 | 0.97127 | 3.02051 | 0.0049 | 0.0599 | 0.0551 | 498.1225 | 0.1526 |
| Bore/Drill Rigs | 2018 | 6      | 15      | 0.9127   | 0.7669 | 4.56857 | 4.86917 | 0.0055 | 0.3294 | 0.303  | 554.2038 | 0.1725 |
| Bore/Drill Rigs | 2018 | 16     | 25      | 0.9127   | 0.7669 | 4.56857 | 4.86917 | 0.0055 | 0.3294 | 0.303  | 554.2038 | 0.1725 |
| Bore/Drill Rigs | 2018 | 26     | 50      | 0.9127   | 0.7669 | 4.56857 | 4.86917 | 0.0055 | 0.3294 | 0.303  | 554.2038 | 0.1725 |
| Bore/Drill Rigs | 2018 | 51     | 120     | 0.320098 | 0.269  | 3.32325 | 3.39962 | 0.0048 | 0.1844 | 0.1696 | 479.6719 | 0.1493 |
| Bore/Drill Rigs | 2018 | 121    | 175     | 0.241793 | 0.2032 | 2.96107 | 2.35662 | 0.0049 | 0.1034 | 0.0952 | 495.0734 | 0.1541 |
| Bore/Drill Rigs | 2018 | 176    | 250     | 0.183927 | 0.1545 | 1.07328 | 2.15308 | 0.0048 | 0.0608 | 0.056  | 484.5605 | 0.1509 |
| Bore/Drill Rigs | 2018 | 251    | 500     | 0.160513 | 0.1349 | 1.03203 | 1.74562 | 0.0048 | 0.0522 | 0.0481 | 485.6893 | 0.1512 |
| Bore/Drill Rigs | 2018 | 501    | 750     | 0.14994  | 0.126  | 1.00559 | 1.67873 | 0.0049 | 0.0545 | 0.0501 | 489.7301 | 0.1525 |
| Bore/Drill Rigs | 2018 | 751    | 1000    | 0.149052 | 0.1252 | 0.97772 | 3.03153 | 0.0049 | 0.0604 | 0.0556 | 490.2427 | 0.1526 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type  | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|-----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Bore/Drill Rigs | 2019 | 6      | 15      | 0.858717 | 0.7216 | 4.49723 | 4.71795 | 0.0055 | 0.3025 | 0.2783 | 545.293  | 0.1725 |
| Bore/Drill Rigs | 2019 | 16     | 25      | 0.858717 | 0.7216 | 4.49723 | 4.71795 | 0.0055 | 0.3025 | 0.2783 | 545.293  | 0.1725 |
| Bore/Drill Rigs | 2019 | 26     | 50      | 0.858717 | 0.7216 | 4.49723 | 4.71795 | 0.0055 | 0.3025 | 0.2783 | 545.293  | 0.1725 |
| Bore/Drill Rigs | 2019 | 51     | 120     | 0.317934 | 0.2672 | 3.33202 | 3.32102 | 0.0048 | 0.1802 | 0.1658 | 472.4527 | 0.1495 |
| Bore/Drill Rigs | 2019 | 121    | 175     | 0.215784 | 0.1813 | 2.95563 | 2.01775 | 0.0049 | 0.0876 | 0.0806 | 487.3552 | 0.1542 |
| Bore/Drill Rigs | 2019 | 176    | 250     | 0.170614 | 0.1434 | 1.06058 | 1.8943  | 0.0048 | 0.0537 | 0.0494 | 475.7896 | 0.1505 |
| Bore/Drill Rigs | 2019 | 251    | 500     | 0.153732 | 0.1292 | 1.03449 | 1.55098 | 0.0048 | 0.0479 | 0.0441 | 477.0462 | 0.1509 |
| Bore/Drill Rigs | 2019 | 501    | 750     | 0.138617 | 0.1165 | 0.97074 | 1.44865 | 0.0049 | 0.0478 | 0.044  | 481.8363 | 0.1524 |
| Bore/Drill Rigs | 2019 | 751    | 1000    | 0.153944 | 0.1294 | 0.98342 | 3.04139 | 0.0049 | 0.0609 | 0.056  | 482.3593 | 0.1526 |
| Bore/Drill Rigs | 2020 | 6      | 15      | 0.851825 | 0.7158 | 4.51013 | 4.6451  | 0.0055 | 0.2941 | 0.2706 | 535.2948 | 0.1731 |
| Bore/Drill Rigs | 2020 | 16     | 25      | 0.851825 | 0.7158 | 4.51013 | 4.6451  | 0.0055 | 0.2941 | 0.2706 | 535.2948 | 0.1731 |
| Bore/Drill Rigs | 2020 | 26     | 50      | 0.851825 | 0.7158 | 4.51013 | 4.6451  | 0.0055 | 0.2941 | 0.2706 | 535.2948 | 0.1731 |
| Bore/Drill Rigs | 2020 | 51     | 120     | 0.292949 | 0.2462 | 3.32347 | 3.06601 | 0.0048 | 0.1586 | 0.1459 | 463.5827 | 0.1499 |
| Bore/Drill Rigs | 2020 | 121    | 175     | 0.207426 | 0.1743 | 2.96948 | 1.87149 | 0.0049 | 0.0822 | 0.0757 | 477.722  | 0.1545 |
| Bore/Drill Rigs | 2020 | 176    | 250     | 0.169462 | 0.1424 | 1.06766 | 1.80732 | 0.0048 | 0.0521 | 0.0479 | 466.8342 | 0.151  |
| Bore/Drill Rigs | 2020 | 251    | 500     | 0.148188 | 0.1245 | 1.01263 | 1.40938 | 0.0048 | 0.0446 | 0.041  | 466.8219 | 0.151  |
| Bore/Drill Rigs | 2020 | 501    | 750     | 0.129293 | 0.1086 | 0.97413 | 1.23085 | 0.0049 | 0.0409 | 0.0377 | 473.6679 | 0.1532 |
| Bore/Drill Rigs | 2020 | 751    | 1000    | 0.158163 | 0.1329 | 0.98839 | 3.05008 | 0.0049 | 0.0612 | 0.0563 | 471.8492 | 0.1526 |
| Bore/Drill Rigs | 2021 | 6      | 15      | 0.845639 | 0.7106 | 4.54836 | 4.63432 | 0.0055 | 0.291  | 0.2677 | 535.3782 | 0.1732 |
| Bore/Drill Rigs | 2021 | 16     | 25      | 0.845639 | 0.7106 | 4.54836 | 4.63432 | 0.0055 | 0.291  | 0.2677 | 535.3782 | 0.1732 |
| Bore/Drill Rigs | 2021 | 26     | 50      | 0.845639 | 0.7106 | 4.54836 | 4.63432 | 0.0055 | 0.291  | 0.2677 | 535.3782 | 0.1732 |
| Bore/Drill Rigs | 2021 | 51     | 120     | 0.258162 | 0.2169 | 3.30573 | 2.73675 | 0.0048 | 0.131  | 0.1205 | 464.9725 | 0.1504 |
| Bore/Drill Rigs | 2021 | 121    | 175     | 0.183454 | 0.1542 | 2.9614  | 1.5983  | 0.0049 | 0.0697 | 0.0641 | 477.0482 | 0.1543 |
| Bore/Drill Rigs | 2021 | 176    | 250     | 0.157647 | 0.1325 | 1.06418 | 1.55102 | 0.0048 | 0.047  | 0.0433 | 467.9916 | 0.1514 |
| Bore/Drill Rigs | 2021 | 251    | 500     | 0.139268 | 0.117  | 1.01479 | 1.22069 | 0.0049 | 0.0409 | 0.0376 | 469.8158 | 0.1519 |
| Bore/Drill Rigs | 2021 | 501    | 750     | 0.116134 | 0.0976 | 0.97176 | 0.95517 | 0.0049 | 0.0334 | 0.0307 | 474.079  | 0.1533 |
| Bore/Drill Rigs | 2021 | 751    | 1000    | 0.161679 | 0.1359 | 0.99261 | 3.05759 | 0.0049 | 0.0614 | 0.0565 | 471.8158 | 0.1526 |
| Bore/Drill Rigs | 2022 | 6      | 15      | 0.751445 | 0.6314 | 4.33356 | 4.28474 | 0.0055 | 0.2406 | 0.2213 | 529.8703 | 0.1714 |
| Bore/Drill Rigs | 2022 | 16     | 25      | 0.751445 | 0.6314 | 4.33356 | 4.28474 | 0.0055 | 0.2406 | 0.2213 | 529.8703 | 0.1714 |
| Bore/Drill Rigs | 2022 | 26     | 50      | 0.751445 | 0.6314 | 4.33356 | 4.28474 | 0.0055 | 0.2406 | 0.2213 | 529.8703 | 0.1714 |
| Bore/Drill Rigs | 2022 | 51     | 120     | 0.227425 | 0.1911 | 3.25974 | 2.42459 | 0.0048 | 0.1071 | 0.0985 | 462.2674 | 0.1495 |
| Bore/Drill Rigs | 2022 | 121    | 175     | 0.162807 | 0.1368 | 2.95431 | 1.28831 | 0.0049 | 0.0567 | 0.0522 | 477.3719 | 0.1544 |
| Bore/Drill Rigs | 2022 | 176    | 250     | 0.136848 | 0.115  | 1.04734 | 1.16293 | 0.0048 | 0.0373 | 0.0343 | 468.7604 | 0.1516 |
| Bore/Drill Rigs | 2022 | 251    | 500     | 0.12801  | 0.1076 | 1.00212 | 1.03525 | 0.0048 | 0.0352 | 0.0324 | 467.1923 | 0.1511 |
| Bore/Drill Rigs | 2022 | 501    | 750     | 0.10809  | 0.0908 | 0.97519 | 0.77309 | 0.0049 | 0.028  | 0.0258 | 477.141  | 0.1543 |
| Bore/Drill Rigs | 2022 | 751    | 1000    | 0.067607 | 0.0568 | 0.9452  | 2.27813 | 0.0049 | 0.0182 | 0.0167 | 472.9214 | 0.153  |
| Bore/Drill Rigs | 2023 | 6      | 15      | 0.721105 | 0.6059 | 4.31077 | 4.20831 | 0.0055 | 0.2259 | 0.2078 | 531.9856 | 0.1721 |
| Bore/Drill Rigs | 2023 | 16     | 25      | 0.721105 | 0.6059 | 4.31077 | 4.20831 | 0.0055 | 0.2259 | 0.2078 | 531.9856 | 0.1721 |
| Bore/Drill Rigs | 2023 | 26     | 50      | 0.721105 | 0.6059 | 4.31077 | 4.20831 | 0.0055 | 0.2259 | 0.2078 | 531.9856 | 0.1721 |
| Bore/Drill Rigs | 2023 | 51     | 120     | 0.222828 | 0.1872 | 3.25754 | 2.35656 | 0.0048 | 0.1015 | 0.0934 | 461.214  | 0.1492 |
| Bore/Drill Rigs | 2023 | 121    | 175     | 0.149078 | 0.1253 | 2.9693  | 1.07773 | 0.005  | 0.0478 | 0.044  | 479.6465 | 0.1551 |
| Bore/Drill Rigs | 2023 | 176    | 250     | 0.131367 | 0.1104 | 1.04309 | 1.04653 | 0.0049 | 0.0339 | 0.0312 | 469.7058 | 0.1519 |
| Bore/Drill Rigs | 2023 | 251    | 500     | 0.120261 | 0.1011 | 0.98883 | 0.89764 | 0.0048 | 0.0302 | 0.0278 | 464.0407 | 0.1501 |
| Bore/Drill Rigs | 2023 | 501    | 750     | 0.108039 | 0.0908 | 0.98235 | 0.71664 | 0.005  | 0.0264 | 0.0243 | 479.2199 | 0.155  |
| Bore/Drill Rigs | 2023 | 751    | 1000    | 0.062646 | 0.0526 | 0.93615 | 2.26246 | 0.0049 | 0.0178 | 0.0164 | 472.0201 | 0.1527 |
| Bore/Drill Rigs | 2024 | 6      | 15      | 0.724524 | 0.6088 | 4.33098 | 4.15902 | 0.0055 | 0.2191 | 0.2016 | 529.8661 | 0.1714 |
| Bore/Drill Rigs | 2024 | 16     | 25      | 0.724524 | 0.6088 | 4.33098 | 4.15902 | 0.0055 | 0.2191 | 0.2016 | 529.8661 | 0.1714 |
| Bore/Drill Rigs | 2024 | 26     | 50      | 0.724524 | 0.6088 | 4.33098 | 4.15902 | 0.0055 | 0.2191 | 0.2016 | 529.8661 | 0.1714 |
| Bore/Drill Rigs | 2024 | 51     | 120     | 0.211018 | 0.1773 | 3.25123 | 2.21634 | 0.0048 | 0.0904 | 0.0832 | 461.2076 | 0.1492 |
| Bore/Drill Rigs | 2024 | 121    | 175     | 0.148172 | 0.1245 | 2.97803 | 1.02855 | 0.0049 | 0.0464 | 0.0427 | 478.9441 | 0.1549 |
| Bore/Drill Rigs | 2024 | 176    | 250     | 0.128551 | 0.108  | 1.04591 | 0.97542 | 0.0049 | 0.0321 | 0.0296 | 470.7115 | 0.1522 |
| Bore/Drill Rigs | 2024 | 251    | 500     | 0.122153 | 0.1026 | 0.99426 | 0.86053 | 0.0048 | 0.0293 | 0.0269 | 464.4796 | 0.1502 |
| Bore/Drill Rigs | 2024 | 501    | 750     | 0.10623  | 0.0893 | 0.98491 | 0.67139 | 0.005  | 0.0257 | 0.0236 | 480.2246 | 0.1553 |
| Bore/Drill Rigs | 2024 | 751    | 1000    | 0.067347 | 0.0566 | 0.94304 | 2.27306 | 0.0049 | 0.0181 | 0.0167 | 471.9261 | 0.1526 |
| Bore/Drill Rigs | 2025 | 6      | 15      | 0.703036 | 0.5907 | 4.2728  | 3.97786 | 0.0055 | 0.1931 | 0.1777 | 532.8212 | 0.1723 |
| Bore/Drill Rigs | 2025 | 16     | 25      | 0.703036 | 0.5907 | 4.2728  | 3.97786 | 0.0055 | 0.1931 | 0.1777 | 532.8212 | 0.1723 |
| Bore/Drill Rigs | 2025 | 26     | 50      | 0.703036 | 0.5907 | 4.2728  | 3.97786 | 0.0055 | 0.1931 | 0.1777 | 532.8212 | 0.1723 |
| Bore/Drill Rigs | 2025 | 51     | 120     | 0.183914 | 0.1545 | 3.21758 | 1.96363 | 0.0048 | 0.0674 | 0.062  | 459.8291 | 0.1487 |
| Bore/Drill Rigs | 2025 | 121    | 175     | 0.135422 | 0.1138 | 2.9736  | 0.88787 | 0.0049 | 0.0388 | 0.0357 | 478.2657 | 0.1547 |
| Bore/Drill Rigs | 2025 | 176    | 250     | 0.127813 | 0.1074 | 1.04484 | 0.95717 | 0.0049 | 0.0314 | 0.0289 | 470.6535 | 0.1522 |
| Bore/Drill Rigs | 2025 | 251    | 500     | 0.120956 | 0.1016 | 0.99738 | 0.82299 | 0.0048 | 0.0281 | 0.0259 | 467.2892 | 0.1511 |
| Bore/Drill Rigs | 2025 | 501    | 750     | 0.100521 | 0.0845 | 0.98349 | 0.59628 | 0.005  | 0.0226 | 0.0208 | 481.2495 | 0.1556 |
| Bore/Drill Rigs | 2025 | 751    | 1000    | 0.07426  | 0.0624 | 0.95339 | 2.28923 | 0.0049 | 0.0186 | 0.0171 | 471.9168 | 0.1526 |
| Bore/Drill Rigs | 2030 | 6      | 15      | 1.821    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Bore/Drill Rigs | 2030 | 16     | 25      | 2.917    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Bore/Drill Rigs | 2030 | 26     | 50      | 2.88     | 0.348  | 4.029   | 3.02    | 0.007  | 0.013  | 0.013  | 568.299  | 0.031  |
| Bore/Drill Rigs | 2030 | 51     | 120     | 3.773    | 0.183  | 3.434   | 1.415   | 0.006  | 0.012  | 0.012  | 568.299  | 0.016  |
| Bore/Drill Rigs | 2030 | 121    | 175     | 4.786    | 0.127  | 3.038   | 0.279   | 0.006  | 0.01   | 0.01   | 568.299  | 0.011  |
| Bore/Drill Rigs | 2030 | 176    | 250     | 6.363    | 0.127  | 1.035   | 0.274   | 0.006  | 0.01   | 0.01   | 568.299  | 0.011  |
| Bore/Drill Rigs | 2030 | 251    | 500     | 10.531   | 0.127  | 1.006   | 0.274   | 0.005  | 0.01   | 0.01   | 568.299  | 0.011  |
| Bore/Drill Rigs | 2030 | 501    | 750     | 20.808   | 0.127  | 1.006   | 0.274   | 0.005  | 0.01   | 0.01   | 568.299  | 0.011  |
| Bore/Drill Rigs | 2030 | 751    | 1000    | 31.441   | 0.127  | 1.006   | 2.372   | 0.005  | 0.021  | 0.021  | 568.299  | 0.011  |
| Bore/Drill Rigs | 2035 | 6      | 15      | 1.821    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type           | Year | Low HP | High HP | TOG    | ROG   | CO    | NOX    | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|--------------------------|------|--------|---------|--------|-------|-------|--------|-------|-------|-------|---------|-------|
| Bore/Drill Rigs          | 2035 | 16     | 25      | 2.917  | 0.685 | 2.339 | 4.332  | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Bore/Drill Rigs          | 2035 | 26     | 50      | 2.881  | 0.348 | 4.03  | 3.019  | 0.007 | 0.013 | 0.013 | 568.299 | 0.031 |
| Bore/Drill Rigs          | 2035 | 51     | 120     | 3.768  | 0.183 | 3.434 | 1.411  | 0.006 | 0.012 | 0.012 | 568.3   | 0.016 |
| Bore/Drill Rigs          | 2035 | 121    | 175     | 4.767  | 0.126 | 3.039 | 0.272  | 0.006 | 0.01  | 0.01  | 568.299 | 0.011 |
| Bore/Drill Rigs          | 2035 | 176    | 250     | 6.357  | 0.126 | 1.035 | 0.272  | 0.006 | 0.01  | 0.01  | 568.299 | 0.011 |
| Bore/Drill Rigs          | 2035 | 251    | 500     | 10.52  | 0.126 | 1.006 | 0.272  | 0.005 | 0.01  | 0.01  | 568.299 | 0.011 |
| Bore/Drill Rigs          | 2035 | 501    | 750     | 20.787 | 0.126 | 1.006 | 0.272  | 0.005 | 0.01  | 0.01  | 568.299 | 0.011 |
| Bore/Drill Rigs          | 2035 | 751    | 1000    | 31.372 | 0.126 | 1.006 | 2.372  | 0.005 | 0.021 | 0.021 | 568.299 | 0.011 |
| Bore/Drill Rigs          | 2040 | 6      | 15      | 1.821  | 0.661 | 3.469 | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Bore/Drill Rigs          | 2040 | 16     | 25      | 2.917  | 0.685 | 2.339 | 4.332  | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Bore/Drill Rigs          | 2040 | 26     | 50      | 2.883  | 0.348 | 4.032 | 3.019  | 0.007 | 0.013 | 0.013 | 568.3   | 0.031 |
| Bore/Drill Rigs          | 2040 | 51     | 120     | 3.77   | 0.183 | 3.435 | 1.411  | 0.006 | 0.012 | 0.012 | 568.299 | 0.016 |
| Bore/Drill Rigs          | 2040 | 121    | 175     | 4.77   | 0.127 | 3.039 | 0.272  | 0.006 | 0.01  | 0.01  | 568.299 | 0.011 |
| Bore/Drill Rigs          | 2040 | 176    | 250     | 6.36   | 0.127 | 1.035 | 0.272  | 0.006 | 0.01  | 0.01  | 568.3   | 0.011 |
| Bore/Drill Rigs          | 2040 | 251    | 500     | 10.526 | 0.127 | 1.006 | 0.272  | 0.005 | 0.01  | 0.01  | 568.299 | 0.011 |
| Bore/Drill Rigs          | 2040 | 501    | 750     | 20.799 | 0.127 | 1.006 | 0.272  | 0.005 | 0.01  | 0.01  | 568.299 | 0.011 |
| Bore/Drill Rigs          | 2040 | 751    | 1000    | 31.389 | 0.127 | 1.006 | 2.372  | 0.005 | 0.021 | 0.021 | 568.299 | 0.011 |
| Cement and Mortar Mixers | 1990 | 6      | 15      | 2.932  | 1.804 | 4.999 | 9.999  | 1.049 | 0.975 | 0.975 | 568.299 | 0.162 |
| Cement and Mortar Mixers | 1990 | 16     | 25      | 9.992  | 2.213 | 4.999 | 6.919  | 0.855 | 0.741 | 0.741 | 568.299 | 0.199 |
| Cement and Mortar Mixers | 2000 | 6      | 15      | 2.702  | 1.662 | 4.78  | 8.911  | 0.079 | 0.745 | 0.745 | 568.299 | 0.15  |
| Cement and Mortar Mixers | 2000 | 16     | 25      | 9.397  | 2.081 | 4.757 | 6.401  | 0.065 | 0.569 | 0.569 | 568.299 | 0.187 |
| Cement and Mortar Mixers | 2005 | 6      | 15      | 1.628  | 1.001 | 3.791 | 6.3    | 0.079 | 0.465 | 0.465 | 568.299 | 0.09  |
| Cement and Mortar Mixers | 2005 | 16     | 25      | 6.992  | 1.548 | 3.786 | 5.963  | 0.065 | 0.471 | 0.471 | 568.299 | 0.139 |
| Cement and Mortar Mixers | 2010 | 6      | 15      | 1.153  | 0.709 | 3.492 | 4.545  | 0.008 | 0.26  | 0.26  | 568.299 | 0.064 |
| Cement and Mortar Mixers | 2010 | 16     | 25      | 5.056  | 1.119 | 3.049 | 5.286  | 0.007 | 0.346 | 0.346 | 568.299 | 0.101 |
| Cement and Mortar Mixers | 2011 | 6      | 15      | 1.114  | 0.685 | 3.479 | 4.351  | 0.008 | 0.231 | 0.231 | 568.299 | 0.061 |
| Cement and Mortar Mixers | 2011 | 16     | 25      | 4.656  | 1.031 | 2.897 | 5.144  | 0.007 | 0.319 | 0.319 | 568.299 | 0.093 |
| Cement and Mortar Mixers | 2012 | 6      | 15      | 1.096  | 0.674 | 3.472 | 4.272  | 0.008 | 0.209 | 0.209 | 568.299 | 0.06  |
| Cement and Mortar Mixers | 2012 | 16     | 25      | 4.288  | 0.949 | 2.757 | 5.012  | 0.007 | 0.293 | 0.293 | 568.299 | 0.085 |
| Cement and Mortar Mixers | 2013 | 6      | 15      | 1.087  | 0.669 | 3.469 | 4.223  | 0.008 | 0.191 | 0.191 | 568.299 | 0.06  |
| Cement and Mortar Mixers | 2013 | 16     | 25      | 3.952  | 0.875 | 2.63  | 4.887  | 0.007 | 0.269 | 0.269 | 568.299 | 0.078 |
| Cement and Mortar Mixers | 2014 | 6      | 15      | 1.082  | 0.666 | 3.469 | 4.191  | 0.008 | 0.177 | 0.177 | 568.299 | 0.06  |
| Cement and Mortar Mixers | 2014 | 16     | 25      | 3.783  | 0.837 | 2.57  | 4.793  | 0.007 | 0.253 | 0.253 | 568.299 | 0.075 |
| Cement and Mortar Mixers | 2015 | 6      | 15      | 1.079  | 0.663 | 3.469 | 4.168  | 0.008 | 0.171 | 0.171 | 568.3   | 0.059 |
| Cement and Mortar Mixers | 2015 | 16     | 25      | 3.664  | 0.811 | 2.531 | 4.712  | 0.007 | 0.24  | 0.24  | 568.299 | 0.073 |
| Cement and Mortar Mixers | 2016 | 6      | 15      | 1.076  | 0.662 | 3.469 | 4.153  | 0.008 | 0.167 | 0.167 | 568.3   | 0.059 |
| Cement and Mortar Mixers | 2016 | 16     | 25      | 3.558  | 0.788 | 2.496 | 4.636  | 0.007 | 0.227 | 0.227 | 568.299 | 0.071 |
| Cement and Mortar Mixers | 2017 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.145  | 0.008 | 0.165 | 0.165 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2017 | 16     | 25      | 3.466  | 0.767 | 2.466 | 4.567  | 0.007 | 0.216 | 0.216 | 568.299 | 0.069 |
| Cement and Mortar Mixers | 2018 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.142  | 0.008 | 0.163 | 0.163 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2018 | 16     | 25      | 3.384  | 0.749 | 2.44  | 4.504  | 0.007 | 0.205 | 0.205 | 568.299 | 0.067 |
| Cement and Mortar Mixers | 2019 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.142  | 0.008 | 0.162 | 0.162 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2019 | 16     | 25      | 3.321  | 0.735 | 2.417 | 4.469  | 0.007 | 0.196 | 0.196 | 568.299 | 0.066 |
| Cement and Mortar Mixers | 2020 | 6      | 15      | 1.075  | 0.661 | 3.47  | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2020 | 16     | 25      | 3.265  | 0.723 | 2.397 | 4.442  | 0.007 | 0.187 | 0.187 | 568.299 | 0.065 |
| Cement and Mortar Mixers | 2021 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2021 | 16     | 25      | 3.219  | 0.712 | 2.381 | 4.419  | 0.007 | 0.18  | 0.18  | 568.299 | 0.064 |
| Cement and Mortar Mixers | 2022 | 6      | 15      | 1.075  | 0.661 | 3.47  | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2022 | 16     | 25      | 3.182  | 0.704 | 2.367 | 4.399  | 0.007 | 0.175 | 0.175 | 568.299 | 0.063 |
| Cement and Mortar Mixers | 2023 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2023 | 16     | 25      | 3.151  | 0.697 | 2.356 | 4.382  | 0.007 | 0.172 | 0.172 | 568.299 | 0.062 |
| Cement and Mortar Mixers | 2024 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2024 | 16     | 25      | 3.129  | 0.693 | 2.349 | 4.369  | 0.007 | 0.17  | 0.17  | 568.299 | 0.062 |
| Cement and Mortar Mixers | 2025 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2025 | 16     | 25      | 3.113  | 0.689 | 2.344 | 4.357  | 0.007 | 0.168 | 0.168 | 568.299 | 0.062 |
| Cement and Mortar Mixers | 2030 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2030 | 16     | 25      | 3.095  | 0.685 | 2.339 | 4.333  | 0.007 | 0.162 | 0.162 | 568.299 | 0.061 |
| Cement and Mortar Mixers | 2035 | 6      | 15      | 1.075  | 0.661 | 3.469 | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2035 | 16     | 25      | 3.095  | 0.685 | 2.339 | 4.332  | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Cement and Mortar Mixers | 2040 | 6      | 15      | 1.075  | 0.661 | 3.47  | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Cement and Mortar Mixers | 2040 | 16     | 25      | 3.095  | 0.685 | 2.339 | 4.332  | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 1990 | 16     | 25      | 4.947  | 2.213 | 4.999 | 6.919  | 0.855 | 0.741 | 0.741 | 568.299 | 0.199 |
| Concrete/Industrial Saws | 1990 | 26     | 50      | 20.26  | 4.943 | 9.962 | 8.008  | 0.871 | 1.297 | 1.297 | 568.299 | 0.446 |
| Concrete/Industrial Saws | 1990 | 51     | 120     | 24.821 | 2.467 | 5.934 | 15.608 | 0.791 | 1.385 | 1.385 | 568.299 | 0.222 |
| Concrete/Industrial Saws | 1990 | 121    | 175     | 45.581 | 2.097 | 5.376 | 15.952 | 0.758 | 1.172 | 1.172 | 568.3   | 0.189 |
| Concrete/Industrial Saws | 2000 | 16     | 25      | 4.266  | 1.908 | 4.438 | 6.326  | 0.065 | 0.555 | 0.555 | 568.299 | 0.172 |
| Concrete/Industrial Saws | 2000 | 26     | 50      | 14.64  | 3.572 | 7.547 | 6.784  | 0.066 | 0.789 | 0.789 | 568.299 | 0.322 |
| Concrete/Industrial Saws | 2000 | 51     | 120     | 16.713 | 1.661 | 4.354 | 9.903  | 0.06  | 0.77  | 0.77  | 568.299 | 0.149 |
| Concrete/Industrial Saws | 2000 | 121    | 175     | 24.252 | 1.115 | 3.531 | 9.017  | 0.057 | 0.452 | 0.452 | 568.3   | 0.1   |
| Concrete/Industrial Saws | 2005 | 16     | 25      | 1.899  | 0.849 | 2.519 | 5.321  | 0.065 | 0.333 | 0.333 | 568.299 | 0.076 |
| Concrete/Industrial Saws | 2005 | 26     | 50      | 13.023 | 3.177 | 6.994 | 6.32   | 0.066 | 0.732 | 0.732 | 568.299 | 0.286 |
| Concrete/Industrial Saws | 2005 | 51     | 120     | 14.366 | 1.428 | 4.05  | 8.401  | 0.06  | 0.714 | 0.714 | 568.299 | 0.128 |
| Concrete/Industrial Saws | 2005 | 121    | 175     | 20.277 | 0.932 | 3.223 | 7.685  | 0.057 | 0.393 | 0.393 | 568.299 | 0.084 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type           | Year | Low HP | High HP | TOG    | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|--------------------------|------|--------|---------|--------|-------|-------|-------|-------|-------|-------|---------|-------|
| Concrete/Industrial Saws | 2010 | 16     | 25      | 1.545  | 0.691 | 2.339 | 4.411 | 0.007 | 0.216 | 0.216 | 568.299 | 0.062 |
| Concrete/Industrial Saws | 2010 | 26     | 50      | 9.492  | 2.316 | 6.039 | 5.774 | 0.007 | 0.565 | 0.565 | 568.299 | 0.208 |
| Concrete/Industrial Saws | 2010 | 51     | 120     | 10.348 | 1.028 | 3.813 | 6.592 | 0.006 | 0.551 | 0.551 | 568.299 | 0.092 |
| Concrete/Industrial Saws | 2010 | 121    | 175     | 14.859 | 0.683 | 3.116 | 5.838 | 0.006 | 0.306 | 0.306 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2011 | 16     | 25      | 1.539  | 0.688 | 2.339 | 4.372 | 0.007 | 0.193 | 0.193 | 568.299 | 0.062 |
| Concrete/Industrial Saws | 2011 | 26     | 50      | 8.781  | 2.142 | 5.854 | 5.68  | 0.007 | 0.534 | 0.534 | 568.299 | 0.193 |
| Concrete/Industrial Saws | 2011 | 51     | 120     | 9.617  | 0.955 | 3.775 | 6.222 | 0.006 | 0.524 | 0.524 | 568.299 | 0.086 |
| Concrete/Industrial Saws | 2011 | 121    | 175     | 13.917 | 0.64  | 3.104 | 5.491 | 0.006 | 0.293 | 0.293 | 568.299 | 0.057 |
| Concrete/Industrial Saws | 2012 | 16     | 25      | 1.535  | 0.686 | 2.339 | 4.348 | 0.007 | 0.173 | 0.173 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2012 | 26     | 50      | 8.071  | 1.969 | 5.671 | 5.59  | 0.007 | 0.503 | 0.503 | 568.299 | 0.177 |
| Concrete/Industrial Saws | 2012 | 51     | 120     | 8.902  | 0.884 | 3.74  | 5.844 | 0.006 | 0.489 | 0.489 | 568.299 | 0.079 |
| Concrete/Industrial Saws | 2012 | 121    | 175     | 12.992 | 0.597 | 3.094 | 5.146 | 0.006 | 0.272 | 0.272 | 568.299 | 0.053 |
| Concrete/Industrial Saws | 2013 | 16     | 25      | 1.533  | 0.685 | 2.339 | 4.335 | 0.007 | 0.168 | 0.168 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2013 | 26     | 50      | 7.362  | 1.796 | 5.489 | 5.377 | 0.007 | 0.463 | 0.463 | 568.299 | 0.162 |
| Concrete/Industrial Saws | 2013 | 51     | 120     | 8.209  | 0.816 | 3.706 | 5.483 | 0.006 | 0.451 | 0.451 | 568.299 | 0.073 |
| Concrete/Industrial Saws | 2013 | 121    | 175     | 12.096 | 0.556 | 3.086 | 4.829 | 0.006 | 0.25  | 0.25  | 568.299 | 0.05  |
| Concrete/Industrial Saws | 2014 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.164 | 0.164 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2014 | 26     | 50      | 6.665  | 1.626 | 5.313 | 5.172 | 0.007 | 0.424 | 0.424 | 568.299 | 0.146 |
| Concrete/Industrial Saws | 2014 | 51     | 120     | 7.539  | 0.749 | 3.675 | 5.16  | 0.006 | 0.412 | 0.412 | 568.299 | 0.067 |
| Concrete/Industrial Saws | 2014 | 121    | 175     | 11.238 | 0.517 | 3.08  | 4.531 | 0.006 | 0.228 | 0.228 | 568.299 | 0.046 |
| Concrete/Industrial Saws | 2015 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.162 | 0.162 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2015 | 26     | 50      | 6.027  | 1.47  | 5.165 | 4.989 | 0.007 | 0.386 | 0.386 | 568.299 | 0.132 |
| Concrete/Industrial Saws | 2015 | 51     | 120     | 6.878  | 0.683 | 3.647 | 4.789 | 0.006 | 0.372 | 0.372 | 568.3   | 0.061 |
| Concrete/Industrial Saws | 2015 | 121    | 175     | 10.333 | 0.475 | 3.077 | 4.112 | 0.006 | 0.207 | 0.207 | 568.299 | 0.042 |
| Concrete/Industrial Saws | 2016 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2016 | 26     | 50      | 5.419  | 1.322 | 5.029 | 4.818 | 0.007 | 0.35  | 0.35  | 568.3   | 0.119 |
| Concrete/Industrial Saws | 2016 | 51     | 120     | 6.237  | 0.62  | 3.62  | 4.432 | 0.006 | 0.333 | 0.333 | 568.3   | 0.055 |
| Concrete/Industrial Saws | 2016 | 121    | 175     | 9.455  | 0.435 | 3.074 | 3.708 | 0.006 | 0.186 | 0.186 | 568.299 | 0.039 |
| Concrete/Industrial Saws | 2017 | 16     | 25      | 1.532  | 0.685 | 2.34  | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2017 | 26     | 50      | 4.816  | 1.175 | 4.894 | 4.652 | 0.007 | 0.313 | 0.313 | 568.299 | 0.106 |
| Concrete/Industrial Saws | 2017 | 51     | 120     | 5.61   | 0.557 | 3.595 | 4.086 | 0.006 | 0.294 | 0.294 | 568.299 | 0.05  |
| Concrete/Industrial Saws | 2017 | 121    | 175     | 8.602  | 0.395 | 3.073 | 3.316 | 0.006 | 0.165 | 0.165 | 568.299 | 0.035 |
| Concrete/Industrial Saws | 2018 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2018 | 26     | 50      | 4.233  | 1.032 | 4.766 | 4.492 | 0.007 | 0.277 | 0.277 | 568.299 | 0.093 |
| Concrete/Industrial Saws | 2018 | 51     | 120     | 5.014  | 0.498 | 3.571 | 3.754 | 0.006 | 0.256 | 0.256 | 568.299 | 0.044 |
| Concrete/Industrial Saws | 2018 | 121    | 175     | 7.805  | 0.359 | 3.072 | 2.945 | 0.006 | 0.145 | 0.145 | 568.299 | 0.032 |
| Concrete/Industrial Saws | 2019 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2019 | 26     | 50      | 3.686  | 0.899 | 4.645 | 4.338 | 0.007 | 0.242 | 0.242 | 568.299 | 0.081 |
| Concrete/Industrial Saws | 2019 | 51     | 120     | 4.463  | 0.443 | 3.55  | 3.441 | 0.006 | 0.22  | 0.22  | 568.3   | 0.04  |
| Concrete/Industrial Saws | 2019 | 121    | 175     | 7.177  | 0.33  | 3.072 | 2.618 | 0.006 | 0.128 | 0.128 | 568.299 | 0.029 |
| Concrete/Industrial Saws | 2020 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2020 | 26     | 50      | 3.271  | 0.798 | 4.552 | 4.196 | 0.007 | 0.212 | 0.212 | 568.299 | 0.072 |
| Concrete/Industrial Saws | 2020 | 51     | 120     | 4.042  | 0.401 | 3.535 | 3.163 | 0.006 | 0.19  | 0.19  | 568.299 | 0.036 |
| Concrete/Industrial Saws | 2020 | 121    | 175     | 6.669  | 0.306 | 3.072 | 2.324 | 0.006 | 0.114 | 0.114 | 568.299 | 0.027 |
| Concrete/Industrial Saws | 2021 | 16     | 25      | 1.532  | 0.685 | 2.34  | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2021 | 26     | 50      | 2.959  | 0.722 | 4.481 | 4.063 | 0.007 | 0.184 | 0.184 | 568.3   | 0.065 |
| Concrete/Industrial Saws | 2021 | 51     | 120     | 3.721  | 0.369 | 3.523 | 2.913 | 0.006 | 0.166 | 0.166 | 568.299 | 0.033 |
| Concrete/Industrial Saws | 2021 | 121    | 175     | 6.227  | 0.286 | 3.072 | 2.055 | 0.006 | 0.101 | 0.101 | 568.299 | 0.025 |
| Concrete/Industrial Saws | 2022 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2022 | 26     | 50      | 2.705  | 0.66  | 4.422 | 3.936 | 0.007 | 0.158 | 0.158 | 568.3   | 0.059 |
| Concrete/Industrial Saws | 2022 | 51     | 120     | 3.457  | 0.343 | 3.514 | 2.686 | 0.006 | 0.144 | 0.144 | 568.299 | 0.031 |
| Concrete/Industrial Saws | 2022 | 121    | 175     | 5.819  | 0.267 | 3.072 | 1.806 | 0.006 | 0.089 | 0.089 | 568.3   | 0.024 |
| Concrete/Industrial Saws | 2023 | 16     | 25      | 1.532  | 0.685 | 2.34  | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2023 | 26     | 50      | 2.484  | 0.606 | 4.372 | 3.815 | 0.007 | 0.134 | 0.134 | 568.299 | 0.054 |
| Concrete/Industrial Saws | 2023 | 51     | 120     | 3.223  | 0.32  | 3.507 | 2.478 | 0.006 | 0.123 | 0.123 | 568.3   | 0.028 |
| Concrete/Industrial Saws | 2023 | 121    | 175     | 5.453  | 0.25  | 3.072 | 1.599 | 0.006 | 0.077 | 0.077 | 568.299 | 0.022 |
| Concrete/Industrial Saws | 2024 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2024 | 26     | 50      | 2.303  | 0.561 | 4.33  | 3.701 | 0.007 | 0.115 | 0.115 | 568.3   | 0.05  |
| Concrete/Industrial Saws | 2024 | 51     | 120     | 3.023  | 0.3   | 3.5   | 2.315 | 0.006 | 0.106 | 0.106 | 568.299 | 0.027 |
| Concrete/Industrial Saws | 2024 | 121    | 175     | 5.117  | 0.235 | 3.072 | 1.418 | 0.006 | 0.067 | 0.067 | 568.299 | 0.021 |
| Concrete/Industrial Saws | 2025 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2025 | 26     | 50      | 2.153  | 0.525 | 4.297 | 3.592 | 0.007 | 0.099 | 0.099 | 568.299 | 0.047 |
| Concrete/Industrial Saws | 2025 | 51     | 120     | 2.849  | 0.283 | 3.495 | 2.176 | 0.006 | 0.089 | 0.089 | 568.3   | 0.025 |
| Concrete/Industrial Saws | 2025 | 121    | 175     | 4.8    | 0.22  | 3.073 | 1.249 | 0.006 | 0.056 | 0.056 | 568.3   | 0.019 |
| Concrete/Industrial Saws | 2030 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2030 | 26     | 50      | 1.679  | 0.409 | 4.199 | 3.222 | 0.007 | 0.041 | 0.041 | 568.299 | 0.036 |
| Concrete/Industrial Saws | 2030 | 51     | 120     | 2.226  | 0.221 | 3.48  | 1.667 | 0.006 | 0.036 | 0.036 | 568.299 | 0.019 |
| Concrete/Industrial Saws | 2030 | 121    | 175     | 3.551  | 0.163 | 3.074 | 0.59  | 0.006 | 0.025 | 0.025 | 568.299 | 0.014 |
| Concrete/Industrial Saws | 2035 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Concrete/Industrial Saws | 2035 | 26     | 50      | 1.54   | 0.375 | 4.174 | 3.107 | 0.007 | 0.021 | 0.021 | 568.3   | 0.033 |
| Concrete/Industrial Saws | 2035 | 51     | 120     | 2.015  | 0.2   | 3.476 | 1.491 | 0.006 | 0.018 | 0.018 | 568.299 | 0.018 |
| Concrete/Industrial Saws | 2035 | 121    | 175     | 3.121  | 0.143 | 3.075 | 0.374 | 0.006 | 0.014 | 0.014 | 568.299 | 0.012 |
| Concrete/Industrial Saws | 2040 | 16     | 25      | 1.532  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type           | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|--------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Concrete/Industrial Saws | 2040 | 26     | 50      | 1.532    | 0.373  | 4.175   | 3.058   | 0.007  | 0.014  | 0.014  | 568.299  | 0.033  |
| Concrete/Industrial Saws | 2040 | 51     | 120     | 1.968    | 0.195  | 3.477   | 1.434   | 0.006  | 0.013  | 0.013  | 568.299  | 0.017  |
| Concrete/Industrial Saws | 2040 | 121    | 175     | 2.965    | 0.136  | 3.076   | 0.297   | 0.006  | 0.011  | 0.011  | 568.3    | 0.012  |
| Cranes                   | 1990 | 26     | 50      | 13.537   | 5.179  | 10.396  | 8.093   | 0.871  | 1.345  | 1.345  | 568.299  | 0.467  |
| Cranes                   | 1990 | 51     | 120     | 14.178   | 2.508  | 5.983   | 15.674  | 0.791  | 1.427  | 1.427  | 568.299  | 0.226  |
| Cranes                   | 1990 | 121    | 175     | 18.412   | 2.033  | 5.387   | 15.601  | 0.758  | 1.142  | 1.142  | 568.299  | 0.183  |
| Cranes                   | 1990 | 176    | 250     | 25.703   | 2.033  | 5.387   | 15.601  | 0.758  | 1.142  | 1.142  | 568.299  | 0.183  |
| Cranes                   | 1990 | 251    | 500     | 36.191   | 1.782  | 12.529  | 14.718  | 0.662  | 0.968  | 0.968  | 568.299  | 0.16   |
| Cranes                   | 1990 | 501    | 750     | 60.897   | 1.782  | 12.529  | 14.718  | 1.018  | 0.986  | 0.986  | 568.299  | 0.16   |
| Cranes                   | 1990 | 1001   | 9999    | 194.538  | 1.778  | 12.529  | 14.718  | 1.018  | 0.98   | 0.98   | 568.299  | 0.16   |
| Cranes                   | 2000 | 26     | 50      | 12.119   | 4.636  | 9.507   | 7.163   | 0.066  | 0.958  | 0.958  | 568.3    | 0.418  |
| Cranes                   | 2000 | 51     | 120     | 10.887   | 1.926  | 4.81    | 10.905  | 0.06   | 0.93   | 0.93   | 568.299  | 0.173  |
| Cranes                   | 2000 | 121    | 175     | 11.77    | 1.299  | 3.932   | 9.929   | 0.057  | 0.552  | 0.552  | 568.299  | 0.117  |
| Cranes                   | 2000 | 176    | 250     | 14.291   | 1.13   | 3.285   | 9.635   | 0.057  | 0.47   | 0.47   | 568.299  | 0.101  |
| Cranes                   | 2000 | 251    | 500     | 20.704   | 1.019  | 5.545   | 9.139   | 0.05   | 0.411  | 0.411  | 568.299  | 0.092  |
| Cranes                   | 2000 | 501    | 750     | 34.838   | 1.019  | 5.545   | 9.139   | 0.052  | 0.411  | 0.411  | 568.299  | 0.092  |
| Cranes                   | 2000 | 1001   | 9999    | 116.509  | 1.064  | 6.045   | 9.643   | 0.052  | 0.394  | 0.394  | 568.299  | 0.096  |
| Cranes                   | 2005 | 26     | 50      | 10.96    | 4.193  | 8.893   | 6.736   | 0.066  | 0.898  | 0.898  | 568.3    | 0.378  |
| Cranes                   | 2005 | 51     | 120     | 9.53     | 1.686  | 4.493   | 9.357   | 0.06   | 0.875  | 0.875  | 568.299  | 0.152  |
| Cranes                   | 2005 | 121    | 175     | 10.036   | 1.108  | 3.6     | 8.542   | 0.057  | 0.487  | 0.487  | 568.299  | 0.099  |
| Cranes                   | 2005 | 176    | 250     | 10.718   | 0.847  | 2.367   | 8.163   | 0.057  | 0.343  | 0.343  | 568.299  | 0.076  |
| Cranes                   | 2005 | 251    | 500     | 15.234   | 0.75   | 3.287   | 7.448   | 0.05   | 0.303  | 0.303  | 568.299  | 0.067  |
| Cranes                   | 2005 | 501    | 750     | 25.971   | 0.76   | 3.283   | 7.598   | 0.052  | 0.305  | 0.305  | 568.299  | 0.068  |
| Cranes                   | 2005 | 1001   | 9999    | 91.74    | 0.838  | 3.718   | 8.503   | 0.052  | 0.293  | 0.293  | 568.299  | 0.075  |
| Cranes                   | 2010 | 26     | 50      | 2.786882 | 2.3418 | 7.37084 | 6.30432 | 0.0053 | 0.6648 | 0.6116 | 575.653  | 0.1676 |
| Cranes                   | 2010 | 51     | 120     | 1.626435 | 1.3667 | 5.06328 | 11.2099 | 0.0048 | 0.8338 | 0.7671 | 522.2692 | 0.152  |
| Cranes                   | 2010 | 121    | 175     | 0.999512 | 0.8399 | 3.96843 | 9.06236 | 0.0049 | 0.4835 | 0.4448 | 527.7153 | 0.1536 |
| Cranes                   | 2010 | 176    | 250     | 0.826087 | 0.6941 | 2.85637 | 8.39974 | 0.0049 | 0.3833 | 0.3526 | 525.6477 | 0.153  |
| Cranes                   | 2010 | 251    | 500     | 0.629842 | 0.5292 | 4.77692 | 7.05496 | 0.0049 | 0.2916 | 0.2683 | 524.2494 | 0.1526 |
| Cranes                   | 2010 | 501    | 750     | 0.3105   | 0.2609 | 1.59747 | 4.49648 | 0.0049 | 0.149  | 0.1371 | 523.8164 | 0.1525 |
| Cranes                   | 2010 | 1001   | 9999    | 0.387608 | 0.3257 | 1.00751 | 6.39903 | 0.0049 | 0.1506 | 0.1386 | 524.505  | 0.1527 |
| Cranes                   | 2011 | 26     | 50      | 2.66715  | 2.2411 | 7.21121 | 6.2271  | 0.0053 | 0.6409 | 0.5896 | 574.2181 | 0.1676 |
| Cranes                   | 2011 | 51     | 120     | 1.579127 | 1.3269 | 5.02442 | 10.9169 | 0.0048 | 0.8101 | 0.7453 | 521.0055 | 0.152  |
| Cranes                   | 2011 | 121    | 175     | 0.990868 | 0.8326 | 3.9727  | 8.96629 | 0.0049 | 0.4797 | 0.4414 | 526.3466 | 0.1536 |
| Cranes                   | 2011 | 176    | 250     | 0.818849 | 0.6881 | 2.82731 | 8.29972 | 0.0049 | 0.3791 | 0.3488 | 524.3412 | 0.153  |
| Cranes                   | 2011 | 251    | 500     | 0.613791 | 0.5158 | 4.61471 | 6.85019 | 0.0049 | 0.283  | 0.2604 | 523.002  | 0.1526 |
| Cranes                   | 2011 | 501    | 750     | 0.317708 | 0.267  | 1.60931 | 4.47987 | 0.0049 | 0.1509 | 0.1388 | 522.4977 | 0.1525 |
| Cranes                   | 2011 | 1001   | 9999    | 0.392668 | 0.3299 | 1.01544 | 6.442   | 0.0049 | 0.1534 | 0.1411 | 523.1938 | 0.1527 |
| Cranes                   | 2012 | 26     | 50      | 2.575229 | 2.1639 | 7.10245 | 6.16881 | 0.0053 | 0.6225 | 0.5727 | 572.7834 | 0.1676 |
| Cranes                   | 2012 | 51     | 120     | 1.549708 | 1.3022 | 4.99918 | 10.7338 | 0.0048 | 0.7952 | 0.7316 | 519.357  | 0.1519 |
| Cranes                   | 2012 | 121    | 175     | 0.992021 | 0.8336 | 3.98552 | 8.9416  | 0.0049 | 0.4808 | 0.4423 | 525.0081 | 0.1536 |
| Cranes                   | 2012 | 176    | 250     | 0.82388  | 0.6923 | 2.83394 | 8.30152 | 0.0049 | 0.3805 | 0.3501 | 522.9802 | 0.153  |
| Cranes                   | 2012 | 251    | 500     | 0.612564 | 0.5147 | 4.5553  | 6.7893  | 0.0049 | 0.2811 | 0.2586 | 521.6408 | 0.1526 |
| Cranes                   | 2012 | 501    | 750     | 0.324471 | 0.2726 | 1.62066 | 4.45619 | 0.0049 | 0.1517 | 0.1396 | 521.1061 | 0.1524 |
| Cranes                   | 2012 | 1001   | 9999    | 0.397633 | 0.3341 | 1.02322 | 6.48415 | 0.0049 | 0.1561 | 0.1436 | 521.8825 | 0.1527 |
| Cranes                   | 2013 | 26     | 50      | 2.54578  | 2.1392 | 7.11869 | 6.10837 | 0.0053 | 0.6103 | 0.5615 | 569.9097 | 0.1676 |
| Cranes                   | 2013 | 51     | 120     | 1.506211 | 1.2656 | 4.95084 | 10.4655 | 0.0048 | 0.7751 | 0.7131 | 516.6909 | 0.1519 |
| Cranes                   | 2013 | 121    | 175     | 0.982629 | 0.8257 | 3.98019 | 8.83222 | 0.0049 | 0.4764 | 0.4382 | 522.3332 | 0.1536 |
| Cranes                   | 2013 | 176    | 250     | 0.813083 | 0.6832 | 2.80099 | 8.15558 | 0.0049 | 0.3745 | 0.3446 | 520.3446 | 0.153  |
| Cranes                   | 2013 | 251    | 500     | 0.59291  | 0.4982 | 4.36265 | 6.51563 | 0.0049 | 0.27   | 0.2484 | 519.0961 | 0.1526 |
| Cranes                   | 2013 | 501    | 750     | 0.327629 | 0.2753 | 1.62896 | 4.36739 | 0.0049 | 0.1503 | 0.1382 | 518.355  | 0.1524 |
| Cranes                   | 2013 | 1001   | 9999    | 0.402502 | 0.3382 | 1.03085 | 6.5255  | 0.0049 | 0.1588 | 0.1461 | 519.26   | 0.1527 |
| Cranes                   | 2014 | 26     | 50      | 2.516704 | 2.1147 | 7.12566 | 6.09324 | 0.0053 | 0.6073 | 0.5587 | 567.0058 | 0.1676 |
| Cranes                   | 2014 | 51     | 120     | 1.481452 | 1.2448 | 4.92305 | 10.3017 | 0.0048 | 0.7649 | 0.7037 | 514.0286 | 0.1519 |
| Cranes                   | 2014 | 121    | 175     | 0.944168 | 0.7934 | 3.93186 | 8.47052 | 0.0049 | 0.457  | 0.4205 | 519.5114 | 0.1535 |
| Cranes                   | 2014 | 176    | 250     | 0.786323 | 0.6607 | 2.72625 | 7.86026 | 0.0049 | 0.3603 | 0.3314 | 517.6833 | 0.153  |
| Cranes                   | 2014 | 251    | 500     | 0.574656 | 0.4829 | 4.17708 | 6.26415 | 0.0049 | 0.2596 | 0.2388 | 516.5784 | 0.1527 |
| Cranes                   | 2014 | 501    | 750     | 0.333096 | 0.2799 | 1.63547 | 4.32737 | 0.0049 | 0.1507 | 0.1387 | 515.6071 | 0.1524 |
| Cranes                   | 2014 | 1001   | 9999    | 0.143297 | 0.1204 | 0.94782 | 2.28075 | 0.0049 | 0.0544 | 0.05   | 516.6375 | 0.1527 |
| Cranes                   | 2015 | 26     | 50      | 2.483294 | 2.0867 | 7.12517 | 6.07491 | 0.0053 | 0.6005 | 0.5525 | 561.2236 | 0.1675 |
| Cranes                   | 2015 | 51     | 120     | 1.444394 | 1.2137 | 4.88366 | 10.0604 | 0.0048 | 0.7467 | 0.6869 | 508.8366 | 0.1519 |
| Cranes                   | 2015 | 121    | 175     | 0.930749 | 0.7821 | 3.91821 | 8.3254  | 0.0049 | 0.4501 | 0.4141 | 514.2598 | 0.1535 |
| Cranes                   | 2015 | 176    | 250     | 0.764242 | 0.6422 | 2.65334 | 7.62156 | 0.0049 | 0.3479 | 0.3201 | 512.4484 | 0.153  |
| Cranes                   | 2015 | 251    | 500     | 0.565318 | 0.475  | 4.10962 | 6.12404 | 0.0049 | 0.2534 | 0.2331 | 511.1972 | 0.1526 |
| Cranes                   | 2015 | 501    | 750     | 0.340293 | 0.2859 | 1.64279 | 4.31183 | 0.0049 | 0.1518 | 0.1397 | 510.3342 | 0.1524 |
| Cranes                   | 2015 | 1001   | 9999    | 0.156078 | 0.1311 | 0.95679 | 2.29477 | 0.0049 | 0.0554 | 0.051  | 511.3924 | 0.1527 |
| Cranes                   | 2016 | 26     | 50      | 2.535089 | 2.1302 | 7.2684  | 6.11027 | 0.0053 | 0.6102 | 0.5614 | 555.4414 | 0.1675 |
| Cranes                   | 2016 | 51     | 120     | 1.373103 | 1.1538 | 4.79702 | 9.60772 | 0.0048 | 0.7095 | 0.6527 | 503.5992 | 0.1519 |
| Cranes                   | 2016 | 121    | 175     | 0.884915 | 0.7436 | 3.86156 | 7.88718 | 0.0049 | 0.4273 | 0.3931 | 508.9515 | 0.1535 |
| Cranes                   | 2016 | 176    | 250     | 0.741297 | 0.6229 | 2.5822  | 7.38068 | 0.0049 | 0.3349 | 0.3081 | 507.1552 | 0.153  |
| Cranes                   | 2016 | 251    | 500     | 0.527153 | 0.443  | 3.83445 | 5.64865 | 0.0049 | 0.2332 | 0.2145 | 506.0882 | 0.1527 |
| Cranes                   | 2016 | 501    | 750     | 0.347738 | 0.2922 | 1.65024 | 4.31387 | 0.0049 | 0.1529 | 0.1406 | 505.0695 | 0.1523 |
| Cranes                   | 2016 | 1001   | 9999    | 0.168646 | 0.1417 | 0.96562 | 2.30856 | 0.0049 | 0.0565 | 0.0519 | 506.1474 | 0.1527 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Cranes         | 2017 | 26     | 50      | 2.585562 | 2.1726 | 7.40804 | 6.14479 | 0.0053 | 0.6199 | 0.5703 | 546.7815 | 0.1675 |
| Cranes         | 2017 | 51     | 120     | 1.304913 | 1.0965 | 4.71022 | 9.15389 | 0.0048 | 0.6777 | 0.6235 | 495.7534 | 0.1519 |
| Cranes         | 2017 | 121    | 175     | 0.828528 | 0.6962 | 3.78744 | 7.36009 | 0.0049 | 0.3974 | 0.3656 | 501.093  | 0.1535 |
| Cranes         | 2017 | 176    | 250     | 0.667136 | 0.5606 | 2.38452 | 6.65526 | 0.0049 | 0.2967 | 0.273  | 499.3721 | 0.153  |
| Cranes         | 2017 | 251    | 500     | 0.488095 | 0.4101 | 3.54746 | 5.23184 | 0.0049 | 0.2124 | 0.1954 | 498.439  | 0.1527 |
| Cranes         | 2017 | 501    | 750     | 0.34114  | 0.2867 | 1.63305 | 4.1579  | 0.0049 | 0.1471 | 0.1353 | 497.1865 | 0.1523 |
| Cranes         | 2017 | 1001   | 9999    | 0.181003 | 0.1521 | 0.97429 | 2.32212 | 0.0049 | 0.0575 | 0.0529 | 498.2798 | 0.1527 |
| Cranes         | 2018 | 26     | 50      | 2.466121 | 2.0722 | 7.24744 | 6.00385 | 0.0053 | 0.624  | 0.5741 | 538.1219 | 0.1675 |
| Cranes         | 2018 | 51     | 120     | 1.108698 | 0.9316 | 4.45237 | 7.93075 | 0.0048 | 0.5831 | 0.5364 | 488.1172 | 0.152  |
| Cranes         | 2018 | 121    | 175     | 0.739223 | 0.6212 | 3.66571 | 6.5572  | 0.0049 | 0.3511 | 0.323  | 493.0451 | 0.1535 |
| Cranes         | 2018 | 176    | 250     | 0.574877 | 0.4831 | 2.13445 | 5.77298 | 0.0049 | 0.2499 | 0.2299 | 491.4069 | 0.153  |
| Cranes         | 2018 | 251    | 500     | 0.440014 | 0.3697 | 3.1871  | 4.63433 | 0.0049 | 0.187  | 0.172  | 490.8912 | 0.1528 |
| Cranes         | 2018 | 501    | 750     | 0.322048 | 0.2706 | 1.61304 | 3.7688  | 0.0049 | 0.1368 | 0.1259 | 489.0536 | 0.1522 |
| Cranes         | 2018 | 1001   | 9999    | 0.193147 | 0.1623 | 0.98282 | 2.33544 | 0.0049 | 0.0585 | 0.0538 | 490.4122 | 0.1527 |
| Cranes         | 2019 | 26     | 50      | 2.434147 | 2.0454 | 7.24465 | 5.95197 | 0.0053 | 0.6148 | 0.5657 | 529.4626 | 0.1675 |
| Cranes         | 2019 | 51     | 120     | 0.955908 | 0.8032 | 4.26491 | 6.95786 | 0.0048 | 0.5005 | 0.4604 | 480.3251 | 0.152  |
| Cranes         | 2019 | 121    | 175     | 0.675554 | 0.5677 | 3.5982  | 5.94857 | 0.0049 | 0.3177 | 0.2923 | 485.1817 | 0.1535 |
| Cranes         | 2019 | 176    | 250     | 0.50769  | 0.4266 | 1.94079 | 5.0842  | 0.0049 | 0.2155 | 0.1983 | 483.4616 | 0.153  |
| Cranes         | 2019 | 251    | 500     | 0.415431 | 0.3491 | 2.96893 | 4.29654 | 0.0049 | 0.173  | 0.1592 | 483.1422 | 0.1529 |
| Cranes         | 2019 | 501    | 750     | 0.299943 | 0.252  | 1.44568 | 3.42803 | 0.0049 | 0.1238 | 0.1139 | 481.1192 | 0.1522 |
| Cranes         | 2019 | 1001   | 9999    | 0.205078 | 0.1723 | 0.9912  | 2.34854 | 0.0049 | 0.0595 | 0.0547 | 482.5446 | 0.1527 |
| Cranes         | 2020 | 26     | 50      | 2.47956  | 2.0835 | 7.37625 | 5.98471 | 0.0053 | 0.6237 | 0.5738 | 517.9263 | 0.1675 |
| Cranes         | 2020 | 51     | 120     | 0.871016 | 0.7319 | 4.17141 | 6.38117 | 0.0048 | 0.4529 | 0.4167 | 469.8821 | 0.152  |
| Cranes         | 2020 | 121    | 175     | 0.638941 | 0.5369 | 3.56232 | 5.5697  | 0.0049 | 0.2978 | 0.274  | 474.5939 | 0.1535 |
| Cranes         | 2020 | 176    | 250     | 0.45669  | 0.3837 | 1.7904  | 4.56329 | 0.0049 | 0.1881 | 0.1731 | 472.9488 | 0.153  |
| Cranes         | 2020 | 251    | 500     | 0.381547 | 0.3206 | 2.66037 | 3.86243 | 0.0049 | 0.1548 | 0.1424 | 472.5579 | 0.1528 |
| Cranes         | 2020 | 501    | 750     | 0.287724 | 0.2418 | 1.44353 | 3.10471 | 0.0049 | 0.116  | 0.1067 | 470.4254 | 0.1521 |
| Cranes         | 2020 | 1001   | 9999    | 0.216797 | 0.1822 | 0.99943 | 2.3614  | 0.0049 | 0.0604 | 0.0556 | 472.0545 | 0.1527 |
| Cranes         | 2021 | 26     | 50      | 2.516467 | 2.1145 | 7.48883 | 6.01375 | 0.0053 | 0.6311 | 0.5806 | 517.8995 | 0.1675 |
| Cranes         | 2021 | 51     | 120     | 0.77522  | 0.6514 | 4.06507 | 5.73085 | 0.0048 | 0.3983 | 0.3664 | 469.8867 | 0.152  |
| Cranes         | 2021 | 121    | 175     | 0.593174 | 0.4984 | 3.51648 | 5.1125  | 0.0049 | 0.2728 | 0.251  | 474.5458 | 0.1535 |
| Cranes         | 2021 | 176    | 250     | 0.415905 | 0.3495 | 1.67824 | 4.10439 | 0.0049 | 0.1666 | 0.1533 | 472.9057 | 0.1529 |
| Cranes         | 2021 | 251    | 500     | 0.351498 | 0.2954 | 2.44833 | 3.44253 | 0.0049 | 0.1385 | 0.1274 | 472.4553 | 0.1528 |
| Cranes         | 2021 | 501    | 750     | 0.271141 | 0.2278 | 1.43956 | 2.72739 | 0.0049 | 0.1068 | 0.0982 | 470.5495 | 0.1522 |
| Cranes         | 2021 | 1001   | 9999    | 0.228304 | 0.1918 | 1.00751 | 2.37402 | 0.0049 | 0.0614 | 0.0565 | 472.0545 | 0.1527 |
| Cranes         | 2022 | 26     | 50      | 2.41359  | 2.0281 | 7.36828 | 5.8991  | 0.0053 | 0.6031 | 0.5549 | 517.8722 | 0.1675 |
| Cranes         | 2022 | 51     | 120     | 0.687651 | 0.5778 | 3.97198 | 5.14893 | 0.0048 | 0.3459 | 0.3182 | 469.9929 | 0.152  |
| Cranes         | 2022 | 121    | 175     | 0.543527 | 0.4567 | 3.4753  | 4.6169  | 0.0049 | 0.2462 | 0.2265 | 474.5887 | 0.1535 |
| Cranes         | 2022 | 176    | 250     | 0.375691 | 0.3157 | 1.60164 | 3.54149 | 0.0049 | 0.147  | 0.1353 | 472.9832 | 0.153  |
| Cranes         | 2022 | 251    | 500     | 0.31051  | 0.2609 | 2.21201 | 2.89369 | 0.0049 | 0.1173 | 0.1079 | 472.1806 | 0.1527 |
| Cranes         | 2022 | 501    | 750     | 0.238348 | 0.2003 | 1.28309 | 2.25087 | 0.0049 | 0.0888 | 0.0817 | 470.4755 | 0.1522 |
| Cranes         | 2022 | 1001   | 9999    | 0.239599 | 0.2013 | 1.01544 | 2.38641 | 0.0049 | 0.0623 | 0.0573 | 472.0545 | 0.1527 |
| Cranes         | 2023 | 26     | 50      | 2.435567 | 2.0466 | 7.45254 | 5.9225  | 0.0053 | 0.6076 | 0.559  | 517.8722 | 0.1675 |
| Cranes         | 2023 | 51     | 120     | 0.656595 | 0.5517 | 3.9444  | 4.87461 | 0.0048 | 0.3227 | 0.2969 | 469.8891 | 0.152  |
| Cranes         | 2023 | 121    | 175     | 0.503663 | 0.4232 | 3.44284 | 4.22184 | 0.0049 | 0.2237 | 0.2058 | 474.595  | 0.1535 |
| Cranes         | 2023 | 176    | 250     | 0.353966 | 0.2974 | 1.55262 | 3.22938 | 0.0049 | 0.1349 | 0.1241 | 472.9738 | 0.153  |
| Cranes         | 2023 | 251    | 500     | 0.281202 | 0.2363 | 2.01    | 2.5105  | 0.0049 | 0.1015 | 0.0934 | 472.294  | 0.1527 |
| Cranes         | 2023 | 501    | 750     | 0.23207  | 0.195  | 1.28213 | 2.07257 | 0.0049 | 0.0841 | 0.0774 | 470.2508 | 0.1521 |
| Cranes         | 2023 | 1001   | 9999    | 0.250681 | 0.2106 | 1.02322 | 2.39857 | 0.0049 | 0.0632 | 0.0581 | 472.0545 | 0.1527 |
| Cranes         | 2024 | 26     | 50      | 2.304795 | 1.9367 | 7.26852 | 5.78796 | 0.0053 | 0.5771 | 0.531  | 517.8722 | 0.1675 |
| Cranes         | 2024 | 51     | 120     | 0.623876 | 0.5242 | 3.90649 | 4.61888 | 0.0048 | 0.3014 | 0.2773 | 469.9032 | 0.152  |
| Cranes         | 2024 | 121    | 175     | 0.453764 | 0.3813 | 3.3893  | 3.7029  | 0.0049 | 0.1962 | 0.1805 | 474.6358 | 0.1535 |
| Cranes         | 2024 | 176    | 250     | 0.334159 | 0.2808 | 1.50208 | 2.96596 | 0.0049 | 0.1234 | 0.1135 | 472.9638 | 0.153  |
| Cranes         | 2024 | 251    | 500     | 0.274315 | 0.2305 | 1.93263 | 2.38291 | 0.0049 | 0.0963 | 0.0886 | 472.0664 | 0.1527 |
| Cranes         | 2024 | 501    | 750     | 0.227031 | 0.1908 | 1.28334 | 1.89979 | 0.0049 | 0.0796 | 0.0732 | 470.3306 | 0.1521 |
| Cranes         | 2024 | 1001   | 9999    | 0.261551 | 0.2198 | 1.03085 | 2.4105  | 0.0049 | 0.0641 | 0.059  | 472.0545 | 0.1527 |
| Cranes         | 2025 | 26     | 50      | 2.155227 | 1.811  | 7.07168 | 5.63562 | 0.0053 | 0.5427 | 0.4993 | 517.8722 | 0.1675 |
| Cranes         | 2025 | 51     | 120     | 0.551396 | 0.4633 | 3.83081 | 4.13532 | 0.0048 | 0.2604 | 0.2395 | 469.5332 | 0.1519 |
| Cranes         | 2025 | 121    | 175     | 0.397698 | 0.3342 | 3.33544 | 3.16038 | 0.0049 | 0.1663 | 0.153  | 474.7477 | 0.1535 |
| Cranes         | 2025 | 176    | 250     | 0.31508  | 0.2648 | 1.4697  | 2.68128 | 0.0049 | 0.114  | 0.1049 | 472.9798 | 0.153  |
| Cranes         | 2025 | 251    | 500     | 0.259914 | 0.2184 | 1.83363 | 2.15424 | 0.0049 | 0.0879 | 0.0809 | 471.9671 | 0.1526 |
| Cranes         | 2025 | 501    | 750     | 0.204336 | 0.1717 | 1.27366 | 1.63763 | 0.0049 | 0.0677 | 0.0623 | 470.2756 | 0.1521 |
| Cranes         | 2025 | 1001   | 9999    | 0.272209 | 0.2287 | 1.03833 | 2.42219 | 0.0049 | 0.065  | 0.0598 | 472.0545 | 0.1527 |
| Cranes         | 2030 | 26     | 50      | 1.788    | 0.684  | 5.366   | 3.598   | 0.007  | 0.075  | 0.075  | 568.299  | 0.061  |
| Cranes         | 2030 | 51     | 120     | 1.941    | 0.343  | 3.812   | 1.987   | 0.006  | 0.067  | 0.067  | 568.299  | 0.03   |
| Cranes         | 2030 | 121    | 175     | 2.293    | 0.253  | 3.356   | 0.916   | 0.006  | 0.042  | 0.042  | 568.299  | 0.022  |
| Cranes         | 2030 | 176    | 250     | 2.835    | 0.224  | 1.147   | 0.748   | 0.006  | 0.024  | 0.024  | 568.299  | 0.02   |
| Cranes         | 2030 | 251    | 500     | 4.512    | 0.222  | 1.09    | 0.697   | 0.005  | 0.023  | 0.023  | 568.299  | 0.02   |
| Cranes         | 2030 | 501    | 750     | 7.602    | 0.222  | 1.09    | 0.709   | 0.005  | 0.024  | 0.024  | 568.3    | 0.02   |
| Cranes         | 2030 | 1001   | 9999    | 26.83    | 0.245  | 1.108   | 2.8     | 0.005  | 0.043  | 0.043  | 568.299  | 0.022  |
| Cranes         | 2035 | 26     | 50      | 1.568    | 0.6    | 5.292   | 3.401   | 0.007  | 0.039  | 0.039  | 568.299  | 0.054  |
| Cranes         | 2035 | 51     | 120     | 1.696    | 0.3    | 3.801   | 1.676   | 0.006  | 0.036  | 0.036  | 568.3    | 0.027  |
| Cranes         | 2035 | 121    | 175     | 1.923    | 0.212  | 3.357   | 0.519   | 0.006  | 0.024  | 0.024  | 568.299  | 0.019  |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type   | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Cranes           | 2035 | 176    | 250     | 2.568    | 0.203  | 1.143   | 0.463   | 0.006  | 0.016  | 0.016  | 568.299  | 0.018  |
| Cranes           | 2035 | 251    | 500     | 4.111    | 0.202  | 1.087   | 0.441   | 0.005  | 0.016  | 0.016  | 568.299  | 0.018  |
| Cranes           | 2035 | 501    | 750     | 6.923    | 0.202  | 1.087   | 0.446   | 0.005  | 0.016  | 0.016  | 568.299  | 0.018  |
| Cranes           | 2035 | 1001   | 9999    | 22.949   | 0.209  | 1.089   | 2.618   | 0.005  | 0.031  | 0.031  | 568.299  | 0.018  |
| Cranes           | 2040 | 26     | 50      | 1.483    | 0.567  | 5.268   | 3.324   | 0.007  | 0.024  | 0.024  | 568.299  | 0.051  |
| Cranes           | 2040 | 51     | 120     | 1.598    | 0.282  | 3.797   | 1.552   | 0.006  | 0.021  | 0.021  | 568.299  | 0.025  |
| Cranes           | 2040 | 121    | 175     | 1.79     | 0.197  | 3.358   | 0.371   | 0.006  | 0.016  | 0.016  | 568.299  | 0.017  |
| Cranes           | 2040 | 176    | 250     | 2.465    | 0.195  | 1.144   | 0.344   | 0.006  | 0.013  | 0.013  | 568.299  | 0.017  |
| Cranes           | 2040 | 251    | 500     | 3.958    | 0.195  | 1.087   | 0.34    | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Cranes           | 2040 | 501    | 750     | 6.661    | 0.195  | 1.087   | 0.341   | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Cranes           | 2040 | 1001   | 9999    | 21.703   | 0.198  | 1.087   | 2.534   | 0.005  | 0.027  | 0.027  | 568.299  | 0.017  |
| Crawler Tractors | 1990 | 26     | 50      | 11.254   | 4.903  | 9.907   | 7.983   | 0.871  | 1.291  | 1.291  | 568.299  | 0.442  |
| Crawler Tractors | 1990 | 51     | 120     | 14.413   | 2.374  | 5.73    | 14.967  | 0.791  | 1.353  | 1.353  | 568.299  | 0.214  |
| Crawler Tractors | 1990 | 121    | 175     | 19.335   | 1.729  | 5.079   | 13.979  | 0.758  | 0.962  | 0.962  | 568.299  | 0.156  |
| Crawler Tractors | 1990 | 176    | 250     | 26.505   | 1.729  | 5.079   | 13.979  | 0.758  | 0.962  | 0.962  | 568.299  | 0.156  |
| Crawler Tractors | 1990 | 251    | 500     | 36.545   | 1.528  | 11.319  | 13.238  | 0.662  | 0.822  | 0.822  | 568.3    | 0.137  |
| Crawler Tractors | 1990 | 501    | 750     | 65.509   | 1.528  | 11.319  | 13.238  | 1.018  | 0.837  | 0.837  | 568.299  | 0.137  |
| Crawler Tractors | 1990 | 751    | 1000    | 92.189   | 1.518  | 11.319  | 13.238  | 1.018  | 0.826  | 0.826  | 568.299  | 0.137  |
| Crawler Tractors | 2000 | 26     | 50      | 10.858   | 4.73   | 9.675   | 7.197   | 0.066  | 0.973  | 0.973  | 568.299  | 0.426  |
| Crawler Tractors | 2000 | 51     | 120     | 11.94    | 1.966  | 4.886   | 11.097  | 0.06   | 0.949  | 0.949  | 568.299  | 0.177  |
| Crawler Tractors | 2000 | 121    | 175     | 14.976   | 1.339  | 4.018   | 10.157  | 0.057  | 0.57   | 0.57   | 568.3    | 0.12   |
| Crawler Tractors | 2000 | 176    | 250     | 17.901   | 1.168  | 3.367   | 9.863   | 0.057  | 0.486  | 0.486  | 568.299  | 0.105  |
| Crawler Tractors | 2000 | 251    | 500     | 25.11    | 1.049  | 5.849   | 9.341   | 0.05   | 0.424  | 0.424  | 568.299  | 0.094  |
| Crawler Tractors | 2000 | 501    | 750     | 45.011   | 1.049  | 5.849   | 9.341   | 0.052  | 0.424  | 0.424  | 568.299  | 0.094  |
| Crawler Tractors | 2000 | 751    | 1000    | 66.528   | 1.095  | 6.349   | 9.844   | 0.052  | 0.407  | 0.407  | 568.299  | 0.098  |
| Crawler Tractors | 2005 | 26     | 50      | 9.923    | 4.323  | 9.124   | 6.809   | 0.066  | 0.919  | 0.919  | 568.299  | 0.39   |
| Crawler Tractors | 2005 | 51     | 120     | 10.68    | 1.759  | 4.63    | 9.75    | 0.06   | 0.903  | 0.903  | 568.299  | 0.158  |
| Crawler Tractors | 2005 | 121    | 175     | 13.006   | 1.163  | 3.749   | 8.886   | 0.057  | 0.513  | 0.513  | 568.299  | 0.104  |
| Crawler Tractors | 2005 | 176    | 250     | 13.95    | 0.91   | 2.557   | 8.523   | 0.057  | 0.371  | 0.371  | 568.299  | 0.082  |
| Crawler Tractors | 2005 | 251    | 500     | 19.249   | 0.804  | 3.945   | 7.791   | 0.05   | 0.326  | 0.326  | 568.299  | 0.072  |
| Crawler Tractors | 2005 | 501    | 750     | 34.852   | 0.813  | 3.938   | 7.93    | 0.052  | 0.328  | 0.328  | 568.299  | 0.073  |
| Crawler Tractors | 2005 | 751    | 1000    | 54.011   | 0.889  | 4.359   | 8.804   | 0.052  | 0.319  | 0.319  | 568.3    | 0.08   |
| Crawler Tractors | 2010 | 26     | 50      | 3.193884 | 2.6838 | 8.18872 | 6.54779 | 0.0053 | 0.7848 | 0.7221 | 572.972  | 0.1668 |
| Crawler Tractors | 2010 | 51     | 120     | 1.069208 | 0.8984 | 4.10668 | 7.76656 | 0.0049 | 0.6284 | 0.5781 | 530.0152 | 0.1543 |
| Crawler Tractors | 2010 | 121    | 175     | 0.755513 | 0.6348 | 3.40812 | 7.15822 | 0.0049 | 0.378  | 0.3477 | 524.4997 | 0.1527 |
| Crawler Tractors | 2010 | 176    | 250     | 0.540569 | 0.4542 | 1.89919 | 6.46768 | 0.0049 | 0.2494 | 0.2294 | 526.1431 | 0.1531 |
| Crawler Tractors | 2010 | 251    | 500     | 0.491926 | 0.4134 | 3.0665  | 5.96739 | 0.0049 | 0.2267 | 0.2086 | 528.681  | 0.1539 |
| Crawler Tractors | 2010 | 501    | 750     | 0.418044 | 0.3513 | 1.75694 | 5.31967 | 0.0049 | 0.1887 | 0.1736 | 525.9395 | 0.1531 |
| Crawler Tractors | 2010 | 751    | 1000    | 0.545095 | 0.458  | 2.04187 | 7.25547 | 0.0049 | 0.2102 | 0.1934 | 527.6019 | 0.1536 |
| Crawler Tractors | 2011 | 26     | 50      | 3.090465 | 2.5968 | 8.06059 | 6.48764 | 0.0053 | 0.762  | 0.7011 | 571.2544 | 0.1667 |
| Crawler Tractors | 2011 | 51     | 120     | 1.055307 | 0.8868 | 4.11149 | 7.65924 | 0.0049 | 0.6244 | 0.5744 | 528.5468 | 0.1542 |
| Crawler Tractors | 2011 | 121    | 175     | 0.753531 | 0.6332 | 3.422   | 7.0937  | 0.0049 | 0.3775 | 0.3473 | 523.1105 | 0.1526 |
| Crawler Tractors | 2011 | 176    | 250     | 0.541549 | 0.4551 | 1.8844  | 6.42306 | 0.0049 | 0.248  | 0.2281 | 524.8932 | 0.1532 |
| Crawler Tractors | 2011 | 251    | 500     | 0.494702 | 0.4157 | 3.04503 | 5.91443 | 0.0049 | 0.2259 | 0.2078 | 527.4003 | 0.1539 |
| Crawler Tractors | 2011 | 501    | 750     | 0.416615 | 0.3501 | 1.70832 | 5.23606 | 0.0049 | 0.1862 | 0.1713 | 524.9577 | 0.1532 |
| Crawler Tractors | 2011 | 751    | 1000    | 0.550612 | 0.4627 | 2.05264 | 7.30105 | 0.0049 | 0.2123 | 0.1953 | 526.3508 | 0.1536 |
| Crawler Tractors | 2012 | 26     | 50      | 3.127964 | 2.6284 | 8.16399 | 6.51312 | 0.0053 | 0.77   | 0.7084 | 569.8895 | 0.1667 |
| Crawler Tractors | 2012 | 51     | 120     | 1.066067 | 0.8958 | 4.14375 | 7.67928 | 0.0049 | 0.6326 | 0.582  | 527.2248 | 0.1542 |
| Crawler Tractors | 2012 | 121    | 175     | 0.762695 | 0.6409 | 3.4484  | 7.11308 | 0.0049 | 0.3819 | 0.3514 | 521.7707 | 0.1526 |
| Crawler Tractors | 2012 | 176    | 250     | 0.549863 | 0.462  | 1.8924  | 6.43904 | 0.0049 | 0.2499 | 0.2299 | 523.5287 | 0.1532 |
| Crawler Tractors | 2012 | 251    | 500     | 0.502104 | 0.4219 | 3.05662 | 5.9107  | 0.0049 | 0.2272 | 0.209  | 526.0223 | 0.1539 |
| Crawler Tractors | 2012 | 501    | 750     | 0.425611 | 0.3576 | 1.71661 | 5.25574 | 0.0049 | 0.1885 | 0.1734 | 523.7088 | 0.1532 |
| Crawler Tractors | 2012 | 751    | 1000    | 0.555874 | 0.4671 | 2.06265 | 7.34463 | 0.0049 | 0.2144 | 0.1972 | 525.1067 | 0.1536 |
| Crawler Tractors | 2013 | 26     | 50      | 3.060938 | 2.572  | 8.10275 | 6.42928 | 0.0053 | 0.7525 | 0.6923 | 567.3537 | 0.1668 |
| Crawler Tractors | 2013 | 51     | 120     | 1.067402 | 0.8969 | 4.16448 | 7.64718 | 0.0049 | 0.636  | 0.5851 | 524.5941 | 0.1542 |
| Crawler Tractors | 2013 | 121    | 175     | 0.758762 | 0.6376 | 3.4566  | 7.02367 | 0.0049 | 0.3797 | 0.3493 | 519.0712 | 0.1526 |
| Crawler Tractors | 2013 | 176    | 250     | 0.548046 | 0.4605 | 1.8715  | 6.36771 | 0.0049 | 0.2468 | 0.2271 | 520.7236 | 0.1531 |
| Crawler Tractors | 2013 | 251    | 500     | 0.501212 | 0.4212 | 2.99715 | 5.82738 | 0.0049 | 0.2246 | 0.2067 | 523.5592 | 0.1539 |
| Crawler Tractors | 2013 | 501    | 750     | 0.418079 | 0.3513 | 1.67885 | 5.09878 | 0.0049 | 0.1829 | 0.1683 | 520.5693 | 0.1531 |
| Crawler Tractors | 2013 | 751    | 1000    | 0.560878 | 0.4713 | 2.07187 | 7.3862  | 0.0049 | 0.2163 | 0.199  | 522.5513 | 0.1536 |
| Crawler Tractors | 2014 | 26     | 50      | 3.000333 | 2.5211 | 8.04733 | 6.39578 | 0.0053 | 0.7434 | 0.6839 | 564.5641 | 0.1668 |
| Crawler Tractors | 2014 | 51     | 120     | 1.051605 | 0.8836 | 4.16815 | 7.52434 | 0.0049 | 0.6285 | 0.5782 | 522.1187 | 0.1543 |
| Crawler Tractors | 2014 | 121    | 175     | 0.748303 | 0.6288 | 3.45911 | 6.87548 | 0.0049 | 0.3743 | 0.3443 | 516.4039 | 0.1526 |
| Crawler Tractors | 2014 | 176    | 250     | 0.54035  | 0.454  | 1.83765 | 6.23751 | 0.0049 | 0.2411 | 0.2218 | 518.0363 | 0.1531 |
| Crawler Tractors | 2014 | 251    | 500     | 0.490461 | 0.4121 | 2.91108 | 5.61601 | 0.0049 | 0.2172 | 0.1998 | 520.5153 | 0.1538 |
| Crawler Tractors | 2014 | 501    | 750     | 0.412689 | 0.3468 | 1.67523 | 4.89468 | 0.0049 | 0.1786 | 0.1643 | 517.8612 | 0.153  |
| Crawler Tractors | 2014 | 751    | 1000    | 0.565619 | 0.4753 | 2.08028 | 7.42576 | 0.0049 | 0.2182 | 0.2007 | 520.0052 | 0.1537 |
| Crawler Tractors | 2015 | 26     | 50      | 2.990271 | 2.5127 | 8.07628 | 6.37736 | 0.0053 | 0.7408 | 0.6816 | 558.8878 | 0.1669 |
| Crawler Tractors | 2015 | 51     | 120     | 1.05262  | 0.8845 | 4.18907 | 7.4938  | 0.0049 | 0.63   | 0.5796 | 516.8433 | 0.1543 |
| Crawler Tractors | 2015 | 121    | 175     | 0.751623 | 0.6316 | 3.47922 | 6.84937 | 0.0049 | 0.3758 | 0.3457 | 511.3059 | 0.1526 |
| Crawler Tractors | 2015 | 176    | 250     | 0.536796 | 0.4511 | 1.81586 | 6.14312 | 0.0049 | 0.2369 | 0.2179 | 512.8973 | 0.1531 |
| Crawler Tractors | 2015 | 251    | 500     | 0.485596 | 0.408  | 2.84505 | 5.48324 | 0.0049 | 0.2124 | 0.1954 | 515.3725 | 0.1539 |
| Crawler Tractors | 2015 | 501    | 750     | 0.41802  | 0.3513 | 1.66415 | 4.88301 | 0.0049 | 0.1788 | 0.1645 | 512.5402 | 0.153  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type   | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Crawler Tractors | 2015 | 751    | 1000    | 0.570092 | 0.479  | 2.08783 | 7.46329 | 0.0049 | 0.22   | 0.2024 | 514.83   | 0.1537 |
| Crawler Tractors | 2016 | 26     | 50      | 2.99791  | 2.5191 | 8.10441 | 6.31718 | 0.0053 | 0.7329 | 0.6742 | 553.214  | 0.1669 |
| Crawler Tractors | 2016 | 51     | 120     | 1.034441 | 0.8692 | 4.18548 | 7.34589 | 0.0049 | 0.619  | 0.5695 | 511.268  | 0.1542 |
| Crawler Tractors | 2016 | 121    | 175     | 0.743125 | 0.6244 | 3.48211 | 6.7205  | 0.0049 | 0.3705 | 0.3409 | 506.0335 | 0.1526 |
| Crawler Tractors | 2016 | 176    | 250     | 0.534039 | 0.4487 | 1.80295 | 6.04745 | 0.0049 | 0.2332 | 0.2145 | 507.355  | 0.153  |
| Crawler Tractors | 2016 | 251    | 500     | 0.473782 | 0.3981 | 2.74397 | 5.27907 | 0.0049 | 0.2045 | 0.1882 | 510.3385 | 0.1539 |
| Crawler Tractors | 2016 | 501    | 750     | 0.41158  | 0.3458 | 1.6206  | 4.7238  | 0.0049 | 0.1738 | 0.1599 | 507.2527 | 0.153  |
| Crawler Tractors | 2016 | 751    | 1000    | 0.57429  | 0.4826 | 2.09448 | 7.4988  | 0.0049 | 0.2217 | 0.204  | 509.6671 | 0.1537 |
| Crawler Tractors | 2017 | 26     | 50      | 2.926516 | 2.4591 | 8.00596 | 6.20834 | 0.0053 | 0.7116 | 0.6547 | 544.6762 | 0.1669 |
| Crawler Tractors | 2017 | 51     | 120     | 1.010844 | 0.8494 | 4.17611 | 7.141   | 0.0049 | 0.6036 | 0.5553 | 503.2791 | 0.1542 |
| Crawler Tractors | 2017 | 121    | 175     | 0.731209 | 0.6144 | 3.48322 | 6.55188 | 0.0049 | 0.3636 | 0.3345 | 498.1245 | 0.1526 |
| Crawler Tractors | 2017 | 176    | 250     | 0.511144 | 0.4295 | 1.7418  | 5.75969 | 0.0049 | 0.2199 | 0.2023 | 499.832  | 0.1531 |
| Crawler Tractors | 2017 | 251    | 500     | 0.458057 | 0.3849 | 2.6349  | 5.02932 | 0.0049 | 0.1946 | 0.1791 | 502.422  | 0.1539 |
| Crawler Tractors | 2017 | 501    | 750     | 0.386074 | 0.3244 | 1.5221  | 4.36108 | 0.0049 | 0.1597 | 0.1469 | 499.1046 | 0.1529 |
| Crawler Tractors | 2017 | 751    | 1000    | 0.578206 | 0.4859 | 2.10018 | 7.53226 | 0.0049 | 0.2233 | 0.2055 | 501.8777 | 0.1538 |
| Crawler Tractors | 2018 | 26     | 50      | 2.910335 | 2.4455 | 8.0094  | 6.16323 | 0.0053 | 0.7038 | 0.6475 | 536.1409 | 0.1669 |
| Crawler Tractors | 2018 | 51     | 120     | 0.949614 | 0.7979 | 4.1231  | 6.72257 | 0.0049 | 0.5658 | 0.5205 | 494.9217 | 0.1541 |
| Crawler Tractors | 2018 | 121    | 175     | 0.660412 | 0.5549 | 3.42131 | 5.8588  | 0.0049 | 0.3255 | 0.2994 | 490.0002 | 0.1525 |
| Crawler Tractors | 2018 | 176    | 250     | 0.473989 | 0.3983 | 1.65354 | 5.28959 | 0.0049 | 0.2001 | 0.1841 | 491.606  | 0.153  |
| Crawler Tractors | 2018 | 251    | 500     | 0.409351 | 0.344  | 2.38218 | 4.37324 | 0.0049 | 0.1694 | 0.1559 | 493.5104 | 0.1536 |
| Crawler Tractors | 2018 | 501    | 750     | 0.351876 | 0.2957 | 1.4447  | 3.8336  | 0.0049 | 0.1415 | 0.1301 | 491.2659 | 0.1529 |
| Crawler Tractors | 2018 | 751    | 1000    | 0.581827 | 0.4889 | 2.10483 | 7.56366 | 0.0049 | 0.2249 | 0.2069 | 494.1052 | 0.1538 |
| Crawler Tractors | 2019 | 26     | 50      | 2.648469 | 2.2254 | 7.58896 | 5.85476 | 0.0053 | 0.6404 | 0.5892 | 525.9767 | 0.1664 |
| Crawler Tractors | 2019 | 51     | 120     | 0.901167 | 0.7572 | 4.08842 | 6.39347 | 0.0049 | 0.5347 | 0.4919 | 486.9909 | 0.1541 |
| Crawler Tractors | 2019 | 121    | 175     | 0.615173 | 0.5169 | 3.37886 | 5.38191 | 0.0049 | 0.2996 | 0.2756 | 481.6222 | 0.1524 |
| Crawler Tractors | 2019 | 176    | 250     | 0.45175  | 0.3796 | 1.60445 | 4.9721  | 0.0049 | 0.1875 | 0.1725 | 483.4489 | 0.153  |
| Crawler Tractors | 2019 | 251    | 500     | 0.37933  | 0.3187 | 2.21938 | 3.93412 | 0.0049 | 0.1528 | 0.1406 | 485.8645 | 0.1537 |
| Crawler Tractors | 2019 | 501    | 750     | 0.316919 | 0.2663 | 1.35585 | 3.34253 | 0.0049 | 0.123  | 0.1132 | 483.3879 | 0.1529 |
| Crawler Tractors | 2019 | 751    | 1000    | 0.547243 | 0.4598 | 2.02037 | 7.21215 | 0.0049 | 0.2106 | 0.1938 | 486.2545 | 0.1538 |
| Crawler Tractors | 2020 | 26     | 50      | 2.443056 | 2.0528 | 7.3     | 5.64276 | 0.0053 | 0.5912 | 0.5439 | 515.679  | 0.1668 |
| Crawler Tractors | 2020 | 51     | 120     | 0.850709 | 0.7148 | 4.04412 | 6.00933 | 0.0049 | 0.5005 | 0.4604 | 476.3284 | 0.1541 |
| Crawler Tractors | 2020 | 121    | 175     | 0.566576 | 0.4761 | 3.33989 | 4.87226 | 0.0049 | 0.2722 | 0.2504 | 471.015  | 0.1523 |
| Crawler Tractors | 2020 | 176    | 250     | 0.428471 | 0.36   | 1.55491 | 4.63225 | 0.0049 | 0.1746 | 0.1606 | 472.941  | 0.153  |
| Crawler Tractors | 2020 | 251    | 500     | 0.358593 | 0.3013 | 2.0875  | 3.62175 | 0.0049 | 0.1409 | 0.1296 | 475.2338 | 0.1537 |
| Crawler Tractors | 2020 | 501    | 750     | 0.304872 | 0.2562 | 1.31018 | 3.13716 | 0.0049 | 0.1151 | 0.1059 | 473.3119 | 0.1531 |
| Crawler Tractors | 2020 | 751    | 1000    | 0.551035 | 0.463  | 2.02764 | 7.23682 | 0.0049 | 0.212  | 0.195  | 475.6525 | 0.1538 |
| Crawler Tractors | 2021 | 26     | 50      | 2.456387 | 2.064  | 7.34869 | 5.61511 | 0.0053 | 0.5906 | 0.5433 | 516.1077 | 0.1669 |
| Crawler Tractors | 2021 | 51     | 120     | 0.800723 | 0.6728 | 4.00549 | 5.65746 | 0.0049 | 0.4657 | 0.4285 | 476.437  | 0.1541 |
| Crawler Tractors | 2021 | 121    | 175     | 0.518367 | 0.4356 | 3.30982 | 4.3947  | 0.0049 | 0.2445 | 0.225  | 471.421  | 0.1525 |
| Crawler Tractors | 2021 | 176    | 250     | 0.407794 | 0.3427 | 1.51456 | 4.33394 | 0.0049 | 0.1631 | 0.15   | 472.9246 | 0.153  |
| Crawler Tractors | 2021 | 251    | 500     | 0.337066 | 0.2832 | 2.02434 | 3.27633 | 0.0049 | 0.129  | 0.1187 | 474.4843 | 0.1535 |
| Crawler Tractors | 2021 | 501    | 750     | 0.284829 | 0.2393 | 1.26985 | 2.82478 | 0.0049 | 0.1038 | 0.0955 | 473.0941 | 0.153  |
| Crawler Tractors | 2021 | 751    | 1000    | 0.475256 | 0.3993 | 1.89563 | 6.3992  | 0.0049 | 0.1816 | 0.1671 | 471.8224 | 0.1526 |
| Crawler Tractors | 2022 | 26     | 50      | 2.25944  | 1.8986 | 7.04118 | 5.37962 | 0.0053 | 0.5388 | 0.4957 | 516.1476 | 0.1669 |
| Crawler Tractors | 2022 | 51     | 120     | 0.714244 | 0.6002 | 3.92498 | 5.10103 | 0.0049 | 0.4079 | 0.3753 | 476.0219 | 0.154  |
| Crawler Tractors | 2022 | 121    | 175     | 0.463094 | 0.3891 | 3.26382 | 3.82659 | 0.0049 | 0.2137 | 0.1966 | 471.5674 | 0.1525 |
| Crawler Tractors | 2022 | 176    | 250     | 0.364117 | 0.306  | 1.43975 | 3.73672 | 0.0049 | 0.141  | 0.1297 | 472.0975 | 0.1527 |
| Crawler Tractors | 2022 | 251    | 500     | 0.30258  | 0.2543 | 1.91628 | 2.74435 | 0.0049 | 0.1111 | 0.1022 | 474.4115 | 0.1534 |
| Crawler Tractors | 2022 | 501    | 750     | 0.235465 | 0.1979 | 1.18638 | 2.12552 | 0.0049 | 0.0794 | 0.073  | 472.876  | 0.1529 |
| Crawler Tractors | 2022 | 751    | 1000    | 0.424397 | 0.3566 | 1.73227 | 5.92299 | 0.0049 | 0.1624 | 0.1494 | 470.7007 | 0.1522 |
| Crawler Tractors | 2023 | 26     | 50      | 2.228685 | 1.8727 | 7.02687 | 5.32514 | 0.0053 | 0.5262 | 0.4841 | 516.1587 | 0.1669 |
| Crawler Tractors | 2023 | 51     | 120     | 0.663952 | 0.5579 | 3.88936 | 4.76208 | 0.0049 | 0.3728 | 0.343  | 476.1575 | 0.154  |
| Crawler Tractors | 2023 | 121    | 175     | 0.41309  | 0.3471 | 3.23526 | 3.33004 | 0.0049 | 0.1852 | 0.1704 | 471.7805 | 0.1526 |
| Crawler Tractors | 2023 | 176    | 250     | 0.328767 | 0.2763 | 1.39549 | 3.18735 | 0.0049 | 0.1236 | 0.1137 | 471.6244 | 0.1525 |
| Crawler Tractors | 2023 | 251    | 500     | 0.286276 | 0.2406 | 1.85216 | 2.47635 | 0.0049 | 0.1017 | 0.0935 | 474.6128 | 0.1535 |
| Crawler Tractors | 2023 | 501    | 750     | 0.218505 | 0.1836 | 1.15892 | 1.86667 | 0.0049 | 0.0694 | 0.0639 | 472.5297 | 0.1528 |
| Crawler Tractors | 2023 | 751    | 1000    | 0.319268 | 0.2683 | 1.6104  | 4.76968 | 0.0049 | 0.1184 | 0.1089 | 473.6655 | 0.1532 |
| Crawler Tractors | 2024 | 26     | 50      | 2.089827 | 1.756  | 6.68497 | 4.97522 | 0.0053 | 0.4659 | 0.4287 | 515.4658 | 0.1667 |
| Crawler Tractors | 2024 | 51     | 120     | 0.610839 | 0.5133 | 3.85173 | 4.40892 | 0.0049 | 0.3353 | 0.3085 | 476.2342 | 0.154  |
| Crawler Tractors | 2024 | 121    | 175     | 0.387606 | 0.3257 | 3.22706 | 3.04107 | 0.0049 | 0.1702 | 0.1566 | 471.8291 | 0.1526 |
| Crawler Tractors | 2024 | 176    | 250     | 0.313897 | 0.2638 | 1.36992 | 2.95319 | 0.0049 | 0.1146 | 0.1055 | 471.8603 | 0.1526 |
| Crawler Tractors | 2024 | 251    | 500     | 0.271114 | 0.2278 | 1.77984 | 2.2441  | 0.0049 | 0.0926 | 0.0852 | 474.025  | 0.1533 |
| Crawler Tractors | 2024 | 501    | 750     | 0.215283 | 0.1809 | 1.15921 | 1.76658 | 0.0049 | 0.066  | 0.0607 | 472.2827 | 0.1527 |
| Crawler Tractors | 2024 | 751    | 1000    | 0.313081 | 0.2631 | 1.58774 | 4.68945 | 0.0049 | 0.1148 | 0.1056 | 474.6448 | 0.1535 |
| Crawler Tractors | 2025 | 26     | 50      | 2.075042 | 1.7436 | 6.68642 | 4.93567 | 0.0053 | 0.4561 | 0.4196 | 516.1279 | 0.1669 |
| Crawler Tractors | 2025 | 51     | 120     | 0.540303 | 0.454  | 3.78839 | 3.96126 | 0.0049 | 0.2848 | 0.262  | 476.1336 | 0.154  |
| Crawler Tractors | 2025 | 121    | 175     | 0.354345 | 0.2977 | 3.20909 | 2.68768 | 0.0049 | 0.15   | 0.138  | 471.5923 | 0.1525 |
| Crawler Tractors | 2025 | 176    | 250     | 0.276616 | 0.2324 | 1.30849 | 2.46158 | 0.0049 | 0.0961 | 0.0884 | 471.6224 | 0.1525 |
| Crawler Tractors | 2025 | 251    | 500     | 0.247477 | 0.2079 | 1.71697 | 1.92007 | 0.0049 | 0.0805 | 0.0741 | 474.0072 | 0.1533 |
| Crawler Tractors | 2025 | 501    | 750     | 0.198724 | 0.167  | 1.12199 | 1.54452 | 0.0049 | 0.0567 | 0.0522 | 472.4081 | 0.1528 |
| Crawler Tractors | 2025 | 751    | 1000    | 0.308836 | 0.2595 | 1.59298 | 4.59799 | 0.0049 | 0.1115 | 0.1026 | 475.4901 | 0.1538 |
| Crawler Tractors | 2030 | 26     | 50      | 1.912    | 0.833  | 5.605   | 3.808   | 0.007  | 0.116  | 0.116  | 568.299  | 0.075  |
| Crawler Tractors | 2030 | 51     | 120     | 2.461    | 0.405  | 3.871   | 2.341   | 0.006  | 0.105  | 0.105  | 568.299  | 0.036  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type           | Year | Low HP | High HP | TOG     | ROG   | CO     | NOX    | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|--------------------------|------|--------|---------|---------|-------|--------|--------|-------|-------|-------|---------|-------|
| Crawler Tractors         | 2030 | 121    | 175     | 3.315   | 0.296 | 3.397  | 1.266  | 0.006 | 0.065 | 0.065 | 568.299 | 0.026 |
| Crawler Tractors         | 2030 | 176    | 250     | 4.019   | 0.262 | 1.207  | 1.104  | 0.006 | 0.04  | 0.04  | 568.299 | 0.023 |
| Crawler Tractors         | 2030 | 251    | 500     | 6.146   | 0.257 | 1.2    | 1.016  | 0.005 | 0.038 | 0.038 | 568.299 | 0.023 |
| Crawler Tractors         | 2030 | 501    | 750     | 11.033  | 0.257 | 1.2    | 1.033  | 0.005 | 0.038 | 0.038 | 568.299 | 0.023 |
| Crawler Tractors         | 2030 | 751    | 1000    | 16.147  | 0.265 | 1.225  | 3.094  | 0.005 | 0.056 | 0.056 | 568.3   | 0.023 |
| Crawler Tractors         | 2035 | 26     | 50      | 1.626   | 0.708 | 5.493  | 3.558  | 0.007 | 0.066 | 0.066 | 568.299 | 0.063 |
| Crawler Tractors         | 2035 | 51     | 120     | 2.099   | 0.345 | 3.85   | 1.922  | 0.006 | 0.06  | 0.06  | 568.299 | 0.031 |
| Crawler Tractors         | 2035 | 121    | 175     | 2.772   | 0.247 | 3.391  | 0.794  | 0.006 | 0.038 | 0.038 | 568.299 | 0.022 |
| Crawler Tractors         | 2035 | 176    | 250     | 3.521   | 0.229 | 1.182  | 0.695  | 0.006 | 0.026 | 0.026 | 568.299 | 0.02  |
| Crawler Tractors         | 2035 | 251    | 500     | 5.432   | 0.227 | 1.145  | 0.657  | 0.005 | 0.025 | 0.025 | 568.299 | 0.02  |
| Crawler Tractors         | 2035 | 501    | 750     | 9.744   | 0.227 | 1.145  | 0.664  | 0.005 | 0.025 | 0.025 | 568.299 | 0.02  |
| Crawler Tractors         | 2035 | 751    | 1000    | 14.073  | 0.231 | 1.159  | 2.792  | 0.005 | 0.041 | 0.041 | 568.299 | 0.02  |
| Crawler Tractors         | 2040 | 26     | 50      | 1.499   | 0.653 | 5.443  | 3.42   | 0.007 | 0.042 | 0.042 | 568.299 | 0.058 |
| Crawler Tractors         | 2040 | 51     | 120     | 1.924   | 0.316 | 3.839  | 1.709  | 0.006 | 0.039 | 0.039 | 568.299 | 0.028 |
| Crawler Tractors         | 2040 | 121    | 175     | 2.48    | 0.221 | 3.388  | 0.539  | 0.006 | 0.025 | 0.025 | 568.299 | 0.02  |
| Crawler Tractors         | 2040 | 176    | 250     | 3.247   | 0.211 | 1.167  | 0.491  | 0.006 | 0.018 | 0.018 | 568.299 | 0.019 |
| Crawler Tractors         | 2040 | 251    | 500     | 5.035   | 0.21  | 1.113  | 0.47   | 0.005 | 0.018 | 0.018 | 568.299 | 0.018 |
| Crawler Tractors         | 2040 | 501    | 750     | 9.03    | 0.21  | 1.113  | 0.475  | 0.005 | 0.018 | 0.018 | 568.299 | 0.019 |
| Crawler Tractors         | 2040 | 751    | 1000    | 12.945  | 0.213 | 1.122  | 2.652  | 0.005 | 0.032 | 0.032 | 568.299 | 0.019 |
| Crushing/Proc. Equipment | 1990 | 26     | 50      | 11.643  | 4.43  | 9.044  | 7.809  | 0.871 | 1.194 | 1.194 | 568.299 | 0.399 |
| Crushing/Proc. Equipment | 1990 | 51     | 120     | 11.193  | 2.255 | 5.547  | 14.555 | 0.791 | 1.258 | 1.258 | 568.299 | 0.203 |
| Crushing/Proc. Equipment | 1990 | 121    | 175     | 15.383  | 1.54  | 4.913  | 13.086 | 0.758 | 0.834 | 0.834 | 568.299 | 0.138 |
| Crushing/Proc. Equipment | 1990 | 176    | 250     | 22.49   | 1.54  | 4.913  | 13.086 | 0.758 | 0.834 | 0.834 | 568.299 | 0.138 |
| Crushing/Proc. Equipment | 1990 | 251    | 500     | 30.672  | 1.374 | 10.176 | 12.492 | 0.662 | 0.724 | 0.724 | 568.299 | 0.124 |
| Crushing/Proc. Equipment | 1990 | 501    | 750     | 48.337  | 1.374 | 10.175 | 12.492 | 1.018 | 0.737 | 0.737 | 568.299 | 0.124 |
| Crushing/Proc. Equipment | 1990 | 1001   | 9999    | 106.942 | 1.369 | 10.175 | 12.492 | 1.018 | 0.731 | 0.731 | 568.299 | 0.123 |
| Crushing/Proc. Equipment | 2000 | 26     | 50      | 10.827  | 4.12  | 8.551  | 6.954  | 0.066 | 0.876 | 0.876 | 568.299 | 0.371 |
| Crushing/Proc. Equipment | 2000 | 51     | 120     | 8.945   | 1.802 | 4.594  | 10.363 | 0.06  | 0.857 | 0.857 | 568.299 | 0.162 |
| Crushing/Proc. Equipment | 2000 | 121    | 175     | 12.05   | 1.206 | 3.737  | 9.416  | 0.057 | 0.506 | 0.506 | 568.299 | 0.108 |
| Crushing/Proc. Equipment | 2000 | 176    | 250     | 14.723  | 1.008 | 2.963  | 9.058  | 0.057 | 0.414 | 0.414 | 568.299 | 0.09  |
| Crushing/Proc. Equipment | 2000 | 251    | 500     | 20.487  | 0.918 | 5.011  | 8.658  | 0.05  | 0.366 | 0.366 | 568.299 | 0.082 |
| Crushing/Proc. Equipment | 2000 | 501    | 750     | 30.946  | 0.88  | 4.658  | 8.459  | 0.052 | 0.348 | 0.348 | 568.299 | 0.079 |
| Crushing/Proc. Equipment | 2000 | 1001   | 9999    | 77.281  | 0.989 | 5.329  | 9.138  | 0.052 | 0.37  | 0.37  | 568.299 | 0.089 |
| Crushing/Proc. Equipment | 2005 | 26     | 50      | 9.624   | 3.662 | 7.904  | 6.477  | 0.066 | 0.812 | 0.812 | 568.3   | 0.33  |
| Crushing/Proc. Equipment | 2005 | 51     | 120     | 7.644   | 1.54  | 4.24   | 8.68   | 0.06  | 0.794 | 0.794 | 568.299 | 0.138 |
| Crushing/Proc. Equipment | 2005 | 121    | 175     | 10.064  | 1.007 | 3.372  | 7.941  | 0.057 | 0.438 | 0.438 | 568.299 | 0.09  |
| Crushing/Proc. Equipment | 2005 | 176    | 250     | 10.399  | 0.712 | 1.97   | 7.484  | 0.057 | 0.282 | 0.282 | 568.299 | 0.064 |
| Crushing/Proc. Equipment | 2005 | 251    | 500     | 14.029  | 0.628 | 2.549  | 6.846  | 0.05  | 0.252 | 0.252 | 568.299 | 0.056 |
| Crushing/Proc. Equipment | 2005 | 501    | 750     | 22.225  | 0.632 | 2.431  | 6.974  | 0.052 | 0.249 | 0.249 | 568.299 | 0.057 |
| Crushing/Proc. Equipment | 2005 | 1001   | 9999    | 60.257  | 0.771 | 3.042  | 8.054  | 0.052 | 0.268 | 0.268 | 568.299 | 0.069 |
| Crushing/Proc. Equipment | 2010 | 26     | 50      | 7.704   | 2.931 | 7.22   | 6.068  | 0.007 | 0.671 | 0.671 | 568.299 | 0.264 |
| Crushing/Proc. Equipment | 2010 | 51     | 120     | 5.971   | 1.203 | 4.071  | 7.096  | 0.006 | 0.656 | 0.656 | 568.299 | 0.108 |
| Crushing/Proc. Equipment | 2010 | 121    | 175     | 8.033   | 0.804 | 3.307  | 6.322  | 0.006 | 0.362 | 0.362 | 568.299 | 0.072 |
| Crushing/Proc. Equipment | 2010 | 176    | 250     | 7.61    | 0.521 | 1.446  | 5.918  | 0.006 | 0.195 | 0.195 | 568.299 | 0.047 |
| Crushing/Proc. Equipment | 2010 | 251    | 500     | 10.487  | 0.47  | 1.603  | 5.248  | 0.005 | 0.18  | 0.18  | 568.299 | 0.042 |
| Crushing/Proc. Equipment | 2010 | 501    | 750     | 16.814  | 0.478 | 1.568  | 5.449  | 0.005 | 0.183 | 0.183 | 568.299 | 0.043 |
| Crushing/Proc. Equipment | 2010 | 1001   | 9999    | 46.933  | 0.601 | 2.091  | 6.987  | 0.005 | 0.209 | 0.209 | 568.299 | 0.054 |
| Crushing/Proc. Equipment | 2011 | 26     | 50      | 7.155   | 2.722 | 6.995  | 5.972  | 0.007 | 0.636 | 0.636 | 568.299 | 0.245 |
| Crushing/Proc. Equipment | 2011 | 51     | 120     | 5.588   | 1.125 | 4.03   | 6.704  | 0.006 | 0.625 | 0.625 | 568.3   | 0.101 |
| Crushing/Proc. Equipment | 2011 | 121    | 175     | 7.581   | 0.759 | 3.294  | 5.953  | 0.006 | 0.347 | 0.347 | 568.299 | 0.068 |
| Crushing/Proc. Equipment | 2011 | 176    | 250     | 7.059   | 0.483 | 1.356  | 5.498  | 0.006 | 0.175 | 0.175 | 568.299 | 0.043 |
| Crushing/Proc. Equipment | 2011 | 251    | 500     | 9.796   | 0.439 | 1.462  | 4.858  | 0.005 | 0.162 | 0.162 | 568.299 | 0.039 |
| Crushing/Proc. Equipment | 2011 | 501    | 750     | 15.681  | 0.446 | 1.435  | 5.054  | 0.005 | 0.165 | 0.165 | 568.299 | 0.04  |
| Crushing/Proc. Equipment | 2011 | 1001   | 9999    | 44.108  | 0.564 | 1.923  | 6.609  | 0.005 | 0.196 | 0.196 | 568.299 | 0.05  |
| Crushing/Proc. Equipment | 2012 | 26     | 50      | 6.538   | 2.488 | 6.733  | 5.867  | 0.007 | 0.596 | 0.596 | 568.299 | 0.224 |
| Crushing/Proc. Equipment | 2012 | 51     | 120     | 5.173   | 1.042 | 3.984  | 6.269  | 0.006 | 0.582 | 0.582 | 568.299 | 0.094 |
| Crushing/Proc. Equipment | 2012 | 121    | 175     | 7.084   | 0.709 | 3.28   | 5.553  | 0.006 | 0.321 | 0.321 | 568.299 | 0.064 |
| Crushing/Proc. Equipment | 2012 | 176    | 250     | 6.627   | 0.453 | 1.299  | 5.088  | 0.006 | 0.158 | 0.158 | 568.299 | 0.04  |
| Crushing/Proc. Equipment | 2012 | 251    | 500     | 9.273   | 0.415 | 1.362  | 4.48   | 0.005 | 0.147 | 0.147 | 568.3   | 0.037 |
| Crushing/Proc. Equipment | 2012 | 501    | 750     | 14.786  | 0.42  | 1.341  | 4.662  | 0.005 | 0.15  | 0.15  | 568.299 | 0.037 |
| Crushing/Proc. Equipment | 2012 | 1001   | 9999    | 41.105  | 0.526 | 1.755  | 6.197  | 0.005 | 0.182 | 0.182 | 568.299 | 0.047 |
| Crushing/Proc. Equipment | 2013 | 26     | 50      | 5.908   | 2.248 | 6.467  | 5.628  | 0.007 | 0.545 | 0.545 | 568.299 | 0.202 |
| Crushing/Proc. Equipment | 2013 | 51     | 120     | 4.758   | 0.958 | 3.94   | 5.845  | 0.006 | 0.532 | 0.532 | 568.299 | 0.086 |
| Crushing/Proc. Equipment | 2013 | 121    | 175     | 6.588   | 0.659 | 3.267  | 5.177  | 0.006 | 0.293 | 0.293 | 568.299 | 0.059 |
| Crushing/Proc. Equipment | 2013 | 176    | 250     | 6.27    | 0.429 | 1.26   | 4.695  | 0.006 | 0.144 | 0.144 | 568.299 | 0.038 |
| Crushing/Proc. Equipment | 2013 | 251    | 500     | 8.85    | 0.396 | 1.289  | 4.121  | 0.005 | 0.134 | 0.134 | 568.299 | 0.035 |
| Crushing/Proc. Equipment | 2013 | 501    | 750     | 14.055  | 0.399 | 1.273  | 4.285  | 0.005 | 0.136 | 0.136 | 568.299 | 0.036 |
| Crushing/Proc. Equipment | 2013 | 1001   | 9999    | 38.235  | 0.489 | 1.599  | 5.785  | 0.005 | 0.168 | 0.168 | 568.299 | 0.044 |
| Crushing/Proc. Equipment | 2014 | 26     | 50      | 5.288   | 2.012 | 6.212  | 5.399  | 0.007 | 0.494 | 0.494 | 568.299 | 0.181 |
| Crushing/Proc. Equipment | 2014 | 51     | 120     | 4.356   | 0.877 | 3.898  | 5.468  | 0.006 | 0.481 | 0.481 | 568.299 | 0.079 |
| Crushing/Proc. Equipment | 2014 | 121    | 175     | 6.112   | 0.612 | 3.256  | 4.823  | 0.006 | 0.265 | 0.265 | 568.299 | 0.055 |
| Crushing/Proc. Equipment | 2014 | 176    | 250     | 5.916   | 0.405 | 1.228  | 4.239  | 0.006 | 0.13  | 0.13  | 568.299 | 0.036 |
| Crushing/Proc. Equipment | 2014 | 251    | 500     | 8.415   | 0.377 | 1.23   | 3.702  | 0.005 | 0.121 | 0.121 | 568.299 | 0.034 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type           | Year | Low HP | High HP | TOG    | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|--------------------------|------|--------|---------|--------|-------|-------|-------|-------|-------|-------|---------|-------|
| Crushing/Proc. Equipment | 2014 | 501    | 750     | 13.314 | 0.378 | 1.218 | 3.844 | 0.005 | 0.123 | 0.123 | 568.299 | 0.034 |
| Crushing/Proc. Equipment | 2014 | 1001   | 9999    | 35.652 | 0.456 | 1.46  | 5.391 | 0.005 | 0.155 | 0.155 | 568.299 | 0.041 |
| Crushing/Proc. Equipment | 2015 | 26     | 50      | 4.722  | 1.796 | 5.996 | 5.195 | 0.007 | 0.446 | 0.446 | 568.299 | 0.162 |
| Crushing/Proc. Equipment | 2015 | 51     | 120     | 3.959  | 0.797 | 3.859 | 5.04  | 0.006 | 0.43  | 0.43  | 568.299 | 0.071 |
| Crushing/Proc. Equipment | 2015 | 121    | 175     | 5.614  | 0.562 | 3.247 | 4.343 | 0.006 | 0.237 | 0.237 | 568.299 | 0.05  |
| Crushing/Proc. Equipment | 2015 | 176    | 250     | 5.585  | 0.382 | 1.201 | 3.801 | 0.006 | 0.117 | 0.117 | 568.299 | 0.034 |
| Crushing/Proc. Equipment | 2015 | 251    | 500     | 8      | 0.358 | 1.184 | 3.304 | 0.005 | 0.109 | 0.109 | 568.299 | 0.032 |
| Crushing/Proc. Equipment | 2015 | 501    | 750     | 12.614 | 0.358 | 1.176 | 3.422 | 0.005 | 0.111 | 0.111 | 568.299 | 0.032 |
| Crushing/Proc. Equipment | 2015 | 1001   | 9999    | 32.981 | 0.422 | 1.343 | 5.019 | 0.005 | 0.14  | 0.14  | 568.299 | 0.038 |
| Crushing/Proc. Equipment | 2016 | 26     | 50      | 4.186  | 1.593 | 5.801 | 5.006 | 0.007 | 0.399 | 0.399 | 568.299 | 0.143 |
| Crushing/Proc. Equipment | 2016 | 51     | 120     | 3.576  | 0.72  | 3.823 | 4.631 | 0.006 | 0.379 | 0.379 | 568.299 | 0.065 |
| Crushing/Proc. Equipment | 2016 | 121    | 175     | 5.132  | 0.513 | 3.241 | 3.883 | 0.006 | 0.21  | 0.21  | 568.299 | 0.046 |
| Crushing/Proc. Equipment | 2016 | 176    | 250     | 5.267  | 0.36  | 1.178 | 3.381 | 0.006 | 0.105 | 0.105 | 568.299 | 0.032 |
| Crushing/Proc. Equipment | 2016 | 251    | 500     | 7.601  | 0.34  | 1.146 | 2.928 | 0.005 | 0.098 | 0.098 | 568.299 | 0.03  |
| Crushing/Proc. Equipment | 2016 | 501    | 750     | 11.944 | 0.339 | 1.14  | 3.021 | 0.005 | 0.099 | 0.099 | 568.299 | 0.03  |
| Crushing/Proc. Equipment | 2016 | 1001   | 9999    | 31.036 | 0.397 | 1.274 | 4.7   | 0.005 | 0.127 | 0.127 | 568.299 | 0.035 |
| Crushing/Proc. Equipment | 2017 | 26     | 50      | 3.684  | 1.402 | 5.623 | 4.827 | 0.007 | 0.354 | 0.354 | 568.299 | 0.126 |
| Crushing/Proc. Equipment | 2017 | 51     | 120     | 3.216  | 0.647 | 3.791 | 4.244 | 0.006 | 0.33  | 0.33  | 568.299 | 0.058 |
| Crushing/Proc. Equipment | 2017 | 121    | 175     | 4.681  | 0.468 | 3.236 | 3.45  | 0.006 | 0.185 | 0.185 | 568.299 | 0.042 |
| Crushing/Proc. Equipment | 2017 | 176    | 250     | 4.974  | 0.34  | 1.16  | 2.987 | 0.006 | 0.094 | 0.094 | 568.299 | 0.03  |
| Crushing/Proc. Equipment | 2017 | 251    | 500     | 7.242  | 0.324 | 1.118 | 2.602 | 0.005 | 0.088 | 0.088 | 568.299 | 0.029 |
| Crushing/Proc. Equipment | 2017 | 501    | 750     | 11.359 | 0.323 | 1.114 | 2.664 | 0.005 | 0.088 | 0.088 | 568.299 | 0.029 |
| Crushing/Proc. Equipment | 2017 | 1001   | 9999    | 29.544 | 0.378 | 1.231 | 4.423 | 0.005 | 0.117 | 0.117 | 568.299 | 0.034 |
| Crushing/Proc. Equipment | 2018 | 26     | 50      | 3.219  | 1.225 | 5.461 | 4.657 | 0.007 | 0.31  | 0.31  | 568.299 | 0.11  |
| Crushing/Proc. Equipment | 2018 | 51     | 120     | 2.881  | 0.58  | 3.763 | 3.881 | 0.006 | 0.284 | 0.284 | 568.299 | 0.052 |
| Crushing/Proc. Equipment | 2018 | 121    | 175     | 4.267  | 0.427 | 3.234 | 3.049 | 0.006 | 0.161 | 0.161 | 568.299 | 0.038 |
| Crushing/Proc. Equipment | 2018 | 176    | 250     | 4.701  | 0.322 | 1.146 | 2.622 | 0.006 | 0.083 | 0.083 | 568.299 | 0.029 |
| Crushing/Proc. Equipment | 2018 | 251    | 500     | 6.912  | 0.309 | 1.099 | 2.312 | 0.005 | 0.079 | 0.079 | 568.299 | 0.027 |
| Crushing/Proc. Equipment | 2018 | 501    | 750     | 10.84  | 0.308 | 1.097 | 2.358 | 0.005 | 0.079 | 0.079 | 568.299 | 0.027 |
| Crushing/Proc. Equipment | 2018 | 1001   | 9999    | 28.23  | 0.361 | 1.198 | 4.168 | 0.005 | 0.107 | 0.107 | 568.299 | 0.032 |
| Crushing/Proc. Equipment | 2019 | 26     | 50      | 2.798  | 1.064 | 5.316 | 4.495 | 0.007 | 0.269 | 0.269 | 568.299 | 0.096 |
| Crushing/Proc. Equipment | 2019 | 51     | 120     | 2.577  | 0.519 | 3.739 | 3.544 | 0.006 | 0.241 | 0.241 | 568.299 | 0.046 |
| Crushing/Proc. Equipment | 2019 | 121    | 175     | 3.938  | 0.394 | 3.233 | 2.7   | 0.006 | 0.141 | 0.141 | 568.299 | 0.035 |
| Crushing/Proc. Equipment | 2019 | 176    | 250     | 4.451  | 0.304 | 1.134 | 2.3   | 0.006 | 0.074 | 0.074 | 568.299 | 0.027 |
| Crushing/Proc. Equipment | 2019 | 251    | 500     | 6.592  | 0.295 | 1.087 | 2.046 | 0.005 | 0.071 | 0.071 | 568.299 | 0.026 |
| Crushing/Proc. Equipment | 2019 | 501    | 750     | 10.352 | 0.294 | 1.085 | 2.085 | 0.005 | 0.071 | 0.071 | 568.299 | 0.026 |
| Crushing/Proc. Equipment | 2019 | 1001   | 9999    | 26.978 | 0.345 | 1.173 | 3.927 | 0.005 | 0.098 | 0.098 | 568.299 | 0.031 |
| Crushing/Proc. Equipment | 2020 | 26     | 50      | 2.489  | 0.947 | 5.211 | 4.347 | 0.007 | 0.233 | 0.233 | 568.299 | 0.085 |
| Crushing/Proc. Equipment | 2020 | 51     | 120     | 2.348  | 0.473 | 3.722 | 3.249 | 0.006 | 0.206 | 0.206 | 568.299 | 0.042 |
| Crushing/Proc. Equipment | 2020 | 121    | 175     | 3.673  | 0.367 | 3.234 | 2.392 | 0.006 | 0.124 | 0.124 | 568.299 | 0.033 |
| Crushing/Proc. Equipment | 2020 | 176    | 250     | 4.222  | 0.289 | 1.125 | 2.014 | 0.006 | 0.065 | 0.065 | 568.299 | 0.026 |
| Crushing/Proc. Equipment | 2020 | 251    | 500     | 6.283  | 0.281 | 1.078 | 1.799 | 0.005 | 0.063 | 0.063 | 568.299 | 0.025 |
| Crushing/Proc. Equipment | 2020 | 501    | 750     | 9.884  | 0.281 | 1.077 | 1.835 | 0.005 | 0.063 | 0.063 | 568.299 | 0.025 |
| Crushing/Proc. Equipment | 2020 | 1001   | 9999    | 25.755 | 0.329 | 1.153 | 3.699 | 0.005 | 0.089 | 0.089 | 568.299 | 0.029 |
| Crushing/Proc. Equipment | 2021 | 26     | 50      | 2.265  | 0.862 | 5.136 | 4.211 | 0.007 | 0.201 | 0.201 | 568.299 | 0.077 |
| Crushing/Proc. Equipment | 2021 | 51     | 120     | 2.176  | 0.438 | 3.711 | 2.989 | 0.006 | 0.178 | 0.178 | 568.299 | 0.039 |
| Crushing/Proc. Equipment | 2021 | 121    | 175     | 3.442  | 0.344 | 3.235 | 2.114 | 0.006 | 0.109 | 0.109 | 568.299 | 0.031 |
| Crushing/Proc. Equipment | 2021 | 176    | 250     | 4.009  | 0.274 | 1.119 | 1.756 | 0.006 | 0.057 | 0.057 | 568.299 | 0.024 |
| Crushing/Proc. Equipment | 2021 | 251    | 500     | 5.988  | 0.268 | 1.072 | 1.574 | 0.005 | 0.055 | 0.055 | 568.3   | 0.024 |
| Crushing/Proc. Equipment | 2021 | 501    | 750     | 9.434  | 0.268 | 1.072 | 1.606 | 0.005 | 0.055 | 0.055 | 568.299 | 0.024 |
| Crushing/Proc. Equipment | 2021 | 1001   | 9999    | 24.586 | 0.314 | 1.136 | 3.487 | 0.005 | 0.08  | 0.08  | 568.299 | 0.028 |
| Crushing/Proc. Equipment | 2022 | 26     | 50      | 2.09   | 0.795 | 5.081 | 4.083 | 0.007 | 0.172 | 0.172 | 568.299 | 0.071 |
| Crushing/Proc. Equipment | 2022 | 51     | 120     | 2.036  | 0.41  | 3.704 | 2.758 | 0.006 | 0.154 | 0.154 | 568.299 | 0.037 |
| Crushing/Proc. Equipment | 2022 | 121    | 175     | 3.231  | 0.323 | 3.237 | 1.861 | 0.006 | 0.095 | 0.095 | 568.299 | 0.029 |
| Crushing/Proc. Equipment | 2022 | 176    | 250     | 3.808  | 0.26  | 1.114 | 1.521 | 0.006 | 0.05  | 0.05  | 568.299 | 0.023 |
| Crushing/Proc. Equipment | 2022 | 251    | 500     | 5.706  | 0.255 | 1.067 | 1.389 | 0.005 | 0.048 | 0.048 | 568.299 | 0.023 |
| Crushing/Proc. Equipment | 2022 | 501    | 750     | 9.002  | 0.256 | 1.067 | 1.416 | 0.005 | 0.048 | 0.048 | 568.299 | 0.023 |
| Crushing/Proc. Equipment | 2022 | 1001   | 9999    | 23.492 | 0.3   | 1.121 | 3.31  | 0.005 | 0.073 | 0.073 | 568.299 | 0.027 |
| Crushing/Proc. Equipment | 2023 | 26     | 50      | 1.944  | 0.739 | 5.039 | 3.962 | 0.007 | 0.146 | 0.146 | 568.299 | 0.066 |
| Crushing/Proc. Equipment | 2023 | 51     | 120     | 1.914  | 0.385 | 3.7   | 2.552 | 0.006 | 0.132 | 0.132 | 568.299 | 0.034 |
| Crushing/Proc. Equipment | 2023 | 121    | 175     | 3.042  | 0.304 | 3.24  | 1.654 | 0.006 | 0.083 | 0.083 | 568.299 | 0.027 |
| Crushing/Proc. Equipment | 2023 | 176    | 250     | 3.623  | 0.248 | 1.111 | 1.33  | 0.006 | 0.043 | 0.043 | 568.299 | 0.022 |
| Crushing/Proc. Equipment | 2023 | 251    | 500     | 5.444  | 0.244 | 1.064 | 1.227 | 0.005 | 0.042 | 0.042 | 568.299 | 0.022 |
| Crushing/Proc. Equipment | 2023 | 501    | 750     | 8.598  | 0.244 | 1.065 | 1.251 | 0.005 | 0.042 | 0.042 | 568.3   | 0.022 |
| Crushing/Proc. Equipment | 2023 | 1001   | 9999    | 22.463 | 0.287 | 1.107 | 3.16  | 0.005 | 0.066 | 0.066 | 568.299 | 0.025 |
| Crushing/Proc. Equipment | 2024 | 26     | 50      | 1.825  | 0.694 | 5.008 | 3.85  | 0.007 | 0.125 | 0.125 | 568.299 | 0.062 |
| Crushing/Proc. Equipment | 2024 | 51     | 120     | 1.81   | 0.364 | 3.697 | 2.389 | 0.006 | 0.112 | 0.112 | 568.299 | 0.032 |
| Crushing/Proc. Equipment | 2024 | 121    | 175     | 2.866  | 0.287 | 3.243 | 1.472 | 0.006 | 0.071 | 0.071 | 568.299 | 0.025 |
| Crushing/Proc. Equipment | 2024 | 176    | 250     | 3.448  | 0.236 | 1.109 | 1.165 | 0.006 | 0.036 | 0.036 | 568.299 | 0.021 |
| Crushing/Proc. Equipment | 2024 | 251    | 500     | 5.193  | 0.232 | 1.062 | 1.077 | 0.005 | 0.035 | 0.035 | 568.299 | 0.021 |
| Crushing/Proc. Equipment | 2024 | 501    | 750     | 8.207  | 0.233 | 1.063 | 1.098 | 0.005 | 0.036 | 0.036 | 568.299 | 0.021 |
| Crushing/Proc. Equipment | 2024 | 1001   | 9999    | 21.454 | 0.274 | 1.096 | 3.029 | 0.005 | 0.059 | 0.059 | 568.299 | 0.024 |
| Crushing/Proc. Equipment | 2025 | 26     | 50      | 1.724  | 0.656 | 4.982 | 3.742 | 0.007 | 0.107 | 0.107 | 568.299 | 0.059 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type           | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|--------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Crushing/Proc. Equipment | 2025 | 51     | 120     | 1.716    | 0.345  | 3.694   | 2.248   | 0.006  | 0.095  | 0.095  | 568.299  | 0.031  |
| Crushing/Proc. Equipment | 2025 | 121    | 175     | 2.696    | 0.27   | 3.246   | 1.301   | 0.006  | 0.06   | 0.06   | 568.299  | 0.024  |
| Crushing/Proc. Equipment | 2025 | 176    | 250     | 3.279    | 0.224  | 1.108   | 1.012   | 0.006  | 0.031  | 0.031  | 568.299  | 0.02   |
| Crushing/Proc. Equipment | 2025 | 251    | 500     | 4.95     | 0.221  | 1.061   | 0.937   | 0.005  | 0.03   | 0.03   | 568.299  | 0.02   |
| Crushing/Proc. Equipment | 2025 | 501    | 750     | 7.826    | 0.222  | 1.061   | 0.955   | 0.005  | 0.03   | 0.03   | 568.299  | 0.02   |
| Crushing/Proc. Equipment | 2025 | 1001   | 9999    | 20.429   | 0.261  | 1.087   | 2.91    | 0.005  | 0.053  | 0.053  | 568.299  | 0.023  |
| Crushing/Proc. Equipment | 2030 | 26     | 50      | 1.381    | 0.525  | 4.857   | 3.351   | 0.007  | 0.043  | 0.043  | 568.299  | 0.047  |
| Crushing/Proc. Equipment | 2030 | 51     | 120     | 1.35     | 0.272  | 3.673   | 1.708   | 0.006  | 0.038  | 0.038  | 568.299  | 0.024  |
| Crushing/Proc. Equipment | 2030 | 121    | 175     | 1.976    | 0.197  | 3.244   | 0.6     | 0.006  | 0.025  | 0.025  | 568.299  | 0.017  |
| Crushing/Proc. Equipment | 2030 | 176    | 250     | 2.701    | 0.185  | 1.105   | 0.502   | 0.006  | 0.017  | 0.017  | 568.299  | 0.016  |
| Crushing/Proc. Equipment | 2030 | 251    | 500     | 4.113    | 0.184  | 1.058   | 0.476   | 0.005  | 0.017  | 0.017  | 568.299  | 0.016  |
| Crushing/Proc. Equipment | 2030 | 501    | 750     | 6.473    | 0.184  | 1.058   | 0.478   | 0.005  | 0.017  | 0.017  | 568.299  | 0.016  |
| Crushing/Proc. Equipment | 2030 | 1001   | 9999    | 15.345   | 0.196  | 1.059   | 2.59    | 0.005  | 0.032  | 0.032  | 568.299  | 0.017  |
| Crushing/Proc. Equipment | 2035 | 26     | 50      | 1.282    | 0.487  | 4.819   | 3.237   | 0.007  | 0.023  | 0.023  | 568.299  | 0.044  |
| Crushing/Proc. Equipment | 2035 | 51     | 120     | 1.236    | 0.249  | 3.665   | 1.531   | 0.006  | 0.02   | 0.02   | 568.299  | 0.022  |
| Crushing/Proc. Equipment | 2035 | 121    | 175     | 1.76     | 0.176  | 3.242   | 0.382   | 0.006  | 0.015  | 0.015  | 568.299  | 0.015  |
| Crushing/Proc. Equipment | 2035 | 176    | 250     | 2.521    | 0.172  | 1.104   | 0.342   | 0.006  | 0.012  | 0.012  | 568.3    | 0.015  |
| Crushing/Proc. Equipment | 2035 | 251    | 500     | 3.852    | 0.172  | 1.058   | 0.338   | 0.005  | 0.012  | 0.012  | 568.299  | 0.015  |
| Crushing/Proc. Equipment | 2035 | 501    | 750     | 6.064    | 0.172  | 1.058   | 0.338   | 0.005  | 0.012  | 0.012  | 568.299  | 0.015  |
| Crushing/Proc. Equipment | 2035 | 1001   | 9999    | 13.865   | 0.177  | 1.058   | 2.482   | 0.005  | 0.026  | 0.026  | 568.299  | 0.016  |
| Crushing/Proc. Equipment | 2040 | 26     | 50      | 1.284    | 0.488  | 4.833   | 3.194   | 0.007  | 0.017  | 0.017  | 568.299  | 0.044  |
| Crushing/Proc. Equipment | 2040 | 51     | 120     | 1.219    | 0.245  | 3.67    | 1.477   | 0.006  | 0.015  | 0.015  | 568.299  | 0.022  |
| Crushing/Proc. Equipment | 2040 | 121    | 175     | 1.698    | 0.17   | 3.246   | 0.306   | 0.006  | 0.012  | 0.012  | 568.299  | 0.015  |
| Crushing/Proc. Equipment | 2040 | 176    | 250     | 2.464    | 0.168  | 1.106   | 0.292   | 0.006  | 0.011  | 0.011  | 568.299  | 0.015  |
| Crushing/Proc. Equipment | 2040 | 251    | 500     | 3.766    | 0.168  | 1.059   | 0.292   | 0.005  | 0.011  | 0.011  | 568.299  | 0.015  |
| Crushing/Proc. Equipment | 2040 | 501    | 750     | 5.941    | 0.169  | 1.059   | 0.292   | 0.005  | 0.011  | 0.011  | 568.299  | 0.015  |
| Crushing/Proc. Equipment | 2040 | 1001   | 9999    | 13.333   | 0.17   | 1.059   | 2.457   | 0.005  | 0.024  | 0.024  | 568.299  | 0.015  |
| Dumpers/Tenders          | 1990 | 16     | 25      | 2.645    | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Dumpers/Tenders          | 2000 | 16     | 25      | 2.444    | 2.045  | 4.69    | 6.397   | 0.065  | 0.571  | 0.571  | 568.299  | 0.184  |
| Dumpers/Tenders          | 2005 | 16     | 25      | 1.554    | 1.3    | 3.337   | 5.74    | 0.065  | 0.426  | 0.426  | 568.299  | 0.117  |
| Dumpers/Tenders          | 2010 | 16     | 25      | 0.963    | 0.806  | 2.507   | 4.804   | 0.007  | 0.271  | 0.271  | 568.299  | 0.072  |
| Dumpers/Tenders          | 2011 | 16     | 25      | 0.921    | 0.771  | 2.456   | 4.686   | 0.007  | 0.251  | 0.251  | 568.299  | 0.069  |
| Dumpers/Tenders          | 2012 | 16     | 25      | 0.887    | 0.742  | 2.416   | 4.576   | 0.007  | 0.232  | 0.232  | 568.299  | 0.066  |
| Dumpers/Tenders          | 2013 | 16     | 25      | 0.86     | 0.719  | 2.385   | 4.477   | 0.007  | 0.216  | 0.216  | 568.3    | 0.064  |
| Dumpers/Tenders          | 2014 | 16     | 25      | 0.842    | 0.705  | 2.364   | 4.433   | 0.007  | 0.2    | 0.2    | 568.3    | 0.063  |
| Dumpers/Tenders          | 2015 | 16     | 25      | 0.831    | 0.696  | 2.35    | 4.402   | 0.007  | 0.187  | 0.187  | 568.299  | 0.062  |
| Dumpers/Tenders          | 2016 | 16     | 25      | 0.825    | 0.69   | 2.342   | 4.378   | 0.007  | 0.175  | 0.175  | 568.299  | 0.062  |
| Dumpers/Tenders          | 2017 | 16     | 25      | 0.821    | 0.687  | 2.34    | 4.362   | 0.007  | 0.171  | 0.171  | 568.299  | 0.062  |
| Dumpers/Tenders          | 2018 | 16     | 25      | 0.82     | 0.686  | 2.339   | 4.35    | 0.007  | 0.169  | 0.169  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2019 | 16     | 25      | 0.82     | 0.686  | 2.339   | 4.341   | 0.007  | 0.167  | 0.167  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2020 | 16     | 25      | 0.819    | 0.685  | 2.339   | 4.336   | 0.007  | 0.165  | 0.165  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2021 | 16     | 25      | 0.819    | 0.685  | 2.339   | 4.333   | 0.007  | 0.163  | 0.163  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2022 | 16     | 25      | 0.819    | 0.685  | 2.339   | 4.332   | 0.007  | 0.162  | 0.162  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2023 | 16     | 25      | 0.819    | 0.685  | 2.339   | 4.332   | 0.007  | 0.162  | 0.162  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2024 | 16     | 25      | 0.819    | 0.685  | 2.34    | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2025 | 16     | 25      | 0.819    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2030 | 16     | 25      | 0.819    | 0.685  | 2.34    | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2035 | 16     | 25      | 0.819    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Dumpers/Tenders          | 2040 | 16     | 25      | 0.819    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Excavators               | 1990 | 16     | 25      | 5.933    | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Excavators               | 1990 | 26     | 50      | 21.032   | 5.155  | 10.359  | 8.08    | 0.871  | 1.341  | 1.341  | 568.299  | 0.465  |
| Excavators               | 1990 | 51     | 120     | 29.647   | 2.469  | 5.901   | 15.421  | 0.791  | 1.413  | 1.413  | 568.299  | 0.222  |
| Excavators               | 1990 | 121    | 175     | 35.634   | 1.947  | 5.271   | 15.075  | 0.758  | 1.096  | 1.096  | 568.299  | 0.175  |
| Excavators               | 1990 | 176    | 250     | 50.388   | 1.947  | 5.271   | 15.075  | 0.758  | 1.096  | 1.096  | 568.299  | 0.175  |
| Excavators               | 1990 | 251    | 500     | 65.206   | 1.71   | 12.155  | 14.225  | 0.662  | 0.93   | 0.93   | 568.3    | 0.154  |
| Excavators               | 1990 | 501    | 750     | 108.079  | 1.71   | 12.155  | 14.225  | 1.018  | 0.947  | 0.947  | 568.299  | 0.154  |
| Excavators               | 2000 | 16     | 25      | 4.937    | 1.841  | 4.315   | 6.281   | 0.065  | 0.543  | 0.543  | 568.299  | 0.166  |
| Excavators               | 2000 | 26     | 50      | 18.836   | 4.616  | 9.494   | 7.102   | 0.066  | 0.958  | 0.958  | 568.299  | 0.416  |
| Excavators               | 2000 | 51     | 120     | 21.925   | 1.826  | 4.602   | 10.156  | 0.06   | 0.913  | 0.913  | 568.299  | 0.164  |
| Excavators               | 2000 | 121    | 175     | 22.624   | 1.236  | 3.672   | 9.345   | 0.057  | 0.525  | 0.525  | 568.299  | 0.111  |
| Excavators               | 2000 | 176    | 250     | 25.927   | 1.001  | 2.794   | 8.952   | 0.057  | 0.409  | 0.409  | 568.299  | 0.09   |
| Excavators               | 2000 | 251    | 500     | 34.719   | 0.91   | 3.974   | 8.491   | 0.05   | 0.362  | 0.362  | 568.299  | 0.082  |
| Excavators               | 2000 | 501    | 750     | 57.546   | 0.91   | 3.974   | 8.491   | 0.052  | 0.362  | 0.362  | 568.299  | 0.082  |
| Excavators               | 2005 | 16     | 25      | 2.091    | 0.779  | 2.397   | 5.219   | 0.065  | 0.319  | 0.319  | 568.299  | 0.07   |
| Excavators               | 2005 | 26     | 50      | 16.217   | 3.974  | 8.597   | 6.562   | 0.066  | 0.871  | 0.871  | 568.299  | 0.358  |
| Excavators               | 2005 | 51     | 120     | 19.001   | 1.582  | 4.354   | 8.632   | 0.06   | 0.853  | 0.853  | 568.299  | 0.142  |
| Excavators               | 2005 | 121    | 175     | 18.9     | 1.032  | 3.452   | 7.905   | 0.057  | 0.461  | 0.461  | 568.299  | 0.093  |
| Excavators               | 2005 | 176    | 250     | 18.379   | 0.71   | 1.892   | 7.456   | 0.057  | 0.276  | 0.276  | 568.299  | 0.064  |
| Excavators               | 2005 | 251    | 500     | 24.005   | 0.629  | 2.194   | 6.685   | 0.05   | 0.248  | 0.248  | 568.299  | 0.056  |
| Excavators               | 2005 | 501    | 750     | 40.443   | 0.64   | 2.192   | 6.888   | 0.052  | 0.251  | 0.251  | 568.299  | 0.057  |
| Excavators               | 2010 | 16     | 25      | 0.993664 | 0.835  | 4.56926 | 5.19123 | 0.0054 | 0.4128 | 0.3798 | 584.0737 | 0.17   |
| Excavators               | 2010 | 26     | 50      | 0.993664 | 0.835  | 4.56926 | 5.19123 | 0.0054 | 0.4128 | 0.3798 | 584.0737 | 0.17   |
| Excavators               | 2010 | 51     | 120     | 0.73275  | 0.6157 | 3.69337 | 6.10169 | 0.0048 | 0.4694 | 0.4318 | 518.9941 | 0.1511 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Excavators     | 2010 | 121    | 175     | 0.572846 | 0.4814 | 3.1674  | 5.82964 | 0.0049 | 0.299  | 0.2751 | 525.0484 | 0.1528 |
| Excavators     | 2010 | 176    | 250     | 0.422004 | 0.3546 | 1.45526 | 5.78636 | 0.0049 | 0.1818 | 0.1673 | 525.2427 | 0.1529 |
| Excavators     | 2010 | 251    | 500     | 0.315965 | 0.2655 | 1.44794 | 4.38582 | 0.0049 | 0.1435 | 0.132  | 522.2909 | 0.152  |
| Excavators     | 2010 | 501    | 750     | 0.327987 | 0.2756 | 1.53784 | 4.52996 | 0.0048 | 0.1487 | 0.1368 | 520.4269 | 0.1515 |
| Excavators     | 2011 | 16     | 25      | 0.999474 | 0.8398 | 4.67202 | 5.21824 | 0.0054 | 0.4129 | 0.3798 | 582.8586 | 0.1701 |
| Excavators     | 2011 | 26     | 50      | 0.999474 | 0.8398 | 4.67202 | 5.21824 | 0.0054 | 0.4129 | 0.3798 | 582.8586 | 0.1701 |
| Excavators     | 2011 | 51     | 120     | 0.675188 | 0.5673 | 3.65807 | 5.70006 | 0.0048 | 0.4358 | 0.4009 | 517.4139 | 0.151  |
| Excavators     | 2011 | 121    | 175     | 0.533269 | 0.4481 | 3.15702 | 5.44943 | 0.0049 | 0.2776 | 0.2554 | 523.5178 | 0.1528 |
| Excavators     | 2011 | 176    | 250     | 0.400356 | 0.3364 | 1.41809 | 5.41822 | 0.0049 | 0.1706 | 0.1569 | 523.6886 | 0.1528 |
| Excavators     | 2011 | 251    | 500     | 0.303301 | 0.2549 | 1.41288 | 4.1131  | 0.0049 | 0.1332 | 0.1226 | 521.2972 | 0.1521 |
| Excavators     | 2011 | 501    | 750     | 0.326107 | 0.274  | 1.47034 | 4.42127 | 0.0048 | 0.1457 | 0.1341 | 519.1221 | 0.1515 |
| Excavators     | 2012 | 16     | 25      | 1.018057 | 0.8555 | 4.79179 | 5.19511 | 0.0054 | 0.4123 | 0.3793 | 581.4648 | 0.1701 |
| Excavators     | 2012 | 26     | 50      | 1.018057 | 0.8555 | 4.79179 | 5.19511 | 0.0054 | 0.4123 | 0.3793 | 581.4648 | 0.1701 |
| Excavators     | 2012 | 51     | 120     | 0.67458  | 0.5668 | 3.68099 | 5.63138 | 0.0048 | 0.4336 | 0.3989 | 516.083  | 0.151  |
| Excavators     | 2012 | 121    | 175     | 0.534632 | 0.4492 | 3.17839 | 5.38897 | 0.0049 | 0.275  | 0.253  | 522.0959 | 0.1527 |
| Excavators     | 2012 | 176    | 250     | 0.402641 | 0.3383 | 1.42562 | 5.32577 | 0.0049 | 0.1687 | 0.1552 | 522.4958 | 0.1529 |
| Excavators     | 2012 | 251    | 500     | 0.308496 | 0.2592 | 1.4255  | 4.05714 | 0.0049 | 0.1313 | 0.1208 | 520.034  | 0.1521 |
| Excavators     | 2012 | 501    | 750     | 0.334165 | 0.2808 | 1.47962 | 4.3898  | 0.0048 | 0.1452 | 0.1336 | 517.8167 | 0.1515 |
| Excavators     | 2013 | 16     | 25      | 0.995402 | 0.8364 | 4.80774 | 5.0526  | 0.0054 | 0.3931 | 0.3616 | 578.236  | 0.17   |
| Excavators     | 2013 | 26     | 50      | 0.995402 | 0.8364 | 4.80774 | 5.0526  | 0.0054 | 0.3931 | 0.3616 | 578.236  | 0.17   |
| Excavators     | 2013 | 51     | 120     | 0.639011 | 0.5369 | 3.66866 | 5.3703  | 0.0048 | 0.4043 | 0.372  | 513.7321 | 0.151  |
| Excavators     | 2013 | 121    | 175     | 0.503929 | 0.4234 | 3.16966 | 5.08991 | 0.0049 | 0.2534 | 0.2332 | 519.496  | 0.1527 |
| Excavators     | 2013 | 176    | 250     | 0.383779 | 0.3225 | 1.40068 | 4.93756 | 0.0049 | 0.1572 | 0.1446 | 519.8753 | 0.1529 |
| Excavators     | 2013 | 251    | 500     | 0.295491 | 0.2483 | 1.38754 | 3.73509 | 0.0049 | 0.1208 | 0.1111 | 517.7809 | 0.1522 |
| Excavators     | 2013 | 501    | 750     | 0.301827 | 0.2536 | 1.36166 | 3.92892 | 0.0048 | 0.1262 | 0.1161 | 514.1872 | 0.1512 |
| Excavators     | 2014 | 16     | 25      | 0.981904 | 0.8251 | 4.84434 | 4.96504 | 0.0054 | 0.3802 | 0.3498 | 575.2674 | 0.17   |
| Excavators     | 2014 | 26     | 50      | 0.981904 | 0.8251 | 4.84434 | 4.96504 | 0.0054 | 0.3802 | 0.3498 | 575.2674 | 0.17   |
| Excavators     | 2014 | 51     | 120     | 0.610505 | 0.513  | 3.66313 | 5.13137 | 0.0048 | 0.3824 | 0.3518 | 511.3057 | 0.1511 |
| Excavators     | 2014 | 121    | 175     | 0.464169 | 0.39   | 3.15438 | 4.65701 | 0.0049 | 0.2289 | 0.2106 | 516.9066 | 0.1528 |
| Excavators     | 2014 | 176    | 250     | 0.350137 | 0.2942 | 1.34557 | 4.37384 | 0.0049 | 0.1388 | 0.1277 | 517.3234 | 0.1529 |
| Excavators     | 2014 | 251    | 500     | 0.276896 | 0.2327 | 1.32721 | 3.35284 | 0.0049 | 0.108  | 0.0994 | 515.2151 | 0.1523 |
| Excavators     | 2014 | 501    | 750     | 0.284069 | 0.2387 | 1.34745 | 3.54089 | 0.0048 | 0.1143 | 0.1052 | 511.9453 | 0.1513 |
| Excavators     | 2015 | 16     | 25      | 0.991068 | 0.8328 | 4.92488 | 4.91817 | 0.0054 | 0.3747 | 0.3447 | 569.5116 | 0.17   |
| Excavators     | 2015 | 26     | 50      | 0.991068 | 0.8328 | 4.92488 | 4.91817 | 0.0054 | 0.3747 | 0.3447 | 569.5116 | 0.17   |
| Excavators     | 2015 | 51     | 120     | 0.60346  | 0.5071 | 3.67943 | 5.01907 | 0.0048 | 0.3735 | 0.3436 | 506.1727 | 0.1511 |
| Excavators     | 2015 | 121    | 175     | 0.456597 | 0.3837 | 3.16762 | 4.4807  | 0.0049 | 0.2212 | 0.2035 | 511.6869 | 0.1528 |
| Excavators     | 2015 | 176    | 250     | 0.343545 | 0.2887 | 1.33148 | 4.18222 | 0.0049 | 0.1331 | 0.1224 | 512.0555 | 0.1529 |
| Excavators     | 2015 | 251    | 500     | 0.276143 | 0.232  | 1.31662 | 3.21395 | 0.0049 | 0.1042 | 0.0959 | 509.8675 | 0.1522 |
| Excavators     | 2015 | 501    | 750     | 0.28808  | 0.2421 | 1.35372 | 3.47287 | 0.0048 | 0.1129 | 0.1039 | 506.6816 | 0.1513 |
| Excavators     | 2016 | 16     | 25      | 0.970016 | 0.8151 | 4.94198 | 4.82432 | 0.0054 | 0.3586 | 0.3299 | 563.8026 | 0.1701 |
| Excavators     | 2016 | 26     | 50      | 0.970016 | 0.8151 | 4.94198 | 4.82432 | 0.0054 | 0.3586 | 0.3299 | 563.8026 | 0.1701 |
| Excavators     | 2016 | 51     | 120     | 0.566011 | 0.4756 | 3.66066 | 4.70806 | 0.0048 | 0.3441 | 0.3166 | 500.9659 | 0.1511 |
| Excavators     | 2016 | 121    | 175     | 0.425494 | 0.3575 | 3.15771 | 4.08095 | 0.0049 | 0.2008 | 0.1847 | 506.495  | 0.1528 |
| Excavators     | 2016 | 176    | 250     | 0.312033 | 0.2622 | 1.27749 | 3.66736 | 0.0049 | 0.1158 | 0.1065 | 506.544  | 0.1528 |
| Excavators     | 2016 | 251    | 500     | 0.253752 | 0.2132 | 1.23344 | 2.81451 | 0.0049 | 0.0906 | 0.0834 | 504.2899 | 0.1521 |
| Excavators     | 2016 | 501    | 750     | 0.287698 | 0.2417 | 1.34881 | 3.35762 | 0.0048 | 0.1102 | 0.1014 | 501.6596 | 0.1513 |
| Excavators     | 2017 | 16     | 25      | 0.91741  | 0.7709 | 4.88904 | 4.67818 | 0.0054 | 0.3319 | 0.3053 | 554.9101 | 0.17   |
| Excavators     | 2017 | 26     | 50      | 0.91741  | 0.7709 | 4.88904 | 4.67818 | 0.0054 | 0.3319 | 0.3053 | 554.9101 | 0.17   |
| Excavators     | 2017 | 51     | 120     | 0.523542 | 0.4399 | 3.63939 | 4.37952 | 0.0048 | 0.3103 | 0.2855 | 493.409  | 0.1512 |
| Excavators     | 2017 | 121    | 175     | 0.397029 | 0.3336 | 3.15091 | 3.69967 | 0.0049 | 0.182  | 0.1675 | 498.5222 | 0.1527 |
| Excavators     | 2017 | 176    | 250     | 0.293543 | 0.2467 | 1.24911 | 3.13182 | 0.0049 | 0.1051 | 0.0967 | 498.4364 | 0.1527 |
| Excavators     | 2017 | 251    | 500     | 0.237788 | 0.1998 | 1.19852 | 2.50715 | 0.0049 | 0.0811 | 0.0746 | 496.8098 | 0.1522 |
| Excavators     | 2017 | 501    | 750     | 0.249769 | 0.2099 | 1.22803 | 2.71934 | 0.0048 | 0.0899 | 0.0827 | 494.5496 | 0.1515 |
| Excavators     | 2018 | 16     | 25      | 0.818091 | 0.6874 | 4.70022 | 4.39518 | 0.0054 | 0.2841 | 0.2614 | 545.3468 | 0.1698 |
| Excavators     | 2018 | 26     | 50      | 0.818091 | 0.6874 | 4.70022 | 4.39518 | 0.0054 | 0.2841 | 0.2614 | 545.3468 | 0.1698 |
| Excavators     | 2018 | 51     | 120     | 0.438055 | 0.3681 | 3.56214 | 3.76366 | 0.0048 | 0.2505 | 0.2304 | 486.056  | 0.1513 |
| Excavators     | 2018 | 121    | 175     | 0.324959 | 0.2731 | 3.09338 | 2.92361 | 0.0049 | 0.1418 | 0.1304 | 490.6725 | 0.1528 |
| Excavators     | 2018 | 176    | 250     | 0.240329 | 0.2019 | 1.15209 | 2.59377 | 0.0049 | 0.0788 | 0.0725 | 490.2569 | 0.1526 |
| Excavators     | 2018 | 251    | 500     | 0.207823 | 0.1746 | 1.13951 | 2.05045 | 0.0049 | 0.0664 | 0.0611 | 489.1025 | 0.1523 |
| Excavators     | 2018 | 501    | 750     | 0.22476  | 0.1889 | 1.22359 | 2.26567 | 0.0048 | 0.0759 | 0.0698 | 487.6528 | 0.1518 |
| Excavators     | 2019 | 16     | 25      | 0.75855  | 0.6374 | 4.59698 | 4.19867 | 0.0054 | 0.2503 | 0.2303 | 536.9132 | 0.1699 |
| Excavators     | 2019 | 26     | 50      | 0.75855  | 0.6374 | 4.59698 | 4.19867 | 0.0054 | 0.2503 | 0.2303 | 536.9132 | 0.1699 |
| Excavators     | 2019 | 51     | 120     | 0.386598 | 0.3248 | 3.52421 | 3.36874 | 0.0048 | 0.2107 | 0.1938 | 478.2452 | 0.1513 |
| Excavators     | 2019 | 121    | 175     | 0.293021 | 0.2462 | 3.08163 | 2.53264 | 0.0049 | 0.1221 | 0.1124 | 482.6838 | 0.1527 |
| Excavators     | 2019 | 176    | 250     | 0.220917 | 0.1856 | 1.12671 | 2.24187 | 0.0049 | 0.068  | 0.0625 | 482.2503 | 0.1526 |
| Excavators     | 2019 | 251    | 500     | 0.192898 | 0.1621 | 1.1135  | 1.77986 | 0.0049 | 0.0578 | 0.0532 | 481.2361 | 0.1523 |
| Excavators     | 2019 | 501    | 750     | 0.209677 | 0.1762 | 1.17289 | 1.98661 | 0.0048 | 0.0671 | 0.0618 | 479.2876 | 0.1516 |
| Excavators     | 2020 | 16     | 25      | 0.705964 | 0.5932 | 4.50032 | 4.03131 | 0.0054 | 0.2222 | 0.2044 | 525.3675 | 0.1699 |
| Excavators     | 2020 | 26     | 50      | 0.705964 | 0.5932 | 4.50032 | 4.03131 | 0.0054 | 0.2222 | 0.2044 | 525.3675 | 0.1699 |
| Excavators     | 2020 | 51     | 120     | 0.356064 | 0.2992 | 3.50495 | 3.08964 | 0.0048 | 0.1848 | 0.17   | 468.0546 | 0.1514 |
| Excavators     | 2020 | 121    | 175     | 0.275327 | 0.2314 | 3.08597 | 2.27838 | 0.0049 | 0.1104 | 0.1015 | 472.2891 | 0.1527 |
| Excavators     | 2020 | 176    | 250     | 0.211076 | 0.1774 | 1.11778 | 2.02738 | 0.0049 | 0.0614 | 0.0565 | 471.8828 | 0.1526 |
| Excavators     | 2020 | 251    | 500     | 0.182542 | 0.1534 | 1.1016  | 1.57199 | 0.0049 | 0.0518 | 0.0476 | 470.2956 | 0.1521 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Excavators     | 2020 | 501    | 750     | 0.202011 | 0.1697 | 1.14543 | 1.79718 | 0.0048 | 0.0612 | 0.0563 | 468.8706 | 0.1516 |
| Excavators     | 2021 | 16     | 25      | 0.669315 | 0.5624 | 4.46094 | 3.91866 | 0.0054 | 0.2016 | 0.1855 | 525.3774 | 0.1699 |
| Excavators     | 2021 | 26     | 50      | 0.669315 | 0.5624 | 4.46094 | 3.91866 | 0.0054 | 0.2016 | 0.1855 | 525.3774 | 0.1699 |
| Excavators     | 2021 | 51     | 120     | 0.327314 | 0.275  | 3.49196 | 2.84891 | 0.0048 | 0.1606 | 0.1478 | 467.7906 | 0.1513 |
| Excavators     | 2021 | 121    | 175     | 0.257574 | 0.2164 | 3.08975 | 2.03357 | 0.0049 | 0.0986 | 0.0907 | 472.3586 | 0.1528 |
| Excavators     | 2021 | 176    | 250     | 0.193738 | 0.1628 | 1.10324 | 1.70572 | 0.0049 | 0.0523 | 0.0481 | 471.7931 | 0.1526 |
| Excavators     | 2021 | 251    | 500     | 0.170127 | 0.143  | 1.08777 | 1.33174 | 0.0049 | 0.0446 | 0.041  | 469.6156 | 0.1519 |
| Excavators     | 2021 | 501    | 750     | 0.196683 | 0.1653 | 1.14978 | 1.61856 | 0.0049 | 0.0562 | 0.0517 | 469.547  | 0.1519 |
| Excavators     | 2022 | 16     | 25      | 0.568779 | 0.4779 | 4.27341 | 3.70039 | 0.0054 | 0.1597 | 0.1469 | 525.4468 | 0.1699 |
| Excavators     | 2022 | 26     | 50      | 0.568779 | 0.4779 | 4.27341 | 3.70039 | 0.0054 | 0.1597 | 0.1469 | 525.4468 | 0.1699 |
| Excavators     | 2022 | 51     | 120     | 0.299503 | 0.2517 | 3.47329 | 2.60649 | 0.0048 | 0.1375 | 0.1265 | 467.6256 | 0.1512 |
| Excavators     | 2022 | 121    | 175     | 0.22749  | 0.1912 | 3.074   | 1.6781  | 0.0049 | 0.0811 | 0.0746 | 472.1917 | 0.1527 |
| Excavators     | 2022 | 176    | 250     | 0.176606 | 0.1484 | 1.09157 | 1.38616 | 0.0049 | 0.0435 | 0.04   | 472.0412 | 0.1527 |
| Excavators     | 2022 | 251    | 500     | 0.152263 | 0.1279 | 1.06126 | 1.03988 | 0.0049 | 0.0349 | 0.0321 | 469.7105 | 0.1519 |
| Excavators     | 2022 | 501    | 750     | 0.178436 | 0.1499 | 1.144   | 1.2865  | 0.0048 | 0.0472 | 0.0434 | 469.2892 | 0.1518 |
| Excavators     | 2023 | 16     | 25      | 0.535724 | 0.4502 | 4.23393 | 3.59356 | 0.0054 | 0.1394 | 0.1283 | 525.4286 | 0.1699 |
| Excavators     | 2023 | 26     | 50      | 0.535724 | 0.4502 | 4.23393 | 3.59356 | 0.0054 | 0.1394 | 0.1283 | 525.4286 | 0.1699 |
| Excavators     | 2023 | 51     | 120     | 0.273823 | 0.2301 | 3.45367 | 2.38066 | 0.0048 | 0.1162 | 0.1069 | 467.1573 | 0.1511 |
| Excavators     | 2023 | 121    | 175     | 0.212046 | 0.1782 | 3.07648 | 1.46245 | 0.0049 | 0.0716 | 0.0659 | 472.277  | 0.1527 |
| Excavators     | 2023 | 176    | 250     | 0.168964 | 0.142  | 1.08965 | 1.20943 | 0.0049 | 0.0387 | 0.0356 | 472.2131 | 0.1527 |
| Excavators     | 2023 | 251    | 500     | 0.145171 | 0.122  | 1.05093 | 0.89311 | 0.0049 | 0.0302 | 0.0278 | 469.8892 | 0.152  |
| Excavators     | 2023 | 501    | 750     | 0.171247 | 0.1439 | 1.13199 | 1.15865 | 0.0048 | 0.0432 | 0.0398 | 468.6826 | 0.1516 |
| Excavators     | 2024 | 16     | 25      | 0.495634 | 0.4165 | 4.20529 | 3.50816 | 0.0054 | 0.1195 | 0.11   | 525.979  | 0.1701 |
| Excavators     | 2024 | 26     | 50      | 0.495634 | 0.4165 | 4.20529 | 3.50816 | 0.0054 | 0.1195 | 0.11   | 525.979  | 0.1701 |
| Excavators     | 2024 | 51     | 120     | 0.258544 | 0.2172 | 3.45322 | 2.24781 | 0.0048 | 0.1023 | 0.0942 | 467.3843 | 0.1512 |
| Excavators     | 2024 | 121    | 175     | 0.202572 | 0.1702 | 3.08336 | 1.32479 | 0.0049 | 0.0653 | 0.06   | 472.4279 | 0.1528 |
| Excavators     | 2024 | 176    | 250     | 0.165297 | 0.1389 | 1.0899  | 1.10808 | 0.0049 | 0.0358 | 0.0329 | 472.4415 | 0.1528 |
| Excavators     | 2024 | 251    | 500     | 0.144133 | 0.1211 | 1.05369 | 0.83129 | 0.0049 | 0.0287 | 0.0264 | 469.7108 | 0.1519 |
| Excavators     | 2024 | 501    | 750     | 0.169017 | 0.142  | 1.13421 | 1.10467 | 0.0048 | 0.0406 | 0.0374 | 468.652  | 0.1516 |
| Excavators     | 2025 | 16     | 25      | 0.47994  | 0.4033 | 4.21941 | 3.45298 | 0.0054 | 0.1074 | 0.0988 | 525.7772 | 0.17   |
| Excavators     | 2025 | 26     | 50      | 0.47994  | 0.4033 | 4.21941 | 3.45298 | 0.0054 | 0.1074 | 0.0988 | 525.7772 | 0.17   |
| Excavators     | 2025 | 51     | 120     | 0.23878  | 0.2006 | 3.43876 | 2.08246 | 0.0048 | 0.0853 | 0.0784 | 466.7376 | 0.151  |
| Excavators     | 2025 | 121    | 175     | 0.187811 | 0.1578 | 3.078   | 1.15367 | 0.0049 | 0.0566 | 0.052  | 472.4964 | 0.1528 |
| Excavators     | 2025 | 176    | 250     | 0.155588 | 0.1307 | 1.08136 | 0.96211 | 0.0049 | 0.0316 | 0.0291 | 472.5599 | 0.1528 |
| Excavators     | 2025 | 251    | 500     | 0.137039 | 0.1152 | 1.05072 | 0.72641 | 0.0049 | 0.0257 | 0.0236 | 470.2915 | 0.1521 |
| Excavators     | 2025 | 501    | 750     | 0.165305 | 0.1389 | 1.13484 | 1.02571 | 0.0048 | 0.038  | 0.0349 | 468.5582 | 0.1515 |
| Excavators     | 2030 | 16     | 25      | 1.838    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Excavators     | 2030 | 26     | 50      | 2.458    | 0.602  | 5.309   | 3.393   | 0.007  | 0.038  | 0.038  | 568.299  | 0.054  |
| Excavators     | 2030 | 51     | 120     | 3.618    | 0.301  | 3.806   | 1.676   | 0.006  | 0.034  | 0.034  | 568.299  | 0.027  |
| Excavators     | 2030 | 121    | 175     | 3.914    | 0.213  | 3.362   | 0.525   | 0.006  | 0.023  | 0.023  | 568.299  | 0.019  |
| Excavators     | 2030 | 176    | 250     | 5.258    | 0.203  | 1.145   | 0.452   | 0.006  | 0.016  | 0.016  | 568.299  | 0.018  |
| Excavators     | 2030 | 251    | 500     | 7.722    | 0.202  | 1.088   | 0.433   | 0.005  | 0.016  | 0.016  | 568.299  | 0.018  |
| Excavators     | 2030 | 501    | 750     | 12.807   | 0.202  | 1.088   | 0.437   | 0.005  | 0.016  | 0.016  | 568.299  | 0.018  |
| Excavators     | 2035 | 16     | 25      | 1.838    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Excavators     | 2035 | 26     | 50      | 2.333    | 0.572  | 5.287   | 3.323   | 0.007  | 0.024  | 0.024  | 568.299  | 0.051  |
| Excavators     | 2035 | 51     | 120     | 3.411    | 0.284  | 3.802   | 1.551   | 0.006  | 0.021  | 0.021  | 568.299  | 0.025  |
| Excavators     | 2035 | 121    | 175     | 3.622    | 0.197  | 3.363   | 0.365   | 0.006  | 0.015  | 0.015  | 568.299  | 0.017  |
| Excavators     | 2035 | 176    | 250     | 5.059    | 0.195  | 1.145   | 0.342   | 0.006  | 0.013  | 0.013  | 568.3    | 0.017  |
| Excavators     | 2035 | 251    | 500     | 7.45     | 0.195  | 1.089   | 0.337   | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Excavators     | 2035 | 501    | 750     | 12.348   | 0.195  | 1.088   | 0.338   | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Excavators     | 2040 | 16     | 25      | 1.838    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.3    | 0.061  |
| Excavators     | 2040 | 26     | 50      | 2.314    | 0.567  | 5.283   | 3.29    | 0.007  | 0.019  | 0.019  | 568.299  | 0.051  |
| Excavators     | 2040 | 51     | 120     | 3.36     | 0.279  | 3.802   | 1.507   | 0.006  | 0.017  | 0.017  | 568.299  | 0.025  |
| Excavators     | 2040 | 121    | 175     | 3.532    | 0.193  | 3.363   | 0.311   | 0.006  | 0.013  | 0.013  | 568.299  | 0.017  |
| Excavators     | 2040 | 176    | 250     | 4.971    | 0.192  | 1.145   | 0.3     | 0.006  | 0.011  | 0.011  | 568.299  | 0.017  |
| Excavators     | 2040 | 251    | 500     | 7.322    | 0.192  | 1.089   | 0.3     | 0.005  | 0.011  | 0.011  | 568.299  | 0.017  |
| Excavators     | 2040 | 501    | 750     | 12.137   | 0.192  | 1.089   | 0.3     | 0.005  | 0.011  | 0.011  | 568.299  | 0.017  |
| Forklifts      | 1990 | 26     | 50      | 11.848   | 4.826  | 9.773   | 7.952   | 0.692  | 1.266  | 1.266  | 568.299  | 0.435  |
| Forklifts      | 1990 | 51     | 120     | 12.154   | 2.326  | 5.638   | 14.699  | 0.628  | 1.32   | 1.32   | 568.3    | 0.209  |
| Forklifts      | 1990 | 121    | 175     | 14.423   | 1.537  | 4.938   | 12.932  | 0.602  | 0.849  | 0.849  | 568.299  | 0.138  |
| Forklifts      | 1990 | 176    | 250     | 19.845   | 1.537  | 4.938   | 12.932  | 0.602  | 0.849  | 0.849  | 568.299  | 0.138  |
| Forklifts      | 1990 | 251    | 500     | 25.356   | 1.365  | 10.853  | 12.267  | 0.525  | 0.73   | 0.73   | 568.299  | 0.123  |
| Forklifts      | 2000 | 26     | 50      | 10.952   | 4.461  | 9.216   | 7.035   | 0.065  | 0.934  | 0.934  | 568.3    | 0.402  |
| Forklifts      | 2000 | 51     | 120     | 9.146    | 1.75   | 4.459   | 9.75    | 0.059  | 0.882  | 0.882  | 568.299  | 0.157  |
| Forklifts      | 2000 | 121    | 175     | 11.149   | 1.188  | 3.519   | 9.001   | 0.057  | 0.502  | 0.502  | 568.299  | 0.107  |
| Forklifts      | 2000 | 176    | 250     | 11.958   | 0.926  | 2.534   | 8.546   | 0.057  | 0.372  | 0.372  | 568.299  | 0.083  |
| Forklifts      | 2000 | 251    | 500     | 15.747   | 0.848  | 3.255   | 8.126   | 0.049  | 0.333  | 0.333  | 568.299  | 0.076  |
| Forklifts      | 2005 | 26     | 50      | 10.087   | 4.108  | 8.778   | 6.62    | 0.065  | 0.891  | 0.891  | 568.299  | 0.37   |
| Forklifts      | 2005 | 51     | 120     | 8.425    | 1.612  | 4.35    | 8.602   | 0.059  | 0.876  | 0.876  | 568.299  | 0.145  |
| Forklifts      | 2005 | 121    | 175     | 9.959    | 1.061  | 3.418   | 7.94    | 0.057  | 0.475  | 0.475  | 568.299  | 0.095  |
| Forklifts      | 2005 | 176    | 250     | 8.606    | 0.666  | 1.693   | 7.367   | 0.057  | 0.253  | 0.253  | 568.299  | 0.06   |
| Forklifts      | 2005 | 251    | 500     | 10.976   | 0.591  | 1.803   | 6.611   | 0.049  | 0.23   | 0.23   | 568.299  | 0.053  |
| Forklifts      | 2010 | 26     | 50      | 2.846117 | 2.3915 | 7.62516 | 6.31187 | 0.0054 | 0.7289 | 0.6706 | 583.8704 | 0.17   |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Forklifts      | 2010 | 51     | 120     | 1.045472 | 0.8785 | 4.10764 | 7.63494 | 0.0049 | 0.6245 | 0.5746 | 523.9205 | 0.1525 |
| Forklifts      | 2010 | 121    | 175     | 0.764801 | 0.6426 | 3.54812 | 7.24303 | 0.0049 | 0.3885 | 0.3574 | 524.5625 | 0.1527 |
| Forklifts      | 2010 | 176    | 250     | 0.852639 | 0.7165 | 2.88991 | 8.49545 | 0.0049 | 0.3977 | 0.3658 | 525.9172 | 0.1531 |
| Forklifts      | 2010 | 251    | 500     | 0.814667 | 0.6845 | 5.79345 | 8.13812 | 0.0049 | 0.3811 | 0.3506 | 526.239  | 0.1532 |
| Forklifts      | 2011 | 26     | 50      | 2.771689 | 2.329  | 7.5619  | 6.26642 | 0.0054 | 0.7146 | 0.6574 | 582.4107 | 0.17   |
| Forklifts      | 2011 | 51     | 120     | 1.023636 | 0.8601 | 4.10232 | 7.45983 | 0.0049 | 0.6169 | 0.5675 | 522.6107 | 0.1525 |
| Forklifts      | 2011 | 121    | 175     | 0.759385 | 0.6381 | 3.55732 | 7.14122 | 0.0049 | 0.3854 | 0.3545 | 523.2511 | 0.1527 |
| Forklifts      | 2011 | 176    | 250     | 0.819463 | 0.6886 | 2.77115 | 8.17495 | 0.0049 | 0.3809 | 0.3505 | 524.6024 | 0.1531 |
| Forklifts      | 2011 | 251    | 500     | 0.787175 | 0.6614 | 5.42187 | 7.84    | 0.0049 | 0.3677 | 0.3383 | 524.9234 | 0.1532 |
| Forklifts      | 2012 | 26     | 50      | 2.800937 | 2.3536 | 7.68036 | 6.27736 | 0.0054 | 0.7204 | 0.6628 | 580.951  | 0.17   |
| Forklifts      | 2012 | 51     | 120     | 1.026513 | 0.8626 | 4.13104 | 7.43066 | 0.0049 | 0.6201 | 0.5705 | 521.3009 | 0.1525 |
| Forklifts      | 2012 | 121    | 175     | 0.764904 | 0.6427 | 3.58413 | 7.11981 | 0.0049 | 0.3873 | 0.3563 | 521.9397 | 0.1527 |
| Forklifts      | 2012 | 176    | 250     | 0.82428  | 0.6926 | 2.77846 | 8.14199 | 0.0049 | 0.3808 | 0.3504 | 523.2876 | 0.1531 |
| Forklifts      | 2012 | 251    | 500     | 0.795085 | 0.6681 | 5.42806 | 7.85628 | 0.0049 | 0.3693 | 0.3398 | 523.6078 | 0.1532 |
| Forklifts      | 2013 | 26     | 50      | 2.655997 | 2.2318 | 7.4937  | 6.14743 | 0.0054 | 0.6887 | 0.6336 | 578.0317 | 0.17   |
| Forklifts      | 2013 | 51     | 120     | 0.996839 | 0.8376 | 4.11855 | 7.21545 | 0.0049 | 0.6033 | 0.555  | 518.6813 | 0.1525 |
| Forklifts      | 2013 | 121    | 175     | 0.743778 | 0.625  | 3.57971 | 6.90229 | 0.0049 | 0.3747 | 0.3447 | 519.3169 | 0.1527 |
| Forklifts      | 2013 | 176    | 250     | 0.786493 | 0.6609 | 2.67477 | 7.77338 | 0.0049 | 0.3604 | 0.3316 | 520.658  | 0.1531 |
| Forklifts      | 2013 | 251    | 500     | 0.686735 | 0.577  | 4.6871  | 6.91072 | 0.0049 | 0.3139 | 0.2888 | 520.9766 | 0.1532 |
| Forklifts      | 2014 | 26     | 50      | 2.515249 | 2.1135 | 7.32058 | 6.00609 | 0.0054 | 0.6563 | 0.6038 | 575.1123 | 0.17   |
| Forklifts      | 2014 | 51     | 120     | 0.945485 | 0.7945 | 4.07936 | 6.84833 | 0.0049 | 0.5737 | 0.5278 | 516.0617 | 0.1525 |
| Forklifts      | 2014 | 121    | 175     | 0.688099 | 0.5782 | 3.52073 | 6.35205 | 0.0049 | 0.3451 | 0.3175 | 516.694  | 0.1527 |
| Forklifts      | 2014 | 176    | 250     | 0.731475 | 0.6146 | 2.50114 | 7.27612 | 0.0049 | 0.3301 | 0.3037 | 518.0284 | 0.1531 |
| Forklifts      | 2014 | 251    | 500     | 0.644228 | 0.5413 | 4.25186 | 6.35258 | 0.0049 | 0.2891 | 0.266  | 518.3454 | 0.1532 |
| Forklifts      | 2015 | 26     | 50      | 2.466892 | 2.0729 | 7.29982 | 5.93143 | 0.0054 | 0.6428 | 0.5914 | 569.2736 | 0.17   |
| Forklifts      | 2015 | 51     | 120     | 0.914509 | 0.7684 | 4.06346 | 6.60091 | 0.0049 | 0.5545 | 0.5101 | 510.8225 | 0.1525 |
| Forklifts      | 2015 | 121    | 175     | 0.673169 | 0.5656 | 3.51969 | 6.13482 | 0.0049 | 0.3348 | 0.308  | 511.4484 | 0.1527 |
| Forklifts      | 2015 | 176    | 250     | 0.672054 | 0.5647 | 2.32501 | 6.69668 | 0.0049 | 0.2978 | 0.274  | 512.7693 | 0.1531 |
| Forklifts      | 2015 | 251    | 500     | 0.539875 | 0.4536 | 3.29951 | 5.33227 | 0.0049 | 0.2368 | 0.2178 | 513.083  | 0.1532 |
| Forklifts      | 2016 | 26     | 50      | 2.217878 | 1.8636 | 6.93473 | 5.66211 | 0.0054 | 0.5832 | 0.5365 | 563.4349 | 0.17   |
| Forklifts      | 2016 | 51     | 120     | 0.860278 | 0.7229 | 4.02311 | 6.22192 | 0.0049 | 0.5203 | 0.4786 | 505.5833 | 0.1525 |
| Forklifts      | 2016 | 121    | 175     | 0.630613 | 0.5299 | 3.47253 | 5.67466 | 0.0049 | 0.3101 | 0.2853 | 506.2028 | 0.1527 |
| Forklifts      | 2016 | 176    | 250     | 0.641979 | 0.5394 | 2.22626 | 6.35303 | 0.0049 | 0.2799 | 0.2575 | 507.5101 | 0.1531 |
| Forklifts      | 2016 | 251    | 500     | 0.419581 | 0.3526 | 2.57209 | 4.04212 | 0.0049 | 0.1737 | 0.1598 | 507.8206 | 0.1532 |
| Forklifts      | 2017 | 26     | 50      | 2.026819 | 1.7031 | 6.67251 | 5.45035 | 0.0054 | 0.5355 | 0.4927 | 554.6769 | 0.17   |
| Forklifts      | 2017 | 51     | 120     | 0.799635 | 0.6719 | 3.97881 | 5.81772 | 0.0049 | 0.48   | 0.4416 | 497.7245 | 0.1525 |
| Forklifts      | 2017 | 121    | 175     | 0.604568 | 0.508  | 3.45188 | 5.36215 | 0.0049 | 0.2937 | 0.2702 | 498.3344 | 0.1527 |
| Forklifts      | 2017 | 176    | 250     | 0.589964 | 0.4957 | 2.0923  | 5.75116 | 0.0049 | 0.2518 | 0.2316 | 499.6213 | 0.1531 |
| Forklifts      | 2017 | 251    | 500     | 0.401897 | 0.3377 | 2.50803 | 3.7797  | 0.0049 | 0.1613 | 0.1484 | 499.927  | 0.1532 |
| Forklifts      | 2018 | 26     | 50      | 1.658295 | 1.3934 | 6.10276 | 5.05181 | 0.0054 | 0.4466 | 0.4109 | 545.9188 | 0.17   |
| Forklifts      | 2018 | 51     | 120     | 0.675301 | 0.5674 | 3.85819 | 5.0153  | 0.0049 | 0.4002 | 0.3682 | 489.8657 | 0.1525 |
| Forklifts      | 2018 | 121    | 175     | 0.508414 | 0.4272 | 3.33646 | 4.42984 | 0.0049 | 0.2412 | 0.2219 | 490.4659 | 0.1527 |
| Forklifts      | 2018 | 176    | 250     | 0.506009 | 0.4252 | 1.83475 | 4.93757 | 0.0049 | 0.2072 | 0.1906 | 491.7326 | 0.1531 |
| Forklifts      | 2018 | 251    | 500     | 0.335655 | 0.282  | 1.87814 | 3.01864 | 0.0049 | 0.1245 | 0.1146 | 492.0335 | 0.1532 |
| Forklifts      | 2019 | 26     | 50      | 1.480074 | 1.2437 | 5.88034 | 4.86189 | 0.0054 | 0.4009 | 0.3688 | 537.1608 | 0.17   |
| Forklifts      | 2019 | 51     | 120     | 0.606336 | 0.5095 | 3.80391 | 4.54965 | 0.0049 | 0.3525 | 0.3243 | 482.0069 | 0.1525 |
| Forklifts      | 2019 | 121    | 175     | 0.454984 | 0.3823 | 3.28831 | 3.86458 | 0.0049 | 0.2102 | 0.1934 | 482.5975 | 0.1527 |
| Forklifts      | 2019 | 176    | 250     | 0.445406 | 0.3743 | 1.6773  | 4.2498  | 0.0049 | 0.1753 | 0.1613 | 483.8438 | 0.1531 |
| Forklifts      | 2019 | 251    | 500     | 0.31829  | 0.2675 | 1.814   | 2.75148 | 0.0049 | 0.112  | 0.103  | 484.1399 | 0.1532 |
| Forklifts      | 2020 | 26     | 50      | 1.337399 | 1.1238 | 5.70563 | 4.68572 | 0.0054 | 0.3601 | 0.3313 | 525.4833 | 0.17   |
| Forklifts      | 2020 | 51     | 120     | 0.545921 | 0.4587 | 3.75954 | 4.13299 | 0.0049 | 0.3079 | 0.2833 | 471.5285 | 0.1525 |
| Forklifts      | 2020 | 121    | 175     | 0.402357 | 0.3381 | 3.24885 | 3.3196  | 0.0049 | 0.1797 | 0.1653 | 472.1062 | 0.1527 |
| Forklifts      | 2020 | 176    | 250     | 0.348476 | 0.2928 | 1.44178 | 3.24149 | 0.0049 | 0.1259 | 0.1158 | 473.3255 | 0.1531 |
| Forklifts      | 2020 | 251    | 500     | 0.299035 | 0.2513 | 1.47807 | 2.43991 | 0.0049 | 0.0967 | 0.0889 | 473.6151 | 0.1532 |
| Forklifts      | 2021 | 26     | 50      | 1.192536 | 1.0021 | 5.53477 | 4.5202  | 0.0054 | 0.3178 | 0.2924 | 525.4833 | 0.17   |
| Forklifts      | 2021 | 51     | 120     | 0.490261 | 0.412  | 3.72    | 3.75592 | 0.0049 | 0.2666 | 0.2453 | 471.5285 | 0.1525 |
| Forklifts      | 2021 | 121    | 175     | 0.366939 | 0.3083 | 3.23128 | 2.9207  | 0.0049 | 0.1577 | 0.1451 | 472.1062 | 0.1527 |
| Forklifts      | 2021 | 176    | 250     | 0.296154 | 0.2489 | 1.33672 | 2.58195 | 0.0049 | 0.0992 | 0.0912 | 473.3255 | 0.1531 |
| Forklifts      | 2021 | 251    | 500     | 0.301833 | 0.2536 | 1.48481 | 2.30266 | 0.0049 | 0.0938 | 0.0863 | 473.6151 | 0.1532 |
| Forklifts      | 2022 | 26     | 50      | 1.02259  | 0.8593 | 5.30418 | 4.31214 | 0.0054 | 0.2698 | 0.2482 | 525.4833 | 0.17   |
| Forklifts      | 2022 | 51     | 120     | 0.430627 | 0.3618 | 3.67507 | 3.36021 | 0.0049 | 0.2226 | 0.2048 | 471.5285 | 0.1525 |
| Forklifts      | 2022 | 121    | 175     | 0.324265 | 0.2725 | 3.19749 | 2.47982 | 0.0049 | 0.1324 | 0.1218 | 472.1062 | 0.1527 |
| Forklifts      | 2022 | 176    | 250     | 0.280841 | 0.236  | 1.3171  | 2.31941 | 0.0049 | 0.0898 | 0.0826 | 473.3255 | 0.1531 |
| Forklifts      | 2022 | 251    | 500     | 0.275829 | 0.2318 | 1.21922 | 1.99119 | 0.0049 | 0.0768 | 0.0707 | 473.6151 | 0.1532 |
| Forklifts      | 2023 | 26     | 50      | 0.911766 | 0.7661 | 5.16597 | 4.15219 | 0.0054 | 0.2318 | 0.2132 | 525.4833 | 0.17   |
| Forklifts      | 2023 | 51     | 120     | 0.388709 | 0.3266 | 3.64655 | 3.0569  | 0.0049 | 0.1889 | 0.1738 | 471.5285 | 0.1525 |
| Forklifts      | 2023 | 121    | 175     | 0.289923 | 0.2436 | 3.1799  | 2.11214 | 0.0049 | 0.1105 | 0.1017 | 472.1062 | 0.1527 |
| Forklifts      | 2023 | 176    | 250     | 0.242474 | 0.2037 | 1.23515 | 1.80718 | 0.0049 | 0.0687 | 0.0632 | 473.3255 | 0.1531 |
| Forklifts      | 2023 | 251    | 500     | 0.261765 | 0.22   | 1.21596 | 1.78772 | 0.0049 | 0.0687 | 0.0632 | 473.6151 | 0.1532 |
| Forklifts      | 2024 | 26     | 50      | 0.823848 | 0.6923 | 5.0885  | 4.03948 | 0.0054 | 0.203  | 0.1867 | 525.4833 | 0.17   |
| Forklifts      | 2024 | 51     | 120     | 0.357083 | 0.3    | 3.62907 | 2.81432 | 0.0049 | 0.1625 | 0.1495 | 471.5285 | 0.1525 |
| Forklifts      | 2024 | 121    | 175     | 0.266701 | 0.2241 | 3.17389 | 1.86129 | 0.0049 | 0.0955 | 0.0879 | 472.1062 | 0.1527 |
| Forklifts      | 2024 | 176    | 250     | 0.232645 | 0.1955 | 1.21846 | 1.6253  | 0.0049 | 0.0614 | 0.0565 | 473.3255 | 0.1531 |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Forklifts      | 2024 | 251    | 500     | 0.258844 | 0.2175 | 1.21901 | 1.72336 | 0.0049 | 0.0653 | 0.06   | 473.6151 | 0.1532 |
| Forklifts      | 2025 | 26     | 50      | 0.757155 | 0.6362 | 5.02929 | 3.93206 | 0.0054 | 0.1783 | 0.1641 | 525.4833 | 0.17   |
| Forklifts      | 2025 | 51     | 120     | 0.329382 | 0.2768 | 3.61138 | 2.60732 | 0.0049 | 0.1396 | 0.1284 | 471.5285 | 0.1525 |
| Forklifts      | 2025 | 121    | 175     | 0.248361 | 0.2087 | 3.17013 | 1.653   | 0.0049 | 0.0843 | 0.0776 | 472.1062 | 0.1527 |
| Forklifts      | 2025 | 176    | 250     | 0.226669 | 0.1905 | 1.2143  | 1.46623 | 0.0049 | 0.0562 | 0.0517 | 473.3255 | 0.1531 |
| Forklifts      | 2025 | 251    | 500     | 0.255656 | 0.2148 | 1.22207 | 1.65848 | 0.0049 | 0.0617 | 0.0568 | 473.6151 | 0.1532 |
| Forklifts      | 2030 | 26     | 50      | 1.388    | 0.565  | 5.272   | 3.33    | 0.007  | 0.023  | 0.023  | 568.299  | 0.051  |
| Forklifts      | 2030 | 51     | 120     | 1.48     | 0.283  | 3.799   | 1.555   | 0.006  | 0.021  | 0.021  | 568.299  | 0.025  |
| Forklifts      | 2030 | 121    | 175     | 1.875    | 0.199  | 3.36    | 0.391   | 0.006  | 0.015  | 0.015  | 568.299  | 0.018  |
| Forklifts      | 2030 | 176    | 250     | 2.524    | 0.195  | 1.144   | 0.341   | 0.006  | 0.012  | 0.012  | 568.299  | 0.017  |
| Forklifts      | 2030 | 251    | 500     | 3.633    | 0.195  | 1.088   | 0.341   | 0.005  | 0.012  | 0.012  | 568.299  | 0.017  |
| Forklifts      | 2035 | 26     | 50      | 1.371    | 0.558  | 5.234   | 3.268   | 0.007  | 0.017  | 0.017  | 568.299  | 0.05   |
| Forklifts      | 2035 | 51     | 120     | 1.438    | 0.275  | 3.787   | 1.495   | 0.006  | 0.016  | 0.016  | 568.299  | 0.024  |
| Forklifts      | 2035 | 121    | 175     | 1.775    | 0.189  | 3.35    | 0.299   | 0.006  | 0.012  | 0.012  | 568.3    | 0.017  |
| Forklifts      | 2035 | 176    | 250     | 2.433    | 0.188  | 1.141   | 0.29    | 0.006  | 0.011  | 0.011  | 568.3    | 0.017  |
| Forklifts      | 2035 | 251    | 500     | 3.502    | 0.188  | 1.085   | 0.29    | 0.005  | 0.011  | 0.011  | 568.299  | 0.017  |
| Forklifts      | 2040 | 26     | 50      | 1.38     | 0.562  | 5.256   | 3.272   | 0.007  | 0.017  | 0.017  | 568.299  | 0.05   |
| Forklifts      | 2040 | 51     | 120     | 1.444    | 0.276  | 3.794   | 1.491   | 0.006  | 0.016  | 0.016  | 568.299  | 0.024  |
| Forklifts      | 2040 | 121    | 175     | 1.777    | 0.189  | 3.356   | 0.288   | 0.006  | 0.012  | 0.012  | 568.299  | 0.017  |
| Forklifts      | 2040 | 176    | 250     | 2.445    | 0.189  | 1.143   | 0.288   | 0.006  | 0.011  | 0.011  | 568.299  | 0.017  |
| Forklifts      | 2040 | 251    | 500     | 3.518    | 0.189  | 1.087   | 0.288   | 0.005  | 0.011  | 0.011  | 568.299  | 0.017  |
| Generator Sets | 1990 | 6      | 15      | 4.791    | 1.804  | 4.999   | 10      | 1.018  | 0.974  | 0.974  | 568.299  | 0.162  |
| Generator Sets | 1990 | 16     | 25      | 10.151   | 2.213  | 4.999   | 6.919   | 0.83   | 0.74   | 0.74   | 568.299  | 0.199  |
| Generator Sets | 1990 | 26     | 50      | 24.936   | 3.13   | 6.681   | 7.325   | 0.846  | 0.928  | 0.928  | 568.299  | 0.282  |
| Generator Sets | 1990 | 51     | 120     | 38.362   | 1.891  | 4.97    | 13.19   | 0.768  | 0.985  | 0.985  | 568.299  | 0.17   |
| Generator Sets | 1990 | 121    | 175     | 47.754   | 1.292  | 4.395   | 11.864  | 0.736  | 0.653  | 0.653  | 568.3    | 0.116  |
| Generator Sets | 1990 | 176    | 250     | 71.475   | 1.292  | 4.395   | 11.864  | 0.736  | 0.653  | 0.653  | 568.299  | 0.116  |
| Generator Sets | 1990 | 251    | 500     | 104.891  | 1.196  | 6.53    | 11.613  | 0.642  | 0.596  | 0.596  | 568.299  | 0.107  |
| Generator Sets | 1990 | 501    | 750     | 169.323  | 1.196  | 6.53    | 11.612  | 0.658  | 0.596  | 0.596  | 568.299  | 0.107  |
| Generator Sets | 1990 | 1001   | 9999    | 326.002  | 1.195  | 6.53    | 11.612  | 0.658  | 0.594  | 0.594  | 568.299  | 0.107  |
| Generator Sets | 2000 | 6      | 15      | 4.033    | 1.518  | 4.875   | 8.846   | 0.079  | 0.613  | 0.613  | 568.299  | 0.137  |
| Generator Sets | 2000 | 16     | 25      | 7.648    | 1.667  | 4.783   | 6.405   | 0.065  | 0.51   | 0.51   | 568.299  | 0.15   |
| Generator Sets | 2000 | 26     | 50      | 23.582   | 2.96   | 6.415   | 6.55    | 0.066  | 0.692  | 0.692  | 568.299  | 0.267  |
| Generator Sets | 2000 | 51     | 120     | 31.137   | 1.535  | 4.158   | 9.468   | 0.06   | 0.686  | 0.686  | 568.299  | 0.138  |
| Generator Sets | 2000 | 121    | 175     | 38.027   | 1.029  | 3.381   | 8.612   | 0.057  | 0.404  | 0.404  | 568.299  | 0.092  |
| Generator Sets | 2000 | 176    | 250     | 46.981   | 0.849  | 2.656   | 8.277   | 0.057  | 0.325  | 0.325  | 568.299  | 0.076  |
| Generator Sets | 2000 | 251    | 500     | 70.308   | 0.802  | 3.7     | 8.102   | 0.05   | 0.301  | 0.301  | 568.299  | 0.072  |
| Generator Sets | 2000 | 501    | 750     | 113.5    | 0.802  | 3.7     | 8.102   | 0.051  | 0.301  | 0.301  | 568.3    | 0.072  |
| Generator Sets | 2000 | 1001   | 9999    | 251.503  | 0.921  | 4.274   | 8.686   | 0.051  | 0.344  | 0.344  | 568.299  | 0.083  |
| Generator Sets | 2005 | 6      | 15      | 3.219    | 1.212  | 4.38    | 7.615   | 0.079  | 0.505  | 0.505  | 568.299  | 0.109  |
| Generator Sets | 2005 | 16     | 25      | 5.748    | 1.253  | 3.922   | 6.014   | 0.065  | 0.432  | 0.432  | 568.299  | 0.113  |
| Generator Sets | 2005 | 26     | 50      | 20.78    | 2.608  | 5.919   | 6.099   | 0.066  | 0.64   | 0.64   | 568.3    | 0.235  |
| Generator Sets | 2005 | 51     | 120     | 26.634   | 1.313  | 3.853   | 7.987   | 0.06   | 0.634  | 0.634  | 568.299  | 0.118  |
| Generator Sets | 2005 | 121    | 175     | 31.579   | 0.854  | 3.067   | 7.306   | 0.057  | 0.35   | 0.35   | 568.299  | 0.077  |
| Generator Sets | 2005 | 176    | 250     | 33.443   | 0.604  | 1.801   | 6.892   | 0.057  | 0.229  | 0.229  | 568.299  | 0.054  |
| Generator Sets | 2005 | 251    | 500     | 47.834   | 0.545  | 2.206   | 6.465   | 0.05   | 0.211  | 0.211  | 568.299  | 0.049  |
| Generator Sets | 2005 | 501    | 750     | 79.444   | 0.561  | 2.206   | 6.609   | 0.051  | 0.214  | 0.214  | 568.3    | 0.05   |
| Generator Sets | 2005 | 1001   | 9999    | 195.712  | 0.717  | 2.719   | 7.582   | 0.051  | 0.255  | 0.255  | 568.299  | 0.064  |
| Generator Sets | 2010 | 6      | 15      | 2.532    | 0.953  | 4.027   | 6.387   | 0.008  | 0.38   | 0.38   | 568.299  | 0.086  |
| Generator Sets | 2010 | 16     | 25      | 4.408    | 0.961  | 3.309   | 5.477   | 0.007  | 0.342  | 0.342  | 568.299  | 0.086  |
| Generator Sets | 2010 | 26     | 50      | 16.299   | 2.045  | 5.353   | 5.68    | 0.007  | 0.522  | 0.522  | 568.299  | 0.184  |
| Generator Sets | 2010 | 51     | 120     | 20.399   | 1.005  | 3.677   | 6.573   | 0.006  | 0.516  | 0.516  | 568.299  | 0.09   |
| Generator Sets | 2010 | 121    | 175     | 24.447   | 0.661  | 2.986   | 5.87    | 0.006  | 0.286  | 0.286  | 568.299  | 0.059  |
| Generator Sets | 2010 | 176    | 250     | 23.668   | 0.428  | 1.333   | 5.501   | 0.006  | 0.163  | 0.163  | 568.299  | 0.038  |
| Generator Sets | 2010 | 251    | 500     | 33.685   | 0.384  | 1.482   | 5.015   | 0.005  | 0.153  | 0.153  | 568.299  | 0.034  |
| Generator Sets | 2010 | 501    | 750     | 56.116   | 0.396  | 1.482   | 5.147   | 0.005  | 0.155  | 0.155  | 568.299  | 0.035  |
| Generator Sets | 2010 | 1001   | 9999    | 147.466  | 0.54   | 1.93    | 6.544   | 0.005  | 0.193  | 0.193  | 568.299  | 0.048  |
| Generator Sets | 2011 | 6      | 15      | 2.413    | 0.908  | 3.952   | 6.134   | 0.008  | 0.358  | 0.358  | 568.299  | 0.081  |
| Generator Sets | 2011 | 16     | 25      | 4.22     | 0.92   | 3.179   | 5.36    | 0.007  | 0.325  | 0.325  | 568.299  | 0.083  |
| Generator Sets | 2011 | 26     | 50      | 15.152   | 1.901  | 5.2     | 5.585   | 0.007  | 0.495  | 0.495  | 568.3    | 0.171  |
| Generator Sets | 2011 | 51     | 120     | 19.003   | 0.937  | 3.64    | 6.226   | 0.006  | 0.493  | 0.493  | 568.299  | 0.084  |
| Generator Sets | 2011 | 121    | 175     | 22.889   | 0.619  | 2.974   | 5.544   | 0.006  | 0.274  | 0.274  | 568.299  | 0.055  |
| Generator Sets | 2011 | 176    | 250     | 21.62    | 0.391  | 1.249   | 5.125   | 0.006  | 0.147  | 0.147  | 568.299  | 0.035  |
| Generator Sets | 2011 | 251    | 500     | 30.74    | 0.35   | 1.36    | 4.654   | 0.005  | 0.138  | 0.138  | 568.299  | 0.031  |
| Generator Sets | 2011 | 501    | 750     | 51.271   | 0.362  | 1.36    | 4.784   | 0.005  | 0.14   | 0.14   | 568.299  | 0.032  |
| Generator Sets | 2011 | 1001   | 9999    | 137.042  | 0.502  | 1.784   | 6.202   | 0.005  | 0.18   | 0.18   | 568.299  | 0.045  |
| Generator Sets | 2012 | 6      | 15      | 2.298    | 0.865  | 3.874   | 5.874   | 0.008  | 0.338  | 0.338  | 568.299  | 0.078  |
| Generator Sets | 2012 | 16     | 25      | 4.059    | 0.884  | 3.043   | 5.239   | 0.007  | 0.307  | 0.307  | 568.299  | 0.079  |
| Generator Sets | 2012 | 26     | 50      | 13.912   | 1.746  | 5.03    | 5.485   | 0.007  | 0.466  | 0.466  | 568.299  | 0.157  |
| Generator Sets | 2012 | 51     | 120     | 17.544   | 0.865  | 3.603   | 5.848   | 0.006  | 0.46   | 0.46   | 568.299  | 0.078  |
| Generator Sets | 2012 | 121    | 175     | 21.243   | 0.575  | 2.963   | 5.198   | 0.006  | 0.254  | 0.254  | 568.299  | 0.051  |
| Generator Sets | 2012 | 176    | 250     | 19.998   | 0.361  | 1.196   | 4.77    | 0.006  | 0.133  | 0.133  | 568.3    | 0.032  |
| Generator Sets | 2012 | 251    | 500     | 28.44    | 0.324  | 1.275   | 4.315   | 0.005  | 0.125  | 0.125  | 568.299  | 0.029  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG     | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|----------------|------|--------|---------|---------|-------|-------|-------|-------|-------|-------|---------|-------|
| Generator Sets | 2012 | 501    | 750     | 47.464  | 0.335 | 1.275 | 4.441 | 0.005 | 0.127 | 0.127 | 568.299 | 0.03  |
| Generator Sets | 2012 | 1001   | 9999    | 126.39  | 0.463 | 1.639 | 5.849 | 0.005 | 0.166 | 0.166 | 568.3   | 0.041 |
| Generator Sets | 2013 | 6      | 15      | 2.187   | 0.823 | 3.796 | 5.616 | 0.008 | 0.318 | 0.318 | 568.299 | 0.074 |
| Generator Sets | 2013 | 16     | 25      | 3.907   | 0.851 | 2.907 | 5.117 | 0.007 | 0.289 | 0.289 | 568.299 | 0.076 |
| Generator Sets | 2013 | 26     | 50      | 12.634  | 1.585 | 4.854 | 5.263 | 0.007 | 0.428 | 0.428 | 568.299 | 0.143 |
| Generator Sets | 2013 | 51     | 120     | 16.078  | 0.792 | 3.567 | 5.478 | 0.006 | 0.424 | 0.424 | 568.299 | 0.071 |
| Generator Sets | 2013 | 121    | 175     | 19.587  | 0.53  | 2.953 | 4.873 | 0.006 | 0.233 | 0.233 | 568.299 | 0.047 |
| Generator Sets | 2013 | 176    | 250     | 18.602  | 0.336 | 1.16  | 4.428 | 0.006 | 0.122 | 0.122 | 568.299 | 0.03  |
| Generator Sets | 2013 | 251    | 500     | 26.484  | 0.302 | 1.211 | 3.989 | 0.005 | 0.114 | 0.114 | 568.299 | 0.027 |
| Generator Sets | 2013 | 501    | 750     | 44.22   | 0.312 | 1.211 | 4.113 | 0.005 | 0.116 | 0.116 | 568.299 | 0.028 |
| Generator Sets | 2013 | 1001   | 9999    | 115.946 | 0.425 | 1.502 | 5.494 | 0.005 | 0.152 | 0.152 | 568.299 | 0.038 |
| Generator Sets | 2014 | 6      | 15      | 2.081   | 0.783 | 3.723 | 5.369 | 0.008 | 0.298 | 0.298 | 568.299 | 0.07  |
| Generator Sets | 2014 | 16     | 25      | 3.767   | 0.821 | 2.78  | 5     | 0.007 | 0.272 | 0.272 | 568.299 | 0.074 |
| Generator Sets | 2014 | 26     | 50      | 11.368  | 1.427 | 4.683 | 5.048 | 0.007 | 0.389 | 0.389 | 568.299 | 0.128 |
| Generator Sets | 2014 | 51     | 120     | 14.638  | 0.721 | 3.532 | 5.147 | 0.006 | 0.385 | 0.385 | 568.299 | 0.065 |
| Generator Sets | 2014 | 121    | 175     | 17.974  | 0.486 | 2.945 | 4.565 | 0.006 | 0.212 | 0.212 | 568.299 | 0.043 |
| Generator Sets | 2014 | 176    | 250     | 17.205  | 0.311 | 1.13  | 4.025 | 0.006 | 0.111 | 0.111 | 568.3   | 0.028 |
| Generator Sets | 2014 | 251    | 500     | 24.516  | 0.279 | 1.157 | 3.603 | 0.005 | 0.104 | 0.104 | 568.299 | 0.025 |
| Generator Sets | 2014 | 501    | 750     | 40.956  | 0.289 | 1.157 | 3.724 | 0.005 | 0.106 | 0.106 | 568.299 | 0.026 |
| Generator Sets | 2014 | 1001   | 9999    | 106.127 | 0.389 | 1.377 | 5.15  | 0.005 | 0.138 | 0.138 | 568.299 | 0.035 |
| Generator Sets | 2015 | 6      | 15      | 1.984   | 0.747 | 3.658 | 5.141 | 0.008 | 0.28  | 0.28  | 568.299 | 0.067 |
| Generator Sets | 2015 | 16     | 25      | 3.639   | 0.793 | 2.666 | 4.89  | 0.007 | 0.256 | 0.256 | 568.299 | 0.071 |
| Generator Sets | 2015 | 26     | 50      | 10.213  | 1.281 | 4.538 | 4.858 | 0.007 | 0.353 | 0.353 | 568.299 | 0.115 |
| Generator Sets | 2015 | 51     | 120     | 13.208  | 0.651 | 3.499 | 4.769 | 0.006 | 0.347 | 0.347 | 568.299 | 0.058 |
| Generator Sets | 2015 | 121    | 175     | 16.277  | 0.44  | 2.938 | 4.138 | 0.006 | 0.191 | 0.191 | 568.299 | 0.039 |
| Generator Sets | 2015 | 176    | 250     | 15.884  | 0.287 | 1.104 | 3.633 | 0.006 | 0.1   | 0.1   | 568.3   | 0.025 |
| Generator Sets | 2015 | 251    | 500     | 22.677  | 0.258 | 1.114 | 3.231 | 0.005 | 0.094 | 0.094 | 568.299 | 0.023 |
| Generator Sets | 2015 | 501    | 750     | 37.88   | 0.267 | 1.114 | 3.347 | 0.005 | 0.096 | 0.096 | 568.299 | 0.024 |
| Generator Sets | 2015 | 1001   | 9999    | 95.984  | 0.351 | 1.269 | 4.822 | 0.005 | 0.124 | 0.124 | 568.299 | 0.031 |
| Generator Sets | 2016 | 6      | 15      | 1.914   | 0.72  | 3.622 | 4.978 | 0.008 | 0.264 | 0.264 | 568.299 | 0.065 |
| Generator Sets | 2016 | 16     | 25      | 3.548   | 0.773 | 2.604 | 4.803 | 0.007 | 0.244 | 0.244 | 568.299 | 0.069 |
| Generator Sets | 2016 | 26     | 50      | 9.132   | 1.146 | 4.41  | 4.685 | 0.007 | 0.318 | 0.318 | 568.299 | 0.103 |
| Generator Sets | 2016 | 51     | 120     | 11.84   | 0.583 | 3.469 | 4.41  | 0.006 | 0.309 | 0.309 | 568.299 | 0.052 |
| Generator Sets | 2016 | 121    | 175     | 14.658  | 0.396 | 2.934 | 3.731 | 0.006 | 0.17  | 0.17  | 568.299 | 0.035 |
| Generator Sets | 2016 | 176    | 250     | 14.652  | 0.265 | 1.081 | 3.259 | 0.006 | 0.09  | 0.09  | 568.299 | 0.023 |
| Generator Sets | 2016 | 251    | 500     | 21.002  | 0.239 | 1.077 | 2.882 | 0.005 | 0.084 | 0.084 | 568.299 | 0.021 |
| Generator Sets | 2016 | 501    | 750     | 35.041  | 0.247 | 1.077 | 2.989 | 0.005 | 0.086 | 0.086 | 568.3   | 0.022 |
| Generator Sets | 2016 | 1001   | 9999    | 88.441  | 0.324 | 1.204 | 4.542 | 0.005 | 0.113 | 0.113 | 568.299 | 0.029 |
| Generator Sets | 2017 | 6      | 15      | 1.857   | 0.699 | 3.599 | 4.847 | 0.008 | 0.25  | 0.25  | 568.299 | 0.063 |
| Generator Sets | 2017 | 16     | 25      | 3.476   | 0.757 | 2.564 | 4.729 | 0.007 | 0.233 | 0.233 | 568.299 | 0.068 |
| Generator Sets | 2017 | 26     | 50      | 8.107   | 1.017 | 4.292 | 4.522 | 0.007 | 0.285 | 0.285 | 568.299 | 0.091 |
| Generator Sets | 2017 | 51     | 120     | 10.557  | 0.52  | 3.442 | 4.072 | 0.006 | 0.274 | 0.274 | 568.299 | 0.046 |
| Generator Sets | 2017 | 121    | 175     | 13.162  | 0.356 | 2.931 | 3.347 | 0.006 | 0.151 | 0.151 | 568.299 | 0.032 |
| Generator Sets | 2017 | 176    | 250     | 13.548  | 0.245 | 1.063 | 2.91  | 0.006 | 0.081 | 0.081 | 568.299 | 0.022 |
| Generator Sets | 2017 | 251    | 500     | 19.649  | 0.224 | 1.048 | 2.579 | 0.005 | 0.076 | 0.076 | 568.299 | 0.02  |
| Generator Sets | 2017 | 501    | 750     | 32.544  | 0.23  | 1.048 | 2.66  | 0.005 | 0.077 | 0.077 | 568.299 | 0.02  |
| Generator Sets | 2017 | 1001   | 9999    | 82.27   | 0.301 | 1.161 | 4.293 | 0.005 | 0.104 | 0.104 | 568.299 | 0.027 |
| Generator Sets | 2018 | 6      | 15      | 1.805   | 0.679 | 3.58  | 4.728 | 0.008 | 0.237 | 0.237 | 568.299 | 0.061 |
| Generator Sets | 2018 | 16     | 25      | 3.412   | 0.744 | 2.531 | 4.661 | 0.007 | 0.224 | 0.224 | 568.299 | 0.067 |
| Generator Sets | 2018 | 26     | 50      | 7.133   | 0.895 | 4.182 | 4.366 | 0.007 | 0.253 | 0.253 | 568.299 | 0.08  |
| Generator Sets | 2018 | 51     | 120     | 9.356   | 0.461 | 3.418 | 3.752 | 0.006 | 0.239 | 0.239 | 568.299 | 0.041 |
| Generator Sets | 2018 | 121    | 175     | 11.794  | 0.319 | 2.93  | 2.989 | 0.006 | 0.133 | 0.133 | 568.299 | 0.028 |
| Generator Sets | 2018 | 176    | 250     | 12.549  | 0.226 | 1.048 | 2.582 | 0.006 | 0.072 | 0.072 | 568.299 | 0.02  |
| Generator Sets | 2018 | 251    | 500     | 18.523  | 0.211 | 1.028 | 2.31  | 0.005 | 0.069 | 0.069 | 568.299 | 0.019 |
| Generator Sets | 2018 | 501    | 750     | 30.476  | 0.215 | 1.028 | 2.37  | 0.005 | 0.07  | 0.07  | 568.299 | 0.019 |
| Generator Sets | 2018 | 1001   | 9999    | 76.62   | 0.28  | 1.128 | 4.058 | 0.005 | 0.095 | 0.095 | 568.299 | 0.025 |
| Generator Sets | 2019 | 6      | 15      | 1.758   | 0.662 | 3.562 | 4.617 | 0.008 | 0.224 | 0.224 | 568.299 | 0.059 |
| Generator Sets | 2019 | 16     | 25      | 3.356   | 0.731 | 2.501 | 4.596 | 0.007 | 0.214 | 0.214 | 568.299 | 0.066 |
| Generator Sets | 2019 | 26     | 50      | 6.208   | 0.779 | 4.076 | 4.215 | 0.007 | 0.222 | 0.222 | 568.299 | 0.07  |
| Generator Sets | 2019 | 51     | 120     | 8.233   | 0.405 | 3.396 | 3.446 | 0.006 | 0.206 | 0.206 | 568.299 | 0.036 |
| Generator Sets | 2019 | 121    | 175     | 10.727  | 0.29  | 2.929 | 2.669 | 0.006 | 0.118 | 0.118 | 568.299 | 0.026 |
| Generator Sets | 2019 | 176    | 250     | 11.695  | 0.211 | 1.036 | 2.285 | 0.006 | 0.064 | 0.064 | 568.299 | 0.019 |
| Generator Sets | 2019 | 251    | 500     | 17.492  | 0.199 | 1.015 | 2.056 | 0.005 | 0.062 | 0.062 | 568.299 | 0.018 |
| Generator Sets | 2019 | 501    | 750     | 28.675  | 0.202 | 1.015 | 2.104 | 0.005 | 0.062 | 0.062 | 568.299 | 0.018 |
| Generator Sets | 2019 | 1001   | 9999    | 71.228  | 0.261 | 1.103 | 3.829 | 0.005 | 0.087 | 0.087 | 568.299 | 0.023 |
| Generator Sets | 2020 | 6      | 15      | 1.715   | 0.646 | 3.546 | 4.516 | 0.008 | 0.212 | 0.212 | 568.299 | 0.058 |
| Generator Sets | 2020 | 16     | 25      | 3.307   | 0.721 | 2.473 | 4.538 | 0.007 | 0.205 | 0.205 | 568.299 | 0.065 |
| Generator Sets | 2020 | 26     | 50      | 5.508   | 0.691 | 3.995 | 4.075 | 0.007 | 0.194 | 0.194 | 568.299 | 0.062 |
| Generator Sets | 2020 | 51     | 120     | 7.383   | 0.364 | 3.38  | 3.173 | 0.006 | 0.179 | 0.179 | 568.299 | 0.032 |
| Generator Sets | 2020 | 121    | 175     | 9.884   | 0.267 | 2.93  | 2.38  | 0.006 | 0.105 | 0.105 | 568.299 | 0.024 |
| Generator Sets | 2020 | 176    | 250     | 10.963  | 0.198 | 1.026 | 2.016 | 0.006 | 0.057 | 0.057 | 568.299 | 0.017 |
| Generator Sets | 2020 | 251    | 500     | 16.528  | 0.188 | 1.005 | 1.816 | 0.005 | 0.055 | 0.055 | 568.299 | 0.017 |
| Generator Sets | 2020 | 501    | 750     | 27.045  | 0.191 | 1.005 | 1.858 | 0.005 | 0.056 | 0.056 | 568.299 | 0.017 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG    | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|----------------|------|--------|---------|--------|-------|-------|-------|-------|-------|-------|---------|-------|
| Generator Sets | 2020 | 1001   | 9999    | 66.08  | 0.242 | 1.082 | 3.608 | 0.005 | 0.079 | 0.079 | 568.3   | 0.021 |
| Generator Sets | 2021 | 6      | 15      | 1.683  | 0.634 | 3.531 | 4.441 | 0.008 | 0.201 | 0.201 | 568.299 | 0.057 |
| Generator Sets | 2021 | 16     | 25      | 3.268  | 0.712 | 2.446 | 4.497 | 0.007 | 0.196 | 0.196 | 568.299 | 0.064 |
| Generator Sets | 2021 | 26     | 50      | 4.884  | 0.613 | 3.905 | 3.916 | 0.007 | 0.165 | 0.165 | 568.299 | 0.055 |
| Generator Sets | 2021 | 51     | 120     | 6.62   | 0.326 | 3.361 | 2.888 | 0.006 | 0.153 | 0.153 | 568.299 | 0.029 |
| Generator Sets | 2021 | 121    | 175     | 8.995  | 0.243 | 2.925 | 2.068 | 0.006 | 0.091 | 0.091 | 568.299 | 0.021 |
| Generator Sets | 2021 | 176    | 250     | 10.146 | 0.183 | 1.016 | 1.73  | 0.006 | 0.049 | 0.049 | 568.299 | 0.016 |
| Generator Sets | 2021 | 251    | 500     | 15.395 | 0.175 | 0.996 | 1.562 | 0.005 | 0.048 | 0.048 | 568.299 | 0.015 |
| Generator Sets | 2021 | 501    | 750     | 25.135 | 0.177 | 0.996 | 1.596 | 0.005 | 0.048 | 0.048 | 568.299 | 0.016 |
| Generator Sets | 2021 | 1001   | 9999    | 60.247 | 0.22  | 1.06  | 3.372 | 0.005 | 0.07  | 0.07  | 568.3   | 0.019 |
| Generator Sets | 2022 | 6      | 15      | 1.662  | 0.626 | 3.519 | 4.39  | 0.008 | 0.193 | 0.193 | 568.299 | 0.056 |
| Generator Sets | 2022 | 16     | 25      | 3.242  | 0.706 | 2.426 | 4.47  | 0.007 | 0.188 | 0.188 | 568.299 | 0.063 |
| Generator Sets | 2022 | 26     | 50      | 4.466  | 0.56  | 3.858 | 3.796 | 0.007 | 0.143 | 0.143 | 568.299 | 0.05  |
| Generator Sets | 2022 | 51     | 120     | 6.113  | 0.301 | 3.353 | 2.671 | 0.006 | 0.134 | 0.134 | 568.299 | 0.027 |
| Generator Sets | 2022 | 121    | 175     | 8.363  | 0.226 | 2.926 | 1.83  | 0.006 | 0.081 | 0.081 | 568.299 | 0.02  |
| Generator Sets | 2022 | 176    | 250     | 9.575  | 0.173 | 1.01  | 1.508 | 0.006 | 0.043 | 0.043 | 568.299 | 0.015 |
| Generator Sets | 2022 | 251    | 500     | 14.616 | 0.166 | 0.99  | 1.384 | 0.005 | 0.042 | 0.042 | 568.299 | 0.015 |
| Generator Sets | 2022 | 501    | 750     | 23.822 | 0.168 | 0.99  | 1.412 | 0.005 | 0.043 | 0.043 | 568.299 | 0.015 |
| Generator Sets | 2022 | 1001   | 9999    | 56.346 | 0.206 | 1.045 | 3.202 | 0.005 | 0.063 | 0.063 | 568.299 | 0.018 |
| Generator Sets | 2023 | 6      | 15      | 1.643  | 0.618 | 3.508 | 4.345 | 0.008 | 0.186 | 0.186 | 568.299 | 0.055 |
| Generator Sets | 2023 | 16     | 25      | 3.219  | 0.701 | 2.407 | 4.447 | 0.007 | 0.182 | 0.182 | 568.299 | 0.063 |
| Generator Sets | 2023 | 26     | 50      | 4.102  | 0.514 | 3.819 | 3.685 | 0.007 | 0.124 | 0.124 | 568.299 | 0.046 |
| Generator Sets | 2023 | 51     | 120     | 5.671  | 0.279 | 3.347 | 2.477 | 0.006 | 0.117 | 0.117 | 568.299 | 0.025 |
| Generator Sets | 2023 | 121    | 175     | 7.812  | 0.211 | 2.927 | 1.635 | 0.006 | 0.071 | 0.071 | 568.299 | 0.019 |
| Generator Sets | 2023 | 176    | 250     | 9.077  | 0.164 | 1.006 | 1.328 | 0.006 | 0.038 | 0.038 | 568.299 | 0.014 |
| Generator Sets | 2023 | 251    | 500     | 13.922 | 0.158 | 0.986 | 1.228 | 0.005 | 0.037 | 0.037 | 568.299 | 0.014 |
| Generator Sets | 2023 | 501    | 750     | 22.664 | 0.16  | 0.986 | 1.253 | 0.005 | 0.037 | 0.037 | 568.299 | 0.014 |
| Generator Sets | 2023 | 1001   | 9999    | 53.06  | 0.194 | 1.031 | 3.058 | 0.005 | 0.058 | 0.058 | 568.299 | 0.017 |
| Generator Sets | 2024 | 6      | 15      | 1.627  | 0.612 | 3.499 | 4.305 | 0.008 | 0.181 | 0.181 | 568.299 | 0.055 |
| Generator Sets | 2024 | 16     | 25      | 3.2    | 0.697 | 2.39  | 4.426 | 0.007 | 0.178 | 0.178 | 568.299 | 0.062 |
| Generator Sets | 2024 | 26     | 50      | 3.789  | 0.475 | 3.787 | 3.582 | 0.007 | 0.107 | 0.107 | 568.299 | 0.042 |
| Generator Sets | 2024 | 51     | 120     | 5.287  | 0.26  | 3.342 | 2.321 | 0.006 | 0.101 | 0.101 | 568.299 | 0.023 |
| Generator Sets | 2024 | 121    | 175     | 7.312  | 0.197 | 2.929 | 1.462 | 0.006 | 0.062 | 0.062 | 568.299 | 0.017 |
| Generator Sets | 2024 | 176    | 250     | 8.611  | 0.155 | 1.003 | 1.169 | 0.006 | 0.033 | 0.033 | 568.299 | 0.014 |
| Generator Sets | 2024 | 251    | 500     | 13.26  | 0.151 | 0.983 | 1.082 | 0.005 | 0.032 | 0.032 | 568.3   | 0.013 |
| Generator Sets | 2024 | 501    | 750     | 21.567 | 0.152 | 0.983 | 1.104 | 0.005 | 0.032 | 0.032 | 568.299 | 0.013 |
| Generator Sets | 2024 | 1001   | 9999    | 50.108 | 0.183 | 1.018 | 2.929 | 0.005 | 0.052 | 0.052 | 568.3   | 0.016 |
| Generator Sets | 2025 | 6      | 15      | 1.613  | 0.607 | 3.491 | 4.269 | 0.008 | 0.178 | 0.178 | 568.299 | 0.054 |
| Generator Sets | 2025 | 16     | 25      | 3.185  | 0.694 | 2.376 | 4.407 | 0.007 | 0.175 | 0.175 | 568.299 | 0.062 |
| Generator Sets | 2025 | 26     | 50      | 3.511  | 0.44  | 3.758 | 3.481 | 0.007 | 0.093 | 0.093 | 568.3   | 0.039 |
| Generator Sets | 2025 | 51     | 120     | 4.942  | 0.243 | 3.338 | 2.185 | 0.006 | 0.087 | 0.087 | 568.299 | 0.021 |
| Generator Sets | 2025 | 121    | 175     | 6.832  | 0.184 | 2.93  | 1.297 | 0.006 | 0.053 | 0.053 | 568.299 | 0.016 |
| Generator Sets | 2025 | 176    | 250     | 8.168  | 0.147 | 1     | 1.02  | 0.006 | 0.028 | 0.028 | 568.299 | 0.013 |
| Generator Sets | 2025 | 251    | 500     | 12.627 | 0.144 | 0.981 | 0.945 | 0.005 | 0.027 | 0.027 | 568.3   | 0.013 |
| Generator Sets | 2025 | 501    | 750     | 20.518 | 0.145 | 0.981 | 0.964 | 0.005 | 0.027 | 0.027 | 568.299 | 0.013 |
| Generator Sets | 2025 | 1001   | 9999    | 47.32  | 0.173 | 1.008 | 2.812 | 0.005 | 0.047 | 0.047 | 568.299 | 0.015 |
| Generator Sets | 2030 | 6      | 15      | 1.573  | 0.592 | 3.47  | 4.164 | 0.008 | 0.166 | 0.166 | 568.299 | 0.053 |
| Generator Sets | 2030 | 16     | 25      | 3.15   | 0.686 | 2.34  | 4.347 | 0.007 | 0.165 | 0.165 | 568.299 | 0.061 |
| Generator Sets | 2030 | 26     | 50      | 2.512  | 0.315 | 3.64  | 3.107 | 0.007 | 0.038 | 0.038 | 568.299 | 0.028 |
| Generator Sets | 2030 | 51     | 120     | 3.616  | 0.178 | 3.316 | 1.645 | 0.006 | 0.034 | 0.034 | 568.299 | 0.016 |
| Generator Sets | 2030 | 121    | 175     | 4.837  | 0.13  | 2.929 | 0.601 | 0.006 | 0.023 | 0.023 | 568.299 | 0.011 |
| Generator Sets | 2030 | 176    | 250     | 6.637  | 0.12  | 0.998 | 0.504 | 0.006 | 0.016 | 0.016 | 568.299 | 0.01  |
| Generator Sets | 2030 | 251    | 500     | 10.441 | 0.119 | 0.978 | 0.476 | 0.005 | 0.015 | 0.015 | 568.299 | 0.01  |
| Generator Sets | 2030 | 501    | 750     | 16.888 | 0.119 | 0.978 | 0.482 | 0.005 | 0.015 | 0.015 | 568.299 | 0.01  |
| Generator Sets | 2030 | 1001   | 9999    | 35.17  | 0.128 | 0.979 | 2.483 | 0.005 | 0.029 | 0.029 | 568.299 | 0.011 |
| Generator Sets | 2035 | 6      | 15      | 1.565  | 0.589 | 3.47  | 4.143 | 0.008 | 0.162 | 0.162 | 568.299 | 0.053 |
| Generator Sets | 2035 | 16     | 25      | 3.144  | 0.685 | 2.34  | 4.332 | 0.007 | 0.162 | 0.162 | 568.299 | 0.061 |
| Generator Sets | 2035 | 26     | 50      | 2.206  | 0.276 | 3.607 | 2.991 | 0.007 | 0.018 | 0.018 | 568.299 | 0.024 |
| Generator Sets | 2035 | 51     | 120     | 3.176  | 0.156 | 3.31  | 1.458 | 0.006 | 0.016 | 0.016 | 568.299 | 0.014 |
| Generator Sets | 2035 | 121    | 175     | 4.187  | 0.113 | 2.929 | 0.373 | 0.006 | 0.013 | 0.013 | 568.299 | 0.01  |
| Generator Sets | 2035 | 176    | 250     | 6.1    | 0.11  | 0.998 | 0.331 | 0.006 | 0.011 | 0.011 | 568.299 | 0.009 |
| Generator Sets | 2035 | 251    | 500     | 9.666  | 0.11  | 0.978 | 0.328 | 0.005 | 0.011 | 0.011 | 568.299 | 0.009 |
| Generator Sets | 2035 | 501    | 750     | 15.606 | 0.11  | 0.978 | 0.328 | 0.005 | 0.011 | 0.011 | 568.299 | 0.009 |
| Generator Sets | 2035 | 1001   | 9999    | 31.223 | 0.114 | 0.978 | 2.362 | 0.005 | 0.022 | 0.022 | 568.299 | 0.01  |
| Generator Sets | 2040 | 6      | 15      | 1.565  | 0.589 | 3.469 | 4.142 | 0.008 | 0.161 | 0.161 | 568.299 | 0.053 |
| Generator Sets | 2040 | 16     | 25      | 3.144  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Generator Sets | 2040 | 26     | 50      | 2.182  | 0.273 | 3.601 | 2.941 | 0.007 | 0.012 | 0.012 | 568.3   | 0.024 |
| Generator Sets | 2040 | 51     | 120     | 3.086  | 0.152 | 3.308 | 1.399 | 0.006 | 0.012 | 0.012 | 568.299 | 0.013 |
| Generator Sets | 2040 | 121    | 175     | 3.958  | 0.107 | 2.928 | 0.293 | 0.006 | 0.01  | 0.01  | 568.299 | 0.009 |
| Generator Sets | 2040 | 176    | 250     | 5.86   | 0.106 | 0.997 | 0.277 | 0.006 | 0.009 | 0.009 | 568.299 | 0.009 |
| Generator Sets | 2040 | 251    | 500     | 9.29   | 0.106 | 0.978 | 0.277 | 0.005 | 0.009 | 0.009 | 568.299 | 0.009 |
| Generator Sets | 2040 | 501    | 750     | 14.997 | 0.106 | 0.978 | 0.277 | 0.005 | 0.009 | 0.009 | 568.3   | 0.009 |
| Generator Sets | 2040 | 1001   | 9999    | 29.36  | 0.107 | 0.978 | 2.33  | 0.005 | 0.02  | 0.02  | 568.299 | 0.009 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Graders        | 1990 | 26     | 50      | 10.997   | 4.776  | 9.678   | 7.935   | 0.871  | 1.265  | 1.265  | 568.3    | 0.431  |
| Graders        | 1990 | 51     | 120     | 14.614   | 2.332  | 5.658   | 14.78   | 0.791  | 1.325  | 1.325  | 568.299  | 0.21   |
| Graders        | 1990 | 121    | 175     | 17.684   | 1.707  | 5.007   | 13.838  | 0.758  | 0.946  | 0.946  | 568.299  | 0.154  |
| Graders        | 1990 | 176    | 250     | 24.561   | 1.707  | 5.007   | 13.838  | 0.758  | 0.946  | 0.946  | 568.299  | 0.154  |
| Graders        | 1990 | 251    | 500     | 29.01    | 1.512  | 10.95   | 13.128  | 0.662  | 0.811  | 0.811  | 568.299  | 0.136  |
| Graders        | 1990 | 501    | 750     | 61.406   | 1.512  | 10.95   | 13.128  | 1.018  | 0.826  | 0.826  | 568.3    | 0.136  |
| Graders        | 2000 | 26     | 50      | 10.331   | 4.487  | 9.239   | 7.082   | 0.066  | 0.935  | 0.935  | 568.299  | 0.404  |
| Graders        | 2000 | 51     | 120     | 11.628   | 1.855  | 4.675   | 10.486  | 0.06   | 0.904  | 0.904  | 568.3    | 0.167  |
| Graders        | 2000 | 121    | 175     | 13.017   | 1.256  | 3.786   | 9.601   | 0.057  | 0.531  | 0.531  | 568.299  | 0.113  |
| Graders        | 2000 | 176    | 250     | 15.266   | 1.061  | 3.039   | 9.264   | 0.057  | 0.437  | 0.437  | 568.299  | 0.095  |
| Graders        | 2000 | 251    | 500     | 18.455   | 0.961  | 4.848   | 8.805   | 0.05   | 0.384  | 0.384  | 568.3    | 0.086  |
| Graders        | 2000 | 501    | 750     | 39.064   | 0.961  | 4.848   | 8.805   | 0.052  | 0.384  | 0.384  | 568.299  | 0.086  |
| Graders        | 2005 | 26     | 50      | 9.193    | 3.993  | 8.559   | 6.612   | 0.066  | 0.868  | 0.868  | 568.299  | 0.36   |
| Graders        | 2005 | 51     | 120     | 10.174   | 1.623  | 4.406   | 9.021   | 0.06   | 0.849  | 0.849  | 568.3    | 0.146  |
| Graders        | 2005 | 121    | 175     | 11.01    | 1.062  | 3.522   | 8.238   | 0.057  | 0.469  | 0.469  | 568.299  | 0.095  |
| Graders        | 2005 | 176    | 250     | 11.283   | 0.784  | 2.17    | 7.837   | 0.057  | 0.314  | 0.314  | 568.299  | 0.07   |
| Graders        | 2005 | 251    | 500     | 13.286   | 0.692  | 2.913   | 7.117   | 0.05   | 0.279  | 0.279  | 568.299  | 0.062  |
| Graders        | 2005 | 501    | 750     | 28.569   | 0.703  | 2.909   | 7.284   | 0.052  | 0.282  | 0.282  | 568.299  | 0.063  |
| Graders        | 2010 | 26     | 50      | 3.618169 | 3.0403 | 8.828   | 6.50487 | 0.005  | 0.8516 | 0.7835 | 547.2284 | 0.1593 |
| Graders        | 2010 | 51     | 120     | 1.572744 | 1.3215 | 4.95239 | 10.4805 | 0.0048 | 0.8539 | 0.7856 | 523.7684 | 0.1525 |
| Graders        | 2010 | 121    | 175     | 1.025452 | 0.8617 | 3.90428 | 8.98998 | 0.005  | 0.4962 | 0.4565 | 536.7031 | 0.1562 |
| Graders        | 2010 | 176    | 250     | 0.425787 | 0.3578 | 1.43786 | 5.73143 | 0.0049 | 0.1816 | 0.167  | 530.3343 | 0.1544 |
| Graders        | 2010 | 251    | 500     | 0.323814 | 0.2721 | 1.81115 | 3.80781 | 0.0049 | 0.1418 | 0.1304 | 525.6597 | 0.153  |
| Graders        | 2010 | 501    | 750     | 21.764   | 0.535  | 1.861   | 5.386   | 0.005  | 0.202  | 0.202  | 568.299  | 0.048  |
| Graders        | 2011 | 26     | 50      | 3.655035 | 3.0712 | 8.9223  | 6.52829 | 0.005  | 0.8596 | 0.7909 | 545.8822 | 0.1593 |
| Graders        | 2011 | 51     | 120     | 1.554125 | 1.3059 | 4.9423  | 10.3495 | 0.0048 | 0.8474 | 0.7796 | 522.5082 | 0.1525 |
| Graders        | 2011 | 121    | 175     | 1.019798 | 0.8569 | 3.91881 | 8.91245 | 0.005  | 0.4944 | 0.4548 | 535.2864 | 0.1562 |
| Graders        | 2011 | 176    | 250     | 0.436805 | 0.367  | 1.44556 | 5.74733 | 0.0049 | 0.1832 | 0.1685 | 529.0473 | 0.1544 |
| Graders        | 2011 | 251    | 500     | 0.341103 | 0.2866 | 1.83104 | 3.81827 | 0.0049 | 0.144  | 0.1325 | 524.3479 | 0.153  |
| Graders        | 2011 | 501    | 750     | 20.697   | 0.509  | 1.744   | 4.992   | 0.005  | 0.184  | 0.184  | 568.299  | 0.045  |
| Graders        | 2012 | 26     | 50      | 3.689945 | 3.1006 | 9.01183 | 6.55055 | 0.005  | 0.8672 | 0.7979 | 544.5383 | 0.1593 |
| Graders        | 2012 | 51     | 120     | 1.550155 | 1.3026 | 4.94871 | 10.2881 | 0.0048 | 0.848  | 0.7801 | 521.1967 | 0.1525 |
| Graders        | 2012 | 121    | 175     | 1.022941 | 0.8596 | 3.94251 | 8.89699 | 0.005  | 0.496  | 0.4563 | 533.878  | 0.1562 |
| Graders        | 2012 | 176    | 250     | 0.449323 | 0.3776 | 1.45898 | 5.777   | 0.0049 | 0.1854 | 0.1706 | 527.8224 | 0.1544 |
| Graders        | 2012 | 251    | 500     | 0.355329 | 0.2986 | 1.82432 | 3.8123  | 0.0049 | 0.145  | 0.1334 | 522.8547 | 0.153  |
| Graders        | 2012 | 501    | 750     | 19.697   | 0.485  | 1.642   | 4.624   | 0.005  | 0.168  | 0.168  | 568.299  | 0.043  |
| Graders        | 2013 | 26     | 50      | 3.722893 | 3.1283 | 9.0966  | 6.57166 | 0.005  | 0.8744 | 0.8045 | 541.8285 | 0.1593 |
| Graders        | 2013 | 51     | 120     | 1.548648 | 1.3013 | 4.95898 | 10.2424 | 0.0048 | 0.8494 | 0.7814 | 518.5552 | 0.1525 |
| Graders        | 2013 | 121    | 175     | 1.020021 | 0.8571 | 3.95423 | 8.8338  | 0.005  | 0.4951 | 0.4555 | 530.9753 | 0.1561 |
| Graders        | 2013 | 176    | 250     | 0.455824 | 0.383  | 1.45924 | 5.74577 | 0.0049 | 0.1849 | 0.1701 | 525.0407 | 0.1544 |
| Graders        | 2013 | 251    | 500     | 0.359627 | 0.3022 | 1.7965  | 3.71231 | 0.0049 | 0.1413 | 0.13   | 520.0526 | 0.1529 |
| Graders        | 2013 | 501    | 750     | 18.765   | 0.462  | 1.556   | 4.281   | 0.005  | 0.152  | 0.152  | 568.299  | 0.041  |
| Graders        | 2014 | 26     | 50      | 3.681797 | 3.0937 | 9.06534 | 6.54967 | 0.005  | 0.8672 | 0.7978 | 539.1216 | 0.1593 |
| Graders        | 2014 | 51     | 120     | 1.510465 | 1.2692 | 4.91977 | 9.98567 | 0.0048 | 0.832  | 0.7654 | 515.3819 | 0.1523 |
| Graders        | 2014 | 121    | 175     | 1.007876 | 0.8469 | 3.95083 | 8.70206 | 0.005  | 0.4884 | 0.4493 | 527.8337 | 0.156  |
| Graders        | 2014 | 176    | 250     | 0.463867 | 0.3898 | 1.46245 | 5.73998 | 0.0049 | 0.1853 | 0.1705 | 522.3298 | 0.1544 |
| Graders        | 2014 | 251    | 500     | 0.373775 | 0.3141 | 1.79096 | 3.71371 | 0.0049 | 0.1427 | 0.1313 | 517.3766 | 0.1529 |
| Graders        | 2014 | 501    | 750     | 17.784   | 0.437  | 1.483   | 3.876   | 0.005  | 0.138  | 0.138  | 568.299  | 0.039  |
| Graders        | 2015 | 26     | 50      | 3.711306 | 3.1185 | 9.14399 | 6.56967 | 0.005  | 0.8737 | 0.8038 | 533.6812 | 0.1593 |
| Graders        | 2015 | 51     | 120     | 1.474627 | 1.2391 | 4.88439 | 9.73775 | 0.0048 | 0.8131 | 0.7481 | 509.597  | 0.1521 |
| Graders        | 2015 | 121    | 175     | 1.004333 | 0.8439 | 3.95849 | 8.63742 | 0.005  | 0.4857 | 0.4468 | 522.2182 | 0.1559 |
| Graders        | 2015 | 176    | 250     | 0.471304 | 0.396  | 1.46577 | 5.72754 | 0.0049 | 0.1856 | 0.1708 | 517.1275 | 0.1544 |
| Graders        | 2015 | 251    | 500     | 0.388063 | 0.3261 | 1.79107 | 3.72122 | 0.0049 | 0.1442 | 0.1327 | 512.0975 | 0.1529 |
| Graders        | 2015 | 501    | 750     | 16.846   | 0.414  | 1.42    | 3.501   | 0.005  | 0.124  | 0.124  | 568.299  | 0.037  |
| Graders        | 2016 | 26     | 50      | 3.670899 | 3.0846 | 9.10623 | 6.51973 | 0.005  | 0.8644 | 0.7952 | 528.2444 | 0.1593 |
| Graders        | 2016 | 51     | 120     | 1.419659 | 1.1929 | 4.82948 | 9.41488 | 0.0048 | 0.7799 | 0.7175 | 503.1614 | 0.1518 |
| Graders        | 2016 | 121    | 175     | 0.963567 | 0.8097 | 3.91624 | 8.24966 | 0.005  | 0.4635 | 0.4264 | 516.1305 | 0.1557 |
| Graders        | 2016 | 176    | 250     | 0.473996 | 0.3983 | 1.45911 | 5.6628  | 0.0049 | 0.184  | 0.1692 | 511.6959 | 0.1543 |
| Graders        | 2016 | 251    | 500     | 0.397787 | 0.3343 | 1.77374 | 3.6858  | 0.0049 | 0.144  | 0.1325 | 506.5064 | 0.1528 |
| Graders        | 2016 | 501    | 750     | 15.959   | 0.393  | 1.367   | 3.154   | 0.005  | 0.112  | 0.112  | 568.299  | 0.035  |
| Graders        | 2017 | 26     | 50      | 3.5783   | 3.0068 | 8.97826 | 6.423   | 0.005  | 0.8434 | 0.776  | 520.0747 | 0.1593 |
| Graders        | 2017 | 51     | 120     | 1.385767 | 1.1644 | 4.81041 | 9.19125 | 0.0048 | 0.7585 | 0.6978 | 495.9186 | 0.1519 |
| Graders        | 2017 | 121    | 175     | 0.901    | 0.7571 | 3.84518 | 7.66265 | 0.0049 | 0.4304 | 0.396  | 506.7478 | 0.1553 |
| Graders        | 2017 | 176    | 250     | 0.471391 | 0.3961 | 1.44905 | 5.52488 | 0.0049 | 0.1802 | 0.1658 | 503.8022 | 0.1544 |
| Graders        | 2017 | 251    | 500     | 0.397706 | 0.3342 | 1.70747 | 3.55709 | 0.0049 | 0.1393 | 0.1282 | 498.5996 | 0.1528 |
| Graders        | 2017 | 501    | 750     | 15.127   | 0.372  | 1.323   | 2.835   | 0.005  | 0.1    | 0.1    | 568.299  | 0.033  |
| Graders        | 2018 | 26     | 50      | 3.342571 | 2.8087 | 8.62631 | 6.17962 | 0.005  | 0.7895 | 0.7264 | 511.9098 | 0.1594 |
| Graders        | 2018 | 51     | 120     | 1.27956  | 1.0752 | 4.69711 | 8.51954 | 0.0048 | 0.6971 | 0.6413 | 487.6979 | 0.1518 |
| Graders        | 2018 | 121    | 175     | 0.78708  | 0.6614 | 3.70957 | 6.60465 | 0.0049 | 0.3713 | 0.3416 | 497.3767 | 0.1548 |
| Graders        | 2018 | 176    | 250     | 0.457376 | 0.3843 | 1.41595 | 5.27094 | 0.0049 | 0.1713 | 0.1576 | 495.431  | 0.1542 |
| Graders        | 2018 | 251    | 500     | 0.385909 | 0.3243 | 1.56446 | 3.34465 | 0.0049 | 0.1295 | 0.1191 | 490.5758 | 0.1527 |
| Graders        | 2018 | 501    | 750     | 14.353   | 0.353  | 1.286   | 2.543   | 0.005  | 0.09   | 0.09   | 568.299  | 0.031  |
| Graders        | 2019 | 26     | 50      | 3.11378  | 2.6164 | 8.27912 | 5.94463 | 0.005  | 0.7367 | 0.6778 | 503.7509 | 0.1594 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type       | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Graders              | 2019 | 51     | 120     | 1.228249 | 1.0321 | 4.6424  | 8.1592  | 0.0048 | 0.6653 | 0.612  | 479.9011 | 0.1518 |
| Graders              | 2019 | 121    | 175     | 0.724541 | 0.6088 | 3.65586 | 6.01354 | 0.0049 | 0.3365 | 0.3096 | 489.0419 | 0.1547 |
| Graders              | 2019 | 176    | 250     | 0.428358 | 0.3599 | 1.35927 | 4.86575 | 0.0049 | 0.1562 | 0.1437 | 486.3288 | 0.1539 |
| Graders              | 2019 | 251    | 500     | 0.384059 | 0.3227 | 1.52849 | 3.21794 | 0.0049 | 0.1244 | 0.1145 | 482.5879 | 0.1527 |
| Graders              | 2019 | 501    | 750     | 13.635   | 0.335  | 1.255   | 2.276   | 0.005  | 0.08   | 0.08   | 568.299  | 0.03   |
| Graders              | 2020 | 26     | 50      | 2.994737 | 2.5164 | 8.13394 | 5.82549 | 0.005  | 0.7086 | 0.6519 | 492.8615 | 0.1594 |
| Graders              | 2020 | 51     | 120     | 1.161574 | 0.976  | 4.56142 | 7.72513 | 0.0048 | 0.622  | 0.5722 | 469.3371 | 0.1518 |
| Graders              | 2020 | 121    | 175     | 0.674427 | 0.5667 | 3.62102 | 5.53045 | 0.0049 | 0.3085 | 0.2838 | 478.0403 | 0.1546 |
| Graders              | 2020 | 176    | 250     | 0.41877  | 0.3519 | 1.34183 | 4.67787 | 0.0049 | 0.1495 | 0.1376 | 475.3037 | 0.1537 |
| Graders              | 2020 | 251    | 500     | 0.383198 | 0.322  | 1.5256  | 3.10731 | 0.0049 | 0.1206 | 0.111  | 471.9795 | 0.1526 |
| Graders              | 2020 | 501    | 750     | 12.961   | 0.319  | 1.229   | 2.031   | 0.005  | 0.072  | 0.072  | 568.299  | 0.028  |
| Graders              | 2021 | 26     | 50      | 2.660206 | 2.2353 | 7.62621 | 5.48468 | 0.005  | 0.6313 | 0.5808 | 492.9352 | 0.1594 |
| Graders              | 2021 | 51     | 120     | 1.072144 | 0.9009 | 4.45175 | 7.12535 | 0.0048 | 0.5698 | 0.5242 | 469.0701 | 0.1517 |
| Graders              | 2021 | 121    | 175     | 0.601372 | 0.5053 | 3.55896 | 4.83947 | 0.0049 | 0.27   | 0.2484 | 478.5289 | 0.1548 |
| Graders              | 2021 | 176    | 250     | 0.398657 | 0.335  | 1.30687 | 4.38134 | 0.0049 | 0.1388 | 0.1277 | 474.5386 | 0.1535 |
| Graders              | 2021 | 251    | 500     | 0.383194 | 0.322  | 1.46044 | 3.01257 | 0.0049 | 0.117  | 0.1077 | 471.8981 | 0.1526 |
| Graders              | 2021 | 501    | 750     | 12.333   | 0.303  | 1.207   | 1.808   | 0.005  | 0.064  | 0.064  | 568.299  | 0.027  |
| Graders              | 2022 | 26     | 50      | 2.506375 | 2.1061 | 7.42848 | 5.33188 | 0.005  | 0.5946 | 0.547  | 493.0249 | 0.1595 |
| Graders              | 2022 | 51     | 120     | 0.947815 | 0.7964 | 4.32966 | 6.36004 | 0.0048 | 0.4929 | 0.4534 | 469.6301 | 0.1519 |
| Graders              | 2022 | 121    | 175     | 0.524016 | 0.4403 | 3.49283 | 4.12488 | 0.0049 | 0.2293 | 0.2109 | 478.5664 | 0.1548 |
| Graders              | 2022 | 176    | 250     | 0.365229 | 0.3069 | 1.27327 | 3.8881  | 0.0049 | 0.1237 | 0.1138 | 474.239  | 0.1534 |
| Graders              | 2022 | 251    | 500     | 0.370143 | 0.311  | 1.38967 | 2.80191 | 0.0049 | 0.1082 | 0.0996 | 471.9278 | 0.1526 |
| Graders              | 2022 | 501    | 750     | 11.747   | 0.289  | 1.187   | 1.606   | 0.005  | 0.057  | 0.057  | 568.299  | 0.026  |
| Graders              | 2023 | 26     | 50      | 2.316861 | 1.9468 | 7.19094 | 5.14799 | 0.0051 | 0.5491 | 0.5052 | 494.0202 | 0.1598 |
| Graders              | 2023 | 51     | 120     | 0.855685 | 0.719  | 4.22811 | 5.74006 | 0.0048 | 0.4357 | 0.4009 | 469.2859 | 0.1518 |
| Graders              | 2023 | 121    | 175     | 0.463941 | 0.3898 | 3.45006 | 3.54785 | 0.0049 | 0.1953 | 0.1797 | 478.4629 | 0.1547 |
| Graders              | 2023 | 176    | 250     | 0.337478 | 0.2836 | 1.25173 | 3.44101 | 0.0049 | 0.1115 | 0.1026 | 473.9256 | 0.1533 |
| Graders              | 2023 | 251    | 500     | 0.367269 | 0.3086 | 1.38481 | 2.70451 | 0.0049 | 0.1051 | 0.0967 | 471.0306 | 0.1523 |
| Graders              | 2023 | 501    | 750     | 11.215   | 0.276  | 1.17    | 1.425   | 0.005  | 0.051  | 0.051  | 568.3    | 0.024  |
| Graders              | 2024 | 26     | 50      | 2.201935 | 1.8502 | 7.05059 | 5.0278  | 0.0051 | 0.5204 | 0.4787 | 493.7913 | 0.1597 |
| Graders              | 2024 | 51     | 120     | 0.812369 | 0.6826 | 4.20033 | 5.43389 | 0.0048 | 0.408  | 0.3753 | 469.8208 | 0.1519 |
| Graders              | 2024 | 121    | 175     | 0.433005 | 0.3638 | 3.43239 | 3.20219 | 0.0049 | 0.1768 | 0.1626 | 478.4966 | 0.1548 |
| Graders              | 2024 | 176    | 250     | 0.312074 | 0.2622 | 1.22497 | 3.07323 | 0.0049 | 0.0997 | 0.0917 | 473.6685 | 0.1532 |
| Graders              | 2024 | 251    | 500     | 0.348233 | 0.2926 | 1.35613 | 2.43171 | 0.0049 | 0.0953 | 0.0877 | 470.2664 | 0.1521 |
| Graders              | 2024 | 501    | 750     | 10.734   | 0.264  | 1.155   | 1.265   | 0.005  | 0.046  | 0.046  | 568.3    | 0.023  |
| Graders              | 2025 | 26     | 50      | 2.21878  | 1.8644 | 7.12535 | 5.04301 | 0.0051 | 0.5215 | 0.4798 | 493.5322 | 0.1596 |
| Graders              | 2025 | 51     | 120     | 0.759044 | 0.6378 | 4.14911 | 5.07379 | 0.0048 | 0.3712 | 0.3415 | 468.3155 | 0.1515 |
| Graders              | 2025 | 121    | 175     | 0.391287 | 0.3288 | 3.41759 | 2.77396 | 0.0049 | 0.1521 | 0.1399 | 478.5084 | 0.1548 |
| Graders              | 2025 | 176    | 250     | 0.273788 | 0.2301 | 1.17888 | 2.55629 | 0.0049 | 0.0823 | 0.0757 | 473.4704 | 0.1531 |
| Graders              | 2025 | 251    | 500     | 0.332717 | 0.2796 | 1.31461 | 2.26485 | 0.0049 | 0.088  | 0.0809 | 470.7533 | 0.1523 |
| Graders              | 2025 | 501    | 750     | 10.301   | 0.253  | 1.141   | 1.125   | 0.005  | 0.041  | 0.041  | 568.3    | 0.022  |
| Graders              | 2030 | 26     | 50      | 1.493    | 0.648  | 5.239   | 3.53    | 0.007  | 0.065  | 0.065  | 568.299  | 0.058  |
| Graders              | 2030 | 51     | 120     | 2.028    | 0.323  | 3.775   | 1.903   | 0.006  | 0.058  | 0.058  | 568.299  | 0.029  |
| Graders              | 2030 | 121    | 175     | 2.458    | 0.237  | 3.326   | 0.815   | 0.006  | 0.038  | 0.038  | 568.3    | 0.021  |
| Graders              | 2030 | 176    | 250     | 3.114    | 0.216  | 1.148   | 0.684   | 0.006  | 0.024  | 0.024  | 568.299  | 0.019  |
| Graders              | 2030 | 251    | 500     | 4.115    | 0.214  | 1.097   | 0.647   | 0.005  | 0.023  | 0.023  | 568.299  | 0.019  |
| Graders              | 2030 | 501    | 750     | 8.717    | 0.214  | 1.097   | 0.654   | 0.005  | 0.023  | 0.023  | 568.299  | 0.019  |
| Graders              | 2035 | 26     | 50      | 1.367    | 0.593  | 5.189   | 3.356   | 0.007  | 0.037  | 0.037  | 568.299  | 0.053  |
| Graders              | 2035 | 51     | 120     | 1.837    | 0.293  | 3.767   | 1.661   | 0.006  | 0.034  | 0.034  | 568.299  | 0.026  |
| Graders              | 2035 | 121    | 175     | 2.136    | 0.206  | 3.326   | 0.506   | 0.006  | 0.022  | 0.022  | 568.3    | 0.018  |
| Graders              | 2035 | 176    | 250     | 2.822    | 0.196  | 1.137   | 0.452   | 0.006  | 0.016  | 0.016  | 568.299  | 0.017  |
| Graders              | 2035 | 251    | 500     | 3.746    | 0.195  | 1.083   | 0.434   | 0.005  | 0.016  | 0.016  | 568.299  | 0.017  |
| Graders              | 2035 | 501    | 750     | 7.933    | 0.195  | 1.083   | 0.438   | 0.005  | 0.016  | 0.016  | 568.299  | 0.017  |
| Graders              | 2040 | 26     | 50      | 1.297    | 0.563  | 5.161   | 3.298   | 0.007  | 0.026  | 0.026  | 568.3    | 0.05   |
| Graders              | 2040 | 51     | 120     | 1.747    | 0.278  | 3.764   | 1.56    | 0.006  | 0.024  | 0.024  | 568.299  | 0.025  |
| Graders              | 2040 | 121    | 175     | 2.002    | 0.193  | 3.326   | 0.38    | 0.006  | 0.017  | 0.017  | 568.299  | 0.017  |
| Graders              | 2040 | 176    | 250     | 2.719    | 0.188  | 1.133   | 0.36    | 0.006  | 0.013  | 0.013  | 568.299  | 0.017  |
| Graders              | 2040 | 251    | 500     | 3.619    | 0.188  | 1.079   | 0.351   | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Graders              | 2040 | 501    | 750     | 7.663    | 0.188  | 1.079   | 0.353   | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Off-Highway Tractors | 1990 | 51     | 120     | 7.901    | 2.432  | 5.842   | 15.285  | 0.791  | 1.384  | 1.384  | 568.299  | 0.219  |
| Off-Highway Tractors | 1990 | 121    | 175     | 8.363    | 1.85   | 5.217   | 14.647  | 0.758  | 1.033  | 1.033  | 568.299  | 0.166  |
| Off-Highway Tractors | 1990 | 176    | 250     | 8.363    | 1.85   | 5.217   | 14.647  | 0.758  | 1.033  | 1.033  | 568.299  | 0.166  |
| Off-Highway Tractors | 1990 | 501    | 750     | 32.077   | 1.629  | 11.847  | 13.849  | 1.018  | 0.896  | 0.896  | 568.3    | 0.147  |
| Off-Highway Tractors | 1990 | 751    | 1000    | 45.779   | 1.622  | 11.847  | 13.849  | 1.018  | 0.888  | 0.888  | 568.3    | 0.146  |
| Off-Highway Tractors | 2000 | 51     | 120     | 6.648    | 2.047  | 5.046   | 11.606  | 0.06   | 0.972  | 0.972  | 568.299  | 0.184  |
| Off-Highway Tractors | 2000 | 121    | 175     | 6.386    | 1.413  | 4.213   | 10.675  | 0.057  | 0.602  | 0.602  | 568.299  | 0.127  |
| Off-Highway Tractors | 2000 | 176    | 250     | 5.736    | 1.269  | 3.665   | 10.426  | 0.057  | 0.532  | 0.532  | 568.299  | 0.114  |
| Off-Highway Tractors | 2000 | 501    | 750     | 22.339   | 1.134  | 6.836   | 9.864   | 0.052  | 0.461  | 0.461  | 568.299  | 0.102  |
| Off-Highway Tractors | 2000 | 751    | 1000    | 33.036   | 1.17   | 7.259   | 10.29   | 0.052  | 0.444  | 0.444  | 568.299  | 0.105  |
| Off-Highway Tractors | 2005 | 51     | 120     | 6.042    | 1.86   | 4.801   | 10.379  | 0.06   | 0.932  | 0.932  | 568.299  | 0.167  |
| Off-Highway Tractors | 2005 | 121    | 175     | 5.63     | 1.246  | 3.943   | 9.479   | 0.057  | 0.547  | 0.547  | 568.299  | 0.112  |
| Off-Highway Tractors | 2005 | 176    | 250     | 4.641    | 1.027  | 2.923   | 9.16    | 0.057  | 0.425  | 0.425  | 568.299  | 0.092  |
| Off-Highway Tractors | 2005 | 501    | 750     | 17.978   | 0.913  | 4.992   | 8.543   | 0.052  | 0.372  | 0.372  | 568.299  | 0.082  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type       | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Off-Highway Tractors | 2005 | 751    | 1000    | 27.525   | 0.975  | 5.369   | 9.293   | 0.052  | 0.359  | 0.359  | 568.299  | 0.088  |
| Off-Highway Tractors | 2010 | 51     | 120     | 1.004164 | 0.8438 | 4.06859 | 7.39576 | 0.0049 | 0.6097 | 0.5609 | 529.8898 | 0.1542 |
| Off-Highway Tractors | 2010 | 121    | 175     | 0.623556 | 0.524  | 3.25207 | 6.19445 | 0.0049 | 0.3224 | 0.2966 | 526.0485 | 0.1531 |
| Off-Highway Tractors | 2010 | 176    | 250     | 0.540439 | 0.4541 | 1.80076 | 6.56823 | 0.0049 | 0.241  | 0.2218 | 522.8212 | 0.1522 |
| Off-Highway Tractors | 2010 | 501    | 750     | 0.353776 | 0.2973 | 1.65183 | 4.74911 | 0.0049 | 0.1633 | 0.1503 | 526.6401 | 0.1533 |
| Off-Highway Tractors | 2010 | 751    | 1000    | 1.235451 | 1.0381 | 13.844  | 12.2723 | 0.0049 | 0.6244 | 0.5744 | 524.505  | 0.1527 |
| Off-Highway Tractors | 2011 | 51     | 120     | 0.958318 | 0.8053 | 4.04749 | 7.12201 | 0.0049 | 0.5883 | 0.5412 | 528.6123 | 0.1543 |
| Off-Highway Tractors | 2011 | 121    | 175     | 0.588696 | 0.4947 | 3.25718 | 5.88095 | 0.0049 | 0.307  | 0.2824 | 524.5528 | 0.1531 |
| Off-Highway Tractors | 2011 | 176    | 250     | 0.522937 | 0.4394 | 1.73271 | 6.3706  | 0.0049 | 0.2303 | 0.2119 | 521.5328 | 0.1522 |
| Off-Highway Tractors | 2011 | 501    | 750     | 0.366196 | 0.3077 | 1.66137 | 4.77936 | 0.0049 | 0.1661 | 0.1528 | 525.3172 | 0.1533 |
| Off-Highway Tractors | 2011 | 751    | 1000    | 1.235451 | 1.0381 | 13.844  | 12.2723 | 0.0049 | 0.6244 | 0.5744 | 523.1938 | 0.1527 |
| Off-Highway Tractors | 2012 | 51     | 120     | 0.956826 | 0.804  | 4.07302 | 7.07175 | 0.0049 | 0.588  | 0.5409 | 527.1281 | 0.1542 |
| Off-Highway Tractors | 2012 | 121    | 175     | 0.573556 | 0.4819 | 3.27598 | 5.70904 | 0.0049 | 0.2995 | 0.2755 | 523.1986 | 0.1531 |
| Off-Highway Tractors | 2012 | 176    | 250     | 0.51645  | 0.434  | 1.70131 | 6.26836 | 0.0049 | 0.2249 | 0.2069 | 520.2636 | 0.1522 |
| Off-Highway Tractors | 2012 | 501    | 750     | 0.3785   | 0.318  | 1.67078 | 4.80904 | 0.0049 | 0.1689 | 0.1554 | 523.9941 | 0.1533 |
| Off-Highway Tractors | 2012 | 751    | 1000    | 1.235451 | 1.0381 | 13.844  | 12.2723 | 0.0049 | 0.6244 | 0.5744 | 521.8825 | 0.1527 |
| Off-Highway Tractors | 2013 | 51     | 120     | 0.915141 | 0.769  | 4.04714 | 6.79599 | 0.0049 | 0.564  | 0.5189 | 524.1555 | 0.1541 |
| Off-Highway Tractors | 2013 | 121    | 175     | 0.54434  | 0.4574 | 3.28016 | 5.42114 | 0.0049 | 0.2809 | 0.2585 | 520.6151 | 0.1531 |
| Off-Highway Tractors | 2013 | 176    | 250     | 0.508791 | 0.4275 | 1.67153 | 6.11434 | 0.0049 | 0.2187 | 0.2012 | 517.5627 | 0.1522 |
| Off-Highway Tractors | 2013 | 501    | 750     | 0.342496 | 0.2878 | 1.42496 | 4.32547 | 0.0049 | 0.1491 | 0.1372 | 519.6246 | 0.1528 |
| Off-Highway Tractors | 2013 | 751    | 1000    | 1.235451 | 1.0381 | 13.844  | 12.2723 | 0.0049 | 0.6244 | 0.5744 | 519.26   | 0.1527 |
| Off-Highway Tractors | 2014 | 51     | 120     | 0.830806 | 0.6981 | 3.97241 | 6.28073 | 0.0049 | 0.5133 | 0.4723 | 520.8244 | 0.1539 |
| Off-Highway Tractors | 2014 | 121    | 175     | 0.504784 | 0.4242 | 3.26511 | 5.02525 | 0.0049 | 0.2577 | 0.2371 | 518.1639 | 0.1531 |
| Off-Highway Tractors | 2014 | 176    | 250     | 0.481559 | 0.4046 | 1.62822 | 5.66092 | 0.0049 | 0.2031 | 0.1869 | 514.3699 | 0.152  |
| Off-Highway Tractors | 2014 | 501    | 750     | 0.317193 | 0.2665 | 1.33448 | 4.00651 | 0.0049 | 0.133  | 0.1223 | 516.904  | 0.1528 |
| Off-Highway Tractors | 2014 | 751    | 1000    | 0.100665 | 0.0846 | 0.94694 | 2.27938 | 0.0049 | 0.0543 | 0.0499 | 516.6375 | 0.1527 |
| Off-Highway Tractors | 2015 | 51     | 120     | 0.802587 | 0.6744 | 3.96474 | 6.06726 | 0.0049 | 0.4942 | 0.4547 | 515.3203 | 0.1538 |
| Off-Highway Tractors | 2015 | 121    | 175     | 0.478075 | 0.4017 | 3.26419 | 4.72365 | 0.0049 | 0.2393 | 0.2201 | 512.6079 | 0.153  |
| Off-Highway Tractors | 2015 | 176    | 250     | 0.476529 | 0.4004 | 1.60534 | 5.52773 | 0.0049 | 0.1989 | 0.183  | 509.1896 | 0.152  |
| Off-Highway Tractors | 2015 | 501    | 750     | 0.312134 | 0.2623 | 1.17195 | 3.87437 | 0.0049 | 0.1262 | 0.1161 | 511.0814 | 0.1526 |
| Off-Highway Tractors | 2015 | 751    | 1000    | 0.114305 | 0.096  | 0.96003 | 2.29983 | 0.0049 | 0.0558 | 0.0513 | 511.3924 | 0.1527 |
| Off-Highway Tractors | 2016 | 51     | 120     | 0.743357 | 0.6246 | 3.92464 | 5.6465  | 0.0049 | 0.4538 | 0.4175 | 509.4472 | 0.1537 |
| Off-Highway Tractors | 2016 | 121    | 175     | 0.465284 | 0.391  | 3.27806 | 4.51093 | 0.0049 | 0.229  | 0.2106 | 507.6294 | 0.1531 |
| Off-Highway Tractors | 2016 | 176    | 250     | 0.426838 | 0.3587 | 1.47177 | 4.92994 | 0.0049 | 0.1709 | 0.1572 | 504.1229 | 0.1521 |
| Off-Highway Tractors | 2016 | 501    | 750     | 0.299821 | 0.2519 | 1.14348 | 3.57265 | 0.0049 | 0.1171 | 0.1077 | 505.762  | 0.1526 |
| Off-Highway Tractors | 2016 | 751    | 1000    | 0.127675 | 0.1073 | 0.97285 | 2.31987 | 0.0049 | 0.0573 | 0.0527 | 506.1474 | 0.1527 |
| Off-Highway Tractors | 2017 | 51     | 120     | 0.697857 | 0.5864 | 3.90108 | 5.31726 | 0.0049 | 0.4229 | 0.389  | 501.2453 | 0.1536 |
| Off-Highway Tractors | 2017 | 121    | 175     | 0.423504 | 0.3559 | 3.2589  | 4.02594 | 0.0049 | 0.2049 | 0.1885 | 499.2446 | 0.153  |
| Off-Highway Tractors | 2017 | 176    | 250     | 0.389773 | 0.3275 | 1.403   | 4.38216 | 0.0049 | 0.1511 | 0.139  | 496.4983 | 0.1521 |
| Off-Highway Tractors | 2017 | 501    | 750     | 0.294592 | 0.2475 | 1.14456 | 3.32351 | 0.0049 | 0.1118 | 0.1029 | 497.6181 | 0.1525 |
| Off-Highway Tractors | 2017 | 751    | 1000    | 0.140776 | 0.1183 | 0.98542 | 2.33951 | 0.0049 | 0.0588 | 0.0541 | 498.2798 | 0.1527 |
| Off-Highway Tractors | 2018 | 51     | 120     | 0.621057 | 0.5219 | 3.83227 | 4.78732 | 0.0049 | 0.3728 | 0.343  | 492.8709 | 0.1534 |
| Off-Highway Tractors | 2018 | 121    | 175     | 0.374746 | 0.3149 | 3.2191  | 3.49764 | 0.0049 | 0.1756 | 0.1616 | 491.3128 | 0.153  |
| Off-Highway Tractors | 2018 | 176    | 250     | 0.323278 | 0.2716 | 1.29494 | 3.45421 | 0.0049 | 0.1186 | 0.1091 | 488.6765 | 0.1521 |
| Off-Highway Tractors | 2018 | 501    | 750     | 0.232675 | 0.1955 | 1.11871 | 2.1656  | 0.0049 | 0.0806 | 0.0741 | 490.1818 | 0.1526 |
| Off-Highway Tractors | 2018 | 751    | 1000    | 0.153606 | 0.1291 | 0.99773 | 2.35874 | 0.0049 | 0.0602 | 0.0554 | 490.4122 | 0.1527 |
| Off-Highway Tractors | 2019 | 51     | 120     | 0.562974 | 0.4731 | 3.79465 | 4.42145 | 0.0049 | 0.3311 | 0.3046 | 484.2693 | 0.1532 |
| Off-Highway Tractors | 2019 | 121    | 175     | 0.350048 | 0.2941 | 3.21895 | 3.20755 | 0.0049 | 0.1586 | 0.1459 | 483.4306 | 0.153  |
| Off-Highway Tractors | 2019 | 176    | 250     | 0.283777 | 0.2385 | 1.21832 | 2.9142  | 0.0049 | 0.0976 | 0.0898 | 481.2751 | 0.1523 |
| Off-Highway Tractors | 2019 | 501    | 750     | 0.244248 | 0.2052 | 1.12934 | 2.17682 | 0.0049 | 0.082  | 0.0754 | 482.3091 | 0.1526 |
| Off-Highway Tractors | 2019 | 751    | 1000    | 0.166166 | 0.1396 | 1.00978 | 2.37757 | 0.0049 | 0.0616 | 0.0567 | 482.5446 | 0.1527 |
| Off-Highway Tractors | 2020 | 51     | 120     | 0.533073 | 0.4479 | 3.78798 | 4.18317 | 0.0049 | 0.307  | 0.2825 | 474.1481 | 0.1533 |
| Off-Highway Tractors | 2020 | 121    | 175     | 0.322507 | 0.271  | 3.21511 | 2.89032 | 0.0049 | 0.1402 | 0.129  | 472.9169 | 0.153  |
| Off-Highway Tractors | 2020 | 176    | 250     | 0.263453 | 0.2214 | 1.1813  | 2.57547 | 0.0049 | 0.0862 | 0.0793 | 470.943  | 0.1523 |
| Off-Highway Tractors | 2020 | 501    | 750     | 0.239679 | 0.2014 | 1.13143 | 2.04663 | 0.0049 | 0.0762 | 0.0701 | 471.8151 | 0.1526 |
| Off-Highway Tractors | 2020 | 751    | 1000    | 0.178457 | 0.15   | 1.02156 | 2.39599 | 0.0049 | 0.063  | 0.058  | 472.0545 | 0.1527 |
| Off-Highway Tractors | 2021 | 51     | 120     | 0.469894 | 0.3948 | 3.74258 | 3.77306 | 0.0049 | 0.261  | 0.2401 | 474.5155 | 0.1535 |
| Off-Highway Tractors | 2021 | 121    | 175     | 0.307902 | 0.2587 | 3.21953 | 2.65962 | 0.0049 | 0.1286 | 0.1183 | 472.9236 | 0.153  |
| Off-Highway Tractors | 2021 | 176    | 250     | 0.237665 | 0.1997 | 1.16179 | 2.11341 | 0.0049 | 0.0723 | 0.0665 | 471.0028 | 0.1523 |
| Off-Highway Tractors | 2021 | 501    | 750     | 0.215694 | 0.1812 | 1.12237 | 1.71505 | 0.0049 | 0.063  | 0.058  | 471.8056 | 0.1526 |
| Off-Highway Tractors | 2021 | 751    | 1000    | 0.190478 | 0.1601 | 1.0331  | 2.41401 | 0.0049 | 0.0644 | 0.0592 | 472.0545 | 0.1527 |
| Off-Highway Tractors | 2022 | 51     | 120     | 0.414344 | 0.3482 | 3.70994 | 3.39986 | 0.0049 | 0.2194 | 0.2018 | 475.2338 | 0.1537 |
| Off-Highway Tractors | 2022 | 121    | 175     | 0.275155 | 0.2312 | 3.18586 | 2.23877 | 0.0049 | 0.1073 | 0.0987 | 472.8111 | 0.1529 |
| Off-Highway Tractors | 2022 | 176    | 250     | 0.213642 | 0.1795 | 1.14284 | 1.73242 | 0.0049 | 0.0601 | 0.0553 | 471.1313 | 0.1524 |
| Off-Highway Tractors | 2022 | 501    | 750     | 0.20345  | 0.171  | 1.12111 | 1.43309 | 0.0049 | 0.0545 | 0.0501 | 471.939  | 0.1526 |
| Off-Highway Tractors | 2022 | 751    | 1000    | 0.202228 | 0.1699 | 1.04437 | 2.43162 | 0.0049 | 0.0657 | 0.0604 | 472.0545 | 0.1527 |
| Off-Highway Tractors | 2023 | 51     | 120     | 0.37642  | 0.3163 | 3.68654 | 3.09527 | 0.0049 | 0.1871 | 0.1721 | 476.0871 | 0.154  |
| Off-Highway Tractors | 2023 | 121    | 175     | 0.239199 | 0.201  | 3.14329 | 1.78476 | 0.0049 | 0.0854 | 0.0785 | 472.9962 | 0.153  |
| Off-Highway Tractors | 2023 | 176    | 250     | 0.20356  | 0.171  | 1.13796 | 1.49148 | 0.0049 | 0.053  | 0.0487 | 470.845  | 0.1523 |
| Off-Highway Tractors | 2023 | 501    | 750     | 0.199838 | 0.1679 | 1.12418 | 1.28868 | 0.0049 | 0.0508 | 0.0467 | 471.9321 | 0.1526 |
| Off-Highway Tractors | 2023 | 751    | 1000    | 0.213709 | 0.1796 | 1.05538 | 2.44883 | 0.0049 | 0.067  | 0.0616 | 472.0545 | 0.1527 |
| Off-Highway Tractors | 2024 | 51     | 120     | 0.359218 | 0.3018 | 3.69095 | 2.94932 | 0.0049 | 0.1705 | 0.1569 | 476.3711 | 0.1541 |
| Off-Highway Tractors | 2024 | 121    | 175     | 0.21727  | 0.1826 | 3.1328  | 1.49579 | 0.0049 | 0.0715 | 0.0658 | 473.097  | 0.153  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type       | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Off-Highway Tractors | 2024 | 176    | 250     | 0.200963 | 0.1689 | 1.13461 | 1.37732 | 0.0049 | 0.0491 | 0.0452 | 470.6894 | 0.1522 |
| Off-Highway Tractors | 2024 | 501    | 750     | 0.200706 | 0.1686 | 1.13006 | 1.23477 | 0.0049 | 0.0483 | 0.0444 | 471.9247 | 0.1526 |
| Off-Highway Tractors | 2024 | 751    | 1000    | 0.22492  | 0.189  | 1.06613 | 2.46563 | 0.0049 | 0.0682 | 0.0628 | 472.0545 | 0.1527 |
| Off-Highway Tractors | 2025 | 51     | 120     | 0.32831  | 0.2759 | 3.66914 | 2.70745 | 0.0049 | 0.1439 | 0.1324 | 476.9211 | 0.1542 |
| Off-Highway Tractors | 2025 | 121    | 175     | 0.208537 | 0.1752 | 3.14246 | 1.34858 | 0.0049 | 0.0647 | 0.0595 | 473.3021 | 0.1531 |
| Off-Highway Tractors | 2025 | 176    | 250     | 0.183862 | 0.1545 | 1.13017 | 1.11624 | 0.0049 | 0.04   | 0.0368 | 470.861  | 0.1523 |
| Off-Highway Tractors | 2025 | 501    | 750     | 0.199094 | 0.1673 | 1.13452 | 1.11804 | 0.0049 | 0.0451 | 0.0414 | 471.9169 | 0.1526 |
| Off-Highway Tractors | 2025 | 751    | 1000    | 0.235862 | 0.1982 | 1.07663 | 2.48203 | 0.0049 | 0.0695 | 0.0639 | 472.0545 | 0.1527 |
| Off-Highway Tractors | 2030 | 51     | 120     | 1.683    | 0.518  | 3.944   | 2.959   | 0.006  | 0.175  | 0.175  | 568.299  | 0.046  |
| Off-Highway Tractors | 2030 | 121    | 175     | 1.689    | 0.373  | 3.435   | 1.916   | 0.006  | 0.104  | 0.104  | 568.299  | 0.033  |
| Off-Highway Tractors | 2030 | 176    | 250     | 1.423    | 0.315  | 1.286   | 1.715   | 0.006  | 0.064  | 0.064  | 568.299  | 0.028  |
| Off-Highway Tractors | 2030 | 501    | 750     | 5.992    | 0.304  | 1.351   | 1.59    | 0.005  | 0.06   | 0.06   | 568.299  | 0.027  |
| Off-Highway Tractors | 2030 | 751    | 1000    | 8.981    | 0.318  | 1.409   | 3.569   | 0.005  | 0.078  | 0.078  | 568.3    | 0.028  |
| Off-Highway Tractors | 2035 | 51     | 120     | 1.359    | 0.418  | 3.902   | 2.35    | 0.006  | 0.107  | 0.107  | 568.299  | 0.037  |
| Off-Highway Tractors | 2035 | 121    | 175     | 1.361    | 0.301  | 3.421   | 1.252   | 0.006  | 0.065  | 0.065  | 568.299  | 0.027  |
| Off-Highway Tractors | 2035 | 176    | 250     | 1.211    | 0.268  | 1.232   | 1.115   | 0.006  | 0.042  | 0.042  | 568.299  | 0.024  |
| Off-Highway Tractors | 2035 | 501    | 750     | 5.163    | 0.262  | 1.238   | 1.045   | 0.005  | 0.04   | 0.04   | 568.299  | 0.023  |
| Off-Highway Tractors | 2035 | 751    | 1000    | 7.617    | 0.269  | 1.268   | 3.116   | 0.005  | 0.056  | 0.056  | 568.299  | 0.024  |
| Off-Highway Tractors | 2040 | 51     | 120     | 1.176    | 0.362  | 3.878   | 1.976   | 0.006  | 0.067  | 0.067  | 568.299  | 0.032  |
| Off-Highway Tractors | 2040 | 121    | 175     | 1.162    | 0.257  | 3.412   | 0.836   | 0.006  | 0.041  | 0.041  | 568.299  | 0.023  |
| Off-Highway Tractors | 2040 | 176    | 250     | 1.073    | 0.237  | 1.198   | 0.747   | 0.006  | 0.028  | 0.028  | 568.299  | 0.021  |
| Off-Highway Tractors | 2040 | 501    | 750     | 4.612    | 0.234  | 1.164   | 0.71    | 0.005  | 0.027  | 0.027  | 568.299  | 0.021  |
| Off-Highway Tractors | 2040 | 751    | 1000    | 6.743    | 0.238  | 1.183   | 2.844   | 0.005  | 0.042  | 0.042  | 568.299  | 0.021  |
| Off-Highway Trucks   | 1990 | 121    | 175     | 6.457    | 2.005  | 5.36    | 15.394  | 0.758  | 1.133  | 1.133  | 568.299  | 0.18   |
| Off-Highway Trucks   | 1990 | 176    | 250     | 8.597    | 2.005  | 5.36    | 15.394  | 0.758  | 1.133  | 1.133  | 568.299  | 0.18   |
| Off-Highway Trucks   | 1990 | 251    | 500     | 12.319   | 1.757  | 12.538  | 14.499  | 0.662  | 0.959  | 0.959  | 568.299  | 0.158  |
| Off-Highway Trucks   | 1990 | 501    | 750     | 19.982   | 1.757  | 12.538  | 14.499  | 1.018  | 0.976  | 0.976  | 568.299  | 0.158  |
| Off-Highway Trucks   | 1990 | 751    | 1000    | 28.084   | 1.746  | 12.538  | 14.499  | 1.018  | 0.963  | 0.963  | 568.3    | 0.157  |
| Off-Highway Trucks   | 2000 | 121    | 175     | 4.115    | 1.278  | 3.772   | 9.57    | 0.057  | 0.548  | 0.548  | 568.299  | 0.115  |
| Off-Highway Trucks   | 2000 | 176    | 250     | 4.454    | 1.039  | 2.896   | 9.178   | 0.057  | 0.425  | 0.425  | 568.299  | 0.093  |
| Off-Highway Trucks   | 2000 | 251    | 500     | 6.594    | 0.94   | 4.214   | 8.675   | 0.05   | 0.376  | 0.376  | 568.299  | 0.084  |
| Off-Highway Trucks   | 2000 | 501    | 750     | 10.696   | 0.94   | 4.214   | 8.675   | 0.052  | 0.376  | 0.376  | 568.299  | 0.084  |
| Off-Highway Trucks   | 2000 | 751    | 1000    | 16.13    | 1.003  | 4.878   | 9.339   | 0.052  | 0.355  | 0.355  | 568.3    | 0.09   |
| Off-Highway Trucks   | 2005 | 121    | 175     | 3.462    | 1.075  | 3.531   | 8.1     | 0.057  | 0.481  | 0.481  | 568.299  | 0.097  |
| Off-Highway Trucks   | 2005 | 176    | 250     | 3.21     | 0.748  | 1.978   | 7.652   | 0.057  | 0.291  | 0.291  | 568.299  | 0.067  |
| Off-Highway Trucks   | 2005 | 251    | 500     | 4.695    | 0.669  | 2.332   | 6.848   | 0.05   | 0.26   | 0.26   | 568.299  | 0.06   |
| Off-Highway Trucks   | 2005 | 501    | 750     | 7.697    | 0.677  | 2.33    | 7.052   | 0.052  | 0.264  | 0.264  | 568.299  | 0.061  |
| Off-Highway Trucks   | 2005 | 751    | 1000    | 12.436   | 0.773  | 2.812   | 8.177   | 0.052  | 0.266  | 0.266  | 568.299  | 0.069  |
| Off-Highway Trucks   | 2010 | 121    | 175     | 0.758703 | 0.6375 | 3.51002 | 6.59182 | 0.0048 | 0.3905 | 0.3592 | 522.6455 | 0.1521 |
| Off-Highway Trucks   | 2010 | 176    | 250     | 0.657432 | 0.5524 | 2.13151 | 6.86617 | 0.0048 | 0.29   | 0.2668 | 521.8781 | 0.1519 |
| Off-Highway Trucks   | 2010 | 251    | 500     | 0.5118   | 0.4301 | 2.32222 | 5.52051 | 0.0049 | 0.2133 | 0.1962 | 528.8078 | 0.1539 |
| Off-Highway Trucks   | 2010 | 501    | 750     | 0.633984 | 0.5327 | 3.68555 | 6.54487 | 0.0049 | 0.2757 | 0.2537 | 530.4366 | 0.1544 |
| Off-Highway Trucks   | 2010 | 751    | 1000    | 0.549873 | 0.462  | 2.05613 | 7.15365 | 0.0049 | 0.2114 | 0.1945 | 526.5915 | 0.1533 |
| Off-Highway Trucks   | 2011 | 121    | 175     | 0.704506 | 0.592  | 3.48667 | 6.13879 | 0.0048 | 0.357  | 0.3284 | 521.3222 | 0.1521 |
| Off-Highway Trucks   | 2011 | 176    | 250     | 0.640546 | 0.5382 | 2.08881 | 6.53722 | 0.0048 | 0.2783 | 0.256  | 520.1539 | 0.1518 |
| Off-Highway Trucks   | 2011 | 251    | 500     | 0.515485 | 0.4332 | 2.27798 | 5.39802 | 0.0049 | 0.2097 | 0.1929 | 527.2602 | 0.1539 |
| Off-Highway Trucks   | 2011 | 501    | 750     | 0.643792 | 0.541  | 3.68121 | 6.51376 | 0.0049 | 0.2762 | 0.2541 | 529.0143 | 0.1544 |
| Off-Highway Trucks   | 2011 | 751    | 1000    | 0.55014  | 0.4623 | 2.03783 | 7.09609 | 0.0049 | 0.2112 | 0.1943 | 524.7459 | 0.1531 |
| Off-Highway Trucks   | 2012 | 121    | 175     | 0.704248 | 0.5918 | 3.51164 | 6.0668  | 0.0048 | 0.3535 | 0.3252 | 519.901  | 0.1521 |
| Off-Highway Trucks   | 2012 | 176    | 250     | 0.646155 | 0.5429 | 2.1013  | 6.43814 | 0.0048 | 0.2767 | 0.2546 | 518.7133 | 0.1517 |
| Off-Highway Trucks   | 2012 | 251    | 500     | 0.525914 | 0.4419 | 2.29017 | 5.37678 | 0.0049 | 0.2102 | 0.1934 | 525.9398 | 0.1539 |
| Off-Highway Trucks   | 2012 | 501    | 750     | 0.661317 | 0.5557 | 3.73128 | 6.55684 | 0.0049 | 0.2804 | 0.2579 | 527.6141 | 0.1543 |
| Off-Highway Trucks   | 2012 | 751    | 1000    | 0.55909  | 0.4698 | 2.05327 | 7.10377 | 0.0049 | 0.2133 | 0.1962 | 523.3305 | 0.1531 |
| Off-Highway Trucks   | 2013 | 121    | 175     | 0.671819 | 0.5645 | 3.51059 | 5.78297 | 0.0048 | 0.3302 | 0.3038 | 517.0124 | 0.152  |
| Off-Highway Trucks   | 2013 | 176    | 250     | 0.623589 | 0.524  | 2.04802 | 6.05816 | 0.0048 | 0.2628 | 0.2418 | 515.8273 | 0.1517 |
| Off-Highway Trucks   | 2013 | 251    | 500     | 0.502477 | 0.4222 | 2.17762 | 5.06239 | 0.0049 | 0.1965 | 0.1808 | 523.5459 | 0.1539 |
| Off-Highway Trucks   | 2013 | 501    | 750     | 0.645495 | 0.5424 | 3.55888 | 6.30864 | 0.0049 | 0.2684 | 0.2469 | 525.1075 | 0.1544 |
| Off-Highway Trucks   | 2013 | 751    | 1000    | 0.543085 | 0.4563 | 1.9094  | 6.89277 | 0.0049 | 0.2052 | 0.1888 | 520.5876 | 0.1531 |
| Off-Highway Trucks   | 2014 | 121    | 175     | 0.610195 | 0.5127 | 3.47308 | 5.21922 | 0.0048 | 0.2921 | 0.2688 | 514.0574 | 0.1519 |
| Off-Highway Trucks   | 2014 | 176    | 250     | 0.574728 | 0.4829 | 1.93163 | 5.4411  | 0.0048 | 0.2355 | 0.2166 | 512.8333 | 0.1515 |
| Off-Highway Trucks   | 2014 | 251    | 500     | 0.468214 | 0.3934 | 2.07518 | 4.68575 | 0.0049 | 0.1795 | 0.1652 | 521.0573 | 0.154  |
| Off-Highway Trucks   | 2014 | 501    | 750     | 0.576983 | 0.4848 | 2.95299 | 5.57816 | 0.0049 | 0.2307 | 0.2123 | 521.2295 | 0.154  |
| Off-Highway Trucks   | 2014 | 751    | 1000    | 0.493307 | 0.4145 | 1.77934 | 6.36534 | 0.0049 | 0.1872 | 0.1723 | 516.9385 | 0.1528 |
| Off-Highway Trucks   | 2015 | 121    | 175     | 0.604782 | 0.5082 | 3.48853 | 5.10449 | 0.0048 | 0.2844 | 0.2616 | 508.7011 | 0.1519 |
| Off-Highway Trucks   | 2015 | 176    | 250     | 0.563373 | 0.4734 | 1.89994 | 5.24228 | 0.0048 | 0.2267 | 0.2086 | 507.8087 | 0.1516 |
| Off-Highway Trucks   | 2015 | 251    | 500     | 0.457555 | 0.3845 | 2.0367  | 4.52794 | 0.0049 | 0.173  | 0.1591 | 515.8419 | 0.154  |
| Off-Highway Trucks   | 2015 | 501    | 750     | 0.537539 | 0.4517 | 2.61969 | 5.12427 | 0.0049 | 0.2085 | 0.1918 | 514.6436 | 0.1536 |
| Off-Highway Trucks   | 2015 | 751    | 1000    | 0.489174 | 0.411  | 1.77206 | 6.28012 | 0.0049 | 0.1846 | 0.1698 | 511.1369 | 0.1526 |
| Off-Highway Trucks   | 2016 | 121    | 175     | 0.562854 | 0.473  | 3.45883 | 4.64707 | 0.0048 | 0.2577 | 0.237  | 503.5515 | 0.1519 |
| Off-Highway Trucks   | 2016 | 176    | 250     | 0.530487 | 0.4458 | 1.82377 | 4.82646 | 0.0048 | 0.2077 | 0.1911 | 502.4732 | 0.1516 |
| Off-Highway Trucks   | 2016 | 251    | 500     | 0.418147 | 0.3514 | 1.88523 | 4.04798 | 0.0049 | 0.1527 | 0.1405 | 509.8604 | 0.1538 |
| Off-Highway Trucks   | 2016 | 501    | 750     | 0.497396 | 0.418  | 2.43646 | 4.64247 | 0.0049 | 0.1866 | 0.1717 | 508.3916 | 0.1533 |
| Off-Highway Trucks   | 2016 | 751    | 1000    | 0.467579 | 0.3929 | 1.70739 | 6.0352  | 0.0049 | 0.1754 | 0.1614 | 505.7218 | 0.1525 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type               | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Off-Highway Trucks           | 2017 | 121    | 175     | 0.525186 | 0.4413 | 3.43636 | 4.23649 | 0.0048 | 0.2334 | 0.2147 | 495.924  | 0.152  |
| Off-Highway Trucks           | 2017 | 176    | 250     | 0.496493 | 0.4172 | 1.75281 | 4.36785 | 0.0048 | 0.1887 | 0.1736 | 494.7935 | 0.1516 |
| Off-Highway Trucks           | 2017 | 251    | 500     | 0.387096 | 0.3253 | 1.74773 | 3.66841 | 0.0049 | 0.1362 | 0.1253 | 501.4368 | 0.1536 |
| Off-Highway Trucks           | 2017 | 501    | 750     | 0.468516 | 0.3937 | 2.35644 | 4.25656 | 0.0049 | 0.1702 | 0.1566 | 500.1987 | 0.1533 |
| Off-Highway Trucks           | 2017 | 751    | 1000    | 0.430867 | 0.362  | 1.54555 | 5.65254 | 0.0049 | 0.1591 | 0.1463 | 497.1154 | 0.1523 |
| Off-Highway Trucks           | 2018 | 121    | 175     | 0.456313 | 0.3834 | 3.38333 | 3.54273 | 0.0048 | 0.1922 | 0.1768 | 488.0439 | 0.1519 |
| Off-Highway Trucks           | 2018 | 176    | 250     | 0.405448 | 0.3407 | 1.54329 | 3.45071 | 0.0048 | 0.1413 | 0.13   | 487.6353 | 0.1518 |
| Off-Highway Trucks           | 2018 | 251    | 500     | 0.341588 | 0.287  | 1.5595  | 3.08995 | 0.0049 | 0.1128 | 0.1038 | 493.5059 | 0.1536 |
| Off-Highway Trucks           | 2018 | 501    | 750     | 0.413946 | 0.3478 | 2.17619 | 3.69054 | 0.0049 | 0.1431 | 0.1316 | 492.1136 | 0.1532 |
| Off-Highway Trucks           | 2018 | 751    | 1000    | 0.352998 | 0.2966 | 1.35734 | 4.85753 | 0.0048 | 0.1265 | 0.1163 | 487.7902 | 0.1519 |
| Off-Highway Trucks           | 2019 | 121    | 175     | 0.38382  | 0.3225 | 3.32598 | 2.82463 | 0.0049 | 0.1494 | 0.1375 | 480.3623 | 0.152  |
| Off-Highway Trucks           | 2019 | 176    | 250     | 0.365362 | 0.307  | 1.46079 | 2.98481 | 0.0049 | 0.119  | 0.1095 | 480.1703 | 0.1519 |
| Off-Highway Trucks           | 2019 | 251    | 500     | 0.313575 | 0.2635 | 1.48346 | 2.66851 | 0.0049 | 0.097  | 0.0893 | 485.3832 | 0.1536 |
| Off-Highway Trucks           | 2019 | 501    | 750     | 0.389037 | 0.3269 | 2.04129 | 3.32044 | 0.0049 | 0.1286 | 0.1183 | 483.2182 | 0.1529 |
| Off-Highway Trucks           | 2019 | 751    | 1000    | 0.351304 | 0.2952 | 1.3561  | 4.76495 | 0.0049 | 0.1242 | 0.1142 | 480.3479 | 0.152  |
| Off-Highway Trucks           | 2020 | 121    | 175     | 0.36879  | 0.3099 | 3.3388  | 2.62769 | 0.0049 | 0.137  | 0.126  | 470.0967 | 0.152  |
| Off-Highway Trucks           | 2020 | 176    | 250     | 0.327003 | 0.2748 | 1.39106 | 2.50726 | 0.0049 | 0.0977 | 0.0899 | 470.1675 | 0.1521 |
| Off-Highway Trucks           | 2020 | 251    | 500     | 0.292906 | 0.2461 | 1.41417 | 2.34677 | 0.0049 | 0.0855 | 0.0787 | 474.5787 | 0.1535 |
| Off-Highway Trucks           | 2020 | 501    | 750     | 0.371665 | 0.3123 | 2.02683 | 3.05816 | 0.0049 | 0.1196 | 0.11   | 472.7499 | 0.1529 |
| Off-Highway Trucks           | 2020 | 751    | 1000    | 0.360605 | 0.303  | 1.37163 | 4.79365 | 0.0049 | 0.1252 | 0.1152 | 469.8892 | 0.152  |
| Off-Highway Trucks           | 2021 | 121    | 175     | 0.331341 | 0.2784 | 3.32405 | 2.24626 | 0.0049 | 0.1131 | 0.1041 | 470.2898 | 0.1521 |
| Off-Highway Trucks           | 2021 | 176    | 250     | 0.29675  | 0.2494 | 1.34839 | 2.10869 | 0.0049 | 0.0821 | 0.0755 | 470.1932 | 0.1521 |
| Off-Highway Trucks           | 2021 | 251    | 500     | 0.267636 | 0.2249 | 1.33781 | 1.95357 | 0.0049 | 0.0717 | 0.0659 | 474.542  | 0.1535 |
| Off-Highway Trucks           | 2021 | 501    | 750     | 0.348975 | 0.2932 | 1.93522 | 2.66798 | 0.0049 | 0.1064 | 0.0979 | 472.991  | 0.153  |
| Off-Highway Trucks           | 2021 | 751    | 1000    | 0.304392 | 0.2558 | 1.25154 | 4.15817 | 0.0049 | 0.0988 | 0.0909 | 471.0552 | 0.1523 |
| Off-Highway Trucks           | 2022 | 121    | 175     | 0.286556 | 0.2408 | 3.28383 | 1.81091 | 0.0049 | 0.0877 | 0.0807 | 470.1813 | 0.1521 |
| Off-Highway Trucks           | 2022 | 176    | 250     | 0.255309 | 0.2145 | 1.27852 | 1.61794 | 0.0049 | 0.0637 | 0.0586 | 469.6151 | 0.1519 |
| Off-Highway Trucks           | 2022 | 251    | 500     | 0.233409 | 0.1961 | 1.24664 | 1.48975 | 0.0049 | 0.0542 | 0.0498 | 474.7136 | 0.1535 |
| Off-Highway Trucks           | 2022 | 501    | 750     | 0.313397 | 0.2633 | 1.74571 | 2.26799 | 0.0049 | 0.0877 | 0.0806 | 473.9773 | 0.1533 |
| Off-Highway Trucks           | 2022 | 751    | 1000    | 0.27833  | 0.2339 | 1.2141  | 3.84239 | 0.0049 | 0.0859 | 0.079  | 472.3437 | 0.1528 |
| Off-Highway Trucks           | 2023 | 121    | 175     | 0.280582 | 0.2358 | 3.30432 | 1.68277 | 0.0049 | 0.0807 | 0.0742 | 470.2917 | 0.1521 |
| Off-Highway Trucks           | 2023 | 176    | 250     | 0.24623  | 0.2069 | 1.27325 | 1.45572 | 0.0048 | 0.059  | 0.0543 | 469.4464 | 0.1518 |
| Off-Highway Trucks           | 2023 | 251    | 500     | 0.222566 | 0.187  | 1.22057 | 1.32428 | 0.0049 | 0.0479 | 0.0441 | 475.0488 | 0.1536 |
| Off-Highway Trucks           | 2023 | 501    | 750     | 0.312722 | 0.2628 | 1.71923 | 2.18151 | 0.0049 | 0.0844 | 0.0776 | 473.7666 | 0.1532 |
| Off-Highway Trucks           | 2023 | 751    | 1000    | 0.254284 | 0.2137 | 1.19398 | 3.54374 | 0.0049 | 0.0739 | 0.068  | 472.8574 | 0.1529 |
| Off-Highway Trucks           | 2024 | 121    | 175     | 0.266426 | 0.2239 | 3.3248  | 1.49436 | 0.0049 | 0.0699 | 0.0644 | 470.2638 | 0.1521 |
| Off-Highway Trucks           | 2024 | 176    | 250     | 0.240426 | 0.202  | 1.25915 | 1.35543 | 0.0048 | 0.0542 | 0.0499 | 469.1126 | 0.1517 |
| Off-Highway Trucks           | 2024 | 251    | 500     | 0.219543 | 0.1845 | 1.20637 | 1.23518 | 0.0049 | 0.0445 | 0.0409 | 475.2203 | 0.1537 |
| Off-Highway Trucks           | 2024 | 501    | 750     | 0.308071 | 0.2589 | 1.64986 | 2.08486 | 0.0049 | 0.0792 | 0.0729 | 473.8394 | 0.1532 |
| Off-Highway Trucks           | 2024 | 751    | 1000    | 0.248432 | 0.2088 | 1.19994 | 3.43925 | 0.0049 | 0.0694 | 0.0639 | 473.0969 | 0.153  |
| Off-Highway Trucks           | 2025 | 121    | 175     | 0.254265 | 0.2137 | 3.32765 | 1.3354  | 0.0049 | 0.0648 | 0.0596 | 470.0035 | 0.152  |
| Off-Highway Trucks           | 2025 | 176    | 250     | 0.220008 | 0.1849 | 1.21268 | 1.12886 | 0.0048 | 0.0432 | 0.0397 | 469.1258 | 0.1517 |
| Off-Highway Trucks           | 2025 | 251    | 500     | 0.210955 | 0.1773 | 1.18233 | 1.06379 | 0.0049 | 0.038  | 0.035  | 474.9697 | 0.1536 |
| Off-Highway Trucks           | 2025 | 501    | 750     | 0.280009 | 0.2353 | 1.57807 | 1.75055 | 0.0049 | 0.066  | 0.0607 | 476.314  | 0.154  |
| Off-Highway Trucks           | 2025 | 751    | 1000    | 0.222695 | 0.1871 | 1.14565 | 3.13521 | 0.0049 | 0.0566 | 0.0521 | 473.3693 | 0.1531 |
| Off-Highway Trucks           | 2030 | 121    | 175     | 0.739    | 0.229  | 3.425   | 0.563   | 0.006  | 0.025  | 0.025  | 568.299  | 0.02   |
| Off-Highway Trucks           | 2030 | 176    | 250     | 0.932    | 0.217  | 1.166   | 0.481   | 0.006  | 0.017  | 0.017  | 568.3    | 0.019  |
| Off-Highway Trucks           | 2030 | 251    | 500     | 1.52     | 0.216  | 1.104   | 0.458   | 0.005  | 0.017  | 0.017  | 568.299  | 0.019  |
| Off-Highway Trucks           | 2030 | 501    | 750     | 2.467    | 0.217  | 1.104   | 0.463   | 0.005  | 0.017  | 0.017  | 568.299  | 0.019  |
| Off-Highway Trucks           | 2030 | 751    | 1000    | 3.55     | 0.22   | 1.107   | 2.651   | 0.005  | 0.033  | 0.033  | 568.3    | 0.019  |
| Off-Highway Trucks           | 2035 | 121    | 175     | 0.68     | 0.211  | 3.425   | 0.38    | 0.006  | 0.016  | 0.016  | 568.299  | 0.019  |
| Off-Highway Trucks           | 2035 | 176    | 250     | 0.894    | 0.208  | 1.167   | 0.353   | 0.006  | 0.013  | 0.013  | 568.299  | 0.018  |
| Off-Highway Trucks           | 2035 | 251    | 500     | 1.461    | 0.208  | 1.105   | 0.348   | 0.005  | 0.013  | 0.013  | 568.299  | 0.018  |
| Off-Highway Trucks           | 2035 | 501    | 750     | 2.371    | 0.208  | 1.105   | 0.348   | 0.005  | 0.013  | 0.013  | 568.299  | 0.018  |
| Off-Highway Trucks           | 2035 | 751    | 1000    | 3.368    | 0.209  | 1.105   | 2.565   | 0.005  | 0.028  | 0.028  | 568.299  | 0.018  |
| Off-Highway Trucks           | 2040 | 121    | 175     | 0.662    | 0.205  | 3.426   | 0.318   | 0.006  | 0.013  | 0.013  | 568.299  | 0.018  |
| Off-Highway Trucks           | 2040 | 176    | 250     | 0.877    | 0.204  | 1.167   | 0.305   | 0.006  | 0.012  | 0.012  | 568.3    | 0.018  |
| Off-Highway Trucks           | 2040 | 251    | 500     | 1.434    | 0.204  | 1.105   | 0.305   | 0.005  | 0.012  | 0.012  | 568.299  | 0.018  |
| Off-Highway Trucks           | 2040 | 501    | 750     | 2.327    | 0.204  | 1.105   | 0.305   | 0.005  | 0.012  | 0.012  | 568.299  | 0.018  |
| Off-Highway Trucks           | 2040 | 751    | 1000    | 3.296    | 0.205  | 1.105   | 2.532   | 0.005  | 0.026  | 0.026  | 568.299  | 0.018  |
| Other Construction Equipment | 1990 | 6      | 15      | 5.348    | 1.804  | 4.999   | 9.999   | 1.049  | 0.975  | 0.975  | 568.3    | 0.162  |
| Other Construction Equipment | 1990 | 16     | 25      | 8.578    | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Other Construction Equipment | 1990 | 26     | 50      | 39.33    | 4.791  | 9.693   | 7.947   | 0.871  | 1.267  | 1.267  | 568.299  | 0.432  |
| Other Construction Equipment | 1990 | 51     | 120     | 56.637   | 2.388  | 5.782   | 15.176  | 0.791  | 1.343  | 1.343  | 568.299  | 0.215  |
| Other Construction Equipment | 1990 | 121    | 175     | 60.86    | 1.948  | 5.191   | 15.112  | 0.758  | 1.085  | 1.085  | 568.299  | 0.175  |
| Other Construction Equipment | 1990 | 251    | 500     | 128.26   | 1.72   | 11.412  | 14.332  | 0.662  | 0.927  | 0.927  | 568.299  | 0.155  |
| Other Construction Equipment | 2000 | 6      | 15      | 4.374    | 1.475  | 4.49    | 8.242   | 0.079  | 0.676  | 0.676  | 568.299  | 0.133  |
| Other Construction Equipment | 2000 | 16     | 25      | 7.591    | 1.958  | 4.53    | 6.358   | 0.065  | 0.563  | 0.563  | 568.3    | 0.176  |
| Other Construction Equipment | 2000 | 26     | 50      | 30.619   | 3.73   | 7.85    | 6.784   | 0.066  | 0.816  | 0.816  | 568.299  | 0.336  |
| Other Construction Equipment | 2000 | 51     | 120     | 38.817   | 1.636  | 4.283   | 9.507   | 0.06   | 0.786  | 0.786  | 568.3    | 0.147  |
| Other Construction Equipment | 2000 | 121    | 175     | 34.573   | 1.106  | 3.417   | 8.749   | 0.057  | 0.453  | 0.453  | 568.299  | 0.099  |
| Other Construction Equipment | 2000 | 251    | 500     | 61.92    | 0.83   | 3.67    | 8.069   | 0.05   | 0.321  | 0.321  | 568.299  | 0.074  |
| Other Construction Equipment | 2005 | 6      | 15      | 2.271    | 0.766  | 3.469   | 5.228   | 0.079  | 0.361  | 0.361  | 568.299  | 0.069  |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type               | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Other Construction Equipment | 2005 | 16     | 25      | 3.564    | 0.919  | 2.642   | 5.412   | 0.065  | 0.347  | 0.347  | 568.3    | 0.082  |
| Other Construction Equipment | 2005 | 26     | 50      | 26.204   | 3.192  | 7.102   | 6.226   | 0.066  | 0.739  | 0.739  | 568.299  | 0.288  |
| Other Construction Equipment | 2005 | 51     | 120     | 33.145   | 1.397  | 4.043   | 8.067   | 0.06   | 0.725  | 0.725  | 568.299  | 0.126  |
| Other Construction Equipment | 2005 | 121    | 175     | 28.235   | 0.903  | 3.208   | 7.379   | 0.057  | 0.392  | 0.392  | 568.299  | 0.081  |
| Other Construction Equipment | 2005 | 251    | 500     | 41.035   | 0.55   | 2.051   | 6.334   | 0.05   | 0.22   | 0.22   | 568.299  | 0.049  |
| Other Construction Equipment | 2010 | 6      | 15      | 1.52864  | 1.2845 | 5.29076 | 5.55407 | 0.0054 | 0.4971 | 0.4573 | 587.5495 | 0.171  |
| Other Construction Equipment | 2010 | 16     | 25      | 1.52864  | 1.2845 | 5.29076 | 5.55407 | 0.0054 | 0.4971 | 0.4573 | 587.5495 | 0.171  |
| Other Construction Equipment | 2010 | 26     | 50      | 1.52864  | 1.2845 | 5.29076 | 5.55407 | 0.0054 | 0.4971 | 0.4573 | 587.5495 | 0.171  |
| Other Construction Equipment | 2010 | 51     | 120     | 0.92739  | 0.7793 | 3.89903 | 7.11752 | 0.0049 | 0.5485 | 0.5046 | 523.1661 | 0.1523 |
| Other Construction Equipment | 2010 | 121    | 175     | 0.769602 | 0.6467 | 3.47406 | 7.30949 | 0.0048 | 0.3797 | 0.3493 | 522.1244 | 0.152  |
| Other Construction Equipment | 2010 | 251    | 500     | 0.480247 | 0.4035 | 3.20434 | 5.78616 | 0.0049 | 0.2188 | 0.2013 | 530.8514 | 0.1545 |
| Other Construction Equipment | 2011 | 6      | 15      | 1.531741 | 1.2871 | 5.36962 | 5.5686  | 0.0054 | 0.4992 | 0.4593 | 586.0703 | 0.171  |
| Other Construction Equipment | 2011 | 16     | 25      | 1.531741 | 1.2871 | 5.36962 | 5.5686  | 0.0054 | 0.4992 | 0.4593 | 586.0703 | 0.171  |
| Other Construction Equipment | 2011 | 26     | 50      | 1.531741 | 1.2871 | 5.36962 | 5.5686  | 0.0054 | 0.4992 | 0.4593 | 586.0703 | 0.171  |
| Other Construction Equipment | 2011 | 51     | 120     | 0.909764 | 0.7645 | 3.89723 | 6.98332 | 0.0048 | 0.5418 | 0.4984 | 521.5282 | 0.1522 |
| Other Construction Equipment | 2011 | 121    | 175     | 0.725704 | 0.6098 | 3.41832 | 6.92098 | 0.0048 | 0.3607 | 0.3318 | 520.664  | 0.1519 |
| Other Construction Equipment | 2011 | 251    | 500     | 0.449646 | 0.3778 | 2.91483 | 5.42766 | 0.0049 | 0.204  | 0.1877 | 529.9639 | 0.1546 |
| Other Construction Equipment | 2012 | 6      | 15      | 1.548775 | 1.3014 | 5.47004 | 5.58169 | 0.0054 | 0.5032 | 0.463  | 584.6639 | 0.171  |
| Other Construction Equipment | 2012 | 16     | 25      | 1.548775 | 1.3014 | 5.47004 | 5.58169 | 0.0054 | 0.5032 | 0.463  | 584.6639 | 0.171  |
| Other Construction Equipment | 2012 | 26     | 50      | 1.548775 | 1.3014 | 5.47004 | 5.58169 | 0.0054 | 0.5032 | 0.463  | 584.6639 | 0.171  |
| Other Construction Equipment | 2012 | 51     | 120     | 0.910724 | 0.7653 | 3.91674 | 6.95644 | 0.0048 | 0.5433 | 0.4998 | 519.9075 | 0.1521 |
| Other Construction Equipment | 2012 | 121    | 175     | 0.730754 | 0.614  | 3.4429  | 6.91612 | 0.0048 | 0.3627 | 0.3337 | 519.3479 | 0.1519 |
| Other Construction Equipment | 2012 | 251    | 500     | 0.458869 | 0.3856 | 2.95715 | 5.42334 | 0.0049 | 0.2059 | 0.1894 | 528.6246 | 0.1546 |
| Other Construction Equipment | 2013 | 6      | 15      | 1.571874 | 1.3208 | 5.57699 | 5.60361 | 0.0054 | 0.509  | 0.4682 | 581.8471 | 0.1711 |
| Other Construction Equipment | 2013 | 16     | 25      | 1.571874 | 1.3208 | 5.57699 | 5.60361 | 0.0054 | 0.509  | 0.4682 | 581.8471 | 0.1711 |
| Other Construction Equipment | 2013 | 26     | 50      | 1.571874 | 1.3208 | 5.57699 | 5.60361 | 0.0054 | 0.509  | 0.4682 | 581.8471 | 0.1711 |
| Other Construction Equipment | 2013 | 51     | 120     | 0.892781 | 0.7502 | 3.91866 | 6.82868 | 0.0048 | 0.5315 | 0.489  | 517.5939 | 0.1522 |
| Other Construction Equipment | 2013 | 121    | 175     | 0.708053 | 0.595  | 3.41257 | 6.69102 | 0.0048 | 0.351  | 0.3229 | 516.9857 | 0.152  |
| Other Construction Equipment | 2013 | 251    | 500     | 0.440093 | 0.3698 | 2.79519 | 5.14317 | 0.0049 | 0.1942 | 0.1787 | 525.1086 | 0.1544 |
| Other Construction Equipment | 2014 | 6      | 15      | 1.547867 | 1.3006 | 5.60223 | 5.56546 | 0.0054 | 0.5023 | 0.4621 | 578.9591 | 0.1711 |
| Other Construction Equipment | 2014 | 16     | 25      | 1.547867 | 1.3006 | 5.60223 | 5.56546 | 0.0054 | 0.5023 | 0.4621 | 578.9591 | 0.1711 |
| Other Construction Equipment | 2014 | 26     | 50      | 1.547867 | 1.3006 | 5.60223 | 5.56546 | 0.0054 | 0.5023 | 0.4621 | 578.9591 | 0.1711 |
| Other Construction Equipment | 2014 | 51     | 120     | 0.866935 | 0.7285 | 3.90558 | 6.63282 | 0.0049 | 0.5177 | 0.4763 | 515.2847 | 0.1523 |
| Other Construction Equipment | 2014 | 121    | 175     | 0.674237 | 0.5665 | 3.38516 | 6.37185 | 0.0048 | 0.3332 | 0.3065 | 514.5518 | 0.1521 |
| Other Construction Equipment | 2014 | 251    | 500     | 0.392211 | 0.3296 | 2.47571 | 4.5608  | 0.0049 | 0.168  | 0.1546 | 520.9444 | 0.1539 |
| Other Construction Equipment | 2015 | 6      | 15      | 1.557753 | 1.3089 | 5.68113 | 5.56397 | 0.0054 | 0.5034 | 0.4631 | 573.0198 | 0.1711 |
| Other Construction Equipment | 2015 | 16     | 25      | 1.557753 | 1.3089 | 5.68113 | 5.56397 | 0.0054 | 0.5034 | 0.4631 | 573.0198 | 0.1711 |
| Other Construction Equipment | 2015 | 26     | 50      | 1.557753 | 1.3089 | 5.68113 | 5.56397 | 0.0054 | 0.5034 | 0.4631 | 573.0198 | 0.1711 |
| Other Construction Equipment | 2015 | 51     | 120     | 0.860334 | 0.7229 | 3.9159  | 6.53649 | 0.0049 | 0.5118 | 0.4709 | 510.1706 | 0.1523 |
| Other Construction Equipment | 2015 | 121    | 175     | 0.66302  | 0.5571 | 3.38183 | 6.2305  | 0.0048 | 0.3264 | 0.3003 | 509.3069 | 0.152  |
| Other Construction Equipment | 2015 | 251    | 500     | 0.386006 | 0.3244 | 2.40724 | 4.41519 | 0.0049 | 0.1626 | 0.1496 | 515.1953 | 0.1538 |
| Other Construction Equipment | 2016 | 6      | 15      | 1.524032 | 1.2806 | 5.67687 | 5.49921 | 0.0054 | 0.492  | 0.4526 | 566.9782 | 0.171  |
| Other Construction Equipment | 2016 | 16     | 25      | 1.524032 | 1.2806 | 5.67687 | 5.49921 | 0.0054 | 0.492  | 0.4526 | 566.9782 | 0.171  |
| Other Construction Equipment | 2016 | 26     | 50      | 1.524032 | 1.2806 | 5.67687 | 5.49921 | 0.0054 | 0.492  | 0.4526 | 566.9782 | 0.171  |
| Other Construction Equipment | 2016 | 51     | 120     | 0.837049 | 0.7034 | 3.90894 | 6.32533 | 0.0049 | 0.4957 | 0.456  | 505.349  | 0.1524 |
| Other Construction Equipment | 2016 | 121    | 175     | 0.62413  | 0.5244 | 3.35672 | 5.81763 | 0.0048 | 0.3059 | 0.2815 | 503.9641 | 0.152  |
| Other Construction Equipment | 2016 | 251    | 500     | 0.366005 | 0.3075 | 2.28488 | 4.08972 | 0.0049 | 0.1507 | 0.1386 | 509.7062 | 0.1537 |
| Other Construction Equipment | 2017 | 6      | 15      | 1.480652 | 1.2442 | 5.65509 | 5.42066 | 0.0054 | 0.4774 | 0.4392 | 558.0007 | 0.171  |
| Other Construction Equipment | 2017 | 16     | 25      | 1.480652 | 1.2442 | 5.65509 | 5.42066 | 0.0054 | 0.4774 | 0.4392 | 558.0007 | 0.171  |
| Other Construction Equipment | 2017 | 26     | 50      | 1.480652 | 1.2442 | 5.65509 | 5.42066 | 0.0054 | 0.4774 | 0.4392 | 558.0007 | 0.171  |
| Other Construction Equipment | 2017 | 51     | 120     | 0.804436 | 0.6759 | 3.88542 | 6.06955 | 0.0049 | 0.4749 | 0.4369 | 497.3832 | 0.1524 |
| Other Construction Equipment | 2017 | 121    | 175     | 0.595557 | 0.5004 | 3.3767  | 5.49424 | 0.0048 | 0.2903 | 0.2671 | 495.9311 | 0.152  |
| Other Construction Equipment | 2017 | 251    | 500     | 0.3449   | 0.2898 | 2.12114 | 3.77706 | 0.0049 | 0.1382 | 0.1272 | 501.1295 | 0.1535 |
| Other Construction Equipment | 2018 | 6      | 15      | 1.39068  | 1.1686 | 5.54108 | 5.27161 | 0.0054 | 0.4492 | 0.4133 | 548.9388 | 0.1709 |
| Other Construction Equipment | 2018 | 16     | 25      | 1.39068  | 1.1686 | 5.54108 | 5.27161 | 0.0054 | 0.4492 | 0.4133 | 548.9388 | 0.1709 |
| Other Construction Equipment | 2018 | 26     | 50      | 1.39068  | 1.1686 | 5.54108 | 5.27161 | 0.0054 | 0.4492 | 0.4133 | 548.9388 | 0.1709 |
| Other Construction Equipment | 2018 | 51     | 120     | 0.711314 | 0.5977 | 3.79863 | 5.44123 | 0.0049 | 0.4166 | 0.3833 | 490.018  | 0.1525 |
| Other Construction Equipment | 2018 | 121    | 175     | 0.519398 | 0.4364 | 3.26346 | 4.75499 | 0.0048 | 0.2502 | 0.2302 | 487.9859 | 0.1519 |
| Other Construction Equipment | 2018 | 251    | 500     | 0.298599 | 0.2509 | 1.81261 | 3.16693 | 0.0049 | 0.1146 | 0.1054 | 493.36   | 0.1536 |
| Other Construction Equipment | 2019 | 6      | 15      | 1.370834 | 1.1519 | 5.54123 | 5.20338 | 0.0054 | 0.4374 | 0.4024 | 539.7349 | 0.1708 |
| Other Construction Equipment | 2019 | 16     | 25      | 1.370834 | 1.1519 | 5.54123 | 5.20338 | 0.0054 | 0.4374 | 0.4024 | 539.7349 | 0.1708 |
| Other Construction Equipment | 2019 | 26     | 50      | 1.370834 | 1.1519 | 5.54123 | 5.20338 | 0.0054 | 0.4374 | 0.4024 | 539.7349 | 0.1708 |
| Other Construction Equipment | 2019 | 51     | 120     | 0.655004 | 0.5504 | 3.7535  | 5.04831 | 0.0049 | 0.3789 | 0.3486 | 482.2177 | 0.1526 |
| Other Construction Equipment | 2019 | 121    | 175     | 0.490382 | 0.4121 | 3.25619 | 4.4331  | 0.0049 | 0.2335 | 0.2148 | 480.4518 | 0.152  |
| Other Construction Equipment | 2019 | 251    | 500     | 0.277883 | 0.2335 | 1.66739 | 2.85547 | 0.0049 | 0.1026 | 0.0944 | 485.4127 | 0.1536 |
| Other Construction Equipment | 2020 | 6      | 15      | 1.276029 | 1.0722 | 5.40446 | 5.03626 | 0.0054 | 0.4052 | 0.3728 | 527.9656 | 0.1708 |
| Other Construction Equipment | 2020 | 16     | 25      | 1.276029 | 1.0722 | 5.40446 | 5.03626 | 0.0054 | 0.4052 | 0.3728 | 527.9656 | 0.1708 |
| Other Construction Equipment | 2020 | 26     | 50      | 1.276029 | 1.0722 | 5.40446 | 5.03626 | 0.0054 | 0.4052 | 0.3728 | 527.9656 | 0.1708 |
| Other Construction Equipment | 2020 | 51     | 120     | 0.617777 | 0.5191 | 3.73189 | 4.7712  | 0.0049 | 0.3537 | 0.3254 | 472.2162 | 0.1527 |
| Other Construction Equipment | 2020 | 121    | 175     | 0.461441 | 0.3877 | 2.3528  | 4.11203 | 0.0049 | 0.217  | 0.1996 | 469.9837 | 0.152  |
| Other Construction Equipment | 2020 | 251    | 500     | 0.266788 | 0.2242 | 1.6338  | 2.63672 | 0.0049 | 0.096  | 0.0883 | 475.2326 | 0.1537 |
| Other Construction Equipment | 2021 | 6      | 15      | 1.201423 | 1.0095 | 5.30749 | 4.90234 | 0.0054 | 0.3816 | 0.351  | 527.7834 | 0.1707 |
| Other Construction Equipment | 2021 | 16     | 25      | 1.201423 | 1.0095 | 5.30749 | 4.90234 | 0.0054 | 0.3816 | 0.351  | 527.7834 | 0.1707 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type                     | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Other Construction Equipment       | 2021 | 26     | 50      | 1.201423 | 1.0095 | 5.30749 | 4.90234 | 0.0054 | 0.3816 | 0.351  | 527.7834 | 0.1707 |
| Other Construction Equipment       | 2021 | 51     | 120     | 0.573212 | 0.4817 | 3.70304 | 4.4558  | 0.0049 | 0.3234 | 0.2975 | 472.275  | 0.1527 |
| Other Construction Equipment       | 2021 | 121    | 175     | 0.392185 | 0.3295 | 3.18275 | 3.43847 | 0.0048 | 0.1798 | 0.1654 | 469.7642 | 0.1519 |
| Other Construction Equipment       | 2021 | 251    | 500     | 0.256006 | 0.2151 | 1.59874 | 2.42822 | 0.0049 | 0.0897 | 0.0825 | 475.2124 | 0.1537 |
| Other Construction Equipment       | 2022 | 6      | 15      | 1.094466 | 0.9197 | 5.16732 | 4.74117 | 0.0054 | 0.3478 | 0.32   | 529.1825 | 0.1711 |
| Other Construction Equipment       | 2022 | 16     | 25      | 1.094466 | 0.9197 | 5.16732 | 4.74117 | 0.0054 | 0.3478 | 0.32   | 529.1825 | 0.1711 |
| Other Construction Equipment       | 2022 | 26     | 50      | 1.094466 | 0.9197 | 5.16732 | 4.74117 | 0.0054 | 0.3478 | 0.32   | 529.1825 | 0.1711 |
| Other Construction Equipment       | 2022 | 51     | 120     | 0.523663 | 0.44   | 3.66623 | 4.09846 | 0.0049 | 0.2884 | 0.2653 | 472.3178 | 0.1528 |
| Other Construction Equipment       | 2022 | 121    | 175     | 0.351187 | 0.2951 | 3.15539 | 2.99437 | 0.0048 | 0.1562 | 0.1437 | 469.6126 | 0.1519 |
| Other Construction Equipment       | 2022 | 251    | 500     | 0.223796 | 0.1881 | 1.43828 | 1.97544 | 0.0049 | 0.0742 | 0.0683 | 475.9983 | 0.1539 |
| Other Construction Equipment       | 2023 | 6      | 15      | 1.030598 | 0.866  | 5.07368 | 4.59446 | 0.0055 | 0.3215 | 0.2958 | 529.3389 | 0.1712 |
| Other Construction Equipment       | 2023 | 16     | 25      | 1.030598 | 0.866  | 5.07368 | 4.59446 | 0.0055 | 0.3215 | 0.2958 | 529.3389 | 0.1712 |
| Other Construction Equipment       | 2023 | 26     | 50      | 1.030598 | 0.866  | 5.07368 | 4.59446 | 0.0055 | 0.3215 | 0.2958 | 529.3389 | 0.1712 |
| Other Construction Equipment       | 2023 | 51     | 120     | 0.482844 | 0.4057 | 3.63188 | 3.79013 | 0.0049 | 0.2588 | 0.2381 | 471.9899 | 0.1527 |
| Other Construction Equipment       | 2023 | 121    | 175     | 0.325455 | 0.2735 | 3.14152 | 2.69821 | 0.0048 | 0.1405 | 0.1292 | 469.5579 | 0.1519 |
| Other Construction Equipment       | 2023 | 251    | 500     | 0.214667 | 0.1804 | 1.39596 | 1.81226 | 0.0049 | 0.0688 | 0.0633 | 476.1847 | 0.154  |
| Other Construction Equipment       | 2024 | 6      | 15      | 0.984979 | 0.8277 | 5.03181 | 4.51017 | 0.0055 | 0.3048 | 0.2805 | 529.2094 | 0.1712 |
| Other Construction Equipment       | 2024 | 16     | 25      | 0.984979 | 0.8277 | 5.03181 | 4.51017 | 0.0055 | 0.3048 | 0.2805 | 529.2094 | 0.1712 |
| Other Construction Equipment       | 2024 | 26     | 50      | 0.984979 | 0.8277 | 5.03181 | 4.51017 | 0.0055 | 0.3048 | 0.2805 | 529.2094 | 0.1712 |
| Other Construction Equipment       | 2024 | 51     | 120     | 0.454266 | 0.3817 | 3.61958 | 3.58173 | 0.0049 | 0.2369 | 0.2179 | 472.1254 | 0.1527 |
| Other Construction Equipment       | 2024 | 121    | 175     | 0.310043 | 0.2605 | 3.14951 | 2.52019 | 0.0048 | 0.13   | 0.1196 | 469.5445 | 0.1519 |
| Other Construction Equipment       | 2024 | 251    | 500     | 0.208244 | 0.175  | 1.38248 | 1.67692 | 0.0049 | 0.0644 | 0.0592 | 476.4838 | 0.1541 |
| Other Construction Equipment       | 2025 | 6      | 15      | 0.901061 | 0.7571 | 4.87388 | 4.30575 | 0.0055 | 0.2678 | 0.2464 | 528.9535 | 0.1711 |
| Other Construction Equipment       | 2025 | 16     | 25      | 0.901061 | 0.7571 | 4.87388 | 4.30575 | 0.0055 | 0.2678 | 0.2464 | 528.9535 | 0.1711 |
| Other Construction Equipment       | 2025 | 26     | 50      | 0.901061 | 0.7571 | 4.87388 | 4.30575 | 0.0055 | 0.2678 | 0.2464 | 528.9535 | 0.1711 |
| Other Construction Equipment       | 2025 | 51     | 120     | 0.40612  | 0.3413 | 3.58397 | 3.25221 | 0.0049 | 0.2029 | 0.1867 | 472.7482 | 0.1529 |
| Other Construction Equipment       | 2025 | 121    | 175     | 0.279358 | 0.2347 | 3.13647 | 2.16742 | 0.0049 | 0.1121 | 0.1031 | 469.843  | 0.152  |
| Other Construction Equipment       | 2025 | 251    | 500     | 0.200431 | 0.1684 | 1.3582  | 1.55241 | 0.0049 | 0.0594 | 0.0547 | 476.2959 | 0.154  |
| Other Construction Equipment       | 2030 | 6      | 15      | 1.96     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Other Construction Equipment       | 2030 | 16     | 25      | 2.657    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Other Construction Equipment       | 2030 | 26     | 50      | 3.526    | 0.429  | 4.39    | 3.19    | 0.007  | 0.03   | 0.03   | 568.299  | 0.038  |
| Other Construction Equipment       | 2030 | 51     | 120     | 5.348    | 0.225  | 3.538   | 1.576   | 0.006  | 0.027  | 0.027  | 568.3    | 0.02   |
| Other Construction Equipment       | 2030 | 121    | 175     | 5.057    | 0.161  | 3.127   | 0.459   | 0.006  | 0.019  | 0.019  | 568.299  | 0.014  |
| Other Construction Equipment       | 2030 | 251    | 500     | 11.523   | 0.154  | 1.028   | 0.391   | 0.005  | 0.014  | 0.014  | 568.3    | 0.013  |
| Other Construction Equipment       | 2035 | 6      | 15      | 1.96     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Other Construction Equipment       | 2035 | 16     | 25      | 2.657    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Other Construction Equipment       | 2035 | 26     | 50      | 3.367    | 0.41   | 4.377   | 3.124   | 0.007  | 0.018  | 0.018  | 568.299  | 0.037  |
| Other Construction Equipment       | 2035 | 51     | 120     | 5.057    | 0.213  | 3.536   | 1.474   | 0.006  | 0.017  | 0.017  | 568.299  | 0.019  |
| Other Construction Equipment       | 2035 | 121    | 175     | 4.686    | 0.15   | 3.128   | 0.334   | 0.006  | 0.013  | 0.013  | 568.299  | 0.013  |
| Other Construction Equipment       | 2035 | 251    | 500     | 11.034   | 0.147  | 1.029   | 0.311   | 0.005  | 0.011  | 0.011  | 568.299  | 0.013  |
| Other Construction Equipment       | 2040 | 6      | 15      | 1.96     | 0.661  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.3    | 0.059  |
| Other Construction Equipment       | 2040 | 16     | 25      | 2.657    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Other Construction Equipment       | 2040 | 26     | 50      | 3.359    | 0.409  | 4.377   | 3.096   | 0.007  | 0.015  | 0.015  | 568.3    | 0.036  |
| Other Construction Equipment       | 2040 | 51     | 120     | 4.992    | 0.21   | 3.536   | 1.441   | 0.006  | 0.014  | 0.014  | 568.299  | 0.018  |
| Other Construction Equipment       | 2040 | 121    | 175     | 4.556    | 0.145  | 3.128   | 0.29    | 0.006  | 0.011  | 0.011  | 568.299  | 0.013  |
| Other Construction Equipment       | 2040 | 251    | 500     | 10.825   | 0.145  | 1.029   | 0.282   | 0.005  | 0.01   | 0.01   | 568.299  | 0.013  |
| Other General Industrial Equipment | 1990 | 6      | 15      | 4.264    | 1.804  | 4.999   | 9.999   | 0.833  | 0.968  | 0.968  | 568.299  | 0.162  |
| Other General Industrial Equipment | 1990 | 16     | 25      | 12.555   | 2.213  | 4.999   | 6.919   | 0.679  | 0.735  | 0.735  | 568.299  | 0.199  |
| Other General Industrial Equipment | 1990 | 26     | 50      | 38.808   | 4.828  | 9.768   | 7.957   | 0.692  | 1.266  | 1.266  | 568.299  | 0.435  |
| Other General Industrial Equipment | 1990 | 51     | 120     | 54.2     | 2.363  | 5.72    | 14.962  | 0.628  | 1.331  | 1.331  | 568.299  | 0.213  |
| Other General Industrial Equipment | 1990 | 121    | 175     | 57.106   | 1.61   | 5.066   | 13.434  | 0.602  | 0.88   | 0.88   | 568.299  | 0.145  |
| Other General Industrial Equipment | 1990 | 176    | 250     | 80.71    | 1.61   | 5.066   | 13.434  | 0.602  | 0.88   | 0.88   | 568.299  | 0.145  |
| Other General Industrial Equipment | 1990 | 251    | 500     | 139.861  | 1.425  | 11.207  | 12.743  | 0.525  | 0.756  | 0.756  | 568.299  | 0.128  |
| Other General Industrial Equipment | 1990 | 501    | 750     | 230.516  | 1.425  | 11.207  | 12.743  | 0.538  | 0.756  | 0.756  | 568.299  | 0.128  |
| Other General Industrial Equipment | 1990 | 751    | 1000    | 293.256  | 1.417  | 11.207  | 12.743  | 0.538  | 0.746  | 0.746  | 568.299  | 0.127  |
| Other General Industrial Equipment | 2000 | 6      | 15      | 2.475    | 1.047  | 4.258   | 7.362   | 0.079  | 0.428  | 0.428  | 568.299  | 0.094  |
| Other General Industrial Equipment | 2000 | 16     | 25      | 5.83     | 1.027  | 4.322   | 6.284   | 0.064  | 0.431  | 0.431  | 568.299  | 0.092  |
| Other General Industrial Equipment | 2000 | 26     | 50      | 36.086   | 4.49   | 9.236   | 7.09    | 0.065  | 0.935  | 0.935  | 568.299  | 0.405  |
| Other General Industrial Equipment | 2000 | 51     | 120     | 43.196   | 1.883  | 4.733   | 10.664  | 0.059  | 0.91   | 0.91   | 568.299  | 0.169  |
| Other General Industrial Equipment | 2000 | 121    | 175     | 44.74    | 1.261  | 3.852   | 9.686   | 0.057  | 0.536  | 0.536  | 568.299  | 0.113  |
| Other General Industrial Equipment | 2000 | 176    | 250     | 53       | 1.057  | 3.072   | 9.325   | 0.057  | 0.438  | 0.438  | 568.299  | 0.095  |
| Other General Industrial Equipment | 2000 | 251    | 500     | 93.834   | 0.956  | 5.179   | 8.862   | 0.049  | 0.385  | 0.385  | 568.299  | 0.086  |
| Other General Industrial Equipment | 2000 | 501    | 750     | 154.656  | 0.956  | 5.179   | 8.862   | 0.051  | 0.385  | 0.385  | 568.3    | 0.086  |
| Other General Industrial Equipment | 2000 | 751    | 1000    | 214.063  | 1.034  | 5.791   | 9.479   | 0.051  | 0.385  | 0.385  | 568.299  | 0.093  |
| Other General Industrial Equipment | 2005 | 6      | 15      | 1.674    | 0.708  | 3.469   | 4.985   | 0.079  | 0.35   | 0.35   | 568.299  | 0.063  |
| Other General Industrial Equipment | 2005 | 16     | 25      | 4.288    | 0.755  | 2.4     | 5.226   | 0.064  | 0.315  | 0.315  | 568.299  | 0.068  |
| Other General Industrial Equipment | 2005 | 26     | 50      | 33.133   | 4.122  | 8.765   | 6.676   | 0.065  | 0.888  | 0.888  | 568.299  | 0.371  |
| Other General Industrial Equipment | 2005 | 51     | 120     | 37.812   | 1.649  | 4.418   | 9.041   | 0.059  | 0.867  | 0.867  | 568.299  | 0.148  |
| Other General Industrial Equipment | 2005 | 121    | 175     | 38.439   | 1.084  | 3.513   | 8.273   | 0.057  | 0.479  | 0.479  | 568.299  | 0.097  |
| Other General Industrial Equipment | 2005 | 176    | 250     | 38.228   | 0.762  | 2.065   | 7.795   | 0.057  | 0.301  | 0.301  | 568.299  | 0.068  |
| Other General Industrial Equipment | 2005 | 251    | 500     | 66.246   | 0.675  | 2.681   | 7.094   | 0.049  | 0.269  | 0.269  | 568.299  | 0.06   |
| Other General Industrial Equipment | 2005 | 501    | 750     | 110.94   | 0.686  | 2.681   | 7.252   | 0.051  | 0.272  | 0.272  | 568.3    | 0.061  |
| Other General Industrial Equipment | 2005 | 751    | 1000    | 166.893  | 0.806  | 3.276   | 8.322   | 0.051  | 0.28   | 0.28   | 568.299  | 0.072  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type                     | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Other General Industrial Equipment | 2010 | 6      | 15      | 1.873274 | 1.5741 | 6.00712 | 5.68505 | 0.0054 | 0.5635 | 0.5184 | 584.6401 | 0.1702 |
| Other General Industrial Equipment | 2010 | 16     | 25      | 1.873274 | 1.5741 | 6.00712 | 5.68505 | 0.0054 | 0.5635 | 0.5184 | 584.6401 | 0.1702 |
| Other General Industrial Equipment | 2010 | 26     | 50      | 1.873274 | 1.5741 | 6.00712 | 5.68505 | 0.0054 | 0.5635 | 0.5184 | 584.6401 | 0.1702 |
| Other General Industrial Equipment | 2010 | 51     | 120     | 1.01726  | 0.8548 | 4.0773  | 7.36447 | 0.0048 | 0.611  | 0.5621 | 522.222  | 0.152  |
| Other General Industrial Equipment | 2010 | 121    | 175     | 0.746027 | 0.6269 | 3.51505 | 7.0202  | 0.0049 | 0.3789 | 0.3486 | 524.278  | 0.1526 |
| Other General Industrial Equipment | 2010 | 176    | 250     | 0.769173 | 0.6463 | 2.61803 | 8.04899 | 0.0049 | 0.3587 | 0.33   | 525.8035 | 0.153  |
| Other General Industrial Equipment | 2010 | 251    | 500     | 0.489206 | 0.4111 | 2.96412 | 5.68219 | 0.0049 | 0.2194 | 0.2019 | 525.4767 | 0.153  |
| Other General Industrial Equipment | 2010 | 501    | 750     | 0.368598 | 0.3097 | 1.62081 | 4.78207 | 0.0049 | 0.1677 | 0.1543 | 526.0709 | 0.1531 |
| Other General Industrial Equipment | 2010 | 751    | 1000    | 0.368913 | 0.31   | 1.02418 | 6.10226 | 0.0049 | 0.1483 | 0.1364 | 524.505  | 0.1527 |
| Other General Industrial Equipment | 2011 | 6      | 15      | 1.86071  | 1.5635 | 6.08575 | 5.69446 | 0.0054 | 0.5623 | 0.5173 | 583.1785 | 0.1702 |
| Other General Industrial Equipment | 2011 | 16     | 25      | 1.86071  | 1.5635 | 6.08575 | 5.69446 | 0.0054 | 0.5623 | 0.5173 | 583.1785 | 0.1702 |
| Other General Industrial Equipment | 2011 | 26     | 50      | 1.86071  | 1.5635 | 6.08575 | 5.69446 | 0.0054 | 0.5623 | 0.5173 | 583.1785 | 0.1702 |
| Other General Industrial Equipment | 2011 | 51     | 120     | 1.006419 | 0.8457 | 4.08854 | 7.24885 | 0.0048 | 0.6088 | 0.5601 | 520.9164 | 0.152  |
| Other General Industrial Equipment | 2011 | 121    | 175     | 0.688559 | 0.5786 | 3.47165 | 6.5273  | 0.0049 | 0.352  | 0.3238 | 522.9673 | 0.1526 |
| Other General Industrial Equipment | 2011 | 176    | 250     | 0.679053 | 0.5706 | 2.33422 | 7.30022 | 0.0049 | 0.3134 | 0.2883 | 524.489  | 0.153  |
| Other General Industrial Equipment | 2011 | 251    | 500     | 0.467324 | 0.3927 | 2.74249 | 5.42881 | 0.0049 | 0.2067 | 0.1902 | 524.163  | 0.153  |
| Other General Industrial Equipment | 2011 | 501    | 750     | 0.373245 | 0.3136 | 1.62791 | 4.72869 | 0.0049 | 0.1634 | 0.1503 | 524.7557 | 0.1531 |
| Other General Industrial Equipment | 2011 | 751    | 1000    | 0.37971  | 0.3191 | 1.03813 | 6.1714  | 0.0049 | 0.1529 | 0.1407 | 523.1938 | 0.1527 |
| Other General Industrial Equipment | 2012 | 6      | 15      | 1.895405 | 1.5927 | 6.24676 | 5.71254 | 0.0054 | 0.5694 | 0.5239 | 581.7169 | 0.1702 |
| Other General Industrial Equipment | 2012 | 16     | 25      | 1.895405 | 1.5927 | 6.24676 | 5.71254 | 0.0054 | 0.5694 | 0.5239 | 581.7169 | 0.1702 |
| Other General Industrial Equipment | 2012 | 26     | 50      | 1.895405 | 1.5927 | 6.24676 | 5.71254 | 0.0054 | 0.5694 | 0.5239 | 581.7169 | 0.1702 |
| Other General Industrial Equipment | 2012 | 51     | 120     | 1.008569 | 0.8475 | 4.12133 | 7.21493 | 0.0048 | 0.612  | 0.563  | 519.6109 | 0.152  |
| Other General Industrial Equipment | 2012 | 121    | 175     | 0.685664 | 0.5761 | 3.49618 | 6.44491 | 0.0049 | 0.3488 | 0.3209 | 521.6566 | 0.1526 |
| Other General Industrial Equipment | 2012 | 176    | 250     | 0.675065 | 0.5672 | 2.33594 | 7.14362 | 0.0049 | 0.3084 | 0.2837 | 523.1745 | 0.153  |
| Other General Industrial Equipment | 2012 | 251    | 500     | 0.47625  | 0.4002 | 2.75094 | 5.39821 | 0.0049 | 0.2069 | 0.1903 | 522.8493 | 0.153  |
| Other General Industrial Equipment | 2012 | 501    | 750     | 0.379047 | 0.3185 | 1.63473 | 4.69855 | 0.0049 | 0.1609 | 0.148  | 523.4405 | 0.1531 |
| Other General Industrial Equipment | 2012 | 751    | 1000    | 0.390508 | 0.3281 | 1.05208 | 6.24054 | 0.0049 | 0.1575 | 0.1449 | 521.8825 | 0.1527 |
| Other General Industrial Equipment | 2013 | 6      | 15      | 1.848739 | 1.5535 | 6.26146 | 5.64536 | 0.0054 | 0.5557 | 0.5113 | 578.7937 | 0.1702 |
| Other General Industrial Equipment | 2013 | 16     | 25      | 1.848739 | 1.5535 | 6.26146 | 5.64536 | 0.0054 | 0.5557 | 0.5113 | 578.7937 | 0.1702 |
| Other General Industrial Equipment | 2013 | 26     | 50      | 1.848739 | 1.5535 | 6.26146 | 5.64536 | 0.0054 | 0.5557 | 0.5113 | 578.7937 | 0.1702 |
| Other General Industrial Equipment | 2013 | 51     | 120     | 0.982208 | 0.8253 | 4.11871 | 7.03299 | 0.0048 | 0.5968 | 0.5491 | 516.9998 | 0.152  |
| Other General Industrial Equipment | 2013 | 121    | 175     | 0.6403   | 0.538  | 3.4592  | 6.02319 | 0.0049 | 0.3243 | 0.2984 | 519.0352 | 0.1526 |
| Other General Industrial Equipment | 2013 | 176    | 250     | 0.609561 | 0.5122 | 2.15134 | 6.51958 | 0.0049 | 0.273  | 0.2511 | 520.5455 | 0.153  |
| Other General Industrial Equipment | 2013 | 251    | 500     | 0.434695 | 0.3653 | 2.62159 | 4.82071 | 0.0049 | 0.1827 | 0.1681 | 520.2219 | 0.153  |
| Other General Industrial Equipment | 2013 | 501    | 750     | 0.344704 | 0.2896 | 1.58393 | 4.12057 | 0.0049 | 0.1392 | 0.1281 | 520.8102 | 0.1531 |
| Other General Industrial Equipment | 2013 | 751    | 1000    | 0.401306 | 0.3372 | 1.06602 | 6.30968 | 0.0049 | 0.1621 | 0.1492 | 519.26   | 0.1527 |
| Other General Industrial Equipment | 2014 | 6      | 15      | 1.810128 | 1.521  | 6.28785 | 5.58361 | 0.0054 | 0.5439 | 0.5004 | 575.8705 | 0.1702 |
| Other General Industrial Equipment | 2014 | 16     | 25      | 1.810128 | 1.521  | 6.28785 | 5.58361 | 0.0054 | 0.5439 | 0.5004 | 575.8705 | 0.1702 |
| Other General Industrial Equipment | 2014 | 26     | 50      | 1.810128 | 1.521  | 6.28785 | 5.58361 | 0.0054 | 0.5439 | 0.5004 | 575.8705 | 0.1702 |
| Other General Industrial Equipment | 2014 | 51     | 120     | 0.938561 | 0.7887 | 4.09005 | 6.72277 | 0.0048 | 0.5739 | 0.528  | 514.3886 | 0.152  |
| Other General Industrial Equipment | 2014 | 121    | 175     | 0.621882 | 0.5226 | 3.46929 | 5.79166 | 0.0049 | 0.3118 | 0.2868 | 516.4138 | 0.1526 |
| Other General Industrial Equipment | 2014 | 176    | 250     | 0.580321 | 0.4876 | 2.05376 | 6.15263 | 0.0049 | 0.2546 | 0.2342 | 517.9164 | 0.153  |
| Other General Industrial Equipment | 2014 | 251    | 500     | 0.422239 | 0.3548 | 2.49943 | 4.56494 | 0.0049 | 0.1724 | 0.1587 | 517.5945 | 0.153  |
| Other General Industrial Equipment | 2014 | 501    | 750     | 0.304364 | 0.2557 | 1.48882 | 3.62195 | 0.0049 | 0.1153 | 0.1061 | 518.1798 | 0.1531 |
| Other General Industrial Equipment | 2014 | 751    | 1000    | 0.412103 | 0.3463 | 1.07997 | 6.37883 | 0.0049 | 0.1668 | 0.1534 | 516.6375 | 0.1527 |
| Other General Industrial Equipment | 2015 | 6      | 15      | 1.779268 | 1.4951 | 6.32452 | 5.52435 | 0.0054 | 0.5324 | 0.4898 | 570.0241 | 0.1702 |
| Other General Industrial Equipment | 2015 | 16     | 25      | 1.779268 | 1.4951 | 6.32452 | 5.52435 | 0.0054 | 0.5324 | 0.4898 | 570.0241 | 0.1702 |
| Other General Industrial Equipment | 2015 | 26     | 50      | 1.779268 | 1.4951 | 6.32452 | 5.52435 | 0.0054 | 0.5324 | 0.4898 | 570.0241 | 0.1702 |
| Other General Industrial Equipment | 2015 | 51     | 120     | 0.905303 | 0.7607 | 4.0811  | 6.50163 | 0.0048 | 0.5528 | 0.5086 | 509.1664 | 0.152  |
| Other General Industrial Equipment | 2015 | 121    | 175     | 0.589015 | 0.4949 | 3.45434 | 5.3974  | 0.0049 | 0.294  | 0.2704 | 511.171  | 0.1526 |
| Other General Industrial Equipment | 2015 | 176    | 250     | 0.538134 | 0.4522 | 1.9257  | 5.64293 | 0.0049 | 0.2295 | 0.2111 | 512.6584 | 0.153  |
| Other General Industrial Equipment | 2015 | 251    | 500     | 0.420225 | 0.3531 | 2.43603 | 4.42481 | 0.0049 | 0.1671 | 0.1537 | 512.3397 | 0.153  |
| Other General Industrial Equipment | 2015 | 501    | 750     | 0.298831 | 0.2511 | 1.49062 | 3.36512 | 0.0049 | 0.1092 | 0.1004 | 512.9191 | 0.1531 |
| Other General Industrial Equipment | 2015 | 751    | 1000    | 0.422901 | 0.3554 | 1.09391 | 6.44797 | 0.0049 | 0.1714 | 0.1577 | 511.3924 | 0.1527 |
| Other General Industrial Equipment | 2016 | 6      | 15      | 1.690474 | 1.4205 | 6.25866 | 5.40705 | 0.0054 | 0.5065 | 0.466  | 564.1777 | 0.1702 |
| Other General Industrial Equipment | 2016 | 16     | 25      | 1.690474 | 1.4205 | 6.25866 | 5.40705 | 0.0054 | 0.5065 | 0.466  | 564.1777 | 0.1702 |
| Other General Industrial Equipment | 2016 | 26     | 50      | 1.690474 | 1.4205 | 6.25866 | 5.40705 | 0.0054 | 0.5065 | 0.466  | 564.1777 | 0.1702 |
| Other General Industrial Equipment | 2016 | 51     | 120     | 0.851445 | 0.7155 | 4.04541 | 6.14411 | 0.0048 | 0.5178 | 0.4764 | 503.9442 | 0.152  |
| Other General Industrial Equipment | 2016 | 121    | 175     | 0.559455 | 0.4701 | 3.43665 | 5.05466 | 0.0049 | 0.2758 | 0.2537 | 505.9282 | 0.1526 |
| Other General Industrial Equipment | 2016 | 176    | 250     | 0.519923 | 0.4369 | 1.8667  | 5.40733 | 0.0049 | 0.2173 | 0.1999 | 507.4004 | 0.153  |
| Other General Industrial Equipment | 2016 | 251    | 500     | 0.407021 | 0.342  | 2.36652 | 4.14966 | 0.0049 | 0.1589 | 0.1462 | 507.085  | 0.153  |
| Other General Industrial Equipment | 2016 | 501    | 750     | 0.289084 | 0.2429 | 1.49061 | 3.10202 | 0.0049 | 0.1004 | 0.0924 | 507.6584 | 0.1531 |
| Other General Industrial Equipment | 2016 | 751    | 1000    | 0.288345 | 0.2423 | 1.04483 | 4.7462  | 0.0049 | 0.112  | 0.103  | 506.1474 | 0.1527 |
| Other General Industrial Equipment | 2017 | 6      | 15      | 1.605819 | 1.3493 | 6.17923 | 5.27694 | 0.0054 | 0.4793 | 0.4409 | 555.4081 | 0.1702 |
| Other General Industrial Equipment | 2017 | 16     | 25      | 1.605819 | 1.3493 | 6.17923 | 5.27694 | 0.0054 | 0.4793 | 0.4409 | 555.4081 | 0.1702 |
| Other General Industrial Equipment | 2017 | 26     | 50      | 1.605819 | 1.3493 | 6.17923 | 5.27694 | 0.0054 | 0.4793 | 0.4409 | 555.4081 | 0.1702 |
| Other General Industrial Equipment | 2017 | 51     | 120     | 0.785454 | 0.66   | 3.99811 | 5.72138 | 0.0048 | 0.4705 | 0.4328 | 496.1109 | 0.152  |
| Other General Industrial Equipment | 2017 | 121    | 175     | 0.520155 | 0.4371 | 3.39928 | 4.53359 | 0.0049 | 0.2495 | 0.2296 | 498.0641 | 0.1526 |
| Other General Industrial Equipment | 2017 | 176    | 250     | 0.489435 | 0.4113 | 1.78    | 5.02246 | 0.0049 | 0.199  | 0.183  | 499.5133 | 0.153  |
| Other General Industrial Equipment | 2017 | 251    | 500     | 0.397215 | 0.3338 | 2.36453 | 3.9491  | 0.0049 | 0.152  | 0.1399 | 499.2028 | 0.153  |
| Other General Industrial Equipment | 2017 | 501    | 750     | 0.260833 | 0.2192 | 1.48016 | 2.59187 | 0.0049 | 0.0862 | 0.0793 | 499.7673 | 0.1531 |
| Other General Industrial Equipment | 2017 | 751    | 1000    | 0.29828  | 0.2506 | 1.05719 | 4.7865  | 0.0049 | 0.1145 | 0.1053 | 498.2798 | 0.1527 |
| Other General Industrial Equipment | 2018 | 6      | 15      | 1.373834 | 1.1544 | 5.82717 | 4.97857 | 0.0054 | 0.4137 | 0.3806 | 546.6385 | 0.1702 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type                     | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Other General Industrial Equipment | 2018 | 16     | 25      | 1.373834 | 1.1544 | 5.82717 | 4.97857 | 0.0054 | 0.4137 | 0.3806 | 546.6385 | 0.1702 |
| Other General Industrial Equipment | 2018 | 26     | 50      | 1.373834 | 1.1544 | 5.82717 | 4.97857 | 0.0054 | 0.4137 | 0.3806 | 546.6385 | 0.1702 |
| Other General Industrial Equipment | 2018 | 51     | 120     | 0.663253 | 0.5573 | 3.87633 | 4.95455 | 0.0048 | 0.3917 | 0.3604 | 488.2775 | 0.152  |
| Other General Industrial Equipment | 2018 | 121    | 175     | 0.377931 | 0.3176 | 3.23662 | 3.23673 | 0.0049 | 0.172  | 0.1582 | 490.1999 | 0.1526 |
| Other General Industrial Equipment | 2018 | 176    | 250     | 0.360768 | 0.3031 | 1.45525 | 3.64819 | 0.0049 | 0.1348 | 0.124  | 491.6263 | 0.153  |
| Other General Industrial Equipment | 2018 | 251    | 500     | 0.301755 | 0.2536 | 1.58301 | 2.90735 | 0.0049 | 0.1036 | 0.0953 | 491.3207 | 0.153  |
| Other General Industrial Equipment | 2018 | 501    | 750     | 0.257602 | 0.2165 | 1.48303 | 2.41933 | 0.0049 | 0.0826 | 0.076  | 491.8763 | 0.1531 |
| Other General Industrial Equipment | 2018 | 751    | 1000    | 0.306245 | 0.2573 | 1.06646 | 4.81007 | 0.0049 | 0.1159 | 0.1066 | 490.4122 | 0.1527 |
| Other General Industrial Equipment | 2019 | 6      | 15      | 1.240314 | 1.0422 | 5.66186 | 4.80683 | 0.0054 | 0.3737 | 0.3438 | 537.8689 | 0.1702 |
| Other General Industrial Equipment | 2019 | 16     | 25      | 1.240314 | 1.0422 | 5.66186 | 4.80683 | 0.0054 | 0.3737 | 0.3438 | 537.8689 | 0.1702 |
| Other General Industrial Equipment | 2019 | 26     | 50      | 1.240314 | 1.0422 | 5.66186 | 4.80683 | 0.0054 | 0.3737 | 0.3438 | 537.8689 | 0.1702 |
| Other General Industrial Equipment | 2019 | 51     | 120     | 0.594634 | 0.4997 | 3.82128 | 4.49674 | 0.0048 | 0.3429 | 0.3155 | 480.4442 | 0.152  |
| Other General Industrial Equipment | 2019 | 121    | 175     | 0.359068 | 0.3017 | 3.24129 | 2.99891 | 0.0049 | 0.1565 | 0.144  | 482.3357 | 0.1526 |
| Other General Industrial Equipment | 2019 | 176    | 250     | 0.307665 | 0.2585 | 1.29893 | 3.01996 | 0.0049 | 0.1058 | 0.0973 | 483.7392 | 0.153  |
| Other General Industrial Equipment | 2019 | 251    | 500     | 0.283854 | 0.2385 | 1.56115 | 2.57531 | 0.0049 | 0.0923 | 0.0849 | 483.4385 | 0.153  |
| Other General Industrial Equipment | 2019 | 501    | 750     | 0.236758 | 0.1989 | 1.47441 | 2.11518 | 0.0049 | 0.0758 | 0.0697 | 483.9852 | 0.1531 |
| Other General Industrial Equipment | 2019 | 751    | 1000    | 0.31421  | 0.264  | 1.07573 | 4.83364 | 0.0049 | 0.1172 | 0.1079 | 482.5446 | 0.1527 |
| Other General Industrial Equipment | 2020 | 6      | 15      | 1.125869 | 0.946  | 5.50397 | 4.62219 | 0.0054 | 0.334  | 0.3073 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2020 | 16     | 25      | 1.125869 | 0.946  | 5.50397 | 4.62219 | 0.0054 | 0.334  | 0.3073 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2020 | 26     | 50      | 1.125869 | 0.946  | 5.50397 | 4.62219 | 0.0054 | 0.334  | 0.3073 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2020 | 51     | 120     | 0.53075  | 0.446  | 3.77073 | 4.06079 | 0.0048 | 0.2959 | 0.2722 | 469.9998 | 0.152  |
| Other General Industrial Equipment | 2020 | 121    | 175     | 0.319281 | 0.2683 | 3.22922 | 2.57503 | 0.0049 | 0.135  | 0.1242 | 471.8502 | 0.1526 |
| Other General Industrial Equipment | 2020 | 176    | 250     | 0.281815 | 0.2368 | 1.23914 | 2.66782 | 0.0049 | 0.0902 | 0.083  | 473.2231 | 0.153  |
| Other General Industrial Equipment | 2020 | 251    | 500     | 0.247036 | 0.2076 | 1.34424 | 2.06187 | 0.0049 | 0.0724 | 0.0666 | 472.929  | 0.153  |
| Other General Industrial Equipment | 2020 | 501    | 750     | 0.207847 | 0.1746 | 1.46184 | 1.67591 | 0.0049 | 0.0622 | 0.0572 | 473.4638 | 0.1531 |
| Other General Industrial Equipment | 2020 | 751    | 1000    | 0.322174 | 0.2707 | 1.085   | 4.85721 | 0.0049 | 0.1186 | 0.1092 | 472.0545 | 0.1527 |
| Other General Industrial Equipment | 2021 | 6      | 15      | 0.989462 | 0.8314 | 5.31354 | 4.42532 | 0.0054 | 0.2889 | 0.2658 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2021 | 16     | 25      | 0.989462 | 0.8314 | 5.31354 | 4.42532 | 0.0054 | 0.2889 | 0.2658 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2021 | 26     | 50      | 0.989462 | 0.8314 | 5.31354 | 4.42532 | 0.0054 | 0.2889 | 0.2658 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2021 | 51     | 120     | 0.480398 | 0.4037 | 3.74029 | 3.7177  | 0.0049 | 0.2559 | 0.2354 | 469.9998 | 0.152  |
| Other General Industrial Equipment | 2021 | 121    | 175     | 0.302394 | 0.2541 | 3.23421 | 2.34745 | 0.0049 | 0.1209 | 0.1113 | 471.8502 | 0.1526 |
| Other General Industrial Equipment | 2021 | 176    | 250     | 0.242448 | 0.2037 | 1.17138 | 2.0939  | 0.0049 | 0.0696 | 0.0641 | 473.2231 | 0.153  |
| Other General Industrial Equipment | 2021 | 251    | 500     | 0.232592 | 0.1954 | 1.32956 | 1.79624 | 0.0049 | 0.0642 | 0.059  | 472.929  | 0.153  |
| Other General Industrial Equipment | 2021 | 501    | 750     | 0.197551 | 0.166  | 1.46305 | 1.38672 | 0.0049 | 0.0544 | 0.05   | 473.4638 | 0.1531 |
| Other General Industrial Equipment | 2021 | 751    | 1000    | 0.328625 | 0.2761 | 1.09291 | 4.87557 | 0.0049 | 0.1196 | 0.1101 | 472.0545 | 0.1527 |
| Other General Industrial Equipment | 2022 | 6      | 15      | 0.835231 | 0.7018 | 5.07591 | 4.19687 | 0.0054 | 0.2377 | 0.2187 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2022 | 16     | 25      | 0.835231 | 0.7018 | 5.07591 | 4.19687 | 0.0054 | 0.2377 | 0.2187 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2022 | 26     | 50      | 0.835231 | 0.7018 | 5.07591 | 4.19687 | 0.0054 | 0.2377 | 0.2187 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2022 | 51     | 120     | 0.403101 | 0.3387 | 3.66821 | 3.19968 | 0.0049 | 0.1991 | 0.1831 | 469.9998 | 0.152  |
| Other General Industrial Equipment | 2022 | 121    | 175     | 0.289798 | 0.2435 | 3.23346 | 2.14959 | 0.0049 | 0.1109 | 0.102  | 471.8502 | 0.1526 |
| Other General Industrial Equipment | 2022 | 176    | 250     | 0.222216 | 0.1867 | 1.13752 | 1.75874 | 0.0049 | 0.0569 | 0.0523 | 473.2231 | 0.153  |
| Other General Industrial Equipment | 2022 | 251    | 500     | 0.208015 | 0.1748 | 1.17139 | 1.43348 | 0.0049 | 0.0499 | 0.0459 | 472.929  | 0.153  |
| Other General Industrial Equipment | 2022 | 501    | 750     | 0.177285 | 0.149  | 1.45658 | 1.06247 | 0.0049 | 0.0458 | 0.0422 | 473.4638 | 0.1531 |
| Other General Industrial Equipment | 2022 | 751    | 1000    | 0.223076 | 0.1874 | 1.03925 | 3.942   | 0.0049 | 0.0793 | 0.073  | 472.0545 | 0.1527 |
| Other General Industrial Equipment | 2023 | 6      | 15      | 0.717857 | 0.6032 | 4.88317 | 3.99304 | 0.0054 | 0.194  | 0.1785 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2023 | 16     | 25      | 0.717857 | 0.6032 | 4.88317 | 3.99304 | 0.0054 | 0.194  | 0.1785 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2023 | 26     | 50      | 0.717857 | 0.6032 | 4.88317 | 3.99304 | 0.0054 | 0.194  | 0.1785 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2023 | 51     | 120     | 0.366077 | 0.3076 | 3.64703 | 2.92394 | 0.0049 | 0.1685 | 0.155  | 469.9998 | 0.152  |
| Other General Industrial Equipment | 2023 | 121    | 175     | 0.238568 | 0.2005 | 3.17453 | 1.60937 | 0.0049 | 0.0802 | 0.0738 | 471.8502 | 0.1526 |
| Other General Industrial Equipment | 2023 | 176    | 250     | 0.214876 | 0.1806 | 1.14024 | 1.53043 | 0.0049 | 0.0512 | 0.0471 | 473.2231 | 0.153  |
| Other General Industrial Equipment | 2023 | 251    | 500     | 0.195172 | 0.164  | 1.12057 | 1.25618 | 0.0049 | 0.043  | 0.0396 | 472.929  | 0.153  |
| Other General Industrial Equipment | 2023 | 501    | 750     | 0.131565 | 0.1106 | 1.10458 | 0.62571 | 0.0049 | 0.0226 | 0.0208 | 473.4638 | 0.1531 |
| Other General Industrial Equipment | 2023 | 751    | 1000    | 0.229255 | 0.1926 | 1.04852 | 3.95649 | 0.0049 | 0.0798 | 0.0734 | 472.0545 | 0.1527 |
| Other General Industrial Equipment | 2024 | 6      | 15      | 0.649743 | 0.546  | 4.78022 | 3.85892 | 0.0054 | 0.1654 | 0.1522 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2024 | 16     | 25      | 0.649743 | 0.546  | 4.78022 | 3.85892 | 0.0054 | 0.1654 | 0.1522 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2024 | 26     | 50      | 0.649743 | 0.546  | 4.78022 | 3.85892 | 0.0054 | 0.1654 | 0.1522 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2024 | 51     | 120     | 0.341745 | 0.2872 | 3.63929 | 2.70778 | 0.0049 | 0.1459 | 0.1342 | 469.9998 | 0.152  |
| Other General Industrial Equipment | 2024 | 121    | 175     | 0.226791 | 0.1906 | 3.18534 | 1.44774 | 0.0049 | 0.0727 | 0.0669 | 471.8502 | 0.1526 |
| Other General Industrial Equipment | 2024 | 176    | 250     | 0.205547 | 0.1727 | 1.14124 | 1.31888 | 0.0049 | 0.0457 | 0.0421 | 473.2231 | 0.153  |
| Other General Industrial Equipment | 2024 | 251    | 500     | 0.187509 | 0.1576 | 1.1102  | 1.15288 | 0.0049 | 0.0395 | 0.0363 | 472.929  | 0.153  |
| Other General Industrial Equipment | 2024 | 501    | 750     | 0.137014 | 0.1151 | 1.11228 | 0.62782 | 0.0049 | 0.0227 | 0.0209 | 473.4638 | 0.1531 |
| Other General Industrial Equipment | 2024 | 751    | 1000    | 0.235434 | 0.1978 | 1.05779 | 3.97098 | 0.0049 | 0.0802 | 0.0738 | 472.0545 | 0.1527 |
| Other General Industrial Equipment | 2025 | 6      | 15      | 0.585572 | 0.492  | 4.67981 | 3.71721 | 0.0054 | 0.1362 | 0.1253 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2025 | 16     | 25      | 0.585572 | 0.492  | 4.67981 | 3.71721 | 0.0054 | 0.1362 | 0.1253 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2025 | 26     | 50      | 0.585572 | 0.492  | 4.67981 | 3.71721 | 0.0054 | 0.1362 | 0.1253 | 526.1761 | 0.1702 |
| Other General Industrial Equipment | 2025 | 51     | 120     | 0.306396 | 0.2575 | 3.61204 | 2.43889 | 0.0049 | 0.1181 | 0.1086 | 469.9998 | 0.152  |
| Other General Industrial Equipment | 2025 | 121    | 175     | 0.224974 | 0.189  | 3.20434 | 1.36379 | 0.0049 | 0.0702 | 0.0646 | 471.8502 | 0.1526 |
| Other General Industrial Equipment | 2025 | 176    | 250     | 0.184121 | 0.1547 | 1.13176 | 1.02801 | 0.0049 | 0.0362 | 0.0333 | 473.2231 | 0.153  |
| Other General Industrial Equipment | 2025 | 251    | 500     | 0.180295 | 0.1515 | 1.10932 | 1.05334 | 0.0049 | 0.0353 | 0.0325 | 472.929  | 0.153  |
| Other General Industrial Equipment | 2025 | 501    | 750     | 0.139282 | 0.117  | 1.1152  | 0.629   | 0.0049 | 0.0228 | 0.021  | 473.4638 | 0.1531 |
| Other General Industrial Equipment | 2025 | 751    | 1000    | 0.241613 | 0.203  | 1.06706 | 3.98546 | 0.0049 | 0.0806 | 0.0742 | 472.0545 | 0.1527 |
| Other General Industrial Equipment | 2030 | 6      | 15      | 1.393    | 0.589  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.053  |
| Other General Industrial Equipment | 2030 | 16     | 25      | 3.889    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type                     | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Other General Industrial Equipment | 2030 | 26     | 50      | 4.896    | 0.609  | 5.299   | 3.46    | 0.007  | 0.048  | 0.048  | 568.299  | 0.054  |
| Other General Industrial Equipment | 2030 | 51     | 120     | 7.091    | 0.309  | 3.802   | 1.766   | 0.006  | 0.043  | 0.043  | 568.299  | 0.027  |
| Other General Industrial Equipment | 2030 | 121    | 175     | 7.93     | 0.223  | 3.357   | 0.641   | 0.006  | 0.028  | 0.028  | 568.299  | 0.02   |
| Other General Industrial Equipment | 2030 | 176    | 250     | 10.485   | 0.209  | 1.143   | 0.536   | 0.006  | 0.018  | 0.018  | 568.299  | 0.018  |
| Other General Industrial Equipment | 2030 | 251    | 500     | 20.447   | 0.208  | 1.087   | 0.506   | 0.005  | 0.018  | 0.018  | 568.299  | 0.018  |
| Other General Industrial Equipment | 2030 | 501    | 750     | 33.725   | 0.208  | 1.087   | 0.512   | 0.005  | 0.018  | 0.018  | 568.299  | 0.018  |
| Other General Industrial Equipment | 2030 | 751    | 1000    | 44.002   | 0.212  | 1.088   | 2.66    | 0.005  | 0.035  | 0.035  | 568.299  | 0.019  |
| Other General Industrial Equipment | 2035 | 6      | 15      | 1.393    | 0.589  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.053  |
| Other General Industrial Equipment | 2035 | 16     | 25      | 3.889    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Other General Industrial Equipment | 2035 | 26     | 50      | 4.535    | 0.564  | 5.255   | 3.334   | 0.007  | 0.025  | 0.025  | 568.299  | 0.05   |
| Other General Industrial Equipment | 2035 | 51     | 120     | 6.486    | 0.282  | 3.794   | 1.567   | 0.006  | 0.022  | 0.022  | 568.3    | 0.025  |
| Other General Industrial Equipment | 2035 | 121    | 175     | 7.079    | 0.199  | 3.355   | 0.399   | 0.006  | 0.016  | 0.016  | 568.3    | 0.018  |
| Other General Industrial Equipment | 2035 | 176    | 250     | 9.803    | 0.195  | 1.143   | 0.355   | 0.006  | 0.013  | 0.013  | 568.299  | 0.017  |
| Other General Industrial Equipment | 2035 | 251    | 500     | 19.187   | 0.195  | 1.087   | 0.351   | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Other General Industrial Equipment | 2035 | 501    | 750     | 31.624   | 0.195  | 1.087   | 0.351   | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Other General Industrial Equipment | 2035 | 751    | 1000    | 40.723   | 0.196  | 1.087   | 2.532   | 0.005  | 0.028  | 0.028  | 568.299  | 0.017  |
| Other General Industrial Equipment | 2040 | 6      | 15      | 1.393    | 0.589  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.053  |
| Other General Industrial Equipment | 2040 | 16     | 25      | 3.889    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Other General Industrial Equipment | 2040 | 26     | 50      | 4.521    | 0.562  | 5.257   | 3.283   | 0.007  | 0.019  | 0.019  | 568.299  | 0.05   |
| Other General Industrial Equipment | 2040 | 51     | 120     | 6.373    | 0.277  | 3.794   | 1.506   | 0.006  | 0.017  | 0.017  | 568.299  | 0.025  |
| Other General Industrial Equipment | 2040 | 121    | 175     | 6.806    | 0.191  | 3.356   | 0.315   | 0.006  | 0.012  | 0.012  | 568.299  | 0.017  |
| Other General Industrial Equipment | 2040 | 176    | 250     | 9.551    | 0.19   | 1.143   | 0.299   | 0.006  | 0.011  | 0.011  | 568.299  | 0.017  |
| Other General Industrial Equipment | 2040 | 251    | 500     | 18.696   | 0.19   | 1.087   | 0.299   | 0.005  | 0.011  | 0.011  | 568.299  | 0.017  |
| Other General Industrial Equipment | 2040 | 501    | 750     | 30.815   | 0.19   | 1.087   | 0.299   | 0.005  | 0.011  | 0.011  | 568.299  | 0.017  |
| Other General Industrial Equipment | 2040 | 751    | 1000    | 39.521   | 0.191  | 1.087   | 2.5     | 0.005  | 0.025  | 0.025  | 568.299  | 0.017  |
| Other Material Handling Equipment  | 1990 | 26     | 50      | 12.278   | 4.763  | 9.649   | 7.932   | 0.692  | 1.252  | 1.252  | 568.3    | 0.429  |
| Other Material Handling Equipment  | 1990 | 51     | 120     | 12.096   | 2.346  | 5.692   | 14.896  | 0.628  | 1.317  | 1.317  | 568.299  | 0.211  |
| Other Material Handling Equipment  | 1990 | 121    | 175     | 16.59    | 1.599  | 5.041   | 13.377  | 0.602  | 0.872  | 0.872  | 568.299  | 0.144  |
| Other Material Handling Equipment  | 1990 | 176    | 250     | 19.708   | 1.599  | 5.041   | 13.377  | 0.602  | 0.872  | 0.872  | 568.3    | 0.144  |
| Other Material Handling Equipment  | 1990 | 251    | 500     | 23.083   | 1.417  | 11.046  | 12.702  | 0.525  | 0.75   | 0.75   | 568.299  | 0.127  |
| Other Material Handling Equipment  | 1990 | 1001   | 9999    | 88.844   | 1.41   | 11.046  | 12.702  | 0.525  | 0.741  | 0.741  | 568.3    | 0.127  |
| Other Material Handling Equipment  | 2000 | 26     | 50      | 11.414   | 4.428  | 9.121   | 7.068   | 0.065  | 0.925  | 0.925  | 568.299  | 0.399  |
| Other Material Handling Equipment  | 2000 | 51     | 120     | 9.647    | 1.871  | 4.712   | 10.623  | 0.059  | 0.901  | 0.901  | 568.299  | 0.168  |
| Other Material Handling Equipment  | 2000 | 121    | 175     | 13       | 1.253  | 3.836   | 9.648   | 0.057  | 0.531  | 0.531  | 568.299  | 0.113  |
| Other Material Handling Equipment  | 2000 | 176    | 250     | 12.957   | 1.051  | 3.061   | 9.289   | 0.057  | 0.435  | 0.435  | 568.3    | 0.094  |
| Other Material Handling Equipment  | 2000 | 251    | 500     | 15.5     | 0.951  | 5.171   | 8.836   | 0.049  | 0.383  | 0.383  | 568.299  | 0.085  |
| Other Material Handling Equipment  | 2000 | 1001   | 9999    | 65.006   | 1.031  | 5.779   | 9.45    | 0.049  | 0.384  | 0.384  | 568.299  | 0.093  |
| Other Material Handling Equipment  | 2005 | 26     | 50      | 10.467   | 4.06   | 8.646   | 6.65    | 0.065  | 0.878  | 0.878  | 568.299  | 0.366  |
| Other Material Handling Equipment  | 2005 | 51     | 120     | 8.426    | 1.634  | 4.393   | 9.001   | 0.059  | 0.857  | 0.857  | 568.3    | 0.147  |
| Other Material Handling Equipment  | 2005 | 121    | 175     | 11.141   | 1.073  | 3.493   | 8.235   | 0.057  | 0.473  | 0.473  | 568.299  | 0.096  |
| Other Material Handling Equipment  | 2005 | 176    | 250     | 9.335    | 0.757  | 2.058   | 7.76    | 0.057  | 0.299  | 0.299  | 568.299  | 0.068  |
| Other Material Handling Equipment  | 2005 | 251    | 500     | 10.914   | 0.67   | 2.676   | 7.071   | 0.049  | 0.268  | 0.268  | 568.299  | 0.06   |
| Other Material Handling Equipment  | 2005 | 1001   | 9999    | 50.601   | 0.803  | 3.267   | 8.291   | 0.049  | 0.278  | 0.278  | 568.299  | 0.072  |
| Other Material Handling Equipment  | 2010 | 26     | 50      | 2.513226 | 2.1118 | 7.14242 | 6.11921 | 0.0054 | 0.6727 | 0.6189 | 581.8987 | 0.1694 |
| Other Material Handling Equipment  | 2010 | 51     | 120     | 0.880333 | 0.7397 | 3.91836 | 6.86036 | 0.0049 | 0.5499 | 0.5059 | 526.2094 | 0.1532 |
| Other Material Handling Equipment  | 2010 | 121    | 175     | 0.703937 | 0.5915 | 3.45939 | 6.62945 | 0.0049 | 0.3644 | 0.3353 | 524.6881 | 0.1527 |
| Other Material Handling Equipment  | 2010 | 176    | 250     | 0.639111 | 0.537  | 2.2178  | 7.05748 | 0.0049 | 0.2919 | 0.2685 | 523.8689 | 0.1525 |
| Other Material Handling Equipment  | 2010 | 251    | 500     | 0.474577 | 0.3988 | 2.89546 | 5.53948 | 0.0049 | 0.2246 | 0.2066 | 522.5525 | 0.1521 |
| Other Material Handling Equipment  | 2010 | 1001   | 9999    | 0.19342  | 0.1625 | 0.96514 | 4.31467 | 0.0049 | 0.0998 | 0.0918 | 524.505  | 0.1527 |
| Other Material Handling Equipment  | 2011 | 26     | 50      | 2.357707 | 1.9811 | 6.95209 | 6.0264  | 0.0054 | 0.644  | 0.5925 | 580.4439 | 0.1694 |
| Other Material Handling Equipment  | 2011 | 51     | 120     | 0.835489 | 0.702  | 3.89742 | 6.54765 | 0.0049 | 0.5271 | 0.485  | 524.8938 | 0.1532 |
| Other Material Handling Equipment  | 2011 | 121    | 175     | 0.695125 | 0.5841 | 3.45599 | 6.48588 | 0.0049 | 0.3599 | 0.3311 | 523.3764 | 0.1527 |
| Other Material Handling Equipment  | 2011 | 176    | 250     | 0.63663  | 0.5349 | 2.18416 | 6.98965 | 0.0049 | 0.288  | 0.265  | 522.5592 | 0.1525 |
| Other Material Handling Equipment  | 2011 | 251    | 500     | 0.474482 | 0.3987 | 2.78574 | 5.43165 | 0.0049 | 0.2207 | 0.203  | 521.2461 | 0.1521 |
| Other Material Handling Equipment  | 2011 | 1001   | 9999    | 0.210247 | 0.1767 | 0.97804 | 4.35542 | 0.0049 | 0.1031 | 0.0949 | 523.1938 | 0.1527 |
| Other Material Handling Equipment  | 2012 | 26     | 50      | 2.238738 | 1.8812 | 6.81597 | 5.92499 | 0.0054 | 0.6197 | 0.5702 | 578.9892 | 0.1694 |
| Other Material Handling Equipment  | 2012 | 51     | 120     | 0.817068 | 0.6866 | 3.90414 | 6.36758 | 0.0049 | 0.5159 | 0.4746 | 523.5783 | 0.1532 |
| Other Material Handling Equipment  | 2012 | 121    | 175     | 0.692769 | 0.5821 | 3.47827 | 6.40913 | 0.0049 | 0.3565 | 0.328  | 522.0647 | 0.1527 |
| Other Material Handling Equipment  | 2012 | 176    | 250     | 0.646463 | 0.5432 | 2.19514 | 7.02565 | 0.0049 | 0.2902 | 0.267  | 521.2496 | 0.1525 |
| Other Material Handling Equipment  | 2012 | 251    | 500     | 0.470349 | 0.3952 | 2.61135 | 5.30246 | 0.0049 | 0.2145 | 0.1973 | 519.9397 | 0.1521 |
| Other Material Handling Equipment  | 2012 | 1001   | 9999    | 0.227073 | 0.1908 | 0.99094 | 4.39617 | 0.0049 | 0.1065 | 0.0979 | 521.8825 | 0.1527 |
| Other Material Handling Equipment  | 2013 | 26     | 50      | 2.105942 | 1.7696 | 6.66457 | 5.85572 | 0.0054 | 0.596  | 0.5483 | 576.0797 | 0.1694 |
| Other Material Handling Equipment  | 2013 | 51     | 120     | 0.724086 | 0.6084 | 3.82317 | 5.76277 | 0.0049 | 0.447  | 0.4112 | 520.9473 | 0.1532 |
| Other Material Handling Equipment  | 2013 | 121    | 175     | 0.665996 | 0.5596 | 3.43613 | 6.15356 | 0.0049 | 0.3328 | 0.3062 | 519.4412 | 0.1527 |
| Other Material Handling Equipment  | 2013 | 176    | 250     | 0.634565 | 0.5332 | 2.16882 | 6.82184 | 0.0049 | 0.2811 | 0.2587 | 518.6302 | 0.1525 |
| Other Material Handling Equipment  | 2013 | 251    | 500     | 0.438071 | 0.3681 | 2.33558 | 4.87099 | 0.0049 | 0.1948 | 0.1792 | 517.327  | 0.1521 |
| Other Material Handling Equipment  | 2013 | 1001   | 9999    | 0.2439   | 0.2049 | 1.00384 | 4.43692 | 0.0049 | 0.1098 | 0.101  | 519.26   | 0.1527 |
| Other Material Handling Equipment  | 2014 | 26     | 50      | 2.017454 | 1.6952 | 6.58988 | 5.75119 | 0.0054 | 0.5751 | 0.5291 | 573.1702 | 0.1694 |
| Other Material Handling Equipment  | 2014 | 51     | 120     | 0.66398  | 0.5579 | 3.77914 | 5.37202 | 0.0049 | 0.4122 | 0.3792 | 518.3162 | 0.1532 |
| Other Material Handling Equipment  | 2014 | 121    | 175     | 0.628738 | 0.5283 | 3.43064 | 5.79759 | 0.0049 | 0.3128 | 0.2877 | 516.8178 | 0.1527 |
| Other Material Handling Equipment  | 2014 | 176    | 250     | 0.565441 | 0.4751 | 1.93605 | 6.17254 | 0.0049 | 0.2421 | 0.2227 | 516.0109 | 0.1525 |
| Other Material Handling Equipment  | 2014 | 251    | 500     | 0.394393 | 0.3314 | 1.92674 | 4.35658 | 0.0049 | 0.1689 | 0.1554 | 514.7142 | 0.1521 |
| Other Material Handling Equipment  | 2014 | 1001   | 9999    | 0.168044 | 0.1412 | 0.97804 | 3.4363  | 0.0049 | 0.0665 | 0.0612 | 516.6375 | 0.1527 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type                    | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|-----------------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Other Material Handling Equipment | 2015 | 26     | 50      | 2.062891 | 1.7334 | 6.75642 | 5.7994  | 0.0054 | 0.5863 | 0.5394 | 567.3512 | 0.1694 |
| Other Material Handling Equipment | 2015 | 51     | 120     | 0.628094 | 0.5278 | 3.75787 | 4.98312 | 0.0049 | 0.3827 | 0.352  | 513.0541 | 0.1532 |
| Other Material Handling Equipment | 2015 | 121    | 175     | 0.624881 | 0.5251 | 3.43301 | 5.6445  | 0.0049 | 0.306  | 0.2815 | 511.5709 | 0.1527 |
| Other Material Handling Equipment | 2015 | 176    | 250     | 0.503855 | 0.4234 | 1.74236 | 5.5323  | 0.0049 | 0.2071 | 0.1905 | 510.7722 | 0.1525 |
| Other Material Handling Equipment | 2015 | 251    | 500     | 0.396328 | 0.333  | 1.91761 | 4.27243 | 0.0049 | 0.1655 | 0.1523 | 509.4887 | 0.1521 |
| Other Material Handling Equipment | 2015 | 1001   | 9999    | 0.1762   | 0.1481 | 0.98449 | 3.45753 | 0.0049 | 0.0682 | 0.0627 | 511.3924 | 0.1527 |
| Other Material Handling Equipment | 2016 | 26     | 50      | 2.100647 | 1.7651 | 6.89161 | 5.80157 | 0.0054 | 0.5934 | 0.5459 | 561.5322 | 0.1694 |
| Other Material Handling Equipment | 2016 | 51     | 120     | 0.611519 | 0.5138 | 3.76606 | 4.79843 | 0.0049 | 0.367  | 0.3377 | 507.792  | 0.1532 |
| Other Material Handling Equipment | 2016 | 121    | 175     | 0.581687 | 0.4888 | 3.41823 | 5.21152 | 0.0049 | 0.2795 | 0.2571 | 506.324  | 0.1527 |
| Other Material Handling Equipment | 2016 | 176    | 250     | 0.474176 | 0.3984 | 1.64277 | 5.19629 | 0.0049 | 0.1889 | 0.1738 | 505.5335 | 0.1525 |
| Other Material Handling Equipment | 2016 | 251    | 500     | 0.384009 | 0.3227 | 1.87077 | 4.05322 | 0.0049 | 0.1557 | 0.1433 | 504.2631 | 0.1521 |
| Other Material Handling Equipment | 2016 | 1001   | 9999    | 0.188654 | 0.1585 | 0.99739 | 3.48884 | 0.0049 | 0.0702 | 0.0646 | 506.1474 | 0.1527 |
| Other Material Handling Equipment | 2017 | 26     | 50      | 1.922269 | 1.6152 | 6.63527 | 5.57447 | 0.0054 | 0.5458 | 0.5022 | 552.8037 | 0.1694 |
| Other Material Handling Equipment | 2017 | 51     | 120     | 0.580499 | 0.4878 | 3.75788 | 4.56113 | 0.0049 | 0.3412 | 0.3139 | 499.8989 | 0.1532 |
| Other Material Handling Equipment | 2017 | 121    | 175     | 0.508007 | 0.4269 | 3.35117 | 4.48809 | 0.0049 | 0.2379 | 0.2189 | 498.4537 | 0.1527 |
| Other Material Handling Equipment | 2017 | 176    | 250     | 0.42771  | 0.3594 | 1.51249 | 4.70454 | 0.0049 | 0.163  | 0.15   | 497.6755 | 0.1525 |
| Other Material Handling Equipment | 2017 | 251    | 500     | 0.386945 | 0.3251 | 1.86256 | 3.9709  | 0.0049 | 0.1535 | 0.1413 | 496.4249 | 0.1521 |
| Other Material Handling Equipment | 2017 | 1001   | 9999    | 0.201109 | 0.169  | 1.01029 | 3.52015 | 0.0049 | 0.0722 | 0.0665 | 498.2798 | 0.1527 |
| Other Material Handling Equipment | 2018 | 26     | 50      | 1.534491 | 1.2894 | 6.06083 | 5.18225 | 0.0054 | 0.4567 | 0.4201 | 544.0753 | 0.1694 |
| Other Material Handling Equipment | 2018 | 51     | 120     | 0.484553 | 0.4072 | 3.67482 | 3.9436  | 0.0049 | 0.2711 | 0.2494 | 492.0058 | 0.1532 |
| Other Material Handling Equipment | 2018 | 121    | 175     | 0.38852  | 0.3265 | 3.21803 | 3.33231 | 0.0049 | 0.1725 | 0.1587 | 490.5834 | 0.1527 |
| Other Material Handling Equipment | 2018 | 176    | 250     | 0.376195 | 0.3161 | 1.3884  | 4.09187 | 0.0049 | 0.135  | 0.1242 | 489.8174 | 0.1525 |
| Other Material Handling Equipment | 2018 | 251    | 500     | 0.352182 | 0.2959 | 1.63271 | 3.52439 | 0.0049 | 0.1335 | 0.1228 | 488.5866 | 0.1521 |
| Other Material Handling Equipment | 2018 | 1001   | 9999    | 0.213564 | 0.1795 | 1.02319 | 3.55146 | 0.0049 | 0.0742 | 0.0683 | 490.4122 | 0.1527 |
| Other Material Handling Equipment | 2019 | 26     | 50      | 1.5177   | 1.2753 | 6.13945 | 5.17904 | 0.0054 | 0.4519 | 0.4158 | 535.3468 | 0.1694 |
| Other Material Handling Equipment | 2019 | 51     | 120     | 0.428699 | 0.3602 | 3.63634 | 3.56573 | 0.0049 | 0.2307 | 0.2123 | 484.1126 | 0.1532 |
| Other Material Handling Equipment | 2019 | 121    | 175     | 0.332757 | 0.2796 | 3.1852  | 2.77369 | 0.0049 | 0.1388 | 0.1277 | 482.7131 | 0.1527 |
| Other Material Handling Equipment | 2019 | 176    | 250     | 0.357063 | 0.3    | 1.34052 | 3.81716 | 0.0049 | 0.1231 | 0.1133 | 481.9594 | 0.1525 |
| Other Material Handling Equipment | 2019 | 251    | 500     | 0.346245 | 0.2909 | 1.61951 | 3.37078 | 0.0049 | 0.1278 | 0.1175 | 480.7483 | 0.1521 |
| Other Material Handling Equipment | 2019 | 1001   | 9999    | 0.226018 | 0.1899 | 1.03609 | 3.58277 | 0.0049 | 0.0763 | 0.0702 | 482.5446 | 0.1527 |
| Other Material Handling Equipment | 2020 | 26     | 50      | 1.481858 | 1.2452 | 6.1671  | 5.13925 | 0.0054 | 0.4392 | 0.4041 | 523.7088 | 0.1694 |
| Other Material Handling Equipment | 2020 | 51     | 120     | 0.36479  | 0.3065 | 3.58938 | 3.10396 | 0.0049 | 0.1823 | 0.1677 | 473.5884 | 0.1532 |
| Other Material Handling Equipment | 2020 | 121    | 175     | 0.299922 | 0.252  | 3.17089 | 2.36653 | 0.0049 | 0.1181 | 0.1086 | 472.2193 | 0.1527 |
| Other Material Handling Equipment | 2020 | 176    | 250     | 0.346024 | 0.2908 | 1.31882 | 3.59889 | 0.0049 | 0.1152 | 0.106  | 471.482  | 0.1525 |
| Other Material Handling Equipment | 2020 | 251    | 500     | 0.336187 | 0.2825 | 1.52346 | 3.20974 | 0.0049 | 0.1198 | 0.1102 | 470.2972 | 0.1521 |
| Other Material Handling Equipment | 2020 | 1001   | 9999    | 0.238473 | 0.2004 | 1.04898 | 3.61407 | 0.0049 | 0.0783 | 0.072  | 472.0545 | 0.1527 |
| Other Material Handling Equipment | 2021 | 26     | 50      | 1.318509 | 1.1079 | 5.95956 | 4.96638 | 0.0054 | 0.3956 | 0.364  | 523.7088 | 0.1694 |
| Other Material Handling Equipment | 2021 | 51     | 120     | 0.349969 | 0.2941 | 3.60203 | 2.95622 | 0.0049 | 0.1657 | 0.1524 | 473.5884 | 0.1532 |
| Other Material Handling Equipment | 2021 | 121    | 175     | 0.296084 | 0.2488 | 3.19638 | 2.24633 | 0.0049 | 0.1138 | 0.1047 | 472.2193 | 0.1527 |
| Other Material Handling Equipment | 2021 | 176    | 250     | 0.32063  | 0.2694 | 1.30911 | 3.08193 | 0.0049 | 0.1024 | 0.0942 | 471.482  | 0.1525 |
| Other Material Handling Equipment | 2021 | 251    | 500     | 0.302407 | 0.2541 | 1.44188 | 2.60166 | 0.0049 | 0.1011 | 0.093  | 470.2972 | 0.1521 |
| Other Material Handling Equipment | 2021 | 1001   | 9999    | 0.086228 | 0.0725 | 0.97159 | 2.3179  | 0.0049 | 0.0195 | 0.0179 | 472.0545 | 0.1527 |
| Other Material Handling Equipment | 2022 | 26     | 50      | 1.313129 | 1.1034 | 5.98386 | 4.92048 | 0.0054 | 0.3851 | 0.3543 | 523.7088 | 0.1694 |
| Other Material Handling Equipment | 2022 | 51     | 120     | 0.294157 | 0.2472 | 3.55673 | 2.56673 | 0.0049 | 0.1209 | 0.1112 | 473.5884 | 0.1532 |
| Other Material Handling Equipment | 2022 | 121    | 175     | 0.268495 | 0.2256 | 3.17607 | 1.89383 | 0.0049 | 0.1028 | 0.0945 | 472.2193 | 0.1527 |
| Other Material Handling Equipment | 2022 | 176    | 250     | 0.272302 | 0.2288 | 1.23917 | 2.42542 | 0.0049 | 0.0826 | 0.076  | 471.482  | 0.1525 |
| Other Material Handling Equipment | 2022 | 251    | 500     | 0.269417 | 0.2264 | 1.34592 | 2.06254 | 0.0049 | 0.0834 | 0.0767 | 470.2972 | 0.1521 |
| Other Material Handling Equipment | 2022 | 1001   | 9999    | 0.090526 | 0.0761 | 0.97804 | 2.32798 | 0.0049 | 0.0198 | 0.0182 | 472.0545 | 0.1527 |
| Other Material Handling Equipment | 2023 | 26     | 50      | 1.203044 | 1.0109 | 5.75727 | 4.68435 | 0.0054 | 0.3401 | 0.3129 | 523.7088 | 0.1694 |
| Other Material Handling Equipment | 2023 | 51     | 120     | 0.267491 | 0.2248 | 3.51535 | 2.29768 | 0.0049 | 0.1037 | 0.0954 | 473.5884 | 0.1532 |
| Other Material Handling Equipment | 2023 | 121    | 175     | 0.25813  | 0.2169 | 3.17066 | 1.76898 | 0.0049 | 0.0959 | 0.0882 | 472.2193 | 0.1527 |
| Other Material Handling Equipment | 2023 | 176    | 250     | 0.246291 | 0.207  | 1.20917 | 2.00366 | 0.0049 | 0.069  | 0.0635 | 471.482  | 0.1525 |
| Other Material Handling Equipment | 2023 | 251    | 500     | 0.258837 | 0.2175 | 1.34382 | 1.87023 | 0.0049 | 0.0781 | 0.0719 | 470.2972 | 0.1521 |
| Other Material Handling Equipment | 2023 | 1001   | 9999    | 0.064735 | 0.0544 | 0.93935 | 2.26751 | 0.0049 | 0.0179 | 0.0165 | 472.0545 | 0.1527 |
| Other Material Handling Equipment | 2024 | 26     | 50      | 1.121754 | 0.9426 | 5.6693  | 4.5789  | 0.0054 | 0.3139 | 0.2888 | 523.7088 | 0.1694 |
| Other Material Handling Equipment | 2024 | 51     | 120     | 0.262084 | 0.2202 | 3.51036 | 2.22162 | 0.0049 | 0.0964 | 0.0887 | 473.5884 | 0.1532 |
| Other Material Handling Equipment | 2024 | 121    | 175     | 0.247908 | 0.2083 | 3.18111 | 1.63864 | 0.0049 | 0.088  | 0.0809 | 472.2193 | 0.1527 |
| Other Material Handling Equipment | 2024 | 176    | 250     | 0.250036 | 0.2101 | 1.21822 | 1.98559 | 0.0049 | 0.0682 | 0.0627 | 471.482  | 0.1525 |
| Other Material Handling Equipment | 2024 | 251    | 500     | 0.252116 | 0.2118 | 1.26223 | 1.75588 | 0.0049 | 0.072  | 0.0662 | 470.2972 | 0.1521 |
| Other Material Handling Equipment | 2024 | 1001   | 9999    | 0.069034 | 0.058  | 0.9458  | 2.27759 | 0.0049 | 0.0182 | 0.0168 | 472.0545 | 0.1527 |
| Other Material Handling Equipment | 2025 | 26     | 50      | 0.88573  | 0.7443 | 5.24797 | 4.23278 | 0.0054 | 0.2385 | 0.2194 | 523.7088 | 0.1694 |
| Other Material Handling Equipment | 2025 | 51     | 120     | 0.241784 | 0.2032 | 3.49652 | 2.05524 | 0.0049 | 0.0806 | 0.0742 | 473.5884 | 0.1532 |
| Other Material Handling Equipment | 2025 | 121    | 175     | 0.225132 | 0.1892 | 3.1679  | 1.39583 | 0.0049 | 0.0724 | 0.0666 | 472.2193 | 0.1527 |
| Other Material Handling Equipment | 2025 | 176    | 250     | 0.237677 | 0.1997 | 1.19728 | 1.77352 | 0.0049 | 0.06   | 0.0552 | 471.482  | 0.1525 |
| Other Material Handling Equipment | 2025 | 251    | 500     | 0.242568 | 0.2038 | 1.25988 | 1.60116 | 0.0049 | 0.0667 | 0.0613 | 470.2972 | 0.1521 |
| Other Material Handling Equipment | 2025 | 1001   | 9999    | 0.077631 | 0.0652 | 0.9587  | 2.29775 | 0.0049 | 0.0189 | 0.0173 | 472.0545 | 0.1527 |
| Other Material Handling Equipment | 2030 | 26     | 50      | 1.542    | 0.598  | 5.237   | 3.447   | 0.007  | 0.048  | 0.048  | 568.299  | 0.053  |
| Other Material Handling Equipment | 2030 | 51     | 120     | 1.57     | 0.304  | 3.784   | 1.762   | 0.006  | 0.043  | 0.043  | 568.299  | 0.027  |
| Other Material Handling Equipment | 2030 | 121    | 175     | 2.287    | 0.22   | 3.341   | 0.64    | 0.006  | 0.028  | 0.028  | 568.299  | 0.019  |
| Other Material Handling Equipment | 2030 | 176    | 250     | 2.539    | 0.206  | 1.138   | 0.535   | 0.006  | 0.018  | 0.018  | 568.299  | 0.018  |
| Other Material Handling Equipment | 2030 | 251    | 500     | 3.342    | 0.205  | 1.083   | 0.505   | 0.005  | 0.018  | 0.018  | 568.299  | 0.018  |
| Other Material Handling Equipment | 2030 | 1001   | 9999    | 13.763   | 0.218  | 1.084   | 2.653   | 0.005  | 0.035  | 0.035  | 568.299  | 0.019  |
| Other Material Handling Equipment | 2035 | 26     | 50      | 1.425    | 0.552  | 5.189   | 3.321   | 0.007  | 0.025  | 0.025  | 568.299  | 0.049  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type                    | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|-----------------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Other Material Handling Equipment | 2035 | 51     | 120     | 1.432    | 0.277  | 3.774   | 1.563   | 0.006  | 0.022  | 0.022  | 568.299  | 0.025  |
| Other Material Handling Equipment | 2035 | 121    | 175     | 2.036    | 0.196  | 3.338   | 0.398   | 0.006  | 0.016  | 0.016  | 568.299  | 0.017  |
| Other Material Handling Equipment | 2035 | 176    | 250     | 2.369    | 0.192  | 1.137   | 0.354   | 0.006  | 0.013  | 0.013  | 568.299  | 0.017  |
| Other Material Handling Equipment | 2035 | 251    | 500     | 3.13     | 0.192  | 1.082   | 0.35    | 0.005  | 0.013  | 0.013  | 568.299  | 0.017  |
| Other Material Handling Equipment | 2035 | 1001   | 9999    | 12.454   | 0.197  | 1.082   | 2.525   | 0.005  | 0.027  | 0.027  | 568.299  | 0.017  |
| Other Material Handling Equipment | 2040 | 26     | 50      | 1.42     | 0.551  | 5.191   | 3.269   | 0.007  | 0.018  | 0.018  | 568.299  | 0.049  |
| Other Material Handling Equipment | 2040 | 51     | 120     | 1.407    | 0.272  | 3.775   | 1.502   | 0.006  | 0.017  | 0.017  | 568.3    | 0.024  |
| Other Material Handling Equipment | 2040 | 121    | 175     | 1.956    | 0.188  | 3.339   | 0.314   | 0.006  | 0.012  | 0.012  | 568.299  | 0.017  |
| Other Material Handling Equipment | 2040 | 176    | 250     | 2.307    | 0.187  | 1.137   | 0.298   | 0.006  | 0.011  | 0.011  | 568.299  | 0.016  |
| Other Material Handling Equipment | 2040 | 251    | 500     | 3.048    | 0.187  | 1.082   | 0.298   | 0.005  | 0.011  | 0.011  | 568.299  | 0.016  |
| Other Material Handling Equipment | 2040 | 1001   | 9999    | 11.917   | 0.189  | 1.082   | 2.493   | 0.005  | 0.025  | 0.025  | 568.3    | 0.017  |
| Pavers                            | 1990 | 16     | 25      | 5.971    | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Pavers                            | 1990 | 26     | 50      | 19.405   | 4.794  | 9.701   | 7.946   | 0.871  | 1.268  | 1.268  | 568.299  | 0.432  |
| Pavers                            | 1990 | 51     | 120     | 23.749   | 2.373  | 5.748   | 15.062  | 0.791  | 1.339  | 1.339  | 568.299  | 0.214  |
| Pavers                            | 1990 | 121    | 175     | 33.808   | 1.822  | 5.135   | 14.503  | 0.758  | 1.01   | 1.01   | 568.3    | 0.164  |
| Pavers                            | 1990 | 176    | 250     | 51.225   | 1.822  | 5.135   | 14.503  | 0.758  | 1.01   | 1.01   | 568.299  | 0.164  |
| Pavers                            | 1990 | 251    | 500     | 54.32    | 1.61   | 11.305  | 13.755  | 0.662  | 0.864  | 0.864  | 568.3    | 0.145  |
| Pavers                            | 2000 | 16     | 25      | 5.517    | 2.044  | 4.689   | 6.391   | 0.065  | 0.569  | 0.569  | 568.299  | 0.184  |
| Pavers                            | 2000 | 26     | 50      | 18.072   | 4.464  | 9.175   | 7.116   | 0.066  | 0.93   | 0.93   | 568.299  | 0.402  |
| Pavers                            | 2000 | 51     | 120     | 19.415   | 1.94   | 4.853   | 11.121  | 0.06   | 0.916  | 0.916  | 568.299  | 0.175  |
| Pavers                            | 2000 | 121    | 175     | 24.566   | 1.324  | 4.022   | 10.172  | 0.057  | 0.558  | 0.558  | 568.299  | 0.119  |
| Pavers                            | 2000 | 176    | 250     | 33.03    | 1.175  | 3.443   | 9.909   | 0.057  | 0.488  | 0.488  | 568.299  | 0.106  |
| Pavers                            | 2000 | 251    | 500     | 35.713   | 1.058  | 6.242   | 9.422   | 0.05   | 0.426  | 0.426  | 568.299  | 0.095  |
| Pavers                            | 2005 | 16     | 25      | 3.746    | 1.388  | 3.497   | 5.819   | 0.065  | 0.444  | 0.444  | 568.299  | 0.125  |
| Pavers                            | 2005 | 26     | 50      | 16.699   | 4.125  | 8.722   | 6.746   | 0.066  | 0.883  | 0.883  | 568.299  | 0.372  |
| Pavers                            | 2005 | 51     | 120     | 17.345   | 1.733  | 4.584   | 9.797   | 0.06   | 0.869  | 0.869  | 568.299  | 0.156  |
| Pavers                            | 2005 | 121    | 175     | 21.287   | 1.147  | 3.731   | 8.921   | 0.057  | 0.5    | 0.5    | 568.299  | 0.103  |
| Pavers                            | 2005 | 176    | 250     | 26.087   | 0.928  | 2.661   | 8.591   | 0.057  | 0.382  | 0.382  | 568.299  | 0.083  |
| Pavers                            | 2005 | 251    | 500     | 27.622   | 0.818  | 4.283   | 7.91    | 0.05   | 0.335  | 0.335  | 568.299  | 0.073  |
| Pavers                            | 2010 | 16     | 25      | 2.244446 | 1.886  | 6.22261 | 5.97127 | 0.0054 | 0.6188 | 0.5693 | 585.4019 | 0.1704 |
| Pavers                            | 2010 | 26     | 50      | 2.244446 | 1.886  | 6.22261 | 5.97127 | 0.0054 | 0.6188 | 0.5693 | 585.4019 | 0.1704 |
| Pavers                            | 2010 | 51     | 120     | 0.922393 | 0.7751 | 3.82417 | 7.01944 | 0.0048 | 0.5403 | 0.4971 | 521.2606 | 0.1517 |
| Pavers                            | 2010 | 121    | 175     | 0.693583 | 0.5828 | 3.10662 | 6.66867 | 0.0049 | 0.3369 | 0.31   | 525.3233 | 0.1529 |
| Pavers                            | 2010 | 176    | 250     | 0.236627 | 0.1988 | 1.01703 | 4.38018 | 0.0049 | 0.1109 | 0.1021 | 526.8527 | 0.1534 |
| Pavers                            | 2010 | 251    | 500     | 0.240458 | 0.2021 | 1.1256  | 3.56944 | 0.0048 | 0.1231 | 0.1132 | 517.8758 | 0.1507 |
| Pavers                            | 2011 | 16     | 25      | 2.255759 | 1.8955 | 6.28822 | 5.97418 | 0.0054 | 0.6211 | 0.5714 | 583.8947 | 0.1704 |
| Pavers                            | 2011 | 26     | 50      | 2.255759 | 1.8955 | 6.28822 | 5.97418 | 0.0054 | 0.6211 | 0.5714 | 583.8947 | 0.1704 |
| Pavers                            | 2011 | 51     | 120     | 0.882284 | 0.7414 | 3.7912  | 6.70468 | 0.0048 | 0.5208 | 0.4791 | 519.7431 | 0.1517 |
| Pavers                            | 2011 | 121    | 175     | 0.67473  | 0.567  | 3.11177 | 6.45159 | 0.0049 | 0.3275 | 0.3013 | 524.0864 | 0.1529 |
| Pavers                            | 2011 | 176    | 250     | 0.244703 | 0.2056 | 1.02596 | 4.38871 | 0.0049 | 0.1122 | 0.1033 | 525.5251 | 0.1534 |
| Pavers                            | 2011 | 251    | 500     | 0.249329 | 0.2095 | 1.13249 | 3.58498 | 0.0048 | 0.125  | 0.115  | 516.5811 | 0.1507 |
| Pavers                            | 2012 | 16     | 25      | 2.286702 | 1.9215 | 6.36408 | 5.86068 | 0.0054 | 0.609  | 0.5603 | 582.5825 | 0.1704 |
| Pavers                            | 2012 | 26     | 50      | 2.286702 | 1.9215 | 6.36408 | 5.86068 | 0.0054 | 0.609  | 0.5603 | 582.5825 | 0.1704 |
| Pavers                            | 2012 | 51     | 120     | 0.886577 | 0.745  | 3.81157 | 6.67323 | 0.0048 | 0.5234 | 0.4815 | 518.3581 | 0.1516 |
| Pavers                            | 2012 | 121    | 175     | 0.677654 | 0.5694 | 3.13178 | 6.44162 | 0.0049 | 0.3293 | 0.303  | 522.8325 | 0.1529 |
| Pavers                            | 2012 | 176    | 250     | 0.2532   | 0.2128 | 1.035   | 4.41317 | 0.0049 | 0.114  | 0.1049 | 524.2222 | 0.1534 |
| Pavers                            | 2012 | 251    | 500     | 0.257974 | 0.2168 | 1.13914 | 3.59993 | 0.0048 | 0.1268 | 0.1166 | 515.2863 | 0.1507 |
| Pavers                            | 2013 | 16     | 25      | 2.27571  | 1.9122 | 6.39148 | 5.84153 | 0.0054 | 0.6051 | 0.5567 | 580.2093 | 0.1706 |
| Pavers                            | 2013 | 26     | 50      | 2.27571  | 1.9122 | 6.39148 | 5.84153 | 0.0054 | 0.6051 | 0.5567 | 580.2093 | 0.1706 |
| Pavers                            | 2013 | 51     | 120     | 0.845721 | 0.7106 | 3.79289 | 6.43604 | 0.0048 | 0.5009 | 0.4608 | 516.6013 | 0.1519 |
| Pavers                            | 2013 | 121    | 175     | 0.630117 | 0.5295 | 3.11657 | 6.05919 | 0.0049 | 0.3039 | 0.2796 | 519.6823 | 0.1528 |
| Pavers                            | 2013 | 176    | 250     | 0.245733 | 0.2065 | 1.01743 | 4.23038 | 0.0049 | 0.1061 | 0.0976 | 521.5314 | 0.1533 |
| Pavers                            | 2013 | 251    | 500     | 0.242925 | 0.2041 | 1.08604 | 3.39449 | 0.0048 | 0.1175 | 0.1081 | 514.2313 | 0.1512 |
| Pavers                            | 2014 | 16     | 25      | 2.258865 | 1.8981 | 6.3806  | 5.71682 | 0.0054 | 0.5946 | 0.547  | 577.016  | 0.1705 |
| Pavers                            | 2014 | 26     | 50      | 2.258865 | 1.8981 | 6.3806  | 5.71682 | 0.0054 | 0.5946 | 0.547  | 577.016  | 0.1705 |
| Pavers                            | 2014 | 51     | 120     | 0.81298  | 0.6831 | 3.77256 | 6.19872 | 0.0048 | 0.4827 | 0.4441 | 514.3769 | 0.152  |
| Pavers                            | 2014 | 121    | 175     | 0.597911 | 0.5024 | 3.1146  | 5.73631 | 0.0049 | 0.2869 | 0.2639 | 516.745  | 0.1527 |
| Pavers                            | 2014 | 176    | 250     | 0.247393 | 0.2079 | 1.02279 | 4.14032 | 0.0049 | 0.1051 | 0.0967 | 518.7225 | 0.1533 |
| Pavers                            | 2014 | 251    | 500     | 0.214341 | 0.1801 | 1.00469 | 3.04734 | 0.0048 | 0.1012 | 0.0931 | 512.1908 | 0.1514 |
| Pavers                            | 2015 | 16     | 25      | 2.205076 | 1.8529 | 6.34019 | 5.63731 | 0.0054 | 0.5791 | 0.5327 | 571.0859 | 0.1705 |
| Pavers                            | 2015 | 26     | 50      | 2.205076 | 1.8529 | 6.34019 | 5.63731 | 0.0054 | 0.5791 | 0.5327 | 571.0859 | 0.1705 |
| Pavers                            | 2015 | 51     | 120     | 0.809163 | 0.6799 | 3.78832 | 6.14096 | 0.0048 | 0.4794 | 0.441  | 509.3767 | 0.1521 |
| Pavers                            | 2015 | 121    | 175     | 0.582419 | 0.4894 | 3.11546 | 5.53669 | 0.0049 | 0.2774 | 0.2552 | 511.6457 | 0.1527 |
| Pavers                            | 2015 | 176    | 250     | 0.254974 | 0.2142 | 1.03121 | 4.16051 | 0.0049 | 0.1066 | 0.098  | 513.4682 | 0.1533 |
| Pavers                            | 2015 | 251    | 500     | 0.209561 | 0.1761 | 0.97787 | 2.91741 | 0.0048 | 0.0968 | 0.0891 | 506.0973 | 0.1511 |
| Pavers                            | 2016 | 16     | 25      | 2.174792 | 1.8274 | 6.33993 | 5.57882 | 0.0054 | 0.5688 | 0.5233 | 565.2336 | 0.1705 |
| Pavers                            | 2016 | 26     | 50      | 2.174792 | 1.8274 | 6.33993 | 5.57882 | 0.0054 | 0.5688 | 0.5233 | 565.2336 | 0.1705 |
| Pavers                            | 2016 | 51     | 120     | 0.773362 | 0.6498 | 3.76854 | 5.88646 | 0.0048 | 0.4566 | 0.42   | 503.7795 | 0.152  |
| Pavers                            | 2016 | 121    | 175     | 0.515586 | 0.4332 | 3.08023 | 4.87397 | 0.0049 | 0.2422 | 0.2228 | 506.5401 | 0.1528 |
| Pavers                            | 2016 | 176    | 250     | 0.254126 | 0.2135 | 1.03591 | 4.02384 | 0.0049 | 0.1041 | 0.0958 | 508.0698 | 0.1533 |
| Pavers                            | 2016 | 251    | 500     | 0.214564 | 0.1803 | 0.9829  | 2.88492 | 0.0048 | 0.0962 | 0.0885 | 500.9364 | 0.1511 |
| Pavers                            | 2017 | 16     | 25      | 2.059621 | 1.7307 | 6.19932 | 5.43675 | 0.0054 | 0.5396 | 0.4965 | 556.4528 | 0.1705 |
| Pavers                            | 2017 | 26     | 50      | 2.059621 | 1.7307 | 6.19932 | 5.43675 | 0.0054 | 0.5396 | 0.4965 | 556.4528 | 0.1705 |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type   | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Pavers           | 2017 | 51     | 120     | 0.744072 | 0.6252 | 3.75882 | 5.69243 | 0.0048 | 0.4374 | 0.4024 | 495.9253 | 0.152  |
| Pavers           | 2017 | 121    | 175     | 0.462819 | 0.3889 | 3.06282 | 4.35312 | 0.0049 | 0.2142 | 0.1971 | 498.967  | 0.1529 |
| Pavers           | 2017 | 176    | 250     | 0.247933 | 0.2083 | 1.03652 | 3.80866 | 0.0049 | 0.0997 | 0.0918 | 499.5617 | 0.1531 |
| Pavers           | 2017 | 251    | 500     | 0.199578 | 0.1677 | 0.97942 | 2.48674 | 0.0048 | 0.0874 | 0.0805 | 491.7843 | 0.1507 |
| Pavers           | 2018 | 16     | 25      | 1.831035 | 1.5386 | 5.8493  | 5.12103 | 0.0054 | 0.4782 | 0.4399 | 547.0785 | 0.1703 |
| Pavers           | 2018 | 26     | 50      | 1.831035 | 1.5386 | 5.8493  | 5.12103 | 0.0054 | 0.4782 | 0.4399 | 547.0785 | 0.1703 |
| Pavers           | 2018 | 51     | 120     | 0.637446 | 0.5356 | 3.66032 | 5.01936 | 0.0048 | 0.3752 | 0.3452 | 488.1812 | 0.152  |
| Pavers           | 2018 | 121    | 175     | 0.403099 | 0.3387 | 3.03913 | 3.7472  | 0.0049 | 0.1831 | 0.1684 | 491.322  | 0.153  |
| Pavers           | 2018 | 176    | 250     | 0.235833 | 0.1982 | 1.03446 | 3.47438 | 0.0049 | 0.0922 | 0.0848 | 491.543  | 0.153  |
| Pavers           | 2018 | 251    | 500     | 0.195547 | 0.1643 | 0.98125 | 2.32002 | 0.0048 | 0.0826 | 0.076  | 484.2774 | 0.1508 |
| Pavers           | 2019 | 16     | 25      | 1.687019 | 1.4176 | 5.65687 | 4.91634 | 0.0054 | 0.4361 | 0.4012 | 538.3246 | 0.1703 |
| Pavers           | 2019 | 26     | 50      | 1.687019 | 1.4176 | 5.65687 | 4.91634 | 0.0054 | 0.4361 | 0.4012 | 538.3246 | 0.1703 |
| Pavers           | 2019 | 51     | 120     | 0.589904 | 0.4957 | 3.62215 | 4.67048 | 0.0048 | 0.3455 | 0.3178 | 480.2509 | 0.1519 |
| Pavers           | 2019 | 121    | 175     | 0.355588 | 0.2988 | 3.01323 | 3.24473 | 0.0049 | 0.1589 | 0.1462 | 483.3938 | 0.1529 |
| Pavers           | 2019 | 176    | 250     | 0.222293 | 0.1868 | 1.03181 | 3.11084 | 0.0049 | 0.0842 | 0.0774 | 483.5743 | 0.153  |
| Pavers           | 2019 | 251    | 500     | 0.198123 | 0.1665 | 0.98586 | 2.26992 | 0.0048 | 0.081  | 0.0746 | 476.9707 | 0.1509 |
| Pavers           | 2020 | 16     | 25      | 1.568718 | 1.3182 | 5.52345 | 4.76401 | 0.0054 | 0.4022 | 0.37   | 526.2098 | 0.1702 |
| Pavers           | 2020 | 26     | 50      | 1.568718 | 1.3182 | 5.52345 | 4.76401 | 0.0054 | 0.4022 | 0.37   | 526.2098 | 0.1702 |
| Pavers           | 2020 | 51     | 120     | 0.558949 | 0.4697 | 3.60405 | 4.42718 | 0.0048 | 0.3249 | 0.2989 | 469.8815 | 0.152  |
| Pavers           | 2020 | 121    | 175     | 0.324615 | 0.2728 | 3.0097  | 2.91833 | 0.0049 | 0.1419 | 0.1305 | 472.7746 | 0.1529 |
| Pavers           | 2020 | 176    | 250     | 0.209036 | 0.1756 | 1.02834 | 2.77699 | 0.0049 | 0.076  | 0.0699 | 472.8337 | 0.1529 |
| Pavers           | 2020 | 251    | 500     | 0.195949 | 0.1647 | 0.98677 | 2.13394 | 0.0048 | 0.0772 | 0.071  | 466.2059 | 0.1508 |
| Pavers           | 2021 | 16     | 25      | 1.43708  | 1.2075 | 5.30162 | 4.60183 | 0.0054 | 0.3699 | 0.3403 | 526.5153 | 0.1703 |
| Pavers           | 2021 | 26     | 50      | 1.43708  | 1.2075 | 5.30162 | 4.60183 | 0.0054 | 0.3699 | 0.3403 | 526.5153 | 0.1703 |
| Pavers           | 2021 | 51     | 120     | 0.499355 | 0.4196 | 3.56251 | 4.02622 | 0.0048 | 0.2853 | 0.2625 | 469.7736 | 0.1519 |
| Pavers           | 2021 | 121    | 175     | 0.304315 | 0.2557 | 3.01647 | 2.6948  | 0.0049 | 0.1302 | 0.1198 | 472.5552 | 0.1528 |
| Pavers           | 2021 | 176    | 250     | 0.196899 | 0.1655 | 1.02422 | 2.4844  | 0.0049 | 0.0697 | 0.0642 | 472.4765 | 0.1528 |
| Pavers           | 2021 | 251    | 500     | 0.195105 | 0.1639 | 0.9877  | 2.05298 | 0.0048 | 0.074  | 0.068  | 465.5908 | 0.1506 |
| Pavers           | 2022 | 16     | 25      | 1.299052 | 1.0916 | 5.11433 | 4.42092 | 0.0054 | 0.3297 | 0.3033 | 526.8963 | 0.1704 |
| Pavers           | 2022 | 26     | 50      | 1.299052 | 1.0916 | 5.11433 | 4.42092 | 0.0054 | 0.3297 | 0.3033 | 526.8963 | 0.1704 |
| Pavers           | 2022 | 51     | 120     | 0.443951 | 0.373  | 3.52511 | 3.65932 | 0.0049 | 0.2479 | 0.2281 | 470.1854 | 0.1521 |
| Pavers           | 2022 | 121    | 175     | 0.255688 | 0.2148 | 2.99478 | 2.17958 | 0.0049 | 0.1036 | 0.0953 | 472.7599 | 0.1529 |
| Pavers           | 2022 | 176    | 250     | 0.167123 | 0.1404 | 1.01231 | 1.89985 | 0.0049 | 0.0547 | 0.0503 | 472.3718 | 0.1528 |
| Pavers           | 2022 | 251    | 500     | 0.178545 | 0.15   | 0.98238 | 1.81028 | 0.0048 | 0.0631 | 0.058  | 466.0042 | 0.1507 |
| Pavers           | 2023 | 16     | 25      | 1.198318 | 1.0069 | 5.00667 | 4.28484 | 0.0054 | 0.2985 | 0.2746 | 526.8595 | 0.1704 |
| Pavers           | 2023 | 26     | 50      | 1.198318 | 1.0069 | 5.00667 | 4.28484 | 0.0054 | 0.2985 | 0.2746 | 526.8595 | 0.1704 |
| Pavers           | 2023 | 51     | 120     | 0.415607 | 0.3492 | 3.50733 | 3.42661 | 0.0049 | 0.2262 | 0.2081 | 470.0839 | 0.152  |
| Pavers           | 2023 | 121    | 175     | 0.237199 | 0.1993 | 2.99398 | 1.95517 | 0.0049 | 0.092  | 0.0846 | 472.7178 | 0.1529 |
| Pavers           | 2023 | 176    | 250     | 0.154288 | 0.1296 | 1.01018 | 1.6106  | 0.0049 | 0.047  | 0.0433 | 472.6051 | 0.1529 |
| Pavers           | 2023 | 251    | 500     | 0.18061  | 0.1518 | 0.98653 | 1.77101 | 0.0048 | 0.0616 | 0.0567 | 466.0038 | 0.1507 |
| Pavers           | 2024 | 16     | 25      | 1.130978 | 0.9503 | 4.95625 | 4.20308 | 0.0054 | 0.2791 | 0.2568 | 526.8565 | 0.1704 |
| Pavers           | 2024 | 26     | 50      | 1.130978 | 0.9503 | 4.95625 | 4.20308 | 0.0054 | 0.2791 | 0.2568 | 526.8565 | 0.1704 |
| Pavers           | 2024 | 51     | 120     | 0.40131  | 0.3372 | 3.50784 | 3.2771  | 0.0049 | 0.2126 | 0.1956 | 470.2262 | 0.1521 |
| Pavers           | 2024 | 121    | 175     | 0.226916 | 0.1907 | 3.0042  | 1.80882 | 0.0049 | 0.0845 | 0.0777 | 472.6605 | 0.1529 |
| Pavers           | 2024 | 176    | 250     | 0.141914 | 0.1192 | 1.00872 | 1.34323 | 0.0049 | 0.0412 | 0.0379 | 473.2362 | 0.1531 |
| Pavers           | 2024 | 251    | 500     | 0.169789 | 0.1427 | 0.98624 | 1.54798 | 0.0048 | 0.0537 | 0.0494 | 467.1711 | 0.1511 |
| Pavers           | 2025 | 16     | 25      | 1.092933 | 0.9184 | 4.94451 | 4.13112 | 0.0054 | 0.2646 | 0.2434 | 526.8533 | 0.1704 |
| Pavers           | 2025 | 26     | 50      | 1.092933 | 0.9184 | 4.94451 | 4.13112 | 0.0054 | 0.2646 | 0.2434 | 526.8533 | 0.1704 |
| Pavers           | 2025 | 51     | 120     | 0.373474 | 0.3138 | 3.49286 | 3.06788 | 0.0049 | 0.1905 | 0.1753 | 469.8988 | 0.152  |
| Pavers           | 2025 | 121    | 175     | 0.214799 | 0.1805 | 3.0071  | 1.64396 | 0.0049 | 0.077  | 0.0708 | 472.485  | 0.1528 |
| Pavers           | 2025 | 176    | 250     | 0.127304 | 0.107  | 1.00414 | 1.03493 | 0.0049 | 0.0337 | 0.031  | 473.4832 | 0.1531 |
| Pavers           | 2025 | 251    | 500     | 0.136633 | 0.1148 | 0.96892 | 1.13351 | 0.0048 | 0.039  | 0.0359 | 465.8824 | 0.1507 |
| Pavers           | 2030 | 16     | 25      | 1.849    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Pavers           | 2030 | 26     | 50      | 3.42     | 0.845  | 5.396   | 3.841   | 0.007  | 0.134  | 0.134  | 568.299  | 0.076  |
| Pavers           | 2030 | 51     | 120     | 4.084    | 0.408  | 3.8     | 2.468   | 0.006  | 0.121  | 0.121  | 568.3    | 0.036  |
| Pavers           | 2030 | 121    | 175     | 5.577    | 0.3    | 3.326   | 1.425   | 0.006  | 0.074  | 0.074  | 568.299  | 0.027  |
| Pavers           | 2030 | 176    | 250     | 7.306    | 0.259  | 1.192   | 1.246   | 0.006  | 0.045  | 0.045  | 568.299  | 0.023  |
| Pavers           | 2030 | 251    | 500     | 8.558    | 0.253  | 1.181   | 1.141   | 0.005  | 0.043  | 0.043  | 568.299  | 0.022  |
| Pavers           | 2035 | 16     | 25      | 1.849    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Pavers           | 2035 | 26     | 50      | 2.812    | 0.694  | 5.26    | 3.555   | 0.007  | 0.076  | 0.076  | 568.299  | 0.062  |
| Pavers           | 2035 | 51     | 120     | 3.386    | 0.338  | 3.774   | 1.986   | 0.006  | 0.069  | 0.069  | 568.299  | 0.03   |
| Pavers           | 2035 | 121    | 175     | 4.543    | 0.244  | 3.319   | 0.889   | 0.006  | 0.043  | 0.043  | 568.299  | 0.022  |
| Pavers           | 2035 | 176    | 250     | 6.219    | 0.221  | 1.157   | 0.772   | 0.006  | 0.027  | 0.027  | 568.3    | 0.019  |
| Pavers           | 2035 | 251    | 500     | 7.364    | 0.218  | 1.111   | 0.722   | 0.005  | 0.026  | 0.026  | 568.299  | 0.019  |
| Pavers           | 2040 | 16     | 25      | 1.849    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Pavers           | 2040 | 26     | 50      | 2.504    | 0.618  | 5.189   | 3.393   | 0.007  | 0.047  | 0.047  | 568.299  | 0.055  |
| Pavers           | 2040 | 51     | 120     | 3.03     | 0.302  | 3.763   | 1.731   | 0.006  | 0.043  | 0.043  | 568.299  | 0.027  |
| Pavers           | 2040 | 121    | 175     | 3.958    | 0.213  | 3.319   | 0.583   | 0.006  | 0.027  | 0.027  | 568.299  | 0.019  |
| Pavers           | 2040 | 176    | 250     | 5.625    | 0.2    | 1.138   | 0.525   | 0.006  | 0.018  | 0.018  | 568.299  | 0.018  |
| Pavers           | 2040 | 251    | 500     | 6.703    | 0.198  | 1.085   | 0.498   | 0.005  | 0.018  | 0.018  | 568.299  | 0.017  |
| Paving Equipment | 1990 | 16     | 25      | 5.257    | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Paving Equipment | 1990 | 26     | 50      | 21.788   | 4.84   | 9.783   | 7.965   | 0.871  | 1.277  | 1.277  | 568.299  | 0.436  |
| Paving Equipment | 1990 | 51     | 120     | 24.593   | 2.398  | 5.796   | 15.202  | 0.791  | 1.352  | 1.352  | 568.299  | 0.216  |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type   | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Paving Equipment | 1990 | 121    | 175     | 35.738   | 1.88   | 5.196   | 14.821  | 0.758  | 1.044  | 1.044  | 568.3    | 0.169  |
| Paving Equipment | 1990 | 176    | 250     | 43.262   | 1.88   | 5.196   | 14.821  | 0.758  | 1.044  | 1.044  | 568.299  | 0.169  |
| Paving Equipment | 2000 | 16     | 25      | 4.652    | 1.958  | 4.53    | 6.358   | 0.065  | 0.563  | 0.563  | 568.299  | 0.176  |
| Paving Equipment | 2000 | 26     | 50      | 19.86    | 4.412  | 9.076   | 7.101   | 0.066  | 0.921  | 0.921  | 568.299  | 0.398  |
| Paving Equipment | 2000 | 51     | 120     | 19.826   | 1.933  | 4.844   | 11.122  | 0.06   | 0.909  | 0.909  | 568.299  | 0.174  |
| Paving Equipment | 2000 | 121    | 175     | 25.015   | 1.316  | 4.018   | 10.15   | 0.057  | 0.553  | 0.553  | 568.299  | 0.118  |
| Paving Equipment | 2000 | 176    | 250     | 26.974   | 1.172  | 3.458   | 9.895   | 0.057  | 0.486  | 0.486  | 568.299  | 0.105  |
| Paving Equipment | 2005 | 16     | 25      | 2.184    | 0.919  | 2.642   | 5.412   | 0.065  | 0.347  | 0.347  | 568.299  | 0.082  |
| Paving Equipment | 2005 | 26     | 50      | 18.352   | 4.077  | 8.626   | 6.73    | 0.066  | 0.875  | 0.875  | 568.299  | 0.367  |
| Paving Equipment | 2005 | 51     | 120     | 17.633   | 1.719  | 4.557   | 9.754   | 0.06   | 0.86   | 0.86   | 568.299  | 0.155  |
| Paving Equipment | 2005 | 121    | 175     | 21.589   | 1.135  | 3.705   | 8.873   | 0.057  | 0.494  | 0.494  | 568.299  | 0.102  |
| Paving Equipment | 2005 | 176    | 250     | 21.201   | 0.921  | 2.655   | 8.548   | 0.057  | 0.38   | 0.38   | 568.299  | 0.083  |
| Paving Equipment | 2010 | 16     | 25      | 1.378997 | 1.1587 | 4.92203 | 5.35696 | 0.0054 | 0.4704 | 0.4328 | 578.6236 | 0.1684 |
| Paving Equipment | 2010 | 26     | 50      | 1.378997 | 1.1587 | 4.92203 | 5.35696 | 0.0054 | 0.4704 | 0.4328 | 578.6236 | 0.1684 |
| Paving Equipment | 2010 | 51     | 120     | 0.934999 | 0.7857 | 3.90118 | 7.23593 | 0.0049 | 0.5526 | 0.5084 | 526.5834 | 0.1533 |
| Paving Equipment | 2010 | 121    | 175     | 0.573407 | 0.4818 | 3.13688 | 6.09511 | 0.0049 | 0.2947 | 0.2711 | 523.4127 | 0.1524 |
| Paving Equipment | 2010 | 176    | 250     | 0.486641 | 0.4089 | 1.69744 | 6.03614 | 0.0049 | 0.2235 | 0.2056 | 524.3728 | 0.1526 |
| Paving Equipment | 2011 | 16     | 25      | 1.380687 | 1.1602 | 4.99687 | 5.36974 | 0.0054 | 0.4719 | 0.4342 | 577.1303 | 0.1684 |
| Paving Equipment | 2011 | 26     | 50      | 1.380687 | 1.1602 | 4.99687 | 5.36974 | 0.0054 | 0.4719 | 0.4342 | 577.1303 | 0.1684 |
| Paving Equipment | 2011 | 51     | 120     | 0.895349 | 0.7523 | 3.87125 | 6.99544 | 0.0049 | 0.5361 | 0.4933 | 524.9269 | 0.1532 |
| Paving Equipment | 2011 | 121    | 175     | 0.56507  | 0.4748 | 3.14337 | 5.97526 | 0.0049 | 0.2902 | 0.267  | 522.1549 | 0.1524 |
| Paving Equipment | 2011 | 176    | 250     | 0.466258 | 0.3918 | 1.64572 | 5.77978 | 0.0049 | 0.2129 | 0.1958 | 523.0323 | 0.1526 |
| Paving Equipment | 2012 | 16     | 25      | 1.384947 | 1.1637 | 5.06516 | 5.34363 | 0.0054 | 0.4701 | 0.4325 | 575.687  | 0.1684 |
| Paving Equipment | 2012 | 26     | 50      | 1.384947 | 1.1637 | 5.06516 | 5.34363 | 0.0054 | 0.4701 | 0.4325 | 575.687  | 0.1684 |
| Paving Equipment | 2012 | 51     | 120     | 0.910401 | 0.765  | 3.90635 | 7.04165 | 0.0049 | 0.5462 | 0.5025 | 523.5886 | 0.1532 |
| Paving Equipment | 2012 | 121    | 175     | 0.56544  | 0.4751 | 3.15801 | 5.9326  | 0.0049 | 0.2903 | 0.2671 | 520.7286 | 0.1523 |
| Paving Equipment | 2012 | 176    | 250     | 0.474854 | 0.399  | 1.657   | 5.81292 | 0.0049 | 0.2154 | 0.1982 | 521.7154 | 0.1526 |
| Paving Equipment | 2013 | 16     | 25      | 1.327494 | 1.1155 | 5.02677 | 5.2986  | 0.0054 | 0.4586 | 0.4219 | 572.4644 | 0.1683 |
| Paving Equipment | 2013 | 26     | 50      | 1.327494 | 1.1155 | 5.02677 | 5.2986  | 0.0054 | 0.4586 | 0.4219 | 572.4644 | 0.1683 |
| Paving Equipment | 2013 | 51     | 120     | 0.845445 | 0.7104 | 3.86369 | 6.6576  | 0.0049 | 0.5072 | 0.4666 | 520.6724 | 0.1531 |
| Paving Equipment | 2013 | 121    | 175     | 0.532035 | 0.4471 | 3.1205  | 5.60344 | 0.0049 | 0.2708 | 0.2491 | 517.6606 | 0.1522 |
| Paving Equipment | 2013 | 176    | 250     | 0.40741  | 0.3423 | 1.48037 | 5.25206 | 0.0049 | 0.1804 | 0.166  | 519.5215 | 0.1527 |
| Paving Equipment | 2014 | 16     | 25      | 1.253528 | 1.0533 | 4.95215 | 5.18385 | 0.0054 | 0.4368 | 0.4019 | 569.4822 | 0.1683 |
| Paving Equipment | 2014 | 26     | 50      | 1.253528 | 1.0533 | 4.95215 | 5.18385 | 0.0054 | 0.4368 | 0.4019 | 569.4822 | 0.1683 |
| Paving Equipment | 2014 | 51     | 120     | 0.805438 | 0.6768 | 3.83664 | 6.36952 | 0.0049 | 0.4858 | 0.4469 | 518.0756 | 0.1531 |
| Paving Equipment | 2014 | 121    | 175     | 0.494038 | 0.4151 | 3.09686 | 5.21567 | 0.0049 | 0.2488 | 0.2289 | 515.0343 | 0.1522 |
| Paving Equipment | 2014 | 176    | 250     | 0.369032 | 0.3101 | 1.37011 | 4.78232 | 0.0049 | 0.1584 | 0.1457 | 516.8998 | 0.1527 |
| Paving Equipment | 2015 | 16     | 25      | 1.166929 | 0.9805 | 4.86895 | 5.02757 | 0.0054 | 0.4067 | 0.3742 | 563.5534 | 0.1682 |
| Paving Equipment | 2015 | 26     | 50      | 1.166929 | 0.9805 | 4.86895 | 5.02757 | 0.0054 | 0.4067 | 0.3742 | 563.5534 | 0.1682 |
| Paving Equipment | 2015 | 51     | 120     | 0.786628 | 0.661  | 3.83329 | 6.14454 | 0.0049 | 0.4707 | 0.4331 | 513.1672 | 0.1532 |
| Paving Equipment | 2015 | 121    | 175     | 0.48887  | 0.4108 | 3.10403 | 4.96561 | 0.0049 | 0.2423 | 0.2229 | 509.8942 | 0.1522 |
| Paving Equipment | 2015 | 176    | 250     | 0.374849 | 0.315  | 1.37947 | 4.77176 | 0.0049 | 0.1587 | 0.146  | 511.6544 | 0.1528 |
| Paving Equipment | 2016 | 16     | 25      | 1.178909 | 0.9906 | 4.93662 | 4.98487 | 0.0054 | 0.4035 | 0.3712 | 557.7058 | 0.1682 |
| Paving Equipment | 2016 | 26     | 50      | 1.178909 | 0.9906 | 4.93662 | 4.98487 | 0.0054 | 0.4035 | 0.3712 | 557.7058 | 0.1682 |
| Paving Equipment | 2016 | 51     | 120     | 0.741701 | 0.6232 | 3.79639 | 5.7333  | 0.0049 | 0.4383 | 0.4033 | 507.9102 | 0.1532 |
| Paving Equipment | 2016 | 121    | 175     | 0.442497 | 0.3718 | 3.08114 | 4.3217  | 0.0049 | 0.2145 | 0.1973 | 504.8201 | 0.1523 |
| Paving Equipment | 2016 | 176    | 250     | 0.353542 | 0.2971 | 1.33145 | 4.42821 | 0.0049 | 0.1477 | 0.1359 | 506.1965 | 0.1527 |
| Paving Equipment | 2017 | 16     | 25      | 1.102141 | 0.9261 | 4.80403 | 4.72756 | 0.0054 | 0.3592 | 0.3305 | 548.6481 | 0.1681 |
| Paving Equipment | 2017 | 26     | 50      | 1.102141 | 0.9261 | 4.80403 | 4.72756 | 0.0054 | 0.3592 | 0.3305 | 548.6481 | 0.1681 |
| Paving Equipment | 2017 | 51     | 120     | 0.670017 | 0.563  | 3.74146 | 5.20745 | 0.0049 | 0.3905 | 0.3593 | 500.1649 | 0.1532 |
| Paving Equipment | 2017 | 121    | 175     | 0.407568 | 0.3425 | 3.07321 | 3.89633 | 0.0049 | 0.1946 | 0.1791 | 497.148  | 0.1523 |
| Paving Equipment | 2017 | 176    | 250     | 0.342633 | 0.2879 | 1.333   | 4.12109 | 0.0049 | 0.1415 | 0.1302 | 498.7323 | 0.1528 |
| Paving Equipment | 2018 | 16     | 25      | 0.877571 | 0.7374 | 4.41578 | 4.31244 | 0.0054 | 0.286  | 0.2632 | 540.6115 | 0.1683 |
| Paving Equipment | 2018 | 26     | 50      | 0.877571 | 0.7374 | 4.41578 | 4.31244 | 0.0054 | 0.286  | 0.2632 | 540.6115 | 0.1683 |
| Paving Equipment | 2018 | 51     | 120     | 0.534861 | 0.4494 | 3.60743 | 4.27034 | 0.0049 | 0.3021 | 0.278  | 492.1184 | 0.1532 |
| Paving Equipment | 2018 | 121    | 175     | 0.337615 | 0.2837 | 3.02602 | 3.17208 | 0.0049 | 0.1553 | 0.1429 | 489.2024 | 0.1523 |
| Paving Equipment | 2018 | 176    | 250     | 0.307374 | 0.2583 | 1.28117 | 3.58656 | 0.0049 | 0.1229 | 0.1131 | 490.6833 | 0.1528 |
| Paving Equipment | 2019 | 16     | 25      | 0.838543 | 0.7046 | 4.40798 | 4.23779 | 0.0054 | 0.2697 | 0.2481 | 531.8612 | 0.1683 |
| Paving Equipment | 2019 | 26     | 50      | 0.838543 | 0.7046 | 4.40798 | 4.23779 | 0.0054 | 0.2697 | 0.2481 | 531.8612 | 0.1683 |
| Paving Equipment | 2019 | 51     | 120     | 0.50594  | 0.4251 | 3.59849 | 4.04152 | 0.0049 | 0.2808 | 0.2584 | 484.387  | 0.1533 |
| Paving Equipment | 2019 | 121    | 175     | 0.302373 | 0.2541 | 3.0109  | 2.6924  | 0.0049 | 0.1336 | 0.1229 | 481.2251 | 0.1523 |
| Paving Equipment | 2019 | 176    | 250     | 0.286526 | 0.2408 | 1.24449 | 3.25106 | 0.0049 | 0.1116 | 0.1027 | 482.6441 | 0.1527 |
| Paving Equipment | 2020 | 16     | 25      | 0.73951  | 0.6214 | 4.22322 | 3.9519  | 0.0054 | 0.2169 | 0.1996 | 520.1235 | 0.1682 |
| Paving Equipment | 2020 | 26     | 50      | 0.73951  | 0.6214 | 4.22322 | 3.9519  | 0.0054 | 0.2169 | 0.1996 | 520.1235 | 0.1682 |
| Paving Equipment | 2020 | 51     | 120     | 0.472907 | 0.3974 | 3.58172 | 3.78064 | 0.0049 | 0.2558 | 0.2353 | 473.3249 | 0.1531 |
| Paving Equipment | 2020 | 121    | 175     | 0.294586 | 0.2475 | 3.02393 | 2.55498 | 0.0049 | 0.1278 | 0.1176 | 470.7359 | 0.1522 |
| Paving Equipment | 2020 | 176    | 250     | 0.289784 | 0.2435 | 1.25215 | 3.2202  | 0.0049 | 0.1107 | 0.1018 | 472.1514 | 0.1527 |
| Paving Equipment | 2021 | 16     | 25      | 0.698022 | 0.5865 | 4.21072 | 3.88226 | 0.0054 | 0.2004 | 0.1843 | 520.3965 | 0.1683 |
| Paving Equipment | 2021 | 26     | 50      | 0.698022 | 0.5865 | 4.21072 | 3.88226 | 0.0054 | 0.2004 | 0.1843 | 520.3965 | 0.1683 |
| Paving Equipment | 2021 | 51     | 120     | 0.422572 | 0.3551 | 3.5537  | 3.45065 | 0.0049 | 0.219  | 0.2015 | 473.2205 | 0.153  |
| Paving Equipment | 2021 | 121    | 175     | 0.272687 | 0.2291 | 3.03229 | 2.31505 | 0.0049 | 0.1143 | 0.1052 | 470.6495 | 0.1522 |
| Paving Equipment | 2021 | 176    | 250     | 0.250607 | 0.2106 | 1.20904 | 2.58202 | 0.0049 | 0.0921 | 0.0848 | 472.151  | 0.1527 |
| Paving Equipment | 2022 | 16     | 25      | 0.68013  | 0.5715 | 4.24448 | 3.83611 | 0.0054 | 0.1883 | 0.1732 | 520.6594 | 0.1684 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type   | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Paving Equipment | 2022 | 26     | 50      | 0.68013  | 0.5715 | 4.24448 | 3.83611 | 0.0054 | 0.1883 | 0.1732 | 520.6594 | 0.1684 |
| Paving Equipment | 2022 | 51     | 120     | 0.351718 | 0.2955 | 3.50075 | 2.99968 | 0.0049 | 0.171  | 0.1573 | 473.4475 | 0.1531 |
| Paving Equipment | 2022 | 121    | 175     | 0.253077 | 0.2127 | 3.03777 | 2.07331 | 0.0049 | 0.1011 | 0.093  | 470.6646 | 0.1522 |
| Paving Equipment | 2022 | 176    | 250     | 0.232653 | 0.1955 | 1.20363 | 2.22813 | 0.0049 | 0.083  | 0.0764 | 472.169  | 0.1527 |
| Paving Equipment | 2023 | 16     | 25      | 0.644074 | 0.5412 | 4.24108 | 3.77446 | 0.0054 | 0.1731 | 0.1592 | 521.1138 | 0.1685 |
| Paving Equipment | 2023 | 26     | 50      | 0.644074 | 0.5412 | 4.24108 | 3.77446 | 0.0054 | 0.1731 | 0.1592 | 521.1138 | 0.1685 |
| Paving Equipment | 2023 | 51     | 120     | 0.331302 | 0.2784 | 3.50331 | 2.83717 | 0.0049 | 0.1525 | 0.1403 | 473.427  | 0.1531 |
| Paving Equipment | 2023 | 121    | 175     | 0.242414 | 0.2037 | 3.05059 | 1.91255 | 0.0049 | 0.093  | 0.0856 | 470.663  | 0.1522 |
| Paving Equipment | 2023 | 176    | 250     | 0.208228 | 0.175  | 1.16523 | 1.88495 | 0.0049 | 0.0701 | 0.0645 | 472.169  | 0.1527 |
| Paving Equipment | 2024 | 16     | 25      | 0.622364 | 0.523  | 4.27468 | 3.74329 | 0.0054 | 0.164  | 0.1509 | 521.0575 | 0.1685 |
| Paving Equipment | 2024 | 26     | 50      | 0.622364 | 0.523  | 4.27468 | 3.74329 | 0.0054 | 0.164  | 0.1509 | 521.0575 | 0.1685 |
| Paving Equipment | 2024 | 51     | 120     | 0.311995 | 0.2622 | 3.50288 | 2.67309 | 0.0049 | 0.1354 | 0.1246 | 473.1748 | 0.153  |
| Paving Equipment | 2024 | 121    | 175     | 0.233948 | 0.1966 | 3.06623 | 1.78512 | 0.0049 | 0.0862 | 0.0793 | 470.6614 | 0.1522 |
| Paving Equipment | 2024 | 176    | 250     | 0.164733 | 0.1384 | 1.11417 | 1.29567 | 0.0049 | 0.048  | 0.0441 | 472.2124 | 0.1527 |
| Paving Equipment | 2025 | 16     | 25      | 0.566694 | 0.4762 | 4.20347 | 3.62672 | 0.0054 | 0.1415 | 0.1302 | 520.9975 | 0.1685 |
| Paving Equipment | 2025 | 26     | 50      | 0.566694 | 0.4762 | 4.20347 | 3.62672 | 0.0054 | 0.1415 | 0.1302 | 520.9975 | 0.1685 |
| Paving Equipment | 2025 | 51     | 120     | 0.287394 | 0.2415 | 3.48256 | 2.49628 | 0.0049 | 0.1178 | 0.1084 | 473.4239 | 0.1531 |
| Paving Equipment | 2025 | 121    | 175     | 0.208465 | 0.1752 | 3.03837 | 1.509   | 0.0049 | 0.0746 | 0.0687 | 470.4844 | 0.1522 |
| Paving Equipment | 2025 | 176    | 250     | 0.158556 | 0.1332 | 1.11653 | 1.10952 | 0.0049 | 0.0434 | 0.04   | 472.2341 | 0.1527 |
| Paving Equipment | 2030 | 16     | 25      | 1.628    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Paving Equipment | 2030 | 26     | 50      | 3.613    | 0.802  | 5.309   | 3.809   | 0.007  | 0.126  | 0.126  | 568.299  | 0.072  |
| Paving Equipment | 2030 | 51     | 120     | 4.007    | 0.39   | 3.774   | 2.393   | 0.006  | 0.114  | 0.114  | 568.3    | 0.035  |
| Paving Equipment | 2030 | 121    | 175     | 5.525    | 0.29   | 3.306   | 1.363   | 0.006  | 0.07   | 0.07   | 568.299  | 0.026  |
| Paving Equipment | 2030 | 176    | 250     | 5.771    | 0.25   | 1.171   | 1.176   | 0.006  | 0.042  | 0.042  | 568.299  | 0.022  |
| Paving Equipment | 2035 | 16     | 25      | 1.628    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Paving Equipment | 2035 | 26     | 50      | 2.991    | 0.664  | 5.181   | 3.511   | 0.007  | 0.07   | 0.07   | 568.3    | 0.059  |
| Paving Equipment | 2035 | 51     | 120     | 3.343    | 0.326  | 3.753   | 1.928   | 0.006  | 0.064  | 0.064  | 568.299  | 0.029  |
| Paving Equipment | 2035 | 121    | 175     | 4.485    | 0.235  | 3.303   | 0.832   | 0.006  | 0.04   | 0.04   | 568.299  | 0.021  |
| Paving Equipment | 2035 | 176    | 250     | 4.886    | 0.212  | 1.14    | 0.714   | 0.006  | 0.024  | 0.024  | 568.299  | 0.019  |
| Paving Equipment | 2040 | 16     | 25      | 1.628    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Paving Equipment | 2040 | 26     | 50      | 2.651    | 0.589  | 5.111   | 3.361   | 0.007  | 0.042  | 0.042  | 568.3    | 0.053  |
| Paving Equipment | 2040 | 51     | 120     | 2.989    | 0.291  | 3.744   | 1.687   | 0.006  | 0.039  | 0.039  | 568.299  | 0.026  |
| Paving Equipment | 2040 | 121    | 175     | 3.901    | 0.205  | 3.304   | 0.536   | 0.006  | 0.025  | 0.025  | 568.299  | 0.018  |
| Paving Equipment | 2040 | 176    | 250     | 4.452    | 0.193  | 1.127   | 0.485   | 0.006  | 0.017  | 0.017  | 568.299  | 0.017  |
| Plate Compactors | 1990 | 6      | 15      | 2.156    | 1.804  | 4.999   | 9.999   | 1.049  | 0.975  | 0.975  | 568.299  | 0.162  |
| Plate Compactors | 2000 | 6      | 15      | 1.852    | 1.55   | 4.606   | 8.519   | 0.079  | 0.708  | 0.708  | 568.299  | 0.139  |
| Plate Compactors | 2005 | 6      | 15      | 0.955    | 0.799  | 3.503   | 5.435   | 0.079  | 0.377  | 0.377  | 568.299  | 0.072  |
| Plate Compactors | 2010 | 6      | 15      | 0.794    | 0.664  | 3.469   | 4.178   | 0.008  | 0.198  | 0.198  | 568.299  | 0.059  |
| Plate Compactors | 2011 | 6      | 15      | 0.791    | 0.662  | 3.469   | 4.15    | 0.008  | 0.172  | 0.172  | 568.299  | 0.059  |
| Plate Compactors | 2012 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.165  | 0.165  | 568.3    | 0.059  |
| Plate Compactors | 2013 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.162  | 0.162  | 568.3    | 0.059  |
| Plate Compactors | 2014 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2015 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2016 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2017 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2018 | 6      | 15      | 0.79     | 0.661  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.3    | 0.059  |
| Plate Compactors | 2019 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2020 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2021 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2022 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2023 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2024 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2025 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2030 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2035 | 6      | 15      | 0.79     | 0.661  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Plate Compactors | 2040 | 6      | 15      | 0.79     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Pressure Washers | 1990 | 6      | 15      | 4.972    | 1.804  | 4.999   | 9.999   | 1.018  | 0.974  | 0.974  | 568.299  | 0.162  |
| Pressure Washers | 1990 | 16     | 25      | 8.915    | 2.213  | 5       | 6.92    | 0.83   | 0.74   | 0.74   | 568.3    | 0.199  |
| Pressure Washers | 1990 | 26     | 50      | 20.959   | 2.601  | 5.721   | 7.129   | 0.846  | 0.821  | 0.821  | 568.299  | 0.234  |
| Pressure Washers | 1990 | 51     | 120     | 23.659   | 1.743  | 4.735   | 12.634  | 0.768  | 0.874  | 0.874  | 568.299  | 0.157  |
| Pressure Washers | 1990 | 121    | 175     | 82.001   | 1.272  | 4.353   | 11.763  | 1.123  | 0.649  | 0.649  | 568.299  | 0.114  |
| Pressure Washers | 1990 | 176    | 250     | 77.237   | 0.953  | 3.084   | 9.035   | 1.077  | 0.476  | 0.476  | 568.299  | 0.086  |
| Pressure Washers | 2000 | 6      | 15      | 4.186    | 1.518  | 4.875   | 8.846   | 0.079  | 0.613  | 0.613  | 568.299  | 0.137  |
| Pressure Washers | 2000 | 16     | 25      | 6.717    | 1.667  | 4.783   | 6.405   | 0.065  | 0.51   | 0.51   | 568.299  | 0.15   |
| Pressure Washers | 2000 | 26     | 50      | 19.934   | 2.474  | 5.524   | 6.381   | 0.066  | 0.615  | 0.615  | 568.3    | 0.223  |
| Pressure Washers | 2000 | 51     | 120     | 19.23    | 1.417  | 3.967   | 9.062   | 0.06   | 0.613  | 0.613  | 568.3    | 0.127  |
| Pressure Washers | 2000 | 121    | 175     | 66.055   | 1.024  | 3.38    | 8.685   | 0.059  | 0.399  | 0.399  | 568.299  | 0.092  |
| Pressure Washers | 2000 | 176    | 250     | 35.508   | 0.438  | 1.005   | 6.315   | 0.058  | 0.143  | 0.143  | 568.299  | 0.039  |
| Pressure Washers | 2005 | 6      | 15      | 3.341    | 1.212  | 4.38    | 7.615   | 0.079  | 0.505  | 0.505  | 568.3    | 0.109  |
| Pressure Washers | 2005 | 16     | 25      | 5.048    | 1.253  | 3.922   | 6.014   | 0.065  | 0.432  | 0.432  | 568.299  | 0.113  |
| Pressure Washers | 2005 | 26     | 50      | 17.362   | 2.154  | 5.075   | 5.932   | 0.066  | 0.566  | 0.566  | 568.299  | 0.194  |
| Pressure Washers | 2005 | 51     | 120     | 16.424   | 1.21   | 3.682   | 7.651   | 0.06   | 0.566  | 0.566  | 568.299  | 0.109  |
| Pressure Washers | 2005 | 121    | 175     | 55.65    | 0.863  | 3.072   | 7.441   | 0.059  | 0.349  | 0.349  | 568.299  | 0.077  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type   | Year | Low HP | High HP | TOG    | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|------------------|------|--------|---------|--------|-------|-------|-------|-------|-------|-------|---------|-------|
| Pressure Washers | 2005 | 176    | 250     | 21.871 | 0.27  | 0.986 | 4.822 | 0.058 | 0.111 | 0.111 | 568.299 | 0.024 |
| Pressure Washers | 2010 | 6      | 15      | 2.628  | 0.953 | 4.027 | 6.387 | 0.008 | 0.38  | 0.38  | 568.299 | 0.086 |
| Pressure Washers | 2010 | 16     | 25      | 3.872  | 0.961 | 3.309 | 5.477 | 0.007 | 0.342 | 0.342 | 568.299 | 0.086 |
| Pressure Washers | 2010 | 26     | 50      | 13.073 | 1.622 | 4.517 | 5.501 | 0.007 | 0.453 | 0.453 | 568.299 | 0.146 |
| Pressure Washers | 2010 | 51     | 120     | 12.296 | 0.906 | 3.503 | 6.273 | 0.006 | 0.451 | 0.451 | 568.299 | 0.081 |
| Pressure Washers | 2010 | 121    | 175     | 41.062 | 0.637 | 2.967 | 5.773 | 0.006 | 0.275 | 0.275 | 568.299 | 0.057 |
| Pressure Washers | 2010 | 176    | 250     | 16.502 | 0.203 | 0.986 | 2.5   | 0.006 | 0.1   | 0.1   | 568.299 | 0.018 |
| Pressure Washers | 2011 | 6      | 15      | 2.504  | 0.908 | 3.952 | 6.134 | 0.008 | 0.358 | 0.358 | 568.299 | 0.081 |
| Pressure Washers | 2011 | 16     | 25      | 3.706  | 0.92  | 3.179 | 5.36  | 0.007 | 0.325 | 0.325 | 568.299 | 0.083 |
| Pressure Washers | 2011 | 26     | 50      | 12.056 | 1.496 | 4.382 | 5.405 | 0.007 | 0.428 | 0.428 | 568.299 | 0.135 |
| Pressure Washers | 2011 | 51     | 120     | 11.392 | 0.839 | 3.468 | 5.939 | 0.006 | 0.43  | 0.43  | 568.299 | 0.075 |
| Pressure Washers | 2011 | 121    | 175     | 38.303 | 0.594 | 2.953 | 5.441 | 0.006 | 0.263 | 0.263 | 568.299 | 0.053 |
| Pressure Washers | 2011 | 176    | 250     | 15.247 | 0.188 | 0.986 | 2.086 | 0.006 | 0.072 | 0.072 | 568.299 | 0.016 |
| Pressure Washers | 2012 | 6      | 15      | 2.385  | 0.865 | 3.874 | 5.874 | 0.008 | 0.338 | 0.338 | 568.299 | 0.078 |
| Pressure Washers | 2012 | 16     | 25      | 3.564  | 0.884 | 3.043 | 5.239 | 0.007 | 0.307 | 0.307 | 568.299 | 0.079 |
| Pressure Washers | 2012 | 26     | 50      | 10.983 | 1.363 | 4.238 | 5.306 | 0.007 | 0.402 | 0.402 | 568.299 | 0.123 |
| Pressure Washers | 2012 | 51     | 120     | 10.457 | 0.77  | 3.433 | 5.578 | 0.006 | 0.4   | 0.4   | 568.299 | 0.069 |
| Pressure Washers | 2012 | 121    | 175     | 35.56  | 0.551 | 2.941 | 5.109 | 0.006 | 0.244 | 0.244 | 568.299 | 0.049 |
| Pressure Washers | 2012 | 176    | 250     | 13.887 | 0.171 | 0.986 | 1.749 | 0.006 | 0.046 | 0.046 | 568.299 | 0.015 |
| Pressure Washers | 2013 | 6      | 15      | 2.27   | 0.823 | 3.796 | 5.616 | 0.008 | 0.318 | 0.318 | 568.299 | 0.074 |
| Pressure Washers | 2013 | 16     | 25      | 3.431  | 0.851 | 2.907 | 5.117 | 0.007 | 0.289 | 0.289 | 568.299 | 0.076 |
| Pressure Washers | 2013 | 26     | 50      | 9.897  | 1.228 | 4.092 | 5.086 | 0.007 | 0.367 | 0.367 | 568.299 | 0.11  |
| Pressure Washers | 2013 | 51     | 120     | 9.523  | 0.701 | 3.399 | 5.226 | 0.006 | 0.366 | 0.366 | 568.299 | 0.063 |
| Pressure Washers | 2013 | 121    | 175     | 32.885 | 0.51  | 2.931 | 4.803 | 0.006 | 0.225 | 0.225 | 568.299 | 0.046 |
| Pressure Washers | 2013 | 176    | 250     | 12.508 | 0.154 | 0.986 | 1.468 | 0.006 | 0.021 | 0.021 | 568.299 | 0.013 |
| Pressure Washers | 2014 | 6      | 15      | 2.16   | 0.783 | 3.723 | 5.369 | 0.008 | 0.298 | 0.298 | 568.299 | 0.07  |
| Pressure Washers | 2014 | 16     | 25      | 3.308  | 0.821 | 2.78  | 5     | 0.007 | 0.272 | 0.272 | 568.299 | 0.074 |
| Pressure Washers | 2014 | 26     | 50      | 8.833  | 1.096 | 3.951 | 4.873 | 0.007 | 0.332 | 0.332 | 568.299 | 0.098 |
| Pressure Washers | 2014 | 51     | 120     | 8.608  | 0.634 | 3.367 | 4.912 | 0.006 | 0.332 | 0.332 | 568.299 | 0.057 |
| Pressure Washers | 2014 | 121    | 175     | 30.292 | 0.469 | 2.923 | 4.513 | 0.006 | 0.206 | 0.206 | 568.299 | 0.042 |
| Pressure Washers | 2014 | 176    | 250     | 11.167 | 0.137 | 0.986 | 1.047 | 0.006 | 0.014 | 0.014 | 568.299 | 0.012 |
| Pressure Washers | 2015 | 6      | 15      | 2.059  | 0.747 | 3.657 | 5.141 | 0.008 | 0.28  | 0.28  | 568.299 | 0.067 |
| Pressure Washers | 2015 | 16     | 25      | 3.196  | 0.793 | 2.666 | 4.89  | 0.007 | 0.256 | 0.256 | 568.299 | 0.071 |
| Pressure Washers | 2015 | 26     | 50      | 7.868  | 0.976 | 3.833 | 4.685 | 0.007 | 0.3   | 0.3   | 568.299 | 0.088 |
| Pressure Washers | 2015 | 51     | 120     | 7.703  | 0.567 | 3.336 | 4.551 | 0.006 | 0.297 | 0.297 | 568.299 | 0.051 |
| Pressure Washers | 2015 | 121    | 175     | 27.567 | 0.427 | 2.917 | 4.115 | 0.006 | 0.187 | 0.187 | 568.299 | 0.038 |
| Pressure Washers | 2015 | 176    | 250     | 9.864  | 0.121 | 0.986 | 0.69  | 0.006 | 0.01  | 0.01  | 568.299 | 0.01  |
| Pressure Washers | 2016 | 6      | 15      | 1.986  | 0.72  | 3.622 | 4.978 | 0.008 | 0.264 | 0.264 | 568.299 | 0.065 |
| Pressure Washers | 2016 | 16     | 25      | 3.116  | 0.773 | 2.604 | 4.803 | 0.007 | 0.244 | 0.244 | 568.299 | 0.069 |
| Pressure Washers | 2016 | 26     | 50      | 6.97   | 0.865 | 3.729 | 4.515 | 0.007 | 0.269 | 0.269 | 568.299 | 0.078 |
| Pressure Washers | 2016 | 51     | 120     | 6.839  | 0.504 | 3.308 | 4.209 | 0.006 | 0.264 | 0.264 | 568.299 | 0.045 |
| Pressure Washers | 2016 | 121    | 175     | 24.906 | 0.386 | 2.913 | 3.726 | 0.006 | 0.168 | 0.168 | 568.299 | 0.034 |
| Pressure Washers | 2016 | 176    | 250     | 8.667  | 0.107 | 0.986 | 0.399 | 0.006 | 0.009 | 0.009 | 568.299 | 0.009 |
| Pressure Washers | 2017 | 6      | 15      | 1.927  | 0.699 | 3.599 | 4.847 | 0.008 | 0.25  | 0.25  | 568.299 | 0.063 |
| Pressure Washers | 2017 | 16     | 25      | 3.053  | 0.757 | 2.564 | 4.729 | 0.007 | 0.233 | 0.233 | 568.299 | 0.068 |
| Pressure Washers | 2017 | 26     | 50      | 6.126  | 0.76  | 3.632 | 4.355 | 0.007 | 0.24  | 0.24  | 568.299 | 0.068 |
| Pressure Washers | 2017 | 51     | 120     | 6.031  | 0.444 | 3.283 | 3.888 | 0.006 | 0.233 | 0.233 | 568.3   | 0.04  |
| Pressure Washers | 2017 | 121    | 175     | 22.349 | 0.346 | 2.91  | 3.349 | 0.006 | 0.149 | 0.149 | 568.299 | 0.031 |
| Pressure Washers | 2017 | 176    | 250     | 8.288  | 0.102 | 0.986 | 0.317 | 0.006 | 0.009 | 0.009 | 568.299 | 0.009 |
| Pressure Washers | 2018 | 6      | 15      | 1.874  | 0.679 | 3.58  | 4.728 | 0.008 | 0.237 | 0.237 | 568.299 | 0.061 |
| Pressure Washers | 2018 | 16     | 25      | 2.997  | 0.744 | 2.531 | 4.661 | 0.007 | 0.224 | 0.224 | 568.299 | 0.067 |
| Pressure Washers | 2018 | 26     | 50      | 5.332  | 0.661 | 3.542 | 4.202 | 0.007 | 0.212 | 0.212 | 568.299 | 0.059 |
| Pressure Washers | 2018 | 51     | 120     | 5.276  | 0.388 | 3.26  | 3.584 | 0.006 | 0.203 | 0.203 | 568.299 | 0.035 |
| Pressure Washers | 2018 | 121    | 175     | 19.96  | 0.309 | 2.908 | 2.989 | 0.006 | 0.132 | 0.132 | 568.299 | 0.027 |
| Pressure Washers | 2018 | 176    | 250     | 8.072  | 0.099 | 0.986 | 0.277 | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2019 | 6      | 15      | 1.824  | 0.662 | 3.562 | 4.617 | 0.008 | 0.224 | 0.224 | 568.299 | 0.059 |
| Pressure Washers | 2019 | 16     | 25      | 2.947  | 0.731 | 2.501 | 4.596 | 0.007 | 0.214 | 0.214 | 568.299 | 0.066 |
| Pressure Washers | 2019 | 26     | 50      | 4.585  | 0.569 | 3.457 | 4.053 | 0.007 | 0.184 | 0.184 | 568.299 | 0.051 |
| Pressure Washers | 2019 | 51     | 120     | 4.575  | 0.337 | 3.24  | 3.295 | 0.006 | 0.174 | 0.174 | 568.299 | 0.03  |
| Pressure Washers | 2019 | 121    | 175     | 18.102 | 0.28  | 2.907 | 2.67  | 0.006 | 0.117 | 0.117 | 568.299 | 0.025 |
| Pressure Washers | 2019 | 176    | 250     | 8.005  | 0.098 | 0.986 | 0.265 | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2020 | 6      | 15      | 1.78   | 0.646 | 3.546 | 4.516 | 0.008 | 0.212 | 0.212 | 568.299 | 0.058 |
| Pressure Washers | 2020 | 16     | 25      | 2.904  | 0.721 | 2.473 | 4.538 | 0.007 | 0.205 | 0.205 | 568.299 | 0.065 |
| Pressure Washers | 2020 | 26     | 50      | 4.025  | 0.499 | 3.393 | 3.917 | 0.007 | 0.161 | 0.161 | 568.299 | 0.045 |
| Pressure Washers | 2020 | 51     | 120     | 4.048  | 0.298 | 3.225 | 3.036 | 0.006 | 0.151 | 0.151 | 568.299 | 0.026 |
| Pressure Washers | 2020 | 121    | 175     | 16.638 | 0.258 | 2.907 | 2.383 | 0.006 | 0.104 | 0.104 | 568.299 | 0.023 |
| Pressure Washers | 2020 | 176    | 250     | 8.005  | 0.098 | 0.986 | 0.265 | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2021 | 6      | 15      | 1.747  | 0.634 | 3.531 | 4.441 | 0.008 | 0.201 | 0.201 | 568.299 | 0.057 |
| Pressure Washers | 2021 | 16     | 25      | 2.87   | 0.712 | 2.446 | 4.497 | 0.007 | 0.196 | 0.196 | 568.299 | 0.064 |
| Pressure Washers | 2021 | 26     | 50      | 3.542  | 0.439 | 3.329 | 3.765 | 0.007 | 0.136 | 0.136 | 568.299 | 0.039 |
| Pressure Washers | 2021 | 51     | 120     | 3.592  | 0.264 | 3.21  | 2.766 | 0.006 | 0.129 | 0.129 | 568.299 | 0.023 |
| Pressure Washers | 2021 | 121    | 175     | 15.389 | 0.238 | 2.907 | 2.118 | 0.006 | 0.093 | 0.093 | 568.299 | 0.021 |
| Pressure Washers | 2021 | 176    | 250     | 8.005  | 0.098 | 0.986 | 0.265 | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type   | Year | Low HP | High HP | TOG     | ROG   | CO    | NOX    | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|------------------|------|--------|---------|---------|-------|-------|--------|-------|-------|-------|---------|-------|
| Pressure Washers | 2022 | 6      | 15      | 1.725   | 0.626 | 3.519 | 4.39   | 0.008 | 0.193 | 0.193 | 568.299 | 0.056 |
| Pressure Washers | 2022 | 16     | 25      | 2.847   | 0.706 | 2.426 | 4.47   | 0.007 | 0.188 | 0.188 | 568.299 | 0.063 |
| Pressure Washers | 2022 | 26     | 50      | 3.213   | 0.398 | 3.291 | 3.649  | 0.007 | 0.117 | 0.117 | 568.3   | 0.035 |
| Pressure Washers | 2022 | 51     | 120     | 3.281   | 0.241 | 3.202 | 2.56   | 0.006 | 0.112 | 0.112 | 568.299 | 0.021 |
| Pressure Washers | 2022 | 121    | 175     | 14.252  | 0.221 | 2.907 | 1.871  | 0.006 | 0.082 | 0.082 | 568.299 | 0.019 |
| Pressure Washers | 2022 | 176    | 250     | 8.005   | 0.098 | 0.986 | 0.265  | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2023 | 6      | 15      | 1.706   | 0.618 | 3.508 | 4.345  | 0.008 | 0.186 | 0.186 | 568.299 | 0.055 |
| Pressure Washers | 2023 | 16     | 25      | 2.827   | 0.701 | 2.407 | 4.447  | 0.007 | 0.182 | 0.182 | 568.299 | 0.063 |
| Pressure Washers | 2023 | 26     | 50      | 2.928   | 0.363 | 3.26  | 3.541  | 0.007 | 0.101 | 0.101 | 568.299 | 0.032 |
| Pressure Washers | 2023 | 51     | 120     | 3.012   | 0.222 | 3.196 | 2.377  | 0.006 | 0.097 | 0.097 | 568.299 | 0.02  |
| Pressure Washers | 2023 | 121    | 175     | 13.244  | 0.205 | 2.907 | 1.665  | 0.006 | 0.072 | 0.072 | 568.299 | 0.018 |
| Pressure Washers | 2023 | 176    | 250     | 8.005   | 0.098 | 0.986 | 0.265  | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2024 | 6      | 15      | 1.689   | 0.612 | 3.499 | 4.305  | 0.008 | 0.181 | 0.181 | 568.299 | 0.055 |
| Pressure Washers | 2024 | 16     | 25      | 2.811   | 0.697 | 2.39  | 4.426  | 0.007 | 0.178 | 0.178 | 568.299 | 0.062 |
| Pressure Washers | 2024 | 26     | 50      | 2.685   | 0.333 | 3.233 | 3.441  | 0.007 | 0.087 | 0.087 | 568.299 | 0.03  |
| Pressure Washers | 2024 | 51     | 120     | 2.78    | 0.204 | 3.191 | 2.229  | 0.006 | 0.084 | 0.084 | 568.299 | 0.018 |
| Pressure Washers | 2024 | 121    | 175     | 12.332  | 0.191 | 2.907 | 1.482  | 0.006 | 0.062 | 0.062 | 568.299 | 0.017 |
| Pressure Washers | 2024 | 176    | 250     | 8.005   | 0.098 | 0.986 | 0.265  | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2025 | 6      | 15      | 1.674   | 0.607 | 3.491 | 4.269  | 0.008 | 0.178 | 0.178 | 568.299 | 0.054 |
| Pressure Washers | 2025 | 16     | 25      | 2.797   | 0.694 | 2.376 | 4.407  | 0.007 | 0.175 | 0.175 | 568.299 | 0.062 |
| Pressure Washers | 2025 | 26     | 50      | 2.472   | 0.306 | 3.21  | 3.344  | 0.007 | 0.075 | 0.075 | 568.299 | 0.027 |
| Pressure Washers | 2025 | 51     | 120     | 2.575   | 0.189 | 3.186 | 2.1    | 0.006 | 0.072 | 0.072 | 568.299 | 0.017 |
| Pressure Washers | 2025 | 121    | 175     | 11.476  | 0.178 | 2.907 | 1.31   | 0.006 | 0.053 | 0.053 | 568.299 | 0.016 |
| Pressure Washers | 2025 | 176    | 250     | 8.005   | 0.098 | 0.986 | 0.265  | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2030 | 6      | 15      | 1.632   | 0.592 | 3.47  | 4.164  | 0.008 | 0.166 | 0.166 | 568.3   | 0.053 |
| Pressure Washers | 2030 | 16     | 25      | 2.766   | 0.686 | 2.34  | 4.347  | 0.007 | 0.165 | 0.165 | 568.299 | 0.061 |
| Pressure Washers | 2030 | 26     | 50      | 1.735   | 0.215 | 3.124 | 2.989  | 0.007 | 0.03  | 0.03  | 568.299 | 0.019 |
| Pressure Washers | 2030 | 51     | 120     | 1.821   | 0.134 | 3.167 | 1.594  | 0.006 | 0.028 | 0.028 | 568.3   | 0.012 |
| Pressure Washers | 2030 | 121    | 175     | 8.178   | 0.126 | 2.907 | 0.619  | 0.006 | 0.024 | 0.024 | 568.299 | 0.011 |
| Pressure Washers | 2030 | 176    | 250     | 8.005   | 0.098 | 0.986 | 0.265  | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2035 | 6      | 15      | 1.624   | 0.589 | 3.47  | 4.143  | 0.008 | 0.162 | 0.162 | 568.3   | 0.053 |
| Pressure Washers | 2035 | 16     | 25      | 2.761   | 0.685 | 2.34  | 4.332  | 0.007 | 0.162 | 0.162 | 568.299 | 0.061 |
| Pressure Washers | 2035 | 26     | 50      | 1.515   | 0.188 | 3.101 | 2.882  | 0.007 | 0.015 | 0.015 | 568.299 | 0.016 |
| Pressure Washers | 2035 | 51     | 120     | 1.58    | 0.116 | 3.161 | 1.421  | 0.006 | 0.014 | 0.014 | 568.299 | 0.01  |
| Pressure Washers | 2035 | 121    | 175     | 7.052   | 0.109 | 2.907 | 0.382  | 0.006 | 0.013 | 0.013 | 568.299 | 0.009 |
| Pressure Washers | 2035 | 176    | 250     | 8.005   | 0.098 | 0.986 | 0.265  | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pressure Washers | 2040 | 6      | 15      | 1.624   | 0.589 | 3.469 | 4.142  | 0.008 | 0.161 | 0.161 | 568.299 | 0.053 |
| Pressure Washers | 2040 | 16     | 25      | 2.761   | 0.685 | 2.339 | 4.332  | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Pressure Washers | 2040 | 26     | 50      | 1.5     | 0.186 | 3.098 | 2.836  | 0.007 | 0.01  | 0.01  | 568.299 | 0.016 |
| Pressure Washers | 2040 | 51     | 120     | 1.54    | 0.113 | 3.16  | 1.365  | 0.006 | 0.01  | 0.01  | 568.299 | 0.01  |
| Pressure Washers | 2040 | 121    | 175     | 6.649   | 0.103 | 2.907 | 0.293  | 0.006 | 0.01  | 0.01  | 568.299 | 0.009 |
| Pressure Washers | 2040 | 176    | 250     | 8.005   | 0.098 | 0.986 | 0.265  | 0.006 | 0.009 | 0.009 | 568.299 | 0.008 |
| Pumps            | 1990 | 6      | 15      | 3.929   | 1.804 | 4.999 | 10     | 1.018 | 0.974 | 0.974 | 568.299 | 0.162 |
| Pumps            | 1990 | 16     | 25      | 12.652  | 2.213 | 4.999 | 6.92   | 0.83  | 0.74  | 0.74  | 568.299 | 0.199 |
| Pumps            | 1990 | 26     | 50      | 33.318  | 3.307 | 7.004 | 7.391  | 0.846 | 0.964 | 0.964 | 568.299 | 0.298 |
| Pumps            | 1990 | 51     | 120     | 44.398  | 1.941 | 5.049 | 13.378 | 0.768 | 1.022 | 1.022 | 568.299 | 0.175 |
| Pumps            | 1990 | 121    | 175     | 54.599  | 1.328 | 4.466 | 12.036 | 0.736 | 0.678 | 0.678 | 568.299 | 0.119 |
| Pumps            | 1990 | 176    | 250     | 78.462  | 1.328 | 4.466 | 12.036 | 0.736 | 0.678 | 0.678 | 568.299 | 0.119 |
| Pumps            | 1990 | 251    | 500     | 123.784 | 1.222 | 7.034 | 11.736 | 0.642 | 0.614 | 0.614 | 568.3   | 0.11  |
| Pumps            | 1990 | 501    | 750     | 204.643 | 1.222 | 7.034 | 11.736 | 0.658 | 0.614 | 0.614 | 568.299 | 0.11  |
| Pumps            | 1990 | 1001   | 9999    | 484.933 | 1.22  | 7.034 | 11.736 | 0.658 | 0.612 | 0.612 | 568.299 | 0.11  |
| Pumps            | 2000 | 6      | 15      | 3.754   | 1.723 | 4.875 | 9.08   | 0.079 | 0.747 | 0.747 | 568.299 | 0.155 |
| Pumps            | 2000 | 16     | 25      | 11.979  | 2.095 | 4.783 | 6.405  | 0.065 | 0.569 | 0.569 | 568.299 | 0.189 |
| Pumps            | 2000 | 26     | 50      | 31.461  | 3.123 | 6.715 | 6.608  | 0.066 | 0.718 | 0.718 | 568.299 | 0.281 |
| Pumps            | 2000 | 51     | 120     | 36.02   | 1.575 | 4.223 | 9.604  | 0.06  | 0.711 | 0.711 | 568.3   | 0.142 |
| Pumps            | 2000 | 121    | 175     | 43.406  | 1.055 | 3.435 | 8.734  | 0.057 | 0.419 | 0.419 | 568.299 | 0.095 |
| Pumps            | 2000 | 176    | 250     | 51.67   | 0.874 | 2.707 | 8.397  | 0.057 | 0.339 | 0.339 | 568.299 | 0.078 |
| Pumps            | 2000 | 251    | 500     | 83.09   | 0.82  | 3.956 | 8.188  | 0.05  | 0.311 | 0.311 | 568.299 | 0.074 |
| Pumps            | 2000 | 501    | 750     | 137.368 | 0.82  | 3.956 | 8.188  | 0.051 | 0.311 | 0.311 | 568.299 | 0.074 |
| Pumps            | 2000 | 1001   | 9999    | 372.377 | 0.936 | 4.533 | 8.775  | 0.051 | 0.351 | 0.351 | 568.299 | 0.084 |
| Pumps            | 2005 | 6      | 15      | 3.036   | 1.394 | 4.38  | 7.817  | 0.079 | 0.621 | 0.621 | 568.299 | 0.125 |
| Pumps            | 2005 | 16     | 25      | 9.278   | 1.622 | 3.922 | 6.014  | 0.065 | 0.483 | 0.483 | 568.299 | 0.146 |
| Pumps            | 2005 | 26     | 50      | 27.809  | 2.76  | 6.203 | 6.155  | 0.066 | 0.664 | 0.664 | 568.299 | 0.249 |
| Pumps            | 2005 | 51     | 120     | 30.825  | 1.348 | 3.91  | 8.1    | 0.06  | 0.657 | 0.657 | 568.3   | 0.121 |
| Pumps            | 2005 | 121    | 175     | 36.106  | 0.878 | 3.114 | 7.408  | 0.057 | 0.363 | 0.363 | 568.299 | 0.079 |
| Pumps            | 2005 | 176    | 250     | 36.853  | 0.623 | 1.836 | 6.99   | 0.057 | 0.239 | 0.239 | 568.299 | 0.056 |
| Pumps            | 2005 | 251    | 500     | 56.766  | 0.56  | 2.32  | 6.535  | 0.05  | 0.219 | 0.219 | 568.299 | 0.05  |
| Pumps            | 2005 | 501    | 750     | 96.43   | 0.575 | 2.32  | 6.679  | 0.051 | 0.221 | 0.221 | 568.299 | 0.051 |
| Pumps            | 2005 | 1001   | 9999    | 289.357 | 0.728 | 2.838 | 7.658  | 0.051 | 0.258 | 0.258 | 568.299 | 0.065 |
| Pumps            | 2010 | 6      | 15      | 2.449   | 1.124 | 4.027 | 6.554  | 0.008 | 0.473 | 0.473 | 568.299 | 0.101 |
| Pumps            | 2010 | 16     | 25      | 7.245   | 1.267 | 3.309 | 5.477  | 0.007 | 0.384 | 0.384 | 568.299 | 0.114 |
| Pumps            | 2010 | 26     | 50      | 22.041  | 2.188 | 5.634 | 5.74   | 0.007 | 0.545 | 0.545 | 568.3   | 0.197 |
| Pumps            | 2010 | 51     | 120     | 23.77   | 1.039 | 3.735 | 6.675  | 0.006 | 0.538 | 0.538 | 568.299 | 0.093 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG     | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|----------------|------|--------|---------|---------|-------|-------|-------|-------|-------|-------|---------|-------|
| Pumps          | 2010 | 121    | 175     | 28.171  | 0.685 | 3.033 | 5.961 | 0.006 | 0.298 | 0.298 | 568.299 | 0.061 |
| Pumps          | 2010 | 176    | 250     | 26.273  | 0.444 | 1.359 | 5.586 | 0.006 | 0.17  | 0.17  | 568.299 | 0.04  |
| Pumps          | 2010 | 251    | 500     | 40.384  | 0.398 | 1.536 | 5.074 | 0.005 | 0.158 | 0.158 | 568.299 | 0.035 |
| Pumps          | 2010 | 501    | 750     | 68.724  | 0.41  | 1.536 | 5.207 | 0.005 | 0.161 | 0.161 | 568.299 | 0.037 |
| Pumps          | 2010 | 1001   | 9999    | 218.911 | 0.55  | 1.991 | 6.617 | 0.005 | 0.196 | 0.196 | 568.299 | 0.049 |
| Pumps          | 2011 | 6      | 15      | 2.324   | 1.067 | 3.952 | 6.283 | 0.008 | 0.441 | 0.441 | 568.299 | 0.096 |
| Pumps          | 2011 | 16     | 25      | 6.815   | 1.192 | 3.179 | 5.36  | 0.007 | 0.361 | 0.361 | 568.299 | 0.107 |
| Pumps          | 2011 | 26     | 50      | 20.53   | 2.038 | 5.474 | 5.645 | 0.007 | 0.518 | 0.518 | 568.299 | 0.183 |
| Pumps          | 2011 | 51     | 120     | 22.177  | 0.969 | 3.698 | 6.322 | 0.006 | 0.514 | 0.514 | 568.299 | 0.087 |
| Pumps          | 2011 | 121    | 175     | 26.426  | 0.642 | 3.02  | 5.63  | 0.006 | 0.286 | 0.286 | 568.299 | 0.058 |
| Pumps          | 2011 | 176    | 250     | 24.051  | 0.407 | 1.272 | 5.206 | 0.006 | 0.153 | 0.153 | 568.299 | 0.036 |
| Pumps          | 2011 | 251    | 500     | 36.969  | 0.365 | 1.405 | 4.71  | 0.005 | 0.143 | 0.143 | 568.299 | 0.032 |
| Pumps          | 2011 | 501    | 750     | 62.964  | 0.376 | 1.405 | 4.841 | 0.005 | 0.145 | 0.145 | 568.299 | 0.033 |
| Pumps          | 2011 | 1001   | 9999    | 203.755 | 0.512 | 1.835 | 6.273 | 0.005 | 0.183 | 0.183 | 568.299 | 0.046 |
| Pumps          | 2012 | 6      | 15      | 2.194   | 1.007 | 3.874 | 5.999 | 0.008 | 0.407 | 0.407 | 568.299 | 0.09  |
| Pumps          | 2012 | 16     | 25      | 6.363   | 1.113 | 3.043 | 5.239 | 0.007 | 0.337 | 0.337 | 568.299 | 0.1   |
| Pumps          | 2012 | 26     | 50      | 18.887  | 1.875 | 5.296 | 5.545 | 0.007 | 0.488 | 0.488 | 568.299 | 0.169 |
| Pumps          | 2012 | 51     | 120     | 20.51   | 0.896 | 3.66  | 5.939 | 0.006 | 0.481 | 0.481 | 568.299 | 0.08  |
| Pumps          | 2012 | 121    | 175     | 24.576  | 0.597 | 3.009 | 5.28  | 0.006 | 0.265 | 0.265 | 568.299 | 0.053 |
| Pumps          | 2012 | 176    | 250     | 22.301  | 0.377 | 1.218 | 4.846 | 0.006 | 0.139 | 0.139 | 568.299 | 0.034 |
| Pumps          | 2012 | 251    | 500     | 34.322  | 0.338 | 1.311 | 4.367 | 0.005 | 0.13  | 0.13  | 568.299 | 0.03  |
| Pumps          | 2012 | 501    | 750     | 58.469  | 0.349 | 1.311 | 4.495 | 0.005 | 0.132 | 0.132 | 568.299 | 0.031 |
| Pumps          | 2012 | 1001   | 9999    | 188.287 | 0.473 | 1.682 | 5.916 | 0.005 | 0.168 | 0.168 | 568.299 | 0.042 |
| Pumps          | 2013 | 6      | 15      | 2.065   | 0.948 | 3.796 | 5.716 | 0.008 | 0.373 | 0.373 | 568.299 | 0.085 |
| Pumps          | 2013 | 16     | 25      | 5.914   | 1.034 | 2.907 | 5.117 | 0.007 | 0.314 | 0.314 | 568.3   | 0.093 |
| Pumps          | 2013 | 26     | 50      | 17.185  | 1.706 | 5.11  | 5.323 | 0.007 | 0.448 | 0.448 | 568.299 | 0.153 |
| Pumps          | 2013 | 51     | 120     | 18.831  | 0.823 | 3.623 | 5.563 | 0.006 | 0.443 | 0.443 | 568.299 | 0.074 |
| Pumps          | 2013 | 121    | 175     | 22.712  | 0.552 | 2.998 | 4.949 | 0.006 | 0.244 | 0.244 | 568.299 | 0.049 |
| Pumps          | 2013 | 176    | 250     | 20.801  | 0.352 | 1.181 | 4.498 | 0.006 | 0.127 | 0.127 | 568.3   | 0.031 |
| Pumps          | 2013 | 251    | 500     | 32.081  | 0.316 | 1.241 | 4.037 | 0.005 | 0.119 | 0.119 | 568.299 | 0.028 |
| Pumps          | 2013 | 501    | 750     | 54.658  | 0.326 | 1.241 | 4.163 | 0.005 | 0.121 | 0.121 | 568.299 | 0.029 |
| Pumps          | 2013 | 1001   | 9999    | 173.151 | 0.435 | 1.538 | 5.558 | 0.005 | 0.154 | 0.154 | 568.299 | 0.039 |
| Pumps          | 2014 | 6      | 15      | 1.942   | 0.891 | 3.723 | 5.445 | 0.008 | 0.341 | 0.341 | 568.299 | 0.08  |
| Pumps          | 2014 | 16     | 25      | 5.492   | 0.96  | 2.78  | 5     | 0.007 | 0.291 | 0.291 | 568.299 | 0.086 |
| Pumps          | 2014 | 26     | 50      | 15.493  | 1.538 | 4.929 | 5.107 | 0.007 | 0.409 | 0.409 | 568.299 | 0.138 |
| Pumps          | 2014 | 51     | 120     | 17.179  | 0.751 | 3.587 | 5.226 | 0.006 | 0.403 | 0.403 | 568.299 | 0.067 |
| Pumps          | 2014 | 121    | 175     | 20.895  | 0.508 | 2.989 | 4.635 | 0.006 | 0.222 | 0.222 | 568.299 | 0.045 |
| Pumps          | 2014 | 176    | 250     | 19.3    | 0.326 | 1.149 | 4.09  | 0.006 | 0.115 | 0.115 | 568.299 | 0.029 |
| Pumps          | 2014 | 251    | 500     | 29.829  | 0.294 | 1.181 | 3.648 | 0.005 | 0.108 | 0.108 | 568.299 | 0.026 |
| Pumps          | 2014 | 501    | 750     | 50.824  | 0.303 | 1.181 | 3.77  | 0.005 | 0.11  | 0.11  | 568.299 | 0.027 |
| Pumps          | 2014 | 1001   | 9999    | 158.959 | 0.399 | 1.406 | 5.21  | 0.005 | 0.141 | 0.141 | 568.299 | 0.036 |
| Pumps          | 2015 | 6      | 15      | 1.831   | 0.84  | 3.658 | 5.196 | 0.008 | 0.311 | 0.311 | 568.299 | 0.075 |
| Pumps          | 2015 | 16     | 25      | 5.112   | 0.894 | 2.666 | 4.89  | 0.007 | 0.27  | 0.27  | 568.299 | 0.08  |
| Pumps          | 2015 | 26     | 50      | 13.946  | 1.384 | 4.775 | 4.916 | 0.007 | 0.371 | 0.371 | 568.3   | 0.124 |
| Pumps          | 2015 | 51     | 120     | 15.537  | 0.679 | 3.554 | 4.842 | 0.006 | 0.364 | 0.364 | 568.3   | 0.061 |
| Pumps          | 2015 | 121    | 175     | 18.983  | 0.461 | 2.983 | 4.202 | 0.006 | 0.2   | 0.2   | 568.299 | 0.041 |
| Pumps          | 2015 | 176    | 250     | 17.881  | 0.302 | 1.122 | 3.693 | 0.006 | 0.104 | 0.104 | 568.299 | 0.027 |
| Pumps          | 2015 | 251    | 500     | 27.722  | 0.273 | 1.134 | 3.272 | 0.005 | 0.097 | 0.097 | 568.299 | 0.024 |
| Pumps          | 2015 | 501    | 750     | 47.213  | 0.281 | 1.134 | 3.389 | 0.005 | 0.099 | 0.099 | 568.299 | 0.025 |
| Pumps          | 2015 | 1001   | 9999    | 144.304 | 0.363 | 1.293 | 4.878 | 0.005 | 0.127 | 0.127 | 568.299 | 0.032 |
| Pumps          | 2016 | 6      | 15      | 1.762   | 0.809 | 3.622 | 5.023 | 0.008 | 0.289 | 0.289 | 568.299 | 0.073 |
| Pumps          | 2016 | 16     | 25      | 4.893   | 0.855 | 2.604 | 4.803 | 0.007 | 0.255 | 0.255 | 568.299 | 0.077 |
| Pumps          | 2016 | 26     | 50      | 12.497  | 1.24  | 4.64  | 4.742 | 0.007 | 0.335 | 0.335 | 568.299 | 0.111 |
| Pumps          | 2016 | 51     | 120     | 13.964  | 0.61  | 3.523 | 4.478 | 0.006 | 0.325 | 0.325 | 568.299 | 0.055 |
| Pumps          | 2016 | 121    | 175     | 17.155  | 0.417 | 2.978 | 3.789 | 0.006 | 0.179 | 0.179 | 568.299 | 0.037 |
| Pumps          | 2016 | 176    | 250     | 16.558  | 0.28  | 1.099 | 3.313 | 0.006 | 0.094 | 0.094 | 568.299 | 0.025 |
| Pumps          | 2016 | 251    | 500     | 25.804  | 0.254 | 1.093 | 2.919 | 0.005 | 0.088 | 0.088 | 568.299 | 0.022 |
| Pumps          | 2016 | 501    | 750     | 43.884  | 0.262 | 1.093 | 3.028 | 0.005 | 0.089 | 0.089 | 568.299 | 0.023 |
| Pumps          | 2016 | 1001   | 9999    | 133.448 | 0.335 | 1.223 | 4.596 | 0.005 | 0.116 | 0.116 | 568.3   | 0.03  |
| Pumps          | 2017 | 6      | 15      | 1.713   | 0.786 | 3.599 | 4.887 | 0.008 | 0.272 | 0.272 | 568.299 | 0.07  |
| Pumps          | 2017 | 16     | 25      | 4.745   | 0.83  | 2.564 | 4.729 | 0.007 | 0.243 | 0.243 | 568.299 | 0.074 |
| Pumps          | 2017 | 26     | 50      | 11.12   | 1.104 | 4.514 | 4.578 | 0.007 | 0.301 | 0.301 | 568.299 | 0.099 |
| Pumps          | 2017 | 51     | 120     | 12.49   | 0.546 | 3.495 | 4.134 | 0.006 | 0.287 | 0.287 | 568.299 | 0.049 |
| Pumps          | 2017 | 121    | 175     | 15.466  | 0.376 | 2.975 | 3.4   | 0.006 | 0.159 | 0.159 | 568.299 | 0.033 |
| Pumps          | 2017 | 176    | 250     | 15.375  | 0.26  | 1.08  | 2.958 | 0.006 | 0.084 | 0.084 | 568.299 | 0.023 |
| Pumps          | 2017 | 251    | 500     | 24.243  | 0.239 | 1.062 | 2.613 | 0.005 | 0.079 | 0.079 | 568.299 | 0.021 |
| Pumps          | 2017 | 501    | 750     | 40.958  | 0.244 | 1.062 | 2.695 | 0.005 | 0.08  | 0.08  | 568.299 | 0.022 |
| Pumps          | 2017 | 1001   | 9999    | 124.604 | 0.313 | 1.177 | 4.343 | 0.005 | 0.106 | 0.106 | 568.299 | 0.028 |
| Pumps          | 2018 | 6      | 15      | 1.669   | 0.766 | 3.58  | 4.762 | 0.008 | 0.256 | 0.256 | 568.299 | 0.069 |
| Pumps          | 2018 | 16     | 25      | 4.618   | 0.807 | 2.531 | 4.661 | 0.007 | 0.232 | 0.232 | 568.299 | 0.072 |
| Pumps          | 2018 | 26     | 50      | 9.809   | 0.973 | 4.397 | 4.422 | 0.007 | 0.267 | 0.267 | 568.299 | 0.087 |
| Pumps          | 2018 | 51     | 120     | 11.107  | 0.485 | 3.471 | 3.808 | 0.006 | 0.252 | 0.252 | 568.299 | 0.043 |
| Pumps          | 2018 | 121    | 175     | 13.918  | 0.338 | 2.974 | 3.035 | 0.006 | 0.14  | 0.14  | 568.299 | 0.03  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG     | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|----------------|------|--------|---------|---------|-------|-------|-------|-------|-------|-------|---------|-------|
| Pumps          | 2018 | 176    | 250     | 14.304  | 0.242 | 1.065 | 2.624 | 0.006 | 0.075 | 0.075 | 568.299 | 0.021 |
| Pumps          | 2018 | 251    | 500     | 22.927  | 0.226 | 1.041 | 2.34  | 0.005 | 0.071 | 0.071 | 568.299 | 0.02  |
| Pumps          | 2018 | 501    | 750     | 38.511  | 0.23  | 1.041 | 2.401 | 0.005 | 0.072 | 0.072 | 568.299 | 0.02  |
| Pumps          | 2018 | 1001   | 9999    | 116.529 | 0.293 | 1.144 | 4.105 | 0.005 | 0.098 | 0.098 | 568.299 | 0.026 |
| Pumps          | 2019 | 6      | 15      | 1.63    | 0.748 | 3.562 | 4.647 | 0.008 | 0.241 | 0.241 | 568.3   | 0.067 |
| Pumps          | 2019 | 16     | 25      | 4.503   | 0.787 | 2.501 | 4.596 | 0.007 | 0.222 | 0.222 | 568.3   | 0.071 |
| Pumps          | 2019 | 26     | 50      | 8.56    | 0.849 | 4.284 | 4.269 | 0.007 | 0.235 | 0.235 | 568.299 | 0.076 |
| Pumps          | 2019 | 51     | 120     | 9.812   | 0.429 | 3.449 | 3.497 | 0.006 | 0.217 | 0.217 | 568.299 | 0.038 |
| Pumps          | 2019 | 121    | 175     | 12.706  | 0.309 | 2.974 | 2.711 | 0.006 | 0.124 | 0.124 | 568.299 | 0.027 |
| Pumps          | 2019 | 176    | 250     | 13.378  | 0.226 | 1.052 | 2.323 | 0.006 | 0.067 | 0.067 | 568.299 | 0.02  |
| Pumps          | 2019 | 251    | 500     | 21.711  | 0.214 | 1.027 | 2.084 | 0.005 | 0.064 | 0.064 | 568.3   | 0.019 |
| Pumps          | 2019 | 501    | 750     | 36.35   | 0.217 | 1.027 | 2.133 | 0.005 | 0.065 | 0.065 | 568.299 | 0.019 |
| Pumps          | 2019 | 1001   | 9999    | 108.825 | 0.273 | 1.118 | 3.873 | 0.005 | 0.089 | 0.089 | 568.299 | 0.024 |
| Pumps          | 2020 | 6      | 15      | 1.593   | 0.731 | 3.546 | 4.542 | 0.008 | 0.227 | 0.227 | 568.299 | 0.066 |
| Pumps          | 2020 | 16     | 25      | 4.396   | 0.769 | 2.473 | 4.538 | 0.007 | 0.212 | 0.212 | 568.299 | 0.069 |
| Pumps          | 2020 | 26     | 50      | 7.613   | 0.755 | 4.197 | 4.128 | 0.007 | 0.206 | 0.206 | 568.299 | 0.068 |
| Pumps          | 2020 | 51     | 120     | 8.832   | 0.386 | 3.432 | 3.219 | 0.006 | 0.189 | 0.189 | 568.299 | 0.034 |
| Pumps          | 2020 | 121    | 175     | 11.744  | 0.285 | 2.974 | 2.418 | 0.006 | 0.111 | 0.111 | 568.299 | 0.025 |
| Pumps          | 2020 | 176    | 250     | 12.575  | 0.212 | 1.042 | 2.05  | 0.006 | 0.06  | 0.06  | 568.299 | 0.019 |
| Pumps          | 2020 | 251    | 500     | 20.565  | 0.203 | 1.017 | 1.841 | 0.005 | 0.057 | 0.057 | 568.3   | 0.018 |
| Pumps          | 2020 | 501    | 750     | 34.373  | 0.205 | 1.017 | 1.884 | 0.005 | 0.058 | 0.058 | 568.299 | 0.018 |
| Pumps          | 2020 | 1001   | 9999    | 101.462 | 0.255 | 1.096 | 3.649 | 0.005 | 0.081 | 0.081 | 568.3   | 0.023 |
| Pumps          | 2021 | 6      | 15      | 1.563   | 0.717 | 3.531 | 4.462 | 0.008 | 0.214 | 0.214 | 568.299 | 0.064 |
| Pumps          | 2021 | 16     | 25      | 4.302   | 0.752 | 2.446 | 4.497 | 0.007 | 0.201 | 0.201 | 568.299 | 0.067 |
| Pumps          | 2021 | 26     | 50      | 6.761   | 0.671 | 4.099 | 3.966 | 0.007 | 0.175 | 0.175 | 568.299 | 0.06  |
| Pumps          | 2021 | 51     | 120     | 7.94    | 0.347 | 3.412 | 2.928 | 0.006 | 0.162 | 0.162 | 568.3   | 0.031 |
| Pumps          | 2021 | 121    | 175     | 10.713  | 0.26  | 2.968 | 2.101 | 0.006 | 0.096 | 0.096 | 568.299 | 0.023 |
| Pumps          | 2021 | 176    | 250     | 11.658  | 0.197 | 1.031 | 1.759 | 0.006 | 0.052 | 0.052 | 568.299 | 0.017 |
| Pumps          | 2021 | 251    | 500     | 19.186  | 0.189 | 1.007 | 1.584 | 0.005 | 0.05  | 0.05  | 568.299 | 0.017 |
| Pumps          | 2021 | 501    | 750     | 32.005  | 0.191 | 1.007 | 1.618 | 0.005 | 0.05  | 0.05  | 568.299 | 0.017 |
| Pumps          | 2021 | 1001   | 9999    | 92.954  | 0.233 | 1.074 | 3.409 | 0.005 | 0.072 | 0.072 | 568.3   | 0.021 |
| Pumps          | 2022 | 6      | 15      | 1.54    | 0.707 | 3.519 | 4.408 | 0.008 | 0.203 | 0.203 | 568.299 | 0.063 |
| Pumps          | 2022 | 16     | 25      | 4.229   | 0.739 | 2.426 | 4.47  | 0.007 | 0.193 | 0.193 | 568.299 | 0.066 |
| Pumps          | 2022 | 26     | 50      | 6.194   | 0.614 | 4.048 | 3.846 | 0.007 | 0.152 | 0.152 | 568.299 | 0.055 |
| Pumps          | 2022 | 51     | 120     | 7.351   | 0.321 | 3.404 | 2.708 | 0.006 | 0.142 | 0.142 | 568.299 | 0.029 |
| Pumps          | 2022 | 121    | 175     | 9.985   | 0.242 | 2.969 | 1.86  | 0.006 | 0.085 | 0.085 | 568.299 | 0.021 |
| Pumps          | 2022 | 176    | 250     | 11.025  | 0.186 | 1.025 | 1.534 | 0.006 | 0.045 | 0.045 | 568.299 | 0.016 |
| Pumps          | 2022 | 251    | 500     | 18.249  | 0.18  | 1.001 | 1.404 | 0.005 | 0.044 | 0.044 | 568.3   | 0.016 |
| Pumps          | 2022 | 501    | 750     | 30.396  | 0.181 | 1.001 | 1.432 | 0.005 | 0.044 | 0.044 | 568.3   | 0.016 |
| Pumps          | 2022 | 1001   | 9999    | 87.313  | 0.219 | 1.058 | 3.236 | 0.005 | 0.065 | 0.065 | 568.299 | 0.019 |
| Pumps          | 2023 | 6      | 15      | 1.521   | 0.698 | 3.508 | 4.359 | 0.008 | 0.194 | 0.194 | 568.299 | 0.063 |
| Pumps          | 2023 | 16     | 25      | 4.165   | 0.728 | 2.407 | 4.447 | 0.007 | 0.186 | 0.186 | 568.299 | 0.065 |
| Pumps          | 2023 | 26     | 50      | 5.699   | 0.565 | 4.007 | 3.734 | 0.007 | 0.131 | 0.131 | 568.299 | 0.051 |
| Pumps          | 2023 | 51     | 120     | 6.838   | 0.299 | 3.398 | 2.511 | 0.006 | 0.123 | 0.123 | 568.299 | 0.026 |
| Pumps          | 2023 | 121    | 175     | 9.349   | 0.227 | 2.971 | 1.662 | 0.006 | 0.075 | 0.075 | 568.299 | 0.02  |
| Pumps          | 2023 | 176    | 250     | 10.47   | 0.177 | 1.021 | 1.351 | 0.006 | 0.04  | 0.04  | 568.299 | 0.015 |
| Pumps          | 2023 | 251    | 500     | 17.411  | 0.171 | 0.998 | 1.246 | 0.005 | 0.038 | 0.038 | 568.3   | 0.015 |
| Pumps          | 2023 | 501    | 750     | 28.971  | 0.173 | 0.998 | 1.271 | 0.005 | 0.039 | 0.039 | 568.299 | 0.015 |
| Pumps          | 2023 | 1001   | 9999    | 82.523  | 0.207 | 1.043 | 3.09  | 0.005 | 0.059 | 0.059 | 568.299 | 0.018 |
| Pumps          | 2024 | 6      | 15      | 1.503   | 0.69  | 3.499 | 4.316 | 0.008 | 0.188 | 0.188 | 568.299 | 0.062 |
| Pumps          | 2024 | 16     | 25      | 4.107   | 0.718 | 2.39  | 4.426 | 0.007 | 0.181 | 0.181 | 568.299 | 0.064 |
| Pumps          | 2024 | 26     | 50      | 5.272   | 0.523 | 3.974 | 3.63  | 0.007 | 0.114 | 0.114 | 568.299 | 0.047 |
| Pumps          | 2024 | 51     | 120     | 6.391   | 0.279 | 3.393 | 2.352 | 0.006 | 0.107 | 0.107 | 568.299 | 0.025 |
| Pumps          | 2024 | 121    | 175     | 8.769   | 0.213 | 2.973 | 1.486 | 0.006 | 0.065 | 0.065 | 568.299 | 0.019 |
| Pumps          | 2024 | 176    | 250     | 9.948   | 0.168 | 1.018 | 1.189 | 0.006 | 0.034 | 0.034 | 568.3   | 0.015 |
| Pumps          | 2024 | 251    | 500     | 16.61   | 0.164 | 0.994 | 1.098 | 0.005 | 0.033 | 0.033 | 568.299 | 0.014 |
| Pumps          | 2024 | 501    | 750     | 27.614  | 0.164 | 0.994 | 1.12  | 0.005 | 0.034 | 0.034 | 568.299 | 0.014 |
| Pumps          | 2024 | 1001   | 9999    | 78.184  | 0.196 | 1.031 | 2.96  | 0.005 | 0.054 | 0.054 | 568.299 | 0.017 |
| Pumps          | 2025 | 6      | 15      | 1.488   | 0.683 | 3.491 | 4.278 | 0.008 | 0.183 | 0.183 | 568.299 | 0.061 |
| Pumps          | 2025 | 16     | 25      | 4.058   | 0.709 | 2.376 | 4.407 | 0.007 | 0.177 | 0.177 | 568.299 | 0.064 |
| Pumps          | 2025 | 26     | 50      | 4.891   | 0.485 | 3.943 | 3.528 | 0.007 | 0.099 | 0.099 | 568.299 | 0.043 |
| Pumps          | 2025 | 51     | 120     | 5.988   | 0.261 | 3.389 | 2.213 | 0.006 | 0.092 | 0.092 | 568.299 | 0.023 |
| Pumps          | 2025 | 121    | 175     | 8.209   | 0.199 | 2.974 | 1.318 | 0.006 | 0.056 | 0.056 | 568.3   | 0.018 |
| Pumps          | 2025 | 176    | 250     | 9.449   | 0.159 | 1.016 | 1.038 | 0.006 | 0.029 | 0.029 | 568.299 | 0.014 |
| Pumps          | 2025 | 251    | 500     | 15.837  | 0.156 | 0.992 | 0.958 | 0.005 | 0.028 | 0.028 | 568.3   | 0.014 |
| Pumps          | 2025 | 501    | 750     | 26.308  | 0.157 | 0.992 | 0.977 | 0.005 | 0.029 | 0.029 | 568.3   | 0.014 |
| Pumps          | 2025 | 1001   | 9999    | 74.054  | 0.186 | 1.02  | 2.84  | 0.005 | 0.049 | 0.049 | 568.299 | 0.016 |
| Pumps          | 2030 | 6      | 15      | 1.445   | 0.663 | 3.47  | 4.164 | 0.008 | 0.166 | 0.166 | 568.299 | 0.059 |
| Pumps          | 2030 | 16     | 25      | 3.928   | 0.687 | 2.34  | 4.347 | 0.007 | 0.165 | 0.165 | 568.3   | 0.061 |
| Pumps          | 2030 | 26     | 50      | 3.513   | 0.348 | 3.814 | 3.146 | 0.007 | 0.04  | 0.04  | 568.299 | 0.031 |
| Pumps          | 2030 | 51     | 120     | 4.416   | 0.193 | 3.367 | 1.662 | 0.006 | 0.036 | 0.036 | 568.299 | 0.017 |
| Pumps          | 2030 | 121    | 175     | 5.842   | 0.142 | 2.973 | 0.61  | 0.006 | 0.024 | 0.024 | 568.299 | 0.012 |
| Pumps          | 2030 | 176    | 250     | 7.699   | 0.13  | 1.013 | 0.511 | 0.006 | 0.016 | 0.016 | 568.299 | 0.011 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Pumps          | 2030 | 251    | 500     | 13.115   | 0.129  | 0.989   | 0.482   | 0.005  | 0.016  | 0.016  | 568.299  | 0.011  |
| Pumps          | 2030 | 501    | 750     | 21.709   | 0.129  | 0.989   | 0.488   | 0.005  | 0.016  | 0.016  | 568.299  | 0.011  |
| Pumps          | 2030 | 1001   | 9999    | 55.475   | 0.139  | 0.99    | 2.504   | 0.005  | 0.03   | 0.03   | 568.299  | 0.012  |
| Pumps          | 2035 | 6      | 15      | 1.44     | 0.661  | 3.469   | 4.143   | 0.008  | 0.162  | 0.162  | 568.299  | 0.059  |
| Pumps          | 2035 | 16     | 25      | 3.919    | 0.685  | 2.34    | 4.332   | 0.007  | 0.162  | 0.162  | 568.299  | 0.061  |
| Pumps          | 2035 | 26     | 50      | 3.089    | 0.306  | 3.778   | 3.028   | 0.007  | 0.019  | 0.019  | 568.299  | 0.027  |
| Pumps          | 2035 | 51     | 120     | 3.891    | 0.17   | 3.36    | 1.47    | 0.006  | 0.017  | 0.017  | 568.299  | 0.015  |
| Pumps          | 2035 | 121    | 175     | 5.059    | 0.123  | 2.973   | 0.377   | 0.006  | 0.014  | 0.014  | 568.299  | 0.011  |
| Pumps          | 2035 | 176    | 250     | 7.07     | 0.119  | 1.012   | 0.335   | 0.006  | 0.011  | 0.011  | 568.299  | 0.01   |
| Pumps          | 2035 | 251    | 500     | 12.118   | 0.119  | 0.989   | 0.331   | 0.005  | 0.011  | 0.011  | 568.299  | 0.01   |
| Pumps          | 2035 | 501    | 750     | 20.034   | 0.119  | 0.989   | 0.331   | 0.005  | 0.011  | 0.011  | 568.299  | 0.01   |
| Pumps          | 2035 | 1001   | 9999    | 49.373   | 0.124  | 0.989   | 2.38    | 0.005  | 0.023  | 0.023  | 568.299  | 0.011  |
| Pumps          | 2040 | 6      | 15      | 1.44     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Pumps          | 2040 | 16     | 25      | 3.919    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Pumps          | 2040 | 26     | 50      | 3.056    | 0.303  | 3.77    | 2.976   | 0.007  | 0.013  | 0.013  | 568.299  | 0.027  |
| Pumps          | 2040 | 51     | 120     | 3.777    | 0.165  | 3.358   | 1.41    | 0.006  | 0.012  | 0.012  | 568.299  | 0.014  |
| Pumps          | 2040 | 121    | 175     | 4.771    | 0.116  | 2.971   | 0.295   | 0.006  | 0.01   | 0.01   | 568.299  | 0.01   |
| Pumps          | 2040 | 176    | 250     | 6.779    | 0.114  | 1.012   | 0.279   | 0.006  | 0.009  | 0.009  | 568.299  | 0.01   |
| Pumps          | 2040 | 251    | 500     | 11.622   | 0.114  | 0.989   | 0.279   | 0.005  | 0.009  | 0.009  | 568.299  | 0.01   |
| Pumps          | 2040 | 501    | 750     | 19.214   | 0.114  | 0.989   | 0.279   | 0.005  | 0.009  | 0.009  | 568.299  | 0.01   |
| Pumps          | 2040 | 1001   | 9999    | 46.343   | 0.116  | 0.989   | 2.347   | 0.005  | 0.02   | 0.02   | 568.299  | 0.01   |
| Rollers        | 1990 | 6      | 15      | 4.21     | 1.804  | 4.999   | 9.999   | 1.049  | 0.975  | 0.975  | 568.299  | 0.162  |
| Rollers        | 1990 | 16     | 25      | 10.903   | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Rollers        | 1990 | 26     | 50      | 45.466   | 4.738  | 9.598   | 7.927   | 0.871  | 1.256  | 1.256  | 568.299  | 0.427  |
| Rollers        | 1990 | 51     | 120     | 51.677   | 2.372  | 5.756   | 15.111  | 0.791  | 1.332  | 1.332  | 568.3    | 0.214  |
| Rollers        | 1990 | 121    | 175     | 75.451   | 1.889  | 5.165   | 14.858  | 0.758  | 1.046  | 1.046  | 568.299  | 0.17   |
| Rollers        | 1990 | 176    | 250     | 106.808  | 1.889  | 5.165   | 14.858  | 0.758  | 1.046  | 1.046  | 568.299  | 0.17   |
| Rollers        | 1990 | 251    | 500     | 135.093  | 1.669  | 11.266  | 14.103  | 0.662  | 0.896  | 0.896  | 568.299  | 0.15   |
| Rollers        | 2000 | 6      | 15      | 3.444    | 1.475  | 4.49    | 8.242   | 0.079  | 0.676  | 0.676  | 568.3    | 0.133  |
| Rollers        | 2000 | 16     | 25      | 9.648    | 1.958  | 4.53    | 6.358   | 0.065  | 0.563  | 0.563  | 568.299  | 0.176  |
| Rollers        | 2000 | 26     | 50      | 38.643   | 4.027  | 8.379   | 6.941   | 0.066  | 0.861  | 0.861  | 568.299  | 0.363  |
| Rollers        | 2000 | 51     | 120     | 39.062   | 1.793  | 4.585   | 10.425  | 0.06   | 0.844  | 0.844  | 568.299  | 0.161  |
| Rollers        | 2000 | 121    | 175     | 48.357   | 1.21   | 3.749   | 9.501   | 0.057  | 0.503  | 0.503  | 568.299  | 0.109  |
| Rollers        | 2000 | 176    | 250     | 59.24    | 1.047  | 3.108   | 9.211   | 0.057  | 0.427  | 0.427  | 568.299  | 0.094  |
| Rollers        | 2000 | 251    | 500     | 77.413   | 0.956  | 5.254   | 8.821   | 0.05   | 0.379  | 0.379  | 568.299  | 0.086  |
| Rollers        | 2005 | 6      | 15      | 1.788    | 0.766  | 3.469   | 5.228   | 0.079  | 0.361  | 0.361  | 568.299  | 0.069  |
| Rollers        | 2005 | 16     | 25      | 4.53     | 0.919  | 2.642   | 5.412   | 0.065  | 0.347  | 0.347  | 568.299  | 0.082  |
| Rollers        | 2005 | 26     | 50      | 34.997   | 3.647  | 7.864   | 6.51    | 0.066  | 0.808  | 0.808  | 568.299  | 0.329  |
| Rollers        | 2005 | 51     | 120     | 34.046   | 1.563  | 4.289   | 8.963   | 0.06   | 0.79   | 0.79   | 568.299  | 0.141  |
| Rollers        | 2005 | 121    | 175     | 40.854   | 1.023  | 3.44    | 8.18    | 0.057  | 0.441  | 0.441  | 568.299  | 0.092  |
| Rollers        | 2005 | 176    | 250     | 44.594   | 0.788  | 2.262   | 7.822   | 0.057  | 0.319  | 0.319  | 568.299  | 0.071  |
| Rollers        | 2005 | 251    | 500     | 56.466   | 0.697  | 3.183   | 7.196   | 0.05   | 0.282  | 0.282  | 568.299  | 0.062  |
| Rollers        | 2010 | 6      | 15      | 1.637529 | 1.376  | 5.19619 | 5.58863 | 0.0054 | 0.5161 | 0.4748 | 584.6125 | 0.1702 |
| Rollers        | 2010 | 16     | 25      | 1.637529 | 1.376  | 5.19619 | 5.58863 | 0.0054 | 0.5161 | 0.4748 | 584.6125 | 0.1702 |
| Rollers        | 2010 | 26     | 50      | 1.637529 | 1.376  | 5.19619 | 5.58863 | 0.0054 | 0.5161 | 0.4748 | 584.6125 | 0.1702 |
| Rollers        | 2010 | 51     | 120     | 0.983879 | 0.8267 | 3.91429 | 7.50147 | 0.0049 | 0.5604 | 0.5155 | 527.6279 | 0.1536 |
| Rollers        | 2010 | 121    | 175     | 0.511697 | 0.43   | 3.00505 | 5.60543 | 0.0049 | 0.2643 | 0.2432 | 524.1952 | 0.1526 |
| Rollers        | 2010 | 176    | 250     | 0.616159 | 0.5177 | 2.19572 | 7.34127 | 0.0049 | 0.2682 | 0.2467 | 526.2539 | 0.1532 |
| Rollers        | 2010 | 251    | 500     | 0.682816 | 0.5738 | 4.92169 | 7.52047 | 0.005  | 0.313  | 0.2879 | 533.878  | 0.1554 |
| Rollers        | 2011 | 6      | 15      | 1.599963 | 1.3444 | 5.18315 | 5.5647  | 0.0054 | 0.5076 | 0.467  | 583.1085 | 0.1702 |
| Rollers        | 2011 | 16     | 25      | 1.599963 | 1.3444 | 5.18315 | 5.5647  | 0.0054 | 0.5076 | 0.467  | 583.1085 | 0.1702 |
| Rollers        | 2011 | 26     | 50      | 1.599963 | 1.3444 | 5.18315 | 5.5647  | 0.0054 | 0.5076 | 0.467  | 583.1085 | 0.1702 |
| Rollers        | 2011 | 51     | 120     | 0.924436 | 0.7768 | 3.86451 | 7.13388 | 0.0049 | 0.5333 | 0.4906 | 525.9391 | 0.1535 |
| Rollers        | 2011 | 121    | 175     | 0.498798 | 0.4191 | 3.00845 | 5.44712 | 0.0049 | 0.2574 | 0.2368 | 522.9396 | 0.1526 |
| Rollers        | 2011 | 176    | 250     | 0.556319 | 0.4675 | 2.03431 | 6.69107 | 0.0049 | 0.2418 | 0.2225 | 524.8924 | 0.1532 |
| Rollers        | 2011 | 251    | 500     | 0.597293 | 0.5019 | 4.46947 | 6.64358 | 0.0049 | 0.2752 | 0.2532 | 529.5965 | 0.1545 |
| Rollers        | 2012 | 6      | 15      | 1.624226 | 1.3648 | 5.26844 | 5.568   | 0.0054 | 0.5114 | 0.4705 | 581.6678 | 0.1702 |
| Rollers        | 2012 | 16     | 25      | 1.624226 | 1.3648 | 5.26844 | 5.568   | 0.0054 | 0.5114 | 0.4705 | 581.6678 | 0.1702 |
| Rollers        | 2012 | 26     | 50      | 1.624226 | 1.3648 | 5.26844 | 5.568   | 0.0054 | 0.5114 | 0.4705 | 581.6678 | 0.1702 |
| Rollers        | 2012 | 51     | 120     | 0.924087 | 0.7765 | 3.87893 | 7.08604 | 0.0049 | 0.5337 | 0.491  | 524.5269 | 0.1534 |
| Rollers        | 2012 | 121    | 175     | 0.497788 | 0.4183 | 3.02294 | 5.38313 | 0.0049 | 0.2553 | 0.2349 | 521.5511 | 0.1526 |
| Rollers        | 2012 | 176    | 250     | 0.555818 | 0.467  | 2.02691 | 6.64215 | 0.0049 | 0.2409 | 0.2217 | 523.5608 | 0.1532 |
| Rollers        | 2012 | 251    | 500     | 0.604557 | 0.508  | 4.53336 | 6.66671 | 0.0049 | 0.2778 | 0.2556 | 528.1357 | 0.1545 |
| Rollers        | 2013 | 6      | 15      | 1.5981   | 1.3428 | 5.27142 | 5.50162 | 0.0054 | 0.5    | 0.46   | 578.8662 | 0.1702 |
| Rollers        | 2013 | 16     | 25      | 1.5981   | 1.3428 | 5.27142 | 5.50162 | 0.0054 | 0.5    | 0.46   | 578.8662 | 0.1702 |
| Rollers        | 2013 | 26     | 50      | 1.5981   | 1.3428 | 5.27142 | 5.50162 | 0.0054 | 0.5    | 0.46   | 578.8662 | 0.1702 |
| Rollers        | 2013 | 51     | 120     | 0.873627 | 0.7341 | 3.84356 | 6.74964 | 0.0049 | 0.5039 | 0.4636 | 521.8163 | 0.1534 |
| Rollers        | 2013 | 121    | 175     | 0.468308 | 0.3935 | 3.00794 | 5.11335 | 0.0049 | 0.2377 | 0.2187 | 519.0689 | 0.1526 |
| Rollers        | 2013 | 176    | 250     | 0.495332 | 0.4162 | 1.86858 | 5.94235 | 0.0049 | 0.2127 | 0.1957 | 520.4083 | 0.153  |
| Rollers        | 2013 | 251    | 500     | 0.470274 | 0.3952 | 3.53436 | 5.43748 | 0.0049 | 0.2133 | 0.1962 | 524.7654 | 0.1543 |
| Rollers        | 2014 | 6      | 15      | 1.556684 | 1.308  | 5.24275 | 5.39309 | 0.0054 | 0.4836 | 0.4449 | 575.7953 | 0.1702 |
| Rollers        | 2014 | 16     | 25      | 1.556684 | 1.308  | 5.24275 | 5.39309 | 0.0054 | 0.4836 | 0.4449 | 575.7953 | 0.1702 |
| Rollers        | 2014 | 26     | 50      | 1.556684 | 1.308  | 5.24275 | 5.39309 | 0.0054 | 0.4836 | 0.4449 | 575.7953 | 0.1702 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Rollers        | 2014 | 51     | 120     | 0.827072 | 0.695  | 3.80915 | 6.39036 | 0.0049 | 0.4759 | 0.4378 | 518.7866 | 0.1533 |
| Rollers        | 2014 | 121    | 175     | 0.437778 | 0.3679 | 2.99804 | 4.72375 | 0.0049 | 0.2191 | 0.2016 | 516.591  | 0.1527 |
| Rollers        | 2014 | 176    | 250     | 0.453642 | 0.3812 | 1.75988 | 5.40344 | 0.0049 | 0.1914 | 0.1761 | 517.8111 | 0.153  |
| Rollers        | 2014 | 251    | 500     | 0.449616 | 0.3778 | 3.3182  | 5.18322 | 0.0049 | 0.2015 | 0.1854 | 522.0518 | 0.1543 |
| Rollers        | 2015 | 6      | 15      | 1.559602 | 1.3105 | 5.29043 | 5.36547 | 0.0054 | 0.4811 | 0.4427 | 569.9207 | 0.1701 |
| Rollers        | 2015 | 16     | 25      | 1.559602 | 1.3105 | 5.29043 | 5.36547 | 0.0054 | 0.4811 | 0.4427 | 569.9207 | 0.1701 |
| Rollers        | 2015 | 26     | 50      | 1.559602 | 1.3105 | 5.29043 | 5.36547 | 0.0054 | 0.4811 | 0.4427 | 569.9207 | 0.1701 |
| Rollers        | 2015 | 51     | 120     | 0.813228 | 0.6833 | 3.80891 | 6.27158 | 0.0049 | 0.4674 | 0.43   | 513.5052 | 0.1533 |
| Rollers        | 2015 | 121    | 175     | 0.433087 | 0.3639 | 3.00605 | 4.63035 | 0.0049 | 0.2155 | 0.1982 | 511.3935 | 0.1527 |
| Rollers        | 2015 | 176    | 250     | 0.41293  | 0.347  | 1.65049 | 4.93191 | 0.0049 | 0.1708 | 0.1572 | 512.8234 | 0.1531 |
| Rollers        | 2015 | 251    | 500     | 0.441373 | 0.3709 | 3.24549 | 5.03147 | 0.0049 | 0.195  | 0.1794 | 517.2848 | 0.1544 |
| Rollers        | 2016 | 6      | 15      | 1.498736 | 1.2594 | 5.23066 | 5.2356  | 0.0054 | 0.4594 | 0.4226 | 563.9722 | 0.1701 |
| Rollers        | 2016 | 16     | 25      | 1.498736 | 1.2594 | 5.23066 | 5.2356  | 0.0054 | 0.4594 | 0.4226 | 563.9722 | 0.1701 |
| Rollers        | 2016 | 26     | 50      | 1.498736 | 1.2594 | 5.23066 | 5.2356  | 0.0054 | 0.4594 | 0.4226 | 563.9722 | 0.1701 |
| Rollers        | 2016 | 51     | 120     | 0.747631 | 0.6282 | 3.75537 | 5.80563 | 0.0049 | 0.4275 | 0.3933 | 508.1987 | 0.1533 |
| Rollers        | 2016 | 121    | 175     | 0.402004 | 0.3378 | 2.99334 | 4.23872 | 0.0049 | 0.197  | 0.1812 | 505.9041 | 0.1526 |
| Rollers        | 2016 | 176    | 250     | 0.366563 | 0.308  | 1.50673 | 4.39492 | 0.0049 | 0.15   | 0.138  | 507.6939 | 0.1531 |
| Rollers        | 2016 | 251    | 500     | 0.397483 | 0.334  | 2.95647 | 4.45617 | 0.0049 | 0.1731 | 0.1592 | 513.4154 | 0.1549 |
| Rollers        | 2017 | 6      | 15      | 1.425352 | 1.1977 | 5.14727 | 5.09771 | 0.0054 | 0.4357 | 0.4008 | 555.0199 | 0.1701 |
| Rollers        | 2017 | 16     | 25      | 1.425352 | 1.1977 | 5.14727 | 5.09771 | 0.0054 | 0.4357 | 0.4008 | 555.0199 | 0.1701 |
| Rollers        | 2017 | 26     | 50      | 1.425352 | 1.1977 | 5.14727 | 5.09771 | 0.0054 | 0.4357 | 0.4008 | 555.0199 | 0.1701 |
| Rollers        | 2017 | 51     | 120     | 0.690109 | 0.5799 | 3.71315 | 5.4114  | 0.0049 | 0.3921 | 0.3607 | 500.1525 | 0.1532 |
| Rollers        | 2017 | 121    | 175     | 0.373471 | 0.3138 | 2.98069 | 3.87384 | 0.0049 | 0.1804 | 0.1659 | 497.9088 | 0.1526 |
| Rollers        | 2017 | 176    | 250     | 0.326364 | 0.2742 | 1.40849 | 3.92097 | 0.0049 | 0.1294 | 0.1191 | 499.7021 | 0.1531 |
| Rollers        | 2017 | 251    | 500     | 0.353236 | 0.2968 | 2.68487 | 3.84047 | 0.0049 | 0.1501 | 0.1381 | 505.8318 | 0.155  |
| Rollers        | 2018 | 6      | 15      | 1.26668  | 1.0644 | 4.92335 | 4.8416  | 0.0054 | 0.3867 | 0.3557 | 546.2905 | 0.1701 |
| Rollers        | 2018 | 16     | 25      | 1.26668  | 1.0644 | 4.92335 | 4.8416  | 0.0054 | 0.3867 | 0.3557 | 546.2905 | 0.1701 |
| Rollers        | 2018 | 26     | 50      | 1.26668  | 1.0644 | 4.92335 | 4.8416  | 0.0054 | 0.3867 | 0.3557 | 546.2905 | 0.1701 |
| Rollers        | 2018 | 51     | 120     | 0.572467 | 0.481  | 3.60981 | 4.65049 | 0.0049 | 0.32   | 0.2944 | 492.2118 | 0.1532 |
| Rollers        | 2018 | 121    | 175     | 0.315632 | 0.2652 | 2.94895 | 3.18126 | 0.0049 | 0.1472 | 0.1355 | 490.1805 | 0.1526 |
| Rollers        | 2018 | 176    | 250     | 0.251419 | 0.2113 | 1.24341 | 2.99492 | 0.0049 | 0.0938 | 0.0863 | 491.6643 | 0.1531 |
| Rollers        | 2018 | 251    | 500     | 0.291314 | 0.2448 | 2.23145 | 3.09814 | 0.005  | 0.1191 | 0.1095 | 497.9962 | 0.155  |
| Rollers        | 2019 | 6      | 15      | 1.156606 | 0.9719 | 4.77841 | 4.64491 | 0.0054 | 0.3493 | 0.3213 | 537.546  | 0.1701 |
| Rollers        | 2019 | 16     | 25      | 1.156606 | 0.9719 | 4.77841 | 4.64491 | 0.0054 | 0.3493 | 0.3213 | 537.546  | 0.1701 |
| Rollers        | 2019 | 26     | 50      | 1.156606 | 0.9719 | 4.77841 | 4.64491 | 0.0054 | 0.3493 | 0.3213 | 537.546  | 0.1701 |
| Rollers        | 2019 | 51     | 120     | 0.502836 | 0.4225 | 3.55726 | 4.17949 | 0.0049 | 0.2748 | 0.2528 | 484.3362 | 0.1532 |
| Rollers        | 2019 | 121    | 175     | 0.27475  | 0.2309 | 2.93251 | 2.69941 | 0.0049 | 0.1239 | 0.114  | 482.4531 | 0.1526 |
| Rollers        | 2019 | 176    | 250     | 0.250477 | 0.2105 | 1.24854 | 2.88327 | 0.0049 | 0.0918 | 0.0844 | 483.7769 | 0.1531 |
| Rollers        | 2019 | 251    | 500     | 0.278634 | 0.2341 | 2.10142 | 2.90839 | 0.005  | 0.1109 | 0.102  | 489.9774 | 0.155  |
| Rollers        | 2020 | 6      | 15      | 1.102095 | 0.9261 | 4.72504 | 4.53426 | 0.0054 | 0.3289 | 0.3026 | 525.8798 | 0.1701 |
| Rollers        | 2020 | 16     | 25      | 1.102095 | 0.9261 | 4.72504 | 4.53426 | 0.0054 | 0.3289 | 0.3026 | 525.8798 | 0.1701 |
| Rollers        | 2020 | 26     | 50      | 1.102095 | 0.9261 | 4.72504 | 4.53426 | 0.0054 | 0.3289 | 0.3026 | 525.8798 | 0.1701 |
| Rollers        | 2020 | 51     | 120     | 0.462004 | 0.3882 | 3.53135 | 3.88153 | 0.0049 | 0.2475 | 0.2277 | 473.8594 | 0.1533 |
| Rollers        | 2020 | 121    | 175     | 0.256128 | 0.2152 | 2.93333 | 2.45176 | 0.0049 | 0.1126 | 0.1036 | 471.9177 | 0.1526 |
| Rollers        | 2020 | 176    | 250     | 0.248138 | 0.2085 | 1.25343 | 2.75095 | 0.0049 | 0.0892 | 0.082  | 473.3669 | 0.1531 |
| Rollers        | 2020 | 251    | 500     | 0.279691 | 0.235  | 2.11346 | 2.82823 | 0.005  | 0.1094 | 0.1007 | 479.3254 | 0.155  |
| Rollers        | 2021 | 6      | 15      | 1.008559 | 0.8475 | 4.59681 | 4.35097 | 0.0054 | 0.2938 | 0.2703 | 525.7908 | 0.1701 |
| Rollers        | 2021 | 16     | 25      | 1.008559 | 0.8475 | 4.59681 | 4.35097 | 0.0054 | 0.2938 | 0.2703 | 525.7908 | 0.1701 |
| Rollers        | 2021 | 26     | 50      | 1.008559 | 0.8475 | 4.59681 | 4.35097 | 0.0054 | 0.2938 | 0.2703 | 525.7908 | 0.1701 |
| Rollers        | 2021 | 51     | 120     | 0.42061  | 0.3534 | 3.50719 | 3.5889  | 0.0049 | 0.2194 | 0.2018 | 473.9012 | 0.1533 |
| Rollers        | 2021 | 121    | 175     | 0.229571 | 0.1929 | 2.9256  | 2.11691 | 0.0049 | 0.0973 | 0.0895 | 471.9799 | 0.1526 |
| Rollers        | 2021 | 176    | 250     | 0.23384  | 0.1965 | 1.22849 | 2.49332 | 0.0049 | 0.081  | 0.0746 | 473.4704 | 0.1531 |
| Rollers        | 2021 | 251    | 500     | 0.26246  | 0.2205 | 1.94995 | 2.58936 | 0.005  | 0.0997 | 0.0918 | 479.3294 | 0.155  |
| Rollers        | 2022 | 6      | 15      | 0.878567 | 0.7382 | 4.40241 | 4.12773 | 0.0054 | 0.2501 | 0.2301 | 525.691  | 0.17   |
| Rollers        | 2022 | 16     | 25      | 0.878567 | 0.7382 | 4.40241 | 4.12773 | 0.0054 | 0.2501 | 0.2301 | 525.691  | 0.17   |
| Rollers        | 2022 | 26     | 50      | 0.878567 | 0.7382 | 4.40241 | 4.12773 | 0.0054 | 0.2501 | 0.2301 | 525.691  | 0.17   |
| Rollers        | 2022 | 51     | 120     | 0.369089 | 0.3101 | 3.46973 | 3.21896 | 0.0049 | 0.1855 | 0.1707 | 473.9291 | 0.1533 |
| Rollers        | 2022 | 121    | 175     | 0.195547 | 0.1643 | 2.91331 | 1.71408 | 0.0049 | 0.0787 | 0.0724 | 471.9475 | 0.1526 |
| Rollers        | 2022 | 176    | 250     | 0.221959 | 0.1865 | 1.22821 | 2.2116  | 0.0049 | 0.0768 | 0.0707 | 473.5135 | 0.1531 |
| Rollers        | 2022 | 251    | 500     | 0.259221 | 0.2178 | 1.95495 | 2.46341 | 0.0049 | 0.0972 | 0.0894 | 478.9817 | 0.1549 |
| Rollers        | 2023 | 6      | 15      | 0.786211 | 0.6606 | 4.25236 | 3.9211  | 0.0054 | 0.2115 | 0.1946 | 525.8616 | 0.1701 |
| Rollers        | 2023 | 16     | 25      | 0.786211 | 0.6606 | 4.25236 | 3.9211  | 0.0054 | 0.2115 | 0.1946 | 525.8616 | 0.1701 |
| Rollers        | 2023 | 26     | 50      | 0.786211 | 0.6606 | 4.25236 | 3.9211  | 0.0054 | 0.2115 | 0.1946 | 525.8616 | 0.1701 |
| Rollers        | 2023 | 51     | 120     | 0.341189 | 0.2867 | 3.45461 | 3.00302 | 0.0049 | 0.1652 | 0.152  | 473.9363 | 0.1533 |
| Rollers        | 2023 | 121    | 175     | 0.1784   | 0.1499 | 2.90949 | 1.4833  | 0.0049 | 0.0677 | 0.0622 | 471.9351 | 0.1526 |
| Rollers        | 2023 | 176    | 250     | 0.223864 | 0.1881 | 1.23448 | 2.17272 | 0.0049 | 0.0763 | 0.0702 | 473.5164 | 0.1531 |
| Rollers        | 2023 | 251    | 500     | 0.25159  | 0.2114 | 1.95626 | 2.29003 | 0.0049 | 0.0926 | 0.0852 | 478.3028 | 0.1547 |
| Rollers        | 2024 | 6      | 15      | 0.738433 | 0.6205 | 4.20667 | 3.82449 | 0.0054 | 0.1925 | 0.1771 | 525.9565 | 0.1701 |
| Rollers        | 2024 | 16     | 25      | 0.738433 | 0.6205 | 4.20667 | 3.82449 | 0.0054 | 0.1925 | 0.1771 | 525.9565 | 0.1701 |
| Rollers        | 2024 | 26     | 50      | 0.738433 | 0.6205 | 4.20667 | 3.82449 | 0.0054 | 0.1925 | 0.1771 | 525.9565 | 0.1701 |
| Rollers        | 2024 | 51     | 120     | 0.323417 | 0.2718 | 3.45055 | 2.843   | 0.0049 | 0.1505 | 0.1384 | 474.0072 | 0.1533 |
| Rollers        | 2024 | 121    | 175     | 0.168235 | 0.1414 | 2.91426 | 1.32428 | 0.0049 | 0.0605 | 0.0557 | 472.012  | 0.1527 |
| Rollers        | 2024 | 176    | 250     | 0.213553 | 0.1794 | 1.21417 | 1.97675 | 0.0049 | 0.0696 | 0.064  | 473.512  | 0.1531 |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type          | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|-------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Rollers                 | 2024 | 251    | 500     | 0.24978  | 0.2099 | 1.96121 | 2.21612 | 0.0049 | 0.0901 | 0.0829 | 477.9001 | 0.1546 |
| Rollers                 | 2025 | 6      | 15      | 0.677074 | 0.5689 | 4.12543 | 3.68893 | 0.0054 | 0.167  | 0.1536 | 526.1406 | 0.1702 |
| Rollers                 | 2025 | 16     | 25      | 0.677074 | 0.5689 | 4.12543 | 3.68893 | 0.0054 | 0.167  | 0.1536 | 526.1406 | 0.1702 |
| Rollers                 | 2025 | 26     | 50      | 0.677074 | 0.5689 | 4.12543 | 3.68893 | 0.0054 | 0.167  | 0.1536 | 526.1406 | 0.1702 |
| Rollers                 | 2025 | 51     | 120     | 0.303987 | 0.2554 | 3.44432 | 2.69137 | 0.0049 | 0.1354 | 0.1245 | 473.851  | 0.1533 |
| Rollers                 | 2025 | 121    | 175     | 0.150791 | 0.1267 | 2.90859 | 1.10088 | 0.0049 | 0.0494 | 0.0455 | 471.9696 | 0.1526 |
| Rollers                 | 2025 | 176    | 250     | 0.205768 | 0.1729 | 1.21477 | 1.78252 | 0.0049 | 0.0656 | 0.0603 | 473.6813 | 0.1532 |
| Rollers                 | 2025 | 251    | 500     | 0.251787 | 0.2116 | 1.96754 | 2.19998 | 0.0049 | 0.0905 | 0.0832 | 477.5732 | 0.1545 |
| Rollers                 | 2030 | 6      | 15      | 1.543    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Rollers                 | 2030 | 16     | 25      | 3.377    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Rollers                 | 2030 | 26     | 50      | 5.638    | 0.587  | 4.784   | 3.48    | 0.007  | 0.073  | 0.073  | 568.299  | 0.053  |
| Rollers                 | 2030 | 51     | 120     | 6.528    | 0.299  | 3.639   | 1.95    | 0.006  | 0.066  | 0.066  | 568.299  | 0.027  |
| Rollers                 | 2030 | 121    | 175     | 8.923    | 0.223  | 3.203   | 0.907   | 0.006  | 0.042  | 0.042  | 568.299  | 0.02   |
| Rollers                 | 2030 | 176    | 250     | 11.047   | 0.195  | 1.099   | 0.745   | 0.006  | 0.024  | 0.024  | 568.299  | 0.017  |
| Rollers                 | 2030 | 251    | 500     | 15.637   | 0.193  | 1.056   | 0.697   | 0.005  | 0.023  | 0.023  | 568.299  | 0.017  |
| Rollers                 | 2035 | 6      | 15      | 1.543    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Rollers                 | 2035 | 16     | 25      | 3.377    | 0.685  | 2.34    | 4.332   | 0.007  | 0.161  | 0.161  | 568.3    | 0.061  |
| Rollers                 | 2035 | 26     | 50      | 4.867    | 0.507  | 4.711   | 3.28    | 0.007  | 0.038  | 0.038  | 568.299  | 0.045  |
| Rollers                 | 2035 | 51     | 120     | 5.632    | 0.258  | 3.629   | 1.65    | 0.006  | 0.035  | 0.035  | 568.299  | 0.023  |
| Rollers                 | 2035 | 121    | 175     | 7.351    | 0.184  | 3.204   | 0.523   | 0.006  | 0.023  | 0.023  | 568.299  | 0.016  |
| Rollers                 | 2035 | 176    | 250     | 9.79     | 0.173  | 1.091   | 0.465   | 0.006  | 0.016  | 0.016  | 568.299  | 0.015  |
| Rollers                 | 2035 | 251    | 500     | 13.949   | 0.172  | 1.048   | 0.442   | 0.005  | 0.016  | 0.016  | 568.3    | 0.015  |
| Rollers                 | 2040 | 6      | 15      | 1.543    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Rollers                 | 2040 | 16     | 25      | 3.377    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Rollers                 | 2040 | 26     | 50      | 4.508    | 0.469  | 4.682   | 3.207   | 0.007  | 0.024  | 0.024  | 568.299  | 0.042  |
| Rollers                 | 2040 | 51     | 120     | 5.228    | 0.24   | 3.625   | 1.525   | 0.006  | 0.021  | 0.021  | 568.299  | 0.021  |
| Rollers                 | 2040 | 121    | 175     | 6.731    | 0.168  | 3.205   | 0.373   | 0.006  | 0.015  | 0.015  | 568.299  | 0.015  |
| Rollers                 | 2040 | 176    | 250     | 9.355    | 0.165  | 1.092   | 0.348   | 0.006  | 0.012  | 0.012  | 568.299  | 0.014  |
| Rollers                 | 2040 | 251    | 500     | 13.378   | 0.165  | 1.048   | 0.341   | 0.005  | 0.012  | 0.012  | 568.299  | 0.014  |
| Rough Terrain Forklifts | 1990 | 26     | 50      | 13.299   | 5.191  | 10.416  | 8.098   | 0.871  | 1.348  | 1.348  | 568.299  | 0.468  |
| Rough Terrain Forklifts | 1990 | 51     | 120     | 11.91    | 2.52   | 6.008   | 15.753  | 0.791  | 1.432  | 1.432  | 568.299  | 0.227  |
| Rough Terrain Forklifts | 1990 | 121    | 175     | 19.775   | 2.092  | 5.422   | 15.888  | 0.758  | 1.178  | 1.178  | 568.299  | 0.188  |
| Rough Terrain Forklifts | 1990 | 176    | 250     | 27.042   | 2.092  | 5.422   | 15.888  | 0.758  | 1.178  | 1.178  | 568.299  | 0.188  |
| Rough Terrain Forklifts | 1990 | 251    | 500     | 35.607   | 1.834  | 12.637  | 14.986  | 0.662  | 0.998  | 0.998  | 568.299  | 0.165  |
| Rough Terrain Forklifts | 2000 | 26     | 50      | 11.216   | 4.378  | 9.045   | 7.041   | 0.066  | 0.919  | 0.919  | 568.3    | 0.395  |
| Rough Terrain Forklifts | 2000 | 51     | 120     | 8.517    | 1.802  | 4.574   | 10.225  | 0.06   | 0.881  | 0.881  | 568.299  | 0.162  |
| Rough Terrain Forklifts | 2000 | 121    | 175     | 11.484   | 1.215  | 3.676   | 9.36    | 0.057  | 0.511  | 0.511  | 568.3    | 0.109  |
| Rough Terrain Forklifts | 2000 | 176    | 250     | 13.186   | 1.02   | 2.927   | 9.021   | 0.057  | 0.418  | 0.418  | 568.299  | 0.092  |
| Rough Terrain Forklifts | 2000 | 251    | 500     | 18.049   | 0.929  | 4.415   | 8.59    | 0.05   | 0.37   | 0.37   | 568.299  | 0.083  |
| Rough Terrain Forklifts | 2005 | 26     | 50      | 9.835    | 3.839  | 8.285   | 6.528   | 0.066  | 0.844  | 0.844  | 568.299  | 0.346  |
| Rough Terrain Forklifts | 2005 | 51     | 120     | 7.351    | 1.555  | 4.289   | 8.677   | 0.06   | 0.82   | 0.82   | 568.299  | 0.14   |
| Rough Terrain Forklifts | 2005 | 121    | 175     | 9.61     | 1.016  | 3.403   | 7.941   | 0.057  | 0.447  | 0.447  | 568.3    | 0.091  |
| Rough Terrain Forklifts | 2005 | 176    | 250     | 9.418    | 0.728  | 1.995   | 7.52    | 0.057  | 0.289  | 0.289  | 568.299  | 0.065  |
| Rough Terrain Forklifts | 2005 | 251    | 500     | 12.496   | 0.643  | 2.406   | 6.82    | 0.05   | 0.258  | 0.258  | 568.299  | 0.058  |
| Rough Terrain Forklifts | 2010 | 26     | 50      | 1.514602 | 1.2727 | 4.9076  | 5.57504 | 0.0054 | 0.4947 | 0.4551 | 583.8316 | 0.1699 |
| Rough Terrain Forklifts | 2010 | 51     | 120     | 0.607871 | 0.5108 | 3.47103 | 5.81073 | 0.0049 | 0.3855 | 0.3547 | 525.5318 | 0.153  |
| Rough Terrain Forklifts | 2010 | 121    | 175     | 0.37661  | 0.3165 | 2.9137  | 4.78775 | 0.0049 | 0.2124 | 0.1954 | 524.1127 | 0.1526 |
| Rough Terrain Forklifts | 2010 | 176    | 250     | 0.759196 | 0.6379 | 2.86785 | 7.87723 | 0.0049 | 0.3508 | 0.3228 | 527.6921 | 0.1536 |
| Rough Terrain Forklifts | 2010 | 251    | 500     | 0.386691 | 0.3249 | 1.82955 | 5.79984 | 0.0048 | 0.1682 | 0.1548 | 518.8116 | 0.151  |
| Rough Terrain Forklifts | 2011 | 26     | 50      | 1.444446 | 1.2137 | 4.83823 | 5.52279 | 0.0054 | 0.4799 | 0.4415 | 582.3751 | 0.1699 |
| Rough Terrain Forklifts | 2011 | 51     | 120     | 0.549079 | 0.4614 | 3.4365  | 5.4371  | 0.0049 | 0.3519 | 0.3238 | 524.0504 | 0.1529 |
| Rough Terrain Forklifts | 2011 | 121    | 175     | 0.339518 | 0.2853 | 2.87624 | 4.45534 | 0.0049 | 0.1925 | 0.1771 | 522.735  | 0.1525 |
| Rough Terrain Forklifts | 2011 | 176    | 250     | 0.686556 | 0.5769 | 2.63351 | 7.1588  | 0.0049 | 0.317  | 0.2916 | 525.8441 | 0.1534 |
| Rough Terrain Forklifts | 2011 | 251    | 500     | 0.390538 | 0.3282 | 1.84589 | 5.81691 | 0.0048 | 0.1697 | 0.1561 | 517.5182 | 0.151  |
| Rough Terrain Forklifts | 2012 | 26     | 50      | 1.441034 | 1.2109 | 4.88018 | 5.49331 | 0.0054 | 0.4762 | 0.4381 | 580.9231 | 0.1699 |
| Rough Terrain Forklifts | 2012 | 51     | 120     | 0.530399 | 0.4457 | 3.43501 | 5.29115 | 0.0049 | 0.3397 | 0.3125 | 522.6299 | 0.1529 |
| Rough Terrain Forklifts | 2012 | 121    | 175     | 0.336361 | 0.2826 | 2.88643 | 4.38447 | 0.0049 | 0.1886 | 0.1735 | 521.4414 | 0.1525 |
| Rough Terrain Forklifts | 2012 | 176    | 250     | 0.693119 | 0.5824 | 2.65596 | 7.11155 | 0.0049 | 0.3186 | 0.2932 | 524.4406 | 0.1534 |
| Rough Terrain Forklifts | 2012 | 251    | 500     | 0.394706 | 0.3317 | 1.86253 | 5.83389 | 0.0048 | 0.1711 | 0.1574 | 516.2249 | 0.151  |
| Rough Terrain Forklifts | 2013 | 26     | 50      | 1.427232 | 1.1993 | 4.88715 | 5.34043 | 0.0054 | 0.4536 | 0.4173 | 578.2559 | 0.17   |
| Rough Terrain Forklifts | 2013 | 51     | 120     | 0.469882 | 0.3948 | 3.39906 | 4.92337 | 0.0049 | 0.2987 | 0.2748 | 519.906  | 0.1529 |
| Rough Terrain Forklifts | 2013 | 121    | 175     | 0.283862 | 0.2385 | 2.86094 | 3.90677 | 0.0049 | 0.153  | 0.1408 | 518.7027 | 0.1525 |
| Rough Terrain Forklifts | 2013 | 176    | 250     | 0.418518 | 0.3517 | 1.88921 | 4.79966 | 0.0049 | 0.1835 | 0.1688 | 521.6392 | 0.1534 |
| Rough Terrain Forklifts | 2013 | 251    | 500     | 0.334838 | 0.2814 | 1.86541 | 4.62017 | 0.0048 | 0.1406 | 0.1294 | 514.2815 | 0.1512 |
| Rough Terrain Forklifts | 2014 | 26     | 50      | 1.40671  | 1.182  | 4.88713 | 5.22634 | 0.0054 | 0.4359 | 0.401  | 575.3526 | 0.17   |
| Rough Terrain Forklifts | 2014 | 51     | 120     | 0.417386 | 0.3507 | 3.36705 | 4.46728 | 0.0049 | 0.261  | 0.2401 | 517.2602 | 0.1529 |
| Rough Terrain Forklifts | 2014 | 121    | 175     | 0.263476 | 0.2214 | 2.85182 | 3.59442 | 0.0049 | 0.1395 | 0.1283 | 516.0907 | 0.1525 |
| Rough Terrain Forklifts | 2014 | 176    | 250     | 0.221616 | 0.1862 | 1.21218 | 2.98369 | 0.0049 | 0.0871 | 0.0801 | 517.7663 | 0.153  |
| Rough Terrain Forklifts | 2014 | 251    | 500     | 0.202465 | 0.1701 | 0.95399 | 3.49973 | 0.0048 | 0.0761 | 0.0701 | 511.6567 | 0.1512 |
| Rough Terrain Forklifts | 2015 | 26     | 50      | 1.414803 | 1.1888 | 4.93325 | 5.18984 | 0.0054 | 0.4314 | 0.3969 | 569.4875 | 0.17   |
| Rough Terrain Forklifts | 2015 | 51     | 120     | 0.401892 | 0.3377 | 3.36619 | 4.28003 | 0.0049 | 0.2474 | 0.2276 | 512.0859 | 0.1529 |
| Rough Terrain Forklifts | 2015 | 121    | 175     | 0.25808  | 0.2169 | 2.85917 | 3.42042 | 0.0049 | 0.1326 | 0.122  | 510.8541 | 0.1525 |
| Rough Terrain Forklifts | 2015 | 176    | 250     | 0.166466 | 0.1399 | 1.01164 | 2.4626  | 0.0049 | 0.0582 | 0.0535 | 512.1638 | 0.1529 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type          | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|-------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Rough Terrain Forklifts | 2015 | 251    | 500     | 0.207111 | 0.174  | 0.95822 | 3.52067 | 0.0048 | 0.0771 | 0.071  | 506.4349 | 0.1512 |
| Rough Terrain Forklifts | 2016 | 26     | 50      | 1.378654 | 1.1585 | 4.91773 | 5.09924 | 0.0054 | 0.4149 | 0.3817 | 563.3598 | 0.1699 |
| Rough Terrain Forklifts | 2016 | 51     | 120     | 0.358928 | 0.3016 | 3.34169 | 3.84005 | 0.0049 | 0.2131 | 0.1961 | 507.0659 | 0.1529 |
| Rough Terrain Forklifts | 2016 | 121    | 175     | 0.248476 | 0.2088 | 2.865   | 3.2087  | 0.0049 | 0.1244 | 0.1145 | 505.596  | 0.1525 |
| Rough Terrain Forklifts | 2016 | 176    | 250     | 0.171278 | 0.1439 | 1.0177  | 2.46843 | 0.0049 | 0.0587 | 0.054  | 506.8956 | 0.1529 |
| Rough Terrain Forklifts | 2016 | 251    | 500     | 0.211667 | 0.1779 | 0.96236 | 3.54169 | 0.0048 | 0.0781 | 0.0718 | 501.2134 | 0.1512 |
| Rough Terrain Forklifts | 2017 | 26     | 50      | 1.318488 | 1.1079 | 4.83344 | 4.90253 | 0.0054 | 0.3821 | 0.3515 | 554.6234 | 0.1699 |
| Rough Terrain Forklifts | 2017 | 51     | 120     | 0.322506 | 0.271  | 3.31778 | 3.41759 | 0.0049 | 0.1816 | 0.1671 | 499.1682 | 0.1529 |
| Rough Terrain Forklifts | 2017 | 121    | 175     | 0.231401 | 0.1944 | 2.86636 | 2.90167 | 0.0049 | 0.1121 | 0.1031 | 497.7766 | 0.1525 |
| Rough Terrain Forklifts | 2017 | 176    | 250     | 0.175965 | 0.1479 | 1.02362 | 2.47389 | 0.0049 | 0.0592 | 0.0544 | 499.0007 | 0.1529 |
| Rough Terrain Forklifts | 2017 | 251    | 500     | 0.216551 | 0.182  | 0.96636 | 3.56771 | 0.0048 | 0.0792 | 0.0728 | 493.3362 | 0.1512 |
| Rough Terrain Forklifts | 2018 | 26     | 50      | 1.273116 | 1.0698 | 4.76839 | 4.73469 | 0.0054 | 0.3585 | 0.3298 | 545.8693 | 0.1699 |
| Rough Terrain Forklifts | 2018 | 51     | 120     | 0.264415 | 0.2222 | 3.26976 | 2.84496 | 0.0049 | 0.136  | 0.1251 | 491.2107 | 0.1529 |
| Rough Terrain Forklifts | 2018 | 121    | 175     | 0.194786 | 0.1637 | 2.84245 | 2.34168 | 0.0049 | 0.0876 | 0.0806 | 489.9869 | 0.1525 |
| Rough Terrain Forklifts | 2018 | 176    | 250     | 0.181003 | 0.1521 | 1.02948 | 2.48748 | 0.0049 | 0.0598 | 0.055  | 491.0997 | 0.1529 |
| Rough Terrain Forklifts | 2018 | 251    | 500     | 0.172771 | 0.1452 | 0.95802 | 2.70063 | 0.0048 | 0.0599 | 0.0551 | 485.9543 | 0.1513 |
| Rough Terrain Forklifts | 2019 | 26     | 50      | 1.200779 | 1.009  | 4.67405 | 4.55745 | 0.0054 | 0.3277 | 0.3015 | 537.3287 | 0.17   |
| Rough Terrain Forklifts | 2019 | 51     | 120     | 0.240277 | 0.2019 | 3.25848 | 2.6222  | 0.0049 | 0.1168 | 0.1075 | 483.3105 | 0.1529 |
| Rough Terrain Forklifts | 2019 | 121    | 175     | 0.177689 | 0.1493 | 2.84092 | 2.05752 | 0.0049 | 0.0753 | 0.0693 | 482.1188 | 0.1525 |
| Rough Terrain Forklifts | 2019 | 176    | 250     | 0.130153 | 0.1094 | 0.97423 | 1.63905 | 0.0049 | 0.0364 | 0.0335 | 483.0882 | 0.1528 |
| Rough Terrain Forklifts | 2019 | 251    | 500     | 0.138302 | 0.1162 | 0.95034 | 1.96109 | 0.0048 | 0.0429 | 0.0395 | 477.2539 | 0.151  |
| Rough Terrain Forklifts | 2020 | 26     | 50      | 1.188595 | 0.9987 | 4.68594 | 4.4946  | 0.0054 | 0.3164 | 0.2911 | 525.6222 | 0.17   |
| Rough Terrain Forklifts | 2020 | 51     | 120     | 0.225188 | 0.1892 | 3.25575 | 2.45218 | 0.0049 | 0.1026 | 0.0944 | 472.9842 | 0.153  |
| Rough Terrain Forklifts | 2020 | 121    | 175     | 0.170092 | 0.1429 | 2.84466 | 1.86888 | 0.0049 | 0.0684 | 0.0629 | 471.7152 | 0.1526 |
| Rough Terrain Forklifts | 2020 | 176    | 250     | 0.132727 | 0.1115 | 0.97848 | 1.60906 | 0.0049 | 0.0366 | 0.0337 | 472.5671 | 0.1528 |
| Rough Terrain Forklifts | 2020 | 251    | 500     | 0.105484 | 0.0886 | 0.94184 | 1.30199 | 0.0048 | 0.0281 | 0.0258 | 465.7709 | 0.1506 |
| Rough Terrain Forklifts | 2021 | 26     | 50      | 1.152538 | 0.9685 | 4.65658 | 4.41145 | 0.0054 | 0.3038 | 0.2795 | 525.3844 | 0.1699 |
| Rough Terrain Forklifts | 2021 | 51     | 120     | 0.207836 | 0.1746 | 3.25191 | 2.28534 | 0.0049 | 0.0885 | 0.0815 | 473.11   | 0.153  |
| Rough Terrain Forklifts | 2021 | 121    | 175     | 0.154972 | 0.1302 | 2.8447  | 1.61661 | 0.0049 | 0.0596 | 0.0548 | 471.7575 | 0.1526 |
| Rough Terrain Forklifts | 2021 | 176    | 250     | 0.136824 | 0.115  | 0.98379 | 1.61186 | 0.0049 | 0.0368 | 0.0339 | 472.5469 | 0.1528 |
| Rough Terrain Forklifts | 2021 | 251    | 500     | 0.109168 | 0.0917 | 0.94604 | 1.30199 | 0.0048 | 0.0282 | 0.026  | 465.7442 | 0.1506 |
| Rough Terrain Forklifts | 2022 | 26     | 50      | 0.93878  | 0.7888 | 4.3038  | 4.04131 | 0.0054 | 0.2375 | 0.2185 | 525.0151 | 0.1698 |
| Rough Terrain Forklifts | 2022 | 51     | 120     | 0.18871  | 0.1586 | 3.24374 | 2.0983  | 0.0049 | 0.0732 | 0.0673 | 473.089  | 0.153  |
| Rough Terrain Forklifts | 2022 | 121    | 175     | 0.142314 | 0.1196 | 2.84439 | 1.40475 | 0.0049 | 0.0512 | 0.0471 | 471.6773 | 0.1525 |
| Rough Terrain Forklifts | 2022 | 176    | 250     | 0.140994 | 0.1185 | 0.98924 | 1.61688 | 0.0049 | 0.0371 | 0.0342 | 472.5408 | 0.1528 |
| Rough Terrain Forklifts | 2022 | 251    | 500     | 0.081218 | 0.0682 | 0.93709 | 0.55798 | 0.0048 | 0.0089 | 0.0082 | 466.5598 | 0.1509 |
| Rough Terrain Forklifts | 2023 | 26     | 50      | 0.82158  | 0.6904 | 4.12519 | 3.85338 | 0.0054 | 0.2036 | 0.1873 | 524.8024 | 0.1697 |
| Rough Terrain Forklifts | 2023 | 51     | 120     | 0.178416 | 0.1499 | 3.24217 | 1.9836  | 0.0049 | 0.0637 | 0.0586 | 473.1584 | 0.153  |
| Rough Terrain Forklifts | 2023 | 121    | 175     | 0.132417 | 0.1113 | 2.84289 | 1.21796 | 0.0049 | 0.0435 | 0.04   | 471.6217 | 0.1525 |
| Rough Terrain Forklifts | 2023 | 176    | 250     | 0.137509 | 0.1155 | 0.98987 | 1.47399 | 0.0049 | 0.0344 | 0.0317 | 472.7784 | 0.1529 |
| Rough Terrain Forklifts | 2023 | 251    | 500     | 0.082146 | 0.069  | 0.93788 | 0.55845 | 0.0048 | 0.0089 | 0.0082 | 466.554  | 0.1509 |
| Rough Terrain Forklifts | 2024 | 26     | 50      | 0.678189 | 0.5699 | 3.91822 | 3.65343 | 0.0054 | 0.1655 | 0.1523 | 524.9235 | 0.1698 |
| Rough Terrain Forklifts | 2024 | 51     | 120     | 0.172725 | 0.1451 | 3.24468 | 1.91392 | 0.0049 | 0.0583 | 0.0536 | 473.0631 | 0.153  |
| Rough Terrain Forklifts | 2024 | 121    | 175     | 0.122467 | 0.1029 | 2.83416 | 1.04413 | 0.0049 | 0.0386 | 0.0355 | 471.5346 | 0.1525 |
| Rough Terrain Forklifts | 2024 | 176    | 250     | 0.141528 | 0.1189 | 0.99524 | 1.48012 | 0.0049 | 0.0348 | 0.0321 | 472.8527 | 0.1529 |
| Rough Terrain Forklifts | 2024 | 251    | 500     | 0.078846 | 0.0663 | 0.93746 | 0.47582 | 0.0048 | 0.0089 | 0.0082 | 466.5479 | 0.1509 |
| Rough Terrain Forklifts | 2025 | 26     | 50      | 0.542352 | 0.4557 | 3.74002 | 3.47668 | 0.0054 | 0.1279 | 0.1177 | 525.027  | 0.1698 |
| Rough Terrain Forklifts | 2025 | 51     | 120     | 0.16354  | 0.1374 | 3.23971 | 1.82053 | 0.0049 | 0.0511 | 0.047  | 473.0366 | 0.153  |
| Rough Terrain Forklifts | 2025 | 121    | 175     | 0.103861 | 0.0873 | 2.82091 | 0.78628 | 0.0049 | 0.0299 | 0.0275 | 471.4745 | 0.1525 |
| Rough Terrain Forklifts | 2025 | 176    | 250     | 0.145736 | 0.1225 | 1.00073 | 1.48888 | 0.0049 | 0.0354 | 0.0326 | 472.9267 | 0.153  |
| Rough Terrain Forklifts | 2025 | 251    | 500     | 0.081817 | 0.0687 | 0.94151 | 0.47663 | 0.0048 | 0.009  | 0.0083 | 466.5414 | 0.1509 |
| Rough Terrain Forklifts | 2030 | 26     | 50      | 1.404    | 0.548  | 5.031   | 3.359   | 0.007  | 0.039  | 0.039  | 568.299  | 0.049  |
| Rough Terrain Forklifts | 2030 | 51     | 120     | 1.321    | 0.279  | 3.725   | 1.671   | 0.006  | 0.034  | 0.034  | 568.299  | 0.025  |
| Rough Terrain Forklifts | 2030 | 121    | 175     | 1.898    | 0.2    | 3.291   | 0.537   | 0.006  | 0.023  | 0.023  | 568.299  | 0.018  |
| Rough Terrain Forklifts | 2030 | 176    | 250     | 2.47     | 0.191  | 1.121   | 0.463   | 0.006  | 0.016  | 0.016  | 568.299  | 0.017  |
| Rough Terrain Forklifts | 2030 | 251    | 500     | 3.702    | 0.19   | 1.07    | 0.443   | 0.005  | 0.016  | 0.016  | 568.3    | 0.017  |
| Rough Terrain Forklifts | 2035 | 26     | 50      | 1.335    | 0.521  | 5.011   | 3.267   | 0.007  | 0.022  | 0.022  | 568.299  | 0.047  |
| Rough Terrain Forklifts | 2035 | 51     | 120     | 1.24     | 0.262  | 3.722   | 1.53    | 0.006  | 0.02   | 0.02   | 568.299  | 0.023  |
| Rough Terrain Forklifts | 2035 | 121    | 175     | 1.742    | 0.184  | 3.292   | 0.364   | 0.006  | 0.015  | 0.015  | 568.299  | 0.016  |
| Rough Terrain Forklifts | 2035 | 176    | 250     | 2.346    | 0.181  | 1.121   | 0.334   | 0.006  | 0.012  | 0.012  | 568.299  | 0.016  |
| Rough Terrain Forklifts | 2035 | 251    | 500     | 3.524    | 0.181  | 1.071   | 0.331   | 0.005  | 0.012  | 0.012  | 568.3    | 0.016  |
| Rough Terrain Forklifts | 2040 | 26     | 50      | 1.331    | 0.519  | 5.01    | 3.228   | 0.007  | 0.017  | 0.017  | 568.3    | 0.046  |
| Rough Terrain Forklifts | 2040 | 51     | 120     | 1.222    | 0.258  | 3.722   | 1.485   | 0.006  | 0.016  | 0.016  | 568.299  | 0.023  |
| Rough Terrain Forklifts | 2040 | 121    | 175     | 1.687    | 0.178  | 3.292   | 0.303   | 0.006  | 0.012  | 0.012  | 568.3    | 0.016  |
| Rough Terrain Forklifts | 2040 | 176    | 250     | 2.296    | 0.177  | 1.121   | 0.292   | 0.006  | 0.011  | 0.011  | 568.299  | 0.016  |
| Rough Terrain Forklifts | 2040 | 251    | 500     | 3.449    | 0.177  | 1.071   | 0.292   | 0.005  | 0.011  | 0.011  | 568.299  | 0.016  |
| Rubber Tired Dozers     | 1990 | 121    | 175     | 6.172    | 1.886  | 5.29    | 14.831  | 0.758  | 1.059  | 1.059  | 568.299  | 0.17   |
| Rubber Tired Dozers     | 1990 | 176    | 250     | 8.746    | 1.886  | 5.29    | 14.831  | 0.758  | 1.059  | 1.059  | 568.299  | 0.17   |
| Rubber Tired Dozers     | 1990 | 251    | 500     | 11.084   | 1.655  | 12.26   | 13.986  | 0.662  | 0.899  | 0.899  | 568.299  | 0.149  |
| Rubber Tired Dozers     | 1990 | 501    | 750     | 16.688   | 1.655  | 12.26   | 13.986  | 1.018  | 0.915  | 0.915  | 568.3    | 0.149  |
| Rubber Tired Dozers     | 1990 | 751    | 1000    | 24.619   | 1.645  | 12.26   | 13.986  | 1.018  | 0.903  | 0.903  | 568.299  | 0.148  |
| Rubber Tired Dozers     | 2000 | 121    | 175     | 4.761    | 1.454  | 4.295   | 10.881  | 0.057  | 0.624  | 0.624  | 568.299  | 0.131  |
| Rubber Tired Dozers     | 2000 | 176    | 250     | 6.043    | 1.303  | 3.733   | 10.625  | 0.057  | 0.548  | 0.548  | 568.299  | 0.117  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type      | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|---------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Rubber Tired Dozers | 2000 | 251    | 500     | 7.775    | 1.161  | 6.982   | 10.023  | 0.05   | 0.474  | 0.474  | 568.299  | 0.104  |
| Rubber Tired Dozers | 2000 | 501    | 750     | 11.706   | 1.161  | 6.982   | 10.023  | 0.052  | 0.474  | 0.474  | 568.3    | 0.104  |
| Rubber Tired Dozers | 2000 | 751    | 1000    | 17.842   | 1.192  | 7.415   | 10.456  | 0.052  | 0.451  | 0.451  | 568.3    | 0.107  |
| Rubber Tired Dozers | 2005 | 121    | 175     | 4.21     | 1.286  | 4.026   | 9.666   | 0.057  | 0.567  | 0.567  | 568.299  | 0.116  |
| Rubber Tired Dozers | 2005 | 176    | 250     | 4.912    | 1.059  | 2.99    | 9.344   | 0.057  | 0.437  | 0.437  | 568.299  | 0.095  |
| Rubber Tired Dozers | 2005 | 251    | 500     | 6.277    | 0.937  | 5.159   | 8.574   | 0.05   | 0.38   | 0.38   | 568.299  | 0.084  |
| Rubber Tired Dozers | 2005 | 501    | 750     | 9.496    | 0.942  | 5.15    | 8.694   | 0.052  | 0.382  | 0.382  | 568.299  | 0.085  |
| Rubber Tired Dozers | 2005 | 751    | 1000    | 14.937   | 0.998  | 5.524   | 9.444   | 0.052  | 0.369  | 0.369  | 568.299  | 0.09   |
| Rubber Tired Dozers | 2010 | 121    | 175     | 1.12265  | 0.9433 | 4.17063 | 9.78349 | 0.0049 | 0.555  | 0.5106 | 526.3128 | 0.1532 |
| Rubber Tired Dozers | 2010 | 176    | 250     | 0.840919 | 0.7066 | 2.68761 | 8.22344 | 0.0049 | 0.3937 | 0.3622 | 527.9126 | 0.1537 |
| Rubber Tired Dozers | 2010 | 251    | 500     | 0.88356  | 0.7424 | 6.7191  | 8.70703 | 0.0049 | 0.4064 | 0.3739 | 533.1476 | 0.1552 |
| Rubber Tired Dozers | 2010 | 501    | 750     | 0.619996 | 0.521  | 3.1214  | 7.42352 | 0.0049 | 0.2693 | 0.2477 | 525.7054 | 0.153  |
| Rubber Tired Dozers | 2010 | 751    | 1000    | 12.178   | 0.814  | 4.027   | 8.149   | 0.005  | 0.29   | 0.29   | 568.299  | 0.073  |
| Rubber Tired Dozers | 2011 | 121    | 175     | 1.128595 | 0.9483 | 4.18594 | 9.7992  | 0.0049 | 0.5574 | 0.5128 | 524.9639 | 0.1532 |
| Rubber Tired Dozers | 2011 | 176    | 250     | 0.852039 | 0.7159 | 2.69892 | 8.24976 | 0.0049 | 0.3959 | 0.3643 | 526.5967 | 0.1537 |
| Rubber Tired Dozers | 2011 | 251    | 500     | 0.878525 | 0.7382 | 6.65601 | 8.60406 | 0.0049 | 0.4017 | 0.3695 | 532.0871 | 0.1553 |
| Rubber Tired Dozers | 2011 | 501    | 750     | 0.62921  | 0.5287 | 3.13084 | 7.4622  | 0.0049 | 0.2721 | 0.2504 | 524.3841 | 0.153  |
| Rubber Tired Dozers | 2011 | 751    | 1000    | 11.693   | 0.781  | 3.772   | 7.805   | 0.005  | 0.276  | 0.276  | 568.299  | 0.07   |
| Rubber Tired Dozers | 2012 | 121    | 175     | 1.133798 | 0.9527 | 4.1998  | 9.81194 | 0.0049 | 0.5593 | 0.5146 | 523.6318 | 0.1532 |
| Rubber Tired Dozers | 2012 | 176    | 250     | 0.862577 | 0.7248 | 2.70943 | 8.27234 | 0.0049 | 0.398  | 0.3662 | 525.281  | 0.1537 |
| Rubber Tired Dozers | 2012 | 251    | 500     | 0.883165 | 0.7421 | 6.62489 | 8.58436 | 0.0049 | 0.4015 | 0.3694 | 530.6589 | 0.1552 |
| Rubber Tired Dozers | 2012 | 501    | 750     | 0.635938 | 0.5344 | 3.13648 | 7.48052 | 0.0049 | 0.2737 | 0.2518 | 523.0626 | 0.153  |
| Rubber Tired Dozers | 2012 | 751    | 1000    | 11.228   | 0.75   | 3.531   | 7.474   | 0.005  | 0.262  | 0.262  | 568.299  | 0.067  |
| Rubber Tired Dozers | 2013 | 121    | 175     | 1.138698 | 0.9568 | 4.21297 | 9.82334 | 0.0049 | 0.5611 | 0.5162 | 520.9836 | 0.1532 |
| Rubber Tired Dozers | 2013 | 176    | 250     | 0.859983 | 0.7226 | 2.71092 | 8.10695 | 0.0049 | 0.395  | 0.3634 | 522.6456 | 0.1537 |
| Rubber Tired Dozers | 2013 | 251    | 500     | 0.864011 | 0.726  | 6.42295 | 8.33658 | 0.0049 | 0.3898 | 0.3586 | 527.9093 | 0.1552 |
| Rubber Tired Dozers | 2013 | 501    | 750     | 0.641687 | 0.5392 | 3.14069 | 7.49129 | 0.0049 | 0.2747 | 0.2528 | 520.4266 | 0.153  |
| Rubber Tired Dozers | 2013 | 751    | 1000    | 10.78    | 0.72   | 3.306   | 7.155   | 0.005  | 0.249  | 0.249  | 568.299  | 0.065  |
| Rubber Tired Dozers | 2014 | 121    | 175     | 1.143391 | 0.9608 | 4.22564 | 9.83401 | 0.0049 | 0.5627 | 0.5177 | 518.335  | 0.1532 |
| Rubber Tired Dozers | 2014 | 176    | 250     | 0.858402 | 0.7213 | 2.71199 | 7.97218 | 0.0049 | 0.3925 | 0.3611 | 520.0105 | 0.1537 |
| Rubber Tired Dozers | 2014 | 251    | 500     | 0.841688 | 0.7073 | 6.16471 | 8.05819 | 0.0049 | 0.3757 | 0.3457 | 524.6758 | 0.155  |
| Rubber Tired Dozers | 2014 | 501    | 750     | 0.610646 | 0.5131 | 2.75605 | 7.14705 | 0.0049 | 0.2576 | 0.237  | 517.7903 | 0.153  |
| Rubber Tired Dozers | 2014 | 751    | 1000    | 10.347   | 0.691  | 3.096   | 6.849   | 0.005  | 0.236  | 0.236  | 568.3    | 0.062  |
| Rubber Tired Dozers | 2015 | 121    | 175     | 1.147937 | 0.9646 | 4.23794 | 9.84425 | 0.0049 | 0.5643 | 0.5192 | 513.0549 | 0.1532 |
| Rubber Tired Dozers | 2015 | 176    | 250     | 0.866859 | 0.7284 | 2.7204  | 7.9837  | 0.0049 | 0.3939 | 0.3624 | 514.7359 | 0.1537 |
| Rubber Tired Dozers | 2015 | 251    | 500     | 0.842228 | 0.7077 | 6.10151 | 7.99736 | 0.0049 | 0.3731 | 0.3433 | 519.1472 | 0.155  |
| Rubber Tired Dozers | 2015 | 501    | 750     | 0.616719 | 0.5182 | 2.76062 | 7.15777 | 0.0049 | 0.2587 | 0.238  | 512.5253 | 0.153  |
| Rubber Tired Dozers | 2015 | 751    | 1000    | 9.895    | 0.661  | 2.901   | 6.556   | 0.005  | 0.222  | 0.222  | 568.299  | 0.059  |
| Rubber Tired Dozers | 2016 | 121    | 175     | 1.152013 | 0.968  | 4.24901 | 9.85328 | 0.0049 | 0.5657 | 0.5205 | 507.7744 | 0.1532 |
| Rubber Tired Dozers | 2016 | 176    | 250     | 0.875531 | 0.7357 | 2.72943 | 7.99508 | 0.0049 | 0.3953 | 0.3637 | 509.4615 | 0.1537 |
| Rubber Tired Dozers | 2016 | 251    | 500     | 0.819146 | 0.6883 | 5.82829 | 7.71034 | 0.0049 | 0.3588 | 0.3301 | 513.3109 | 0.1548 |
| Rubber Tired Dozers | 2016 | 501    | 750     | 0.622662 | 0.5232 | 2.7651  | 7.16821 | 0.0049 | 0.2597 | 0.2389 | 507.2601 | 0.153  |
| Rubber Tired Dozers | 2016 | 751    | 1000    | 9.45     | 0.631  | 2.723   | 6.277   | 0.005  | 0.208  | 0.208  | 568.3    | 0.057  |
| Rubber Tired Dozers | 2017 | 121    | 175     | 1.074198 | 0.9026 | 4.14895 | 9.12915 | 0.0049 | 0.5248 | 0.4828 | 499.4096 | 0.153  |
| Rubber Tired Dozers | 2017 | 176    | 250     | 0.840865 | 0.7066 | 2.65514 | 7.67081 | 0.0049 | 0.3755 | 0.3454 | 501.5475 | 0.1537 |
| Rubber Tired Dozers | 2017 | 251    | 500     | 0.787455 | 0.6617 | 5.52569 | 7.33345 | 0.0049 | 0.3407 | 0.3134 | 505.8493 | 0.155  |
| Rubber Tired Dozers | 2017 | 501    | 750     | 0.625767 | 0.5258 | 2.76746 | 7.17226 | 0.0049 | 0.2601 | 0.2393 | 499.3665 | 0.153  |
| Rubber Tired Dozers | 2017 | 751    | 1000    | 9.018    | 0.602  | 2.56    | 6.013   | 0.005  | 0.195  | 0.195  | 568.299  | 0.054  |
| Rubber Tired Dozers | 2018 | 121    | 175     | 0.954751 | 0.8023 | 3.98965 | 8.02079 | 0.0049 | 0.4605 | 0.4236 | 491.4921 | 0.153  |
| Rubber Tired Dozers | 2018 | 176    | 250     | 0.796398 | 0.6692 | 2.51156 | 7.20787 | 0.0049 | 0.3504 | 0.3224 | 493.6337 | 0.1537 |
| Rubber Tired Dozers | 2018 | 251    | 500     | 0.71175  | 0.5981 | 4.98205 | 6.50184 | 0.0049 | 0.3002 | 0.2762 | 498.1862 | 0.1551 |
| Rubber Tired Dozers | 2018 | 501    | 750     | 0.602699 | 0.5064 | 2.75902 | 6.72652 | 0.0049 | 0.248  | 0.2282 | 491.4726 | 0.153  |
| Rubber Tired Dozers | 2018 | 751    | 1000    | 8.6      | 0.574  | 2.413   | 5.764   | 0.005  | 0.183  | 0.183  | 568.299  | 0.051  |
| Rubber Tired Dozers | 2019 | 121    | 175     | 0.90312  | 0.7589 | 3.94854 | 7.52037 | 0.0049 | 0.4326 | 0.398  | 483.5585 | 0.153  |
| Rubber Tired Dozers | 2019 | 176    | 250     | 0.774882 | 0.6511 | 2.45855 | 6.92923 | 0.0049 | 0.3379 | 0.3108 | 485.172  | 0.1535 |
| Rubber Tired Dozers | 2019 | 251    | 500     | 0.680848 | 0.5721 | 4.74309 | 6.14335 | 0.0049 | 0.2828 | 0.2602 | 490.383  | 0.1552 |
| Rubber Tired Dozers | 2019 | 501    | 750     | 0.541107 | 0.4547 | 2.59814 | 6.12249 | 0.0049 | 0.2181 | 0.2007 | 483.5786 | 0.153  |
| Rubber Tired Dozers | 2019 | 751    | 1000    | 8.196    | 0.547  | 2.281   | 5.528   | 0.005  | 0.171  | 0.171  | 568.299  | 0.049  |
| Rubber Tired Dozers | 2020 | 121    | 175     | 0.864425 | 0.7264 | 3.89288 | 7.18525 | 0.0049 | 0.4107 | 0.3778 | 473.0116 | 0.153  |
| Rubber Tired Dozers | 2020 | 176    | 250     | 0.737248 | 0.6195 | 2.37104 | 6.50332 | 0.0049 | 0.3185 | 0.293  | 474.7928 | 0.1536 |
| Rubber Tired Dozers | 2020 | 251    | 500     | 0.636621 | 0.5349 | 4.41134 | 5.64089 | 0.0049 | 0.2591 | 0.2384 | 479.7569 | 0.1552 |
| Rubber Tired Dozers | 2020 | 501    | 750     | 0.543245 | 0.4565 | 2.60108 | 6.12255 | 0.0049 | 0.2181 | 0.2007 | 473.0562 | 0.153  |
| Rubber Tired Dozers | 2020 | 751    | 1000    | 7.811    | 0.522  | 2.164   | 5.306   | 0.005  | 0.16   | 0.16   | 568.299  | 0.047  |
| Rubber Tired Dozers | 2021 | 121    | 175     | 0.822557 | 0.6912 | 3.84814 | 6.79037 | 0.0049 | 0.3864 | 0.3555 | 472.9751 | 0.153  |
| Rubber Tired Dozers | 2021 | 176    | 250     | 0.714624 | 0.6005 | 2.31719 | 6.29617 | 0.0049 | 0.3056 | 0.2811 | 474.7984 | 0.1536 |
| Rubber Tired Dozers | 2021 | 251    | 500     | 0.585817 | 0.4922 | 4.04107 | 5.081   | 0.0049 | 0.2321 | 0.2135 | 478.9868 | 0.1549 |
| Rubber Tired Dozers | 2021 | 501    | 750     | 0.545338 | 0.4582 | 2.60396 | 6.12254 | 0.0049 | 0.2182 | 0.2007 | 473.0459 | 0.153  |
| Rubber Tired Dozers | 2021 | 751    | 1000    | 7.448    | 0.497  | 2.057   | 5.095   | 0.005  | 0.15   | 0.15   | 568.299  | 0.044  |
| Rubber Tired Dozers | 2022 | 121    | 175     | 0.714312 | 0.6002 | 3.75194 | 5.80781 | 0.0049 | 0.3264 | 0.3003 | 473.9122 | 0.1533 |
| Rubber Tired Dozers | 2022 | 176    | 250     | 0.571708 | 0.4804 | 2.05563 | 5.04648 | 0.0049 | 0.2395 | 0.2204 | 474.6166 | 0.1535 |
| Rubber Tired Dozers | 2022 | 251    | 500     | 0.565033 | 0.4748 | 3.89489 | 4.80775 | 0.0049 | 0.2199 | 0.2023 | 479.3107 | 0.155  |
| Rubber Tired Dozers | 2022 | 501    | 750     | 0.547387 | 0.46   | 2.60677 | 6.12245 | 0.0049 | 0.2182 | 0.2008 | 473.035  | 0.153  |
| Rubber Tired Dozers | 2022 | 751    | 1000    | 7.106    | 0.475  | 1.961   | 4.896   | 0.005  | 0.14   | 0.14   | 568.299  | 0.042  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type       | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Rubber Tired Dozers  | 2023 | 121    | 175     | 0.700073 | 0.5883 | 3.7664  | 5.65638 | 0.0049 | 0.3158 | 0.2906 | 473.9009 | 0.1533 |
| Rubber Tired Dozers  | 2023 | 176    | 250     | 0.467601 | 0.3929 | 1.78266 | 4.09011 | 0.0049 | 0.1842 | 0.1694 | 474.5967 | 0.1535 |
| Rubber Tired Dozers  | 2023 | 251    | 500     | 0.531484 | 0.4466 | 3.68617 | 4.40835 | 0.0049 | 0.2015 | 0.1854 | 479.4678 | 0.1551 |
| Rubber Tired Dozers  | 2023 | 501    | 750     | 0.502999 | 0.4227 | 2.59131 | 5.33389 | 0.0049 | 0.196  | 0.1803 | 473.0234 | 0.153  |
| Rubber Tired Dozers  | 2023 | 751    | 1000    | 6.786    | 0.453  | 1.874   | 4.709   | 0.005  | 0.131  | 0.131  | 568.299  | 0.04   |
| Rubber Tired Dozers  | 2024 | 121    | 175     | 0.633623 | 0.5324 | 3.69636 | 5.0144  | 0.0049 | 0.2794 | 0.2571 | 473.5147 | 0.1531 |
| Rubber Tired Dozers  | 2024 | 176    | 250     | 0.474702 | 0.3989 | 1.79685 | 4.0904  | 0.0049 | 0.1843 | 0.1696 | 474.5854 | 0.1535 |
| Rubber Tired Dozers  | 2024 | 251    | 500     | 0.495724 | 0.4165 | 3.45746 | 4.03046 | 0.0049 | 0.1823 | 0.1677 | 479.3938 | 0.155  |
| Rubber Tired Dozers  | 2024 | 501    | 750     | 0.506146 | 0.4253 | 2.59604 | 5.33372 | 0.0049 | 0.1961 | 0.1804 | 473.0111 | 0.153  |
| Rubber Tired Dozers  | 2024 | 751    | 1000    | 6.485    | 0.433  | 1.796   | 4.532   | 0.005  | 0.123  | 0.123  | 568.299  | 0.039  |
| Rubber Tired Dozers  | 2025 | 121    | 175     | 0.548636 | 0.461  | 3.61238 | 4.22886 | 0.0049 | 0.2305 | 0.212  | 474.1029 | 0.1533 |
| Rubber Tired Dozers  | 2025 | 176    | 250     | 0.442605 | 0.3719 | 1.72032 | 3.80547 | 0.0049 | 0.1665 | 0.1532 | 474.5734 | 0.1535 |
| Rubber Tired Dozers  | 2025 | 251    | 500     | 0.436562 | 0.3668 | 2.95895 | 3.36957 | 0.0049 | 0.1506 | 0.1386 | 479.0915 | 0.1549 |
| Rubber Tired Dozers  | 2025 | 501    | 750     | 0.509225 | 0.4279 | 2.60066 | 5.33346 | 0.0049 | 0.1962 | 0.1805 | 472.9981 | 0.153  |
| Rubber Tired Dozers  | 2025 | 751    | 1000    | 6.203    | 0.414  | 1.725   | 4.365   | 0.005  | 0.115  | 0.115  | 568.299  | 0.037  |
| Rubber Tired Dozers  | 2030 | 121    | 175     | 1.303    | 0.398  | 3.496   | 2.034   | 0.006  | 0.111  | 0.111  | 568.299  | 0.035  |
| Rubber Tired Dozers  | 2030 | 176    | 250     | 1.556    | 0.335  | 1.322   | 1.828   | 0.006  | 0.069  | 0.069  | 568.299  | 0.03   |
| Rubber Tired Dozers  | 2030 | 251    | 500     | 2.16     | 0.322  | 1.401   | 1.658   | 0.005  | 0.064  | 0.064  | 568.299  | 0.029  |
| Rubber Tired Dozers  | 2030 | 501    | 750     | 3.261    | 0.323  | 1.401   | 1.694   | 0.005  | 0.064  | 0.064  | 568.299  | 0.029  |
| Rubber Tired Dozers  | 2030 | 751    | 1000    | 5.063    | 0.338  | 1.465   | 3.676   | 0.005  | 0.082  | 0.082  | 568.299  | 0.03   |
| Rubber Tired Dozers  | 2035 | 121    | 175     | 1.054    | 0.322  | 3.481   | 1.345   | 0.006  | 0.071  | 0.071  | 568.299  | 0.029  |
| Rubber Tired Dozers  | 2035 | 176    | 250     | 1.326    | 0.286  | 1.262   | 1.203   | 0.006  | 0.046  | 0.046  | 568.299  | 0.025  |
| Rubber Tired Dozers  | 2035 | 251    | 500     | 1.868    | 0.279  | 1.279   | 1.107   | 0.005  | 0.043  | 0.043  | 568.3    | 0.025  |
| Rubber Tired Dozers  | 2035 | 501    | 750     | 2.816    | 0.279  | 1.279   | 1.126   | 0.005  | 0.043  | 0.043  | 568.299  | 0.025  |
| Rubber Tired Dozers  | 2035 | 751    | 1000    | 4.306    | 0.287  | 1.312   | 3.204   | 0.005  | 0.06   | 0.06   | 568.299  | 0.025  |
| Rubber Tired Dozers  | 2040 | 121    | 175     | 0.9      | 0.275  | 3.47    | 0.903   | 0.006  | 0.045  | 0.045  | 568.299  | 0.024  |
| Rubber Tired Dozers  | 2040 | 176    | 250     | 1.176    | 0.253  | 1.225   | 0.81    | 0.006  | 0.031  | 0.031  | 568.299  | 0.022  |
| Rubber Tired Dozers  | 2040 | 251    | 500     | 1.672    | 0.249  | 1.198   | 0.758   | 0.005  | 0.029  | 0.029  | 568.299  | 0.022  |
| Rubber Tired Dozers  | 2040 | 501    | 750     | 2.519    | 0.25   | 1.198   | 0.767   | 0.005  | 0.029  | 0.029  | 568.3    | 0.022  |
| Rubber Tired Dozers  | 2040 | 751    | 1000    | 3.814    | 0.254  | 1.218   | 2.91    | 0.005  | 0.045  | 0.045  | 568.3    | 0.023  |
| Rubber Tired Loaders | 1990 | 16     | 25      | 5.92     | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Rubber Tired Loaders | 1990 | 26     | 50      | 23.869   | 4.848  | 9.805   | 7.964   | 0.871  | 1.279  | 1.279  | 568.299  | 0.437  |
| Rubber Tired Loaders | 1990 | 51     | 120     | 22.055   | 2.368  | 5.728   | 14.978  | 0.791  | 1.345  | 1.345  | 568.299  | 0.213  |
| Rubber Tired Loaders | 1990 | 121    | 175     | 30.1     | 1.791  | 5.094   | 14.294  | 0.758  | 0.995  | 0.995  | 568.299  | 0.161  |
| Rubber Tired Loaders | 1990 | 176    | 250     | 42.179   | 1.791  | 5.094   | 14.294  | 0.758  | 0.995  | 0.995  | 568.3    | 0.161  |
| Rubber Tired Loaders | 1990 | 251    | 500     | 59.295   | 1.583  | 11.282  | 13.545  | 0.662  | 0.851  | 0.851  | 568.3    | 0.142  |
| Rubber Tired Loaders | 1990 | 501    | 750     | 121.471  | 1.583  | 11.282  | 13.545  | 1.018  | 0.867  | 0.867  | 568.299  | 0.142  |
| Rubber Tired Loaders | 1990 | 751    | 1000    | 147.851  | 1.575  | 11.282  | 13.545  | 1.018  | 0.858  | 0.858  | 568.299  | 0.142  |
| Rubber Tired Loaders | 2000 | 16     | 25      | 5.105    | 1.908  | 4.438   | 6.326   | 0.065  | 0.555  | 0.555  | 568.299  | 0.172  |
| Rubber Tired Loaders | 2000 | 26     | 50      | 21.853   | 4.439  | 9.15    | 7.065   | 0.066  | 0.928  | 0.928  | 568.299  | 0.4    |
| Rubber Tired Loaders | 2000 | 51     | 120     | 17.155   | 1.842  | 4.652   | 10.433  | 0.06   | 0.896  | 0.896  | 568.299  | 0.166  |
| Rubber Tired Loaders | 2000 | 121    | 175     | 20.951   | 1.246  | 3.765   | 9.552   | 0.057  | 0.526  | 0.526  | 568.299  | 0.112  |
| Rubber Tired Loaders | 2000 | 176    | 250     | 24.776   | 1.052  | 3.019   | 9.216   | 0.057  | 0.433  | 0.433  | 568.299  | 0.094  |
| Rubber Tired Loaders | 2000 | 251    | 500     | 35.779   | 0.955  | 4.797   | 8.766   | 0.05   | 0.381  | 0.381  | 568.299  | 0.086  |
| Rubber Tired Loaders | 2000 | 501    | 750     | 73.296   | 0.955  | 4.797   | 8.766   | 0.052  | 0.381  | 0.381  | 568.299  | 0.086  |
| Rubber Tired Loaders | 2000 | 751    | 1000    | 95.549   | 1.018  | 5.369   | 9.342   | 0.052  | 0.372  | 0.372  | 568.299  | 0.091  |
| Rubber Tired Loaders | 2005 | 16     | 25      | 2.273    | 0.849  | 2.519   | 5.321   | 0.065  | 0.333  | 0.333  | 568.299  | 0.076  |
| Rubber Tired Loaders | 2005 | 26     | 50      | 19.43    | 3.947  | 8.471   | 6.59    | 0.066  | 0.86   | 0.86   | 568.299  | 0.356  |
| Rubber Tired Loaders | 2005 | 51     | 120     | 14.973   | 1.608  | 4.379   | 8.954   | 0.06   | 0.841  | 0.841  | 568.3    | 0.145  |
| Rubber Tired Loaders | 2005 | 121    | 175     | 17.677   | 1.052  | 3.496   | 8.183   | 0.057  | 0.464  | 0.464  | 568.299  | 0.094  |
| Rubber Tired Loaders | 2005 | 176    | 250     | 18.23    | 0.774  | 2.143   | 7.781   | 0.057  | 0.31   | 0.31   | 568.3    | 0.069  |
| Rubber Tired Loaders | 2005 | 251    | 500     | 25.602   | 0.683  | 2.836   | 7.066   | 0.05   | 0.275  | 0.275  | 568.3    | 0.061  |
| Rubber Tired Loaders | 2005 | 501    | 750     | 53.332   | 0.695  | 2.831   | 7.236   | 0.052  | 0.278  | 0.278  | 568.299  | 0.062  |
| Rubber Tired Loaders | 2005 | 751    | 1000    | 74.257   | 0.791  | 3.279   | 8.232   | 0.052  | 0.275  | 0.275  | 568.299  | 0.071  |
| Rubber Tired Loaders | 2010 | 16     | 25      | 2.807425 | 2.359  | 7.88269 | 6.29919 | 0.0054 | 0.7339 | 0.6752 | 581.9969 | 0.1694 |
| Rubber Tired Loaders | 2010 | 26     | 50      | 2.807425 | 2.359  | 7.88269 | 6.29919 | 0.0054 | 0.7339 | 0.6752 | 581.9969 | 0.1694 |
| Rubber Tired Loaders | 2010 | 51     | 120     | 1.132276 | 0.9514 | 4.28386 | 7.85298 | 0.0048 | 0.6803 | 0.6259 | 519.5038 | 0.1512 |
| Rubber Tired Loaders | 2010 | 121    | 175     | 0.772004 | 0.6487 | 3.56499 | 7.01127 | 0.0049 | 0.3871 | 0.3562 | 523.9006 | 0.1525 |
| Rubber Tired Loaders | 2010 | 176    | 250     | 0.475737 | 0.3998 | 1.50852 | 5.94632 | 0.0049 | 0.1986 | 0.1828 | 522.3501 | 0.152  |
| Rubber Tired Loaders | 2010 | 251    | 500     | 0.495122 | 0.416  | 2.61599 | 5.66307 | 0.0048 | 0.2107 | 0.1939 | 521.885  | 0.1519 |
| Rubber Tired Loaders | 2010 | 501    | 750     | 0.454547 | 0.3819 | 2.10254 | 5.06362 | 0.0047 | 0.197  | 0.1812 | 507.2864 | 0.1477 |
| Rubber Tired Loaders | 2010 | 751    | 1000    | 0.464861 | 0.3906 | 1.45926 | 6.63966 | 0.0049 | 0.1871 | 0.1721 | 523.2526 | 0.1523 |
| Rubber Tired Loaders | 2011 | 16     | 25      | 2.679774 | 2.2518 | 7.77095 | 6.24779 | 0.0054 | 0.7107 | 0.6538 | 581.4262 | 0.1697 |
| Rubber Tired Loaders | 2011 | 26     | 50      | 2.679774 | 2.2518 | 7.77095 | 6.24779 | 0.0054 | 0.7107 | 0.6538 | 581.4262 | 0.1697 |
| Rubber Tired Loaders | 2011 | 51     | 120     | 1.113092 | 0.9353 | 4.28739 | 7.68957 | 0.0048 | 0.6714 | 0.6177 | 517.9363 | 0.1511 |
| Rubber Tired Loaders | 2011 | 121    | 175     | 0.757164 | 0.6362 | 3.57219 | 6.81375 | 0.0049 | 0.3781 | 0.3479 | 522.5315 | 0.1525 |
| Rubber Tired Loaders | 2011 | 176    | 250     | 0.481296 | 0.4044 | 1.50155 | 5.87694 | 0.0049 | 0.1972 | 0.1814 | 520.9732 | 0.152  |
| Rubber Tired Loaders | 2011 | 251    | 500     | 0.501144 | 0.4211 | 2.56846 | 5.5868  | 0.0048 | 0.2089 | 0.1922 | 520.154  | 0.1518 |
| Rubber Tired Loaders | 2011 | 501    | 750     | 0.472712 | 0.3972 | 2.12943 | 5.09397 | 0.0047 | 0.2004 | 0.1843 | 505.881  | 0.1476 |
| Rubber Tired Loaders | 2011 | 751    | 1000    | 0.476526 | 0.4004 | 1.47057 | 6.69396 | 0.0049 | 0.191  | 0.1757 | 521.9232 | 0.1523 |
| Rubber Tired Loaders | 2012 | 16     | 25      | 2.730745 | 2.2946 | 7.96233 | 6.30427 | 0.0054 | 0.7236 | 0.6657 | 579.9785 | 0.1697 |
| Rubber Tired Loaders | 2012 | 26     | 50      | 2.730745 | 2.2946 | 7.96233 | 6.30427 | 0.0054 | 0.7236 | 0.6657 | 579.9785 | 0.1697 |
| Rubber Tired Loaders | 2012 | 51     | 120     | 1.113822 | 0.9359 | 4.31845 | 7.65616 | 0.0048 | 0.6708 | 0.6171 | 516.6239 | 0.1511 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type       | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Rubber Tired Loaders | 2012 | 121    | 175     | 0.765409 | 0.6432 | 3.60616 | 6.79567 | 0.0049 | 0.3796 | 0.3492 | 521.0995 | 0.1524 |
| Rubber Tired Loaders | 2012 | 176    | 250     | 0.492248 | 0.4136 | 1.51119 | 5.85805 | 0.0049 | 0.198  | 0.1822 | 519.646  | 0.152  |
| Rubber Tired Loaders | 2012 | 251    | 500     | 0.515336 | 0.433  | 2.59983 | 5.58714 | 0.0048 | 0.2109 | 0.194  | 518.7236 | 0.1517 |
| Rubber Tired Loaders | 2012 | 501    | 750     | 0.485752 | 0.4082 | 2.14848 | 5.07921 | 0.0047 | 0.2013 | 0.1852 | 504.6824 | 0.1476 |
| Rubber Tired Loaders | 2012 | 751    | 1000    | 0.48616  | 0.4085 | 1.47877 | 6.73245 | 0.0049 | 0.1939 | 0.1784 | 520.592  | 0.1523 |
| Rubber Tired Loaders | 2013 | 16     | 25      | 2.60616  | 2.1899 | 7.83573 | 6.18494 | 0.0054 | 0.6952 | 0.6396 | 577.0156 | 0.1697 |
| Rubber Tired Loaders | 2013 | 26     | 50      | 2.60616  | 2.1899 | 7.83573 | 6.18494 | 0.0054 | 0.6952 | 0.6396 | 577.0156 | 0.1697 |
| Rubber Tired Loaders | 2013 | 51     | 120     | 1.087575 | 0.9139 | 4.31523 | 7.47698 | 0.0048 | 0.6539 | 0.6016 | 513.9368 | 0.1511 |
| Rubber Tired Loaders | 2013 | 121    | 175     | 0.750707 | 0.6308 | 3.60722 | 6.6063  | 0.0049 | 0.3686 | 0.3391 | 518.3787 | 0.1524 |
| Rubber Tired Loaders | 2013 | 176    | 250     | 0.496511 | 0.4172 | 1.5142  | 5.75293 | 0.0048 | 0.1963 | 0.1806 | 516.9736 | 0.152  |
| Rubber Tired Loaders | 2013 | 251    | 500     | 0.517428 | 0.4348 | 2.55447 | 5.4738  | 0.0048 | 0.2077 | 0.1911 | 515.9429 | 0.1517 |
| Rubber Tired Loaders | 2013 | 501    | 750     | 0.49047  | 0.4121 | 2.0823  | 4.99146 | 0.0047 | 0.1986 | 0.1827 | 502.8589 | 0.1478 |
| Rubber Tired Loaders | 2013 | 751    | 1000    | 0.484243 | 0.4069 | 1.45163 | 6.66719 | 0.0049 | 0.193  | 0.1775 | 517.9506 | 0.1523 |
| Rubber Tired Loaders | 2014 | 16     | 25      | 2.51646  | 2.1145 | 7.7699  | 6.10324 | 0.0054 | 0.6758 | 0.6217 | 573.5218 | 0.1695 |
| Rubber Tired Loaders | 2014 | 26     | 50      | 2.51646  | 2.1145 | 7.7699  | 6.10324 | 0.0054 | 0.6758 | 0.6217 | 573.5218 | 0.1695 |
| Rubber Tired Loaders | 2014 | 51     | 120     | 1.032758 | 0.8678 | 4.26762 | 7.12932 | 0.0048 | 0.6189 | 0.5694 | 510.0099 | 0.1507 |
| Rubber Tired Loaders | 2014 | 121    | 175     | 0.720145 | 0.6051 | 3.58536 | 6.27196 | 0.0049 | 0.3503 | 0.3223 | 515.7685 | 0.1524 |
| Rubber Tired Loaders | 2014 | 176    | 250     | 0.483874 | 0.4066 | 1.48551 | 5.49539 | 0.0048 | 0.1868 | 0.1719 | 514.2167 | 0.152  |
| Rubber Tired Loaders | 2014 | 251    | 500     | 0.501158 | 0.4211 | 2.40656 | 5.19438 | 0.0048 | 0.1957 | 0.1801 | 512.5095 | 0.1515 |
| Rubber Tired Loaders | 2014 | 501    | 750     | 0.483251 | 0.4061 | 1.94616 | 4.81047 | 0.0047 | 0.1901 | 0.1749 | 499.6952 | 0.1477 |
| Rubber Tired Loaders | 2014 | 751    | 1000    | 0.492279 | 0.4137 | 1.45724 | 6.69249 | 0.0049 | 0.195  | 0.1794 | 515.307  | 0.1523 |
| Rubber Tired Loaders | 2015 | 16     | 25      | 2.508512 | 2.1078 | 7.83443 | 6.11232 | 0.0054 | 0.6746 | 0.6206 | 567.672  | 0.1695 |
| Rubber Tired Loaders | 2015 | 26     | 50      | 2.508512 | 2.1078 | 7.83443 | 6.11232 | 0.0054 | 0.6746 | 0.6206 | 567.672  | 0.1695 |
| Rubber Tired Loaders | 2015 | 51     | 120     | 1.018295 | 0.8557 | 4.27362 | 7.01153 | 0.0048 | 0.6061 | 0.5576 | 505.0231 | 0.1508 |
| Rubber Tired Loaders | 2015 | 121    | 175     | 0.708161 | 0.5951 | 3.58815 | 6.09735 | 0.0049 | 0.3407 | 0.3134 | 510.4677 | 0.1524 |
| Rubber Tired Loaders | 2015 | 176    | 250     | 0.482642 | 0.4056 | 1.47986 | 5.36927 | 0.0048 | 0.1833 | 0.1686 | 508.9127 | 0.1519 |
| Rubber Tired Loaders | 2015 | 251    | 500     | 0.494223 | 0.4153 | 2.33208 | 5.0195  | 0.0048 | 0.1895 | 0.1744 | 506.3723 | 0.1512 |
| Rubber Tired Loaders | 2015 | 501    | 750     | 0.469822 | 0.3948 | 1.78908 | 4.55578 | 0.0047 | 0.1791 | 0.1648 | 495.31   | 0.1479 |
| Rubber Tired Loaders | 2015 | 751    | 1000    | 0.495538 | 0.4198 | 1.46167 | 6.71262 | 0.0049 | 0.1967 | 0.181  | 510.0449 | 0.1523 |
| Rubber Tired Loaders | 2016 | 16     | 25      | 2.445921 | 2.0553 | 7.79111 | 6.05258 | 0.0054 | 0.6597 | 0.6069 | 561.9032 | 0.1695 |
| Rubber Tired Loaders | 2016 | 26     | 50      | 2.445921 | 2.0553 | 7.79111 | 6.05258 | 0.0054 | 0.6597 | 0.6069 | 561.9032 | 0.1695 |
| Rubber Tired Loaders | 2016 | 51     | 120     | 0.955142 | 0.8026 | 4.21236 | 6.58334 | 0.0048 | 0.5651 | 0.5199 | 499.5935 | 0.1507 |
| Rubber Tired Loaders | 2016 | 121    | 175     | 0.67267  | 0.5652 | 3.56236 | 5.72558 | 0.0049 | 0.3193 | 0.2938 | 505.1308 | 0.1524 |
| Rubber Tired Loaders | 2016 | 176    | 250     | 0.468005 | 0.3933 | 1.45212 | 5.1151  | 0.0048 | 0.1745 | 0.1605 | 503.6542 | 0.1519 |
| Rubber Tired Loaders | 2016 | 251    | 500     | 0.465473 | 0.3911 | 2.15506 | 4.62743 | 0.0048 | 0.1738 | 0.1599 | 500.4314 | 0.1509 |
| Rubber Tired Loaders | 2016 | 501    | 750     | 0.443728 | 0.3729 | 1.70263 | 4.17165 | 0.0047 | 0.164  | 0.1509 | 491.9183 | 0.1484 |
| Rubber Tired Loaders | 2016 | 751    | 1000    | 0.505153 | 0.4245 | 1.46404 | 6.72411 | 0.0049 | 0.1978 | 0.182  | 504.7801 | 0.1523 |
| Rubber Tired Loaders | 2017 | 16     | 25      | 2.32856  | 1.9566 | 7.65953 | 5.95377 | 0.0054 | 0.6328 | 0.5822 | 553.5831 | 0.1696 |
| Rubber Tired Loaders | 2017 | 26     | 50      | 2.32856  | 1.9566 | 7.65953 | 5.95377 | 0.0054 | 0.6328 | 0.5822 | 553.5831 | 0.1696 |
| Rubber Tired Loaders | 2017 | 51     | 120     | 0.900842 | 0.757  | 4.17083 | 6.23569 | 0.0048 | 0.5296 | 0.4872 | 491.8531 | 0.1507 |
| Rubber Tired Loaders | 2017 | 121    | 175     | 0.620654 | 0.5215 | 3.5175  | 5.19525 | 0.0049 | 0.2895 | 0.2663 | 497.3533 | 0.1524 |
| Rubber Tired Loaders | 2017 | 176    | 250     | 0.443532 | 0.3727 | 1.4172  | 4.75473 | 0.0048 | 0.162  | 0.149  | 495.9499 | 0.152  |
| Rubber Tired Loaders | 2017 | 251    | 500     | 0.439436 | 0.3692 | 2.06046 | 4.25314 | 0.0048 | 0.1603 | 0.1475 | 492.2764 | 0.1508 |
| Rubber Tired Loaders | 2017 | 501    | 750     | 0.436922 | 0.3671 | 1.70044 | 4.05049 | 0.0047 | 0.1599 | 0.1471 | 484.3661 | 0.1484 |
| Rubber Tired Loaders | 2017 | 751    | 1000    | 0.493245 | 0.4145 | 1.45641 | 6.55319 | 0.0049 | 0.1918 | 0.1765 | 496.8966 | 0.1522 |
| Rubber Tired Loaders | 2018 | 16     | 25      | 2.100538 | 1.765  | 7.29915 | 5.67925 | 0.0054 | 0.5758 | 0.5297 | 545.0529 | 0.1697 |
| Rubber Tired Loaders | 2018 | 26     | 50      | 2.100538 | 1.765  | 7.29915 | 5.67925 | 0.0054 | 0.5758 | 0.5297 | 545.0529 | 0.1697 |
| Rubber Tired Loaders | 2018 | 51     | 120     | 0.779856 | 0.6553 | 4.04742 | 5.47032 | 0.0048 | 0.4518 | 0.4156 | 484.0931 | 0.1507 |
| Rubber Tired Loaders | 2018 | 121    | 175     | 0.533198 | 0.448  | 3.42332 | 4.36814 | 0.0049 | 0.2423 | 0.2229 | 489.5114 | 0.1524 |
| Rubber Tired Loaders | 2018 | 176    | 250     | 0.396861 | 0.3335 | 1.34644 | 4.13133 | 0.0048 | 0.1401 | 0.1289 | 487.9023 | 0.1519 |
| Rubber Tired Loaders | 2018 | 251    | 500     | 0.397312 | 0.3339 | 1.86807 | 3.72607 | 0.0048 | 0.1395 | 0.1283 | 484.5709 | 0.1509 |
| Rubber Tired Loaders | 2018 | 501    | 750     | 0.393495 | 0.3306 | 1.55549 | 3.5437  | 0.0047 | 0.14   | 0.1288 | 476.5663 | 0.1484 |
| Rubber Tired Loaders | 2018 | 751    | 1000    | 0.399711 | 0.3359 | 1.21289 | 5.67315 | 0.0049 | 0.1541 | 0.1418 | 488.4037 | 0.152  |
| Rubber Tired Loaders | 2019 | 16     | 25      | 1.906195 | 1.6017 | 6.97769 | 5.43193 | 0.0054 | 0.5176 | 0.4762 | 536.2254 | 0.1697 |
| Rubber Tired Loaders | 2019 | 26     | 50      | 1.906195 | 1.6017 | 6.97769 | 5.43193 | 0.0054 | 0.5176 | 0.4762 | 536.2254 | 0.1697 |
| Rubber Tired Loaders | 2019 | 51     | 120     | 0.707701 | 0.5947 | 3.97887 | 5.00611 | 0.0048 | 0.402  | 0.3698 | 475.8636 | 0.1506 |
| Rubber Tired Loaders | 2019 | 121    | 175     | 0.482139 | 0.4051 | 3.38084 | 3.85918 | 0.0049 | 0.2133 | 0.1962 | 481.7364 | 0.1524 |
| Rubber Tired Loaders | 2019 | 176    | 250     | 0.368194 | 0.3094 | 1.30248 | 3.74452 | 0.0048 | 0.1255 | 0.1155 | 480.0997 | 0.1519 |
| Rubber Tired Loaders | 2019 | 251    | 500     | 0.363843 | 0.3057 | 1.7248  | 3.28755 | 0.0048 | 0.1227 | 0.1129 | 477.0415 | 0.1509 |
| Rubber Tired Loaders | 2019 | 501    | 750     | 0.348958 | 0.2932 | 1.45157 | 3.01875 | 0.0048 | 0.1184 | 0.109  | 471.1874 | 0.1491 |
| Rubber Tired Loaders | 2019 | 751    | 1000    | 0.384887 | 0.3234 | 1.20834 | 5.45926 | 0.0049 | 0.1462 | 0.1345 | 480.523  | 0.152  |
| Rubber Tired Loaders | 2020 | 16     | 25      | 1.761913 | 1.4805 | 6.76793 | 5.25369 | 0.0054 | 0.4741 | 0.4362 | 524.6967 | 0.1697 |
| Rubber Tired Loaders | 2020 | 26     | 50      | 1.761913 | 1.4805 | 6.76793 | 5.25369 | 0.0054 | 0.4741 | 0.4362 | 524.6967 | 0.1697 |
| Rubber Tired Loaders | 2020 | 51     | 120     | 0.661113 | 0.5555 | 3.94839 | 4.68644 | 0.0048 | 0.367  | 0.3376 | 465.6735 | 0.1506 |
| Rubber Tired Loaders | 2020 | 121    | 175     | 0.450696 | 0.3787 | 3.36809 | 3.51735 | 0.0049 | 0.1936 | 0.1781 | 471.2135 | 0.1524 |
| Rubber Tired Loaders | 2020 | 176    | 250     | 0.345399 | 0.2902 | 1.26885 | 3.42116 | 0.0048 | 0.1136 | 0.1045 | 469.5127 | 0.1518 |
| Rubber Tired Loaders | 2020 | 251    | 500     | 0.343959 | 0.289  | 1.6304  | 3.01666 | 0.0048 | 0.1122 | 0.1032 | 466.7831 | 0.151  |
| Rubber Tired Loaders | 2020 | 501    | 750     | 0.329462 | 0.2768 | 1.39991 | 2.76722 | 0.0048 | 0.1075 | 0.0989 | 462.193  | 0.1495 |
| Rubber Tired Loaders | 2020 | 751    | 1000    | 0.370676 | 0.3115 | 1.20366 | 5.25309 | 0.0049 | 0.1385 | 0.1274 | 469.9352 | 0.152  |
| Rubber Tired Loaders | 2021 | 16     | 25      | 1.577419 | 1.3255 | 6.44855 | 4.97419 | 0.0054 | 0.4092 | 0.3765 | 524.5505 | 0.1697 |
| Rubber Tired Loaders | 2021 | 26     | 50      | 1.577419 | 1.3255 | 6.44855 | 4.97419 | 0.0054 | 0.4092 | 0.3765 | 524.5505 | 0.1697 |
| Rubber Tired Loaders | 2021 | 51     | 120     | 0.592559 | 0.4979 | 3.8917  | 4.21491 | 0.0048 | 0.3163 | 0.291  | 466.4213 | 0.1509 |
| Rubber Tired Loaders | 2021 | 121    | 175     | 0.411896 | 0.3461 | 3.35381 | 3.11886 | 0.0049 | 0.1706 | 0.1569 | 471.0804 | 0.1524 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type       | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Rubber Tired Loaders | 2021 | 176    | 250     | 0.316703 | 0.2661 | 1.24034 | 2.9977  | 0.0048 | 0.1    | 0.092  | 469.5642 | 0.1519 |
| Rubber Tired Loaders | 2021 | 251    | 500     | 0.314488 | 0.2643 | 1.52922 | 2.61037 | 0.0048 | 0.0974 | 0.0896 | 467.9277 | 0.1513 |
| Rubber Tired Loaders | 2021 | 501    | 750     | 0.322962 | 0.2714 | 1.39703 | 2.64092 | 0.0048 | 0.1023 | 0.0942 | 462.0548 | 0.1494 |
| Rubber Tired Loaders | 2021 | 751    | 1000    | 0.350105 | 0.2942 | 1.2055  | 4.97489 | 0.0049 | 0.1279 | 0.1176 | 471.2577 | 0.1524 |
| Rubber Tired Loaders | 2022 | 16     | 25      | 1.402643 | 1.1786 | 6.20445 | 4.74817 | 0.0054 | 0.3543 | 0.326  | 524.7914 | 0.1697 |
| Rubber Tired Loaders | 2022 | 26     | 50      | 1.402643 | 1.1786 | 6.20445 | 4.74817 | 0.0054 | 0.3543 | 0.326  | 524.7914 | 0.1697 |
| Rubber Tired Loaders | 2022 | 51     | 120     | 0.523774 | 0.4401 | 3.83931 | 3.7684  | 0.0048 | 0.2665 | 0.2452 | 466.4936 | 0.1509 |
| Rubber Tired Loaders | 2022 | 121    | 175     | 0.350975 | 0.2949 | 3.30208 | 2.5181  | 0.0049 | 0.1358 | 0.1249 | 470.9274 | 0.1523 |
| Rubber Tired Loaders | 2022 | 176    | 250     | 0.269035 | 0.2261 | 1.188   | 2.34693 | 0.0049 | 0.0787 | 0.0724 | 469.9041 | 0.152  |
| Rubber Tired Loaders | 2022 | 251    | 500     | 0.281674 | 0.2367 | 1.441   | 2.17525 | 0.0048 | 0.0812 | 0.0747 | 468.1288 | 0.1514 |
| Rubber Tired Loaders | 2022 | 501    | 750     | 0.27713  | 0.2329 | 1.31524 | 2.0971  | 0.0048 | 0.08   | 0.0736 | 463.8194 | 0.15   |
| Rubber Tired Loaders | 2022 | 751    | 1000    | 0.229104 | 0.1925 | 1.16216 | 3.61655 | 0.0049 | 0.0745 | 0.0685 | 472.8577 | 0.1529 |
| Rubber Tired Loaders | 2023 | 16     | 25      | 1.248748 | 1.0493 | 5.97233 | 4.52113 | 0.0054 | 0.3036 | 0.2793 | 524.304  | 0.1696 |
| Rubber Tired Loaders | 2023 | 26     | 50      | 1.248748 | 1.0493 | 5.97233 | 4.52113 | 0.0054 | 0.3036 | 0.2793 | 524.304  | 0.1696 |
| Rubber Tired Loaders | 2023 | 51     | 120     | 0.490267 | 0.412  | 3.82678 | 3.51183 | 0.0048 | 0.2385 | 0.2194 | 466.5584 | 0.1509 |
| Rubber Tired Loaders | 2023 | 121    | 175     | 0.320411 | 0.2692 | 3.29198 | 2.19586 | 0.0049 | 0.1176 | 0.1082 | 470.6601 | 0.1522 |
| Rubber Tired Loaders | 2023 | 176    | 250     | 0.249759 | 0.2099 | 1.17136 | 2.05963 | 0.0049 | 0.069  | 0.0635 | 469.824  | 0.152  |
| Rubber Tired Loaders | 2023 | 251    | 500     | 0.258421 | 0.2171 | 1.38396 | 1.86629 | 0.0048 | 0.0694 | 0.0639 | 468.466  | 0.1515 |
| Rubber Tired Loaders | 2023 | 501    | 750     | 0.269537 | 0.2265 | 1.32307 | 1.92719 | 0.0048 | 0.0745 | 0.0685 | 464.5553 | 0.1502 |
| Rubber Tired Loaders | 2023 | 751    | 1000    | 0.229405 | 0.1928 | 1.17379 | 3.52792 | 0.0049 | 0.071  | 0.0653 | 472.3032 | 0.1528 |
| Rubber Tired Loaders | 2024 | 16     | 25      | 1.200513 | 1.0088 | 5.98698 | 4.46751 | 0.0054 | 0.2862 | 0.2633 | 524.2299 | 0.1695 |
| Rubber Tired Loaders | 2024 | 26     | 50      | 1.200513 | 1.0088 | 5.98698 | 4.46751 | 0.0054 | 0.2862 | 0.2633 | 524.2299 | 0.1695 |
| Rubber Tired Loaders | 2024 | 51     | 120     | 0.472864 | 0.3973 | 3.83209 | 3.33895 | 0.0048 | 0.2205 | 0.2028 | 466.8084 | 0.151  |
| Rubber Tired Loaders | 2024 | 121    | 175     | 0.292737 | 0.246  | 3.28823 | 1.88365 | 0.0049 | 0.1005 | 0.0924 | 470.3567 | 0.1521 |
| Rubber Tired Loaders | 2024 | 176    | 250     | 0.234511 | 0.1971 | 1.1607  | 1.80598 | 0.0049 | 0.0604 | 0.0556 | 469.7875 | 0.1519 |
| Rubber Tired Loaders | 2024 | 251    | 500     | 0.249195 | 0.2094 | 1.3518  | 1.70166 | 0.0048 | 0.0631 | 0.0581 | 468.5133 | 0.1515 |
| Rubber Tired Loaders | 2024 | 501    | 750     | 0.268468 | 0.2256 | 1.33327 | 1.88137 | 0.0048 | 0.0721 | 0.0663 | 464.8656 | 0.1503 |
| Rubber Tired Loaders | 2024 | 751    | 1000    | 0.238754 | 0.2006 | 1.19144 | 3.54358 | 0.0049 | 0.0714 | 0.0657 | 472.3454 | 0.1528 |
| Rubber Tired Loaders | 2025 | 16     | 25      | 1.142731 | 0.9602 | 5.9413  | 4.34846 | 0.0054 | 0.2586 | 0.2379 | 523.9076 | 0.1694 |
| Rubber Tired Loaders | 2025 | 26     | 50      | 1.142731 | 0.9602 | 5.9413  | 4.34846 | 0.0054 | 0.2586 | 0.2379 | 523.9076 | 0.1694 |
| Rubber Tired Loaders | 2025 | 51     | 120     | 0.418779 | 0.3519 | 3.79086 | 2.97026 | 0.0048 | 0.1789 | 0.1646 | 466.8982 | 0.151  |
| Rubber Tired Loaders | 2025 | 121    | 175     | 0.266202 | 0.2237 | 3.28059 | 1.59023 | 0.0049 | 0.084  | 0.0772 | 470.4594 | 0.1522 |
| Rubber Tired Loaders | 2025 | 176    | 250     | 0.211073 | 0.1774 | 1.1417  | 1.44207 | 0.0049 | 0.0484 | 0.0446 | 469.8711 | 0.152  |
| Rubber Tired Loaders | 2025 | 251    | 500     | 0.22979  | 0.1931 | 1.2763  | 1.43264 | 0.0048 | 0.0525 | 0.0483 | 469.1434 | 0.1517 |
| Rubber Tired Loaders | 2025 | 501    | 750     | 0.252566 | 0.2122 | 1.33262 | 1.65408 | 0.0048 | 0.064  | 0.0589 | 465.0523 | 0.1504 |
| Rubber Tired Loaders | 2025 | 751    | 1000    | 0.196905 | 0.1655 | 1.12172 | 3.08852 | 0.0049 | 0.052  | 0.0479 | 472.4559 | 0.1528 |
| Rubber Tired Loaders | 2030 | 16     | 25      | 1.834    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Rubber Tired Loaders | 2030 | 26     | 50      | 3.121    | 0.634  | 5.181   | 3.5     | 0.007  | 0.062  | 0.062  | 568.3    | 0.057  |
| Rubber Tired Loaders | 2030 | 51     | 120     | 2.953    | 0.317  | 3.759   | 1.875   | 0.006  | 0.056  | 0.056  | 568.299  | 0.028  |
| Rubber Tired Loaders | 2030 | 121    | 175     | 3.898    | 0.232  | 3.312   | 0.787   | 0.006  | 0.036  | 0.036  | 568.299  | 0.02   |
| Rubber Tired Loaders | 2030 | 176    | 250     | 4.951    | 0.21   | 1.138   | 0.655   | 0.006  | 0.022  | 0.022  | 568.299  | 0.018  |
| Rubber Tired Loaders | 2030 | 251    | 500     | 7.812    | 0.208  | 1.085   | 0.619   | 0.005  | 0.021  | 0.021  | 568.299  | 0.018  |
| Rubber Tired Loaders | 2030 | 501    | 750     | 16.018   | 0.208  | 1.085   | 0.627   | 0.005  | 0.022  | 0.022  | 568.299  | 0.018  |
| Rubber Tired Loaders | 2030 | 751    | 1000    | 20.168   | 0.214  | 1.099   | 2.722   | 0.005  | 0.039  | 0.039  | 568.299  | 0.019  |
| Rubber Tired Loaders | 2035 | 16     | 25      | 1.834    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Rubber Tired Loaders | 2035 | 26     | 50      | 2.833    | 0.575  | 5.126   | 3.337   | 0.007  | 0.035  | 0.035  | 568.299  | 0.051  |
| Rubber Tired Loaders | 2035 | 51     | 120     | 2.663    | 0.286  | 3.751   | 1.639   | 0.006  | 0.033  | 0.033  | 568.299  | 0.025  |
| Rubber Tired Loaders | 2035 | 121    | 175     | 3.376    | 0.2    | 3.312   | 0.481   | 0.006  | 0.022  | 0.022  | 568.299  | 0.018  |
| Rubber Tired Loaders | 2035 | 176    | 250     | 4.514    | 0.191  | 1.129   | 0.434   | 0.006  | 0.015  | 0.015  | 568.299  | 0.017  |
| Rubber Tired Loaders | 2035 | 251    | 500     | 7.156    | 0.191  | 1.076   | 0.416   | 0.005  | 0.015  | 0.015  | 568.299  | 0.017  |
| Rubber Tired Loaders | 2035 | 501    | 750     | 14.669   | 0.191  | 1.076   | 0.421   | 0.005  | 0.015  | 0.015  | 568.299  | 0.017  |
| Rubber Tired Loaders | 2035 | 751    | 1000    | 18.204   | 0.193  | 1.082   | 2.584   | 0.005  | 0.03   | 0.03   | 568.299  | 0.017  |
| Rubber Tired Loaders | 2040 | 16     | 25      | 1.834    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Rubber Tired Loaders | 2040 | 26     | 50      | 2.684    | 0.545  | 5.102   | 3.283   | 0.007  | 0.024  | 0.024  | 568.3    | 0.049  |
| Rubber Tired Loaders | 2040 | 51     | 120     | 2.53     | 0.271  | 3.748   | 1.543   | 0.006  | 0.022  | 0.022  | 568.3    | 0.024  |
| Rubber Tired Loaders | 2040 | 121    | 175     | 3.172    | 0.188  | 3.314   | 0.365   | 0.006  | 0.016  | 0.016  | 568.299  | 0.017  |
| Rubber Tired Loaders | 2040 | 176    | 250     | 4.375    | 0.185  | 1.128   | 0.346   | 0.006  | 0.013  | 0.013  | 568.299  | 0.016  |
| Rubber Tired Loaders | 2040 | 251    | 500     | 6.953    | 0.185  | 1.076   | 0.338   | 0.005  | 0.013  | 0.013  | 568.3    | 0.016  |
| Rubber Tired Loaders | 2040 | 501    | 750     | 14.247   | 0.185  | 1.076   | 0.34    | 0.005  | 0.013  | 0.013  | 568.299  | 0.016  |
| Rubber Tired Loaders | 2040 | 751    | 1000    | 17.496   | 0.186  | 1.076   | 2.522   | 0.005  | 0.026  | 0.026  | 568.299  | 0.016  |
| Scrapers             | 1990 | 51     | 120     | 7.335    | 2.413  | 5.806   | 15.182  | 0.791  | 1.373  | 1.373  | 568.299  | 0.217  |
| Scrapers             | 1990 | 121    | 175     | 8.743    | 1.823  | 5.174   | 14.491  | 0.758  | 1.017  | 1.017  | 568.299  | 0.164  |
| Scrapers             | 1990 | 176    | 250     | 12.369   | 1.823  | 5.174   | 14.491  | 0.758  | 1.017  | 1.017  | 568.299  | 0.164  |
| Scrapers             | 1990 | 251    | 500     | 16.73    | 1.607  | 11.673  | 13.709  | 0.662  | 0.867  | 0.867  | 568.299  | 0.145  |
| Scrapers             | 1990 | 501    | 750     | 28.902   | 1.607  | 11.673  | 13.709  | 1.018  | 0.883  | 0.883  | 568.299  | 0.145  |
| Scrapers             | 2000 | 51     | 120     | 6.006    | 1.975  | 4.906   | 11.177  | 0.06   | 0.949  | 0.949  | 568.299  | 0.178  |
| Scrapers             | 2000 | 121    | 175     | 6.456    | 1.346  | 4.046   | 10.226  | 0.057  | 0.572  | 0.572  | 568.299  | 0.121  |
| Scrapers             | 2000 | 176    | 250     | 8.023    | 1.183  | 3.423   | 9.944   | 0.057  | 0.493  | 0.493  | 568.299  | 0.106  |
| Scrapers             | 2000 | 251    | 500     | 11.061   | 1.062  | 6.04    | 9.42    | 0.05   | 0.43   | 0.43   | 568.299  | 0.095  |
| Scrapers             | 2000 | 501    | 750     | 19.108   | 1.062  | 6.04    | 9.42    | 0.052  | 0.43   | 0.43   | 568.299  | 0.095  |
| Scrapers             | 2005 | 51     | 120     | 5.36     | 1.763  | 4.636   | 9.807   | 0.06   | 0.901  | 0.901  | 568.299  | 0.159  |
| Scrapers             | 2005 | 121    | 175     | 5.592    | 1.166  | 3.76    | 8.934   | 0.057  | 0.514  | 0.514  | 568.299  | 0.105  |
| Scrapers             | 2005 | 176    | 250     | 6.251    | 0.921  | 2.602   | 8.58    | 0.057  | 0.377  | 0.377  | 568.299  | 0.083  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Scrapers       | 2005 | 251    | 500     | 8.477    | 0.814  | 4.07    | 7.854   | 0.05   | 0.331  | 0.331  | 568.3    | 0.073  |
| Scrapers       | 2005 | 501    | 750     | 14.794   | 0.822  | 4.063   | 7.99    | 0.052  | 0.333  | 0.333  | 568.299  | 0.074  |
| Scrapers       | 2010 | 51     | 120     | 0.828186 | 0.6959 | 3.97834 | 7.09453 | 0.005  | 0.5066 | 0.4661 | 537.9051 | 0.1566 |
| Scrapers       | 2010 | 121    | 175     | 0.907518 | 0.7626 | 3.83189 | 8.55764 | 0.0049 | 0.4438 | 0.4083 | 532.551  | 0.155  |
| Scrapers       | 2010 | 176    | 250     | 0.939807 | 0.7897 | 3.25278 | 9.42837 | 0.0048 | 0.4341 | 0.3994 | 520.9381 | 0.1516 |
| Scrapers       | 2010 | 251    | 500     | 0.595043 | 0.5    | 4.1939  | 6.75544 | 0.0049 | 0.2719 | 0.2501 | 525.1553 | 0.1529 |
| Scrapers       | 2010 | 501    | 750     | 0.454495 | 0.3819 | 3.13671 | 5.53444 | 0.0049 | 0.2092 | 0.1924 | 525.522  | 0.153  |
| Scrapers       | 2011 | 51     | 120     | 0.831534 | 0.6987 | 4.00655 | 7.06921 | 0.005  | 0.5093 | 0.4686 | 536.4691 | 0.1565 |
| Scrapers       | 2011 | 121    | 175     | 0.907072 | 0.7622 | 3.84357 | 8.51777 | 0.0049 | 0.4441 | 0.4086 | 531.1835 | 0.155  |
| Scrapers       | 2011 | 176    | 250     | 0.933155 | 0.7841 | 3.22574 | 9.34756 | 0.0048 | 0.4302 | 0.3958 | 519.6705 | 0.1516 |
| Scrapers       | 2011 | 251    | 500     | 0.590447 | 0.4961 | 4.14563 | 6.64672 | 0.0049 | 0.2679 | 0.2464 | 523.9083 | 0.1529 |
| Scrapers       | 2011 | 501    | 750     | 0.45862  | 0.3854 | 3.14165 | 5.48614 | 0.0049 | 0.2076 | 0.191  | 524.1241 | 0.1529 |
| Scrapers       | 2012 | 51     | 120     | 0.847004 | 0.7117 | 4.04661 | 7.11199 | 0.005  | 0.519  | 0.4775 | 535.1238 | 0.1565 |
| Scrapers       | 2012 | 121    | 175     | 0.915185 | 0.769  | 3.8659  | 8.53485 | 0.0049 | 0.4484 | 0.4125 | 529.8158 | 0.155  |
| Scrapers       | 2012 | 176    | 250     | 0.935111 | 0.7858 | 3.22909 | 9.33173 | 0.0048 | 0.4301 | 0.3957 | 518.3695 | 0.1516 |
| Scrapers       | 2012 | 251    | 500     | 0.596548 | 0.5013 | 4.16192 | 6.64299 | 0.0049 | 0.2686 | 0.2471 | 522.6784 | 0.1529 |
| Scrapers       | 2012 | 501    | 750     | 0.468161 | 0.3934 | 3.16628 | 5.49999 | 0.0049 | 0.2094 | 0.1927 | 522.7621 | 0.1529 |
| Scrapers       | 2013 | 51     | 120     | 0.850862 | 0.715  | 4.06971 | 7.08801 | 0.005  | 0.5234 | 0.4816 | 532.4144 | 0.1565 |
| Scrapers       | 2013 | 121    | 175     | 0.895558 | 0.7525 | 3.85136 | 8.33026 | 0.0049 | 0.4382 | 0.4032 | 527.0754 | 0.155  |
| Scrapers       | 2013 | 176    | 250     | 0.923168 | 0.7757 | 3.18463 | 9.20338 | 0.0048 | 0.4231 | 0.3892 | 515.7585 | 0.1516 |
| Scrapers       | 2013 | 251    | 500     | 0.590637 | 0.4963 | 4.08663 | 6.51716 | 0.0049 | 0.2635 | 0.2425 | 520.0884 | 0.1529 |
| Scrapers       | 2013 | 501    | 750     | 0.462466 | 0.3886 | 3.09865 | 5.3398  | 0.0049 | 0.2036 | 0.1873 | 520.1031 | 0.1529 |
| Scrapers       | 2014 | 51     | 120     | 0.855598 | 0.7189 | 4.09983 | 7.0654  | 0.005  | 0.5262 | 0.4841 | 529.9445 | 0.1566 |
| Scrapers       | 2014 | 121    | 175     | 0.85473  | 0.7182 | 3.80661 | 7.90715 | 0.0049 | 0.4188 | 0.3853 | 524.1709 | 0.1549 |
| Scrapers       | 2014 | 176    | 250     | 0.882887 | 0.7419 | 3.06131 | 8.81494 | 0.0048 | 0.403  | 0.3707 | 512.8529 | 0.1516 |
| Scrapers       | 2014 | 251    | 500     | 0.569739 | 0.4787 | 3.89824 | 6.23299 | 0.0049 | 0.2514 | 0.2313 | 517.3608 | 0.1529 |
| Scrapers       | 2014 | 501    | 750     | 0.438954 | 0.3688 | 2.84564 | 5.01248 | 0.0049 | 0.1895 | 0.1744 | 517.3937 | 0.1529 |
| Scrapers       | 2015 | 51     | 120     | 0.869823 | 0.7309 | 4.13678 | 7.10509 | 0.005  | 0.5348 | 0.4921 | 524.5601 | 0.1566 |
| Scrapers       | 2015 | 121    | 175     | 0.849601 | 0.7139 | 3.80865 | 7.76471 | 0.0049 | 0.415  | 0.3818 | 518.8294 | 0.1549 |
| Scrapers       | 2015 | 176    | 250     | 0.868271 | 0.7296 | 3.00753 | 8.66317 | 0.0048 | 0.3952 | 0.3636 | 507.5699 | 0.1515 |
| Scrapers       | 2015 | 251    | 500     | 0.561967 | 0.4722 | 3.788   | 6.08577 | 0.0049 | 0.2458 | 0.2261 | 511.9471 | 0.1528 |
| Scrapers       | 2015 | 501    | 750     | 0.427981 | 0.3596 | 2.68469 | 4.83862 | 0.0049 | 0.1818 | 0.1673 | 512.0837 | 0.1529 |
| Scrapers       | 2016 | 51     | 120     | 0.883537 | 0.7424 | 4.17273 | 7.14312 | 0.005  | 0.5431 | 0.4996 | 519.1668 | 0.1566 |
| Scrapers       | 2016 | 121    | 175     | 0.818244 | 0.6876 | 3.78062 | 7.3844  | 0.0049 | 0.3967 | 0.365  | 513.4363 | 0.1549 |
| Scrapers       | 2016 | 176    | 250     | 0.814194 | 0.6841 | 2.8398  | 8.10864 | 0.0048 | 0.3669 | 0.3376 | 502.255  | 0.1515 |
| Scrapers       | 2016 | 251    | 500     | 0.538344 | 0.4524 | 3.60633 | 5.75749 | 0.0049 | 0.2321 | 0.2135 | 506.3503 | 0.1527 |
| Scrapers       | 2016 | 501    | 750     | 0.404454 | 0.3399 | 2.48181 | 4.48425 | 0.0049 | 0.1675 | 0.1541 | 506.6381 | 0.1528 |
| Scrapers       | 2017 | 51     | 120     | 0.896722 | 0.7535 | 4.20744 | 7.17946 | 0.005  | 0.551  | 0.5069 | 511.1123 | 0.1566 |
| Scrapers       | 2017 | 121    | 175     | 0.748819 | 0.6292 | 3.70478 | 6.67066 | 0.0049 | 0.3594 | 0.3306 | 505.3309 | 0.1548 |
| Scrapers       | 2017 | 176    | 250     | 0.74607  | 0.6269 | 2.64676 | 7.39867 | 0.0048 | 0.3327 | 0.306  | 494.5231 | 0.1515 |
| Scrapers       | 2017 | 251    | 500     | 0.505877 | 0.4251 | 3.33699 | 5.33951 | 0.0049 | 0.2143 | 0.1971 | 498.4571 | 0.1527 |
| Scrapers       | 2017 | 501    | 750     | 0.386598 | 0.3248 | 2.29479 | 4.21648 | 0.0049 | 0.1558 | 0.1433 | 498.6929 | 0.1528 |
| Scrapers       | 2018 | 51     | 120     | 0.881019 | 0.7403 | 4.20429 | 7.03577 | 0.005  | 0.5425 | 0.4991 | 502.8288 | 0.1565 |
| Scrapers       | 2018 | 121    | 175     | 0.640866 | 0.5385 | 3.56847 | 5.64105 | 0.0049 | 0.3029 | 0.2787 | 497.3396 | 0.1548 |
| Scrapers       | 2018 | 176    | 250     | 0.662403 | 0.5566 | 2.40704 | 6.56304 | 0.0048 | 0.2901 | 0.2669 | 486.9908 | 0.1516 |
| Scrapers       | 2018 | 251    | 500     | 0.439318 | 0.3691 | 2.82811 | 4.56771 | 0.0049 | 0.18   | 0.1656 | 490.7734 | 0.1528 |
| Scrapers       | 2018 | 501    | 750     | 0.349618 | 0.2938 | 1.96493 | 3.74582 | 0.0049 | 0.135  | 0.1242 | 490.5775 | 0.1527 |
| Scrapers       | 2019 | 51     | 120     | 0.854498 | 0.718  | 4.19661 | 6.84136 | 0.005  | 0.5255 | 0.4834 | 494.1    | 0.1563 |
| Scrapers       | 2019 | 121    | 175     | 0.606989 | 0.51   | 3.53297 | 5.26356 | 0.0049 | 0.2833 | 0.2606 | 489.2546 | 0.1548 |
| Scrapers       | 2019 | 176    | 250     | 0.596624 | 0.5013 | 2.23321 | 5.83102 | 0.0048 | 0.2567 | 0.2361 | 479.0317 | 0.1516 |
| Scrapers       | 2019 | 251    | 500     | 0.40804  | 0.3429 | 2.59466 | 4.15646 | 0.0049 | 0.1629 | 0.1498 | 482.7319 | 0.1527 |
| Scrapers       | 2019 | 501    | 750     | 0.329384 | 0.2768 | 1.82903 | 3.43103 | 0.0049 | 0.1232 | 0.1133 | 482.5963 | 0.1527 |
| Scrapers       | 2020 | 51     | 120     | 0.834143 | 0.7009 | 4.19756 | 6.6767  | 0.005  | 0.5101 | 0.4693 | 483.745  | 0.1565 |
| Scrapers       | 2020 | 121    | 175     | 0.568453 | 0.4777 | 3.50114 | 4.86851 | 0.0049 | 0.262  | 0.241  | 478.6077 | 0.1548 |
| Scrapers       | 2020 | 176    | 250     | 0.531032 | 0.4462 | 2.06469 | 5.089   | 0.0048 | 0.2232 | 0.2054 | 468.9883 | 0.1517 |
| Scrapers       | 2020 | 251    | 500     | 0.380326 | 0.3196 | 2.40063 | 3.78254 | 0.0049 | 0.1475 | 0.1357 | 472.1751 | 0.1527 |
| Scrapers       | 2020 | 501    | 750     | 0.311991 | 0.2622 | 1.72502 | 3.12592 | 0.0049 | 0.1132 | 0.1042 | 471.7776 | 0.1526 |
| Scrapers       | 2021 | 51     | 120     | 0.837922 | 0.7041 | 4.21819 | 6.65882 | 0.005  | 0.5124 | 0.4714 | 483.7128 | 0.1564 |
| Scrapers       | 2021 | 121    | 175     | 0.514014 | 0.4319 | 3.45599 | 4.34133 | 0.0049 | 0.2318 | 0.2133 | 478.654  | 0.1548 |
| Scrapers       | 2021 | 176    | 250     | 0.464853 | 0.3906 | 1.88374 | 4.36706 | 0.0048 | 0.1891 | 0.174  | 469.1258 | 0.1517 |
| Scrapers       | 2021 | 251    | 500     | 0.356021 | 0.2992 | 2.25454 | 3.44481 | 0.0049 | 0.134  | 0.1233 | 472.4636 | 0.1528 |
| Scrapers       | 2021 | 501    | 750     | 0.298025 | 0.2504 | 1.65772 | 2.88702 | 0.0049 | 0.1053 | 0.0968 | 471.7859 | 0.1526 |
| Scrapers       | 2022 | 51     | 120     | 0.809995 | 0.6806 | 4.20484 | 6.45548 | 0.005  | 0.4938 | 0.4543 | 483.4481 | 0.1564 |
| Scrapers       | 2022 | 121    | 175     | 0.463814 | 0.3897 | 3.41662 | 3.83296 | 0.0049 | 0.2036 | 0.1873 | 478.7411 | 0.1548 |
| Scrapers       | 2022 | 176    | 250     | 0.406319 | 0.3414 | 1.74265 | 3.66905 | 0.0048 | 0.16   | 0.1472 | 469.2686 | 0.1518 |
| Scrapers       | 2022 | 251    | 500     | 0.313802 | 0.2637 | 2.05212 | 2.87856 | 0.0049 | 0.1124 | 0.1034 | 473.2304 | 0.1531 |
| Scrapers       | 2022 | 501    | 750     | 0.266627 | 0.224  | 1.50816 | 2.47537 | 0.0049 | 0.0899 | 0.0827 | 471.2788 | 0.1524 |
| Scrapers       | 2023 | 51     | 120     | 0.7496   | 0.6299 | 4.14443 | 6.02603 | 0.005  | 0.4579 | 0.4212 | 483.0296 | 0.1562 |
| Scrapers       | 2023 | 121    | 175     | 0.430003 | 0.3613 | 3.39533 | 3.47913 | 0.0049 | 0.1839 | 0.1692 | 478.6814 | 0.1548 |
| Scrapers       | 2023 | 176    | 250     | 0.37772  | 0.3174 | 1.67839 | 3.2838  | 0.0048 | 0.1441 | 0.1325 | 469.5597 | 0.1519 |
| Scrapers       | 2023 | 251    | 500     | 0.301363 | 0.2532 | 1.97527 | 2.66611 | 0.0049 | 0.1045 | 0.0962 | 473.1772 | 0.153  |
| Scrapers       | 2023 | 501    | 750     | 0.26361  | 0.2215 | 1.51295 | 2.38587 | 0.0049 | 0.0872 | 0.0802 | 471.2953 | 0.1524 |
| Scrapers       | 2024 | 51     | 120     | 0.683919 | 0.5747 | 4.09486 | 5.63222 | 0.005  | 0.4144 | 0.3813 | 482.7009 | 0.1561 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Scrapers       | 2024 | 121    | 175     | 0.399992 | 0.3361 | 3.37249 | 3.15631 | 0.0049 | 0.1665 | 0.1532 | 478.8089 | 0.1549 |
| Scrapers       | 2024 | 176    | 250     | 0.358714 | 0.3014 | 1.62739 | 3.01379 | 0.0048 | 0.1332 | 0.1225 | 469.3521 | 0.1518 |
| Scrapers       | 2024 | 251    | 500     | 0.291137 | 0.2446 | 1.92055 | 2.47694 | 0.0049 | 0.0979 | 0.0901 | 472.8455 | 0.1529 |
| Scrapers       | 2024 | 501    | 750     | 0.253257 | 0.2128 | 1.46065 | 2.18653 | 0.0049 | 0.0807 | 0.0743 | 471.4291 | 0.1525 |
| Scrapers       | 2025 | 51     | 120     | 0.673967 | 0.5663 | 4.09423 | 5.50259 | 0.005  | 0.4048 | 0.3724 | 482.3629 | 0.156  |
| Scrapers       | 2025 | 121    | 175     | 0.34526  | 0.2901 | 3.3209  | 2.63098 | 0.0049 | 0.1367 | 0.1258 | 478.9476 | 0.1549 |
| Scrapers       | 2025 | 176    | 250     | 0.346529 | 0.2912 | 1.60249 | 2.80326 | 0.0048 | 0.1254 | 0.1153 | 469.4459 | 0.1518 |
| Scrapers       | 2025 | 251    | 500     | 0.257328 | 0.2162 | 1.7318  | 2.05051 | 0.0049 | 0.0807 | 0.0743 | 472.5394 | 0.1528 |
| Scrapers       | 2025 | 501    | 750     | 0.218534 | 0.1836 | 1.33825 | 1.71287 | 0.0049 | 0.0641 | 0.059  | 472.115  | 0.1527 |
| Scrapers       | 2030 | 51     | 120     | 1.248    | 0.41   | 3.866   | 2.384   | 0.006  | 0.111  | 0.111  | 568.299  | 0.037  |
| Scrapers       | 2030 | 121    | 175     | 1.445    | 0.301  | 3.389   | 1.32    | 0.006  | 0.068  | 0.068  | 568.299  | 0.027  |
| Scrapers       | 2030 | 176    | 250     | 1.794    | 0.264  | 1.206   | 1.149   | 0.006  | 0.042  | 0.042  | 568.299  | 0.023  |
| Scrapers       | 2030 | 251    | 500     | 2.697    | 0.259  | 1.184   | 1.057   | 0.005  | 0.04   | 0.04   | 568.299  | 0.023  |
| Scrapers       | 2030 | 501    | 750     | 4.666    | 0.259  | 1.184   | 1.075   | 0.005  | 0.04   | 0.04   | 568.299  | 0.023  |
| Scrapers       | 2035 | 51     | 120     | 1.058    | 0.348  | 3.842   | 1.943   | 0.006  | 0.064  | 0.064  | 568.299  | 0.031  |
| Scrapers       | 2035 | 121    | 175     | 1.199    | 0.25   | 3.382   | 0.824   | 0.006  | 0.04   | 0.04   | 568.299  | 0.022  |
| Scrapers       | 2035 | 176    | 250     | 1.553    | 0.229  | 1.175   | 0.717   | 0.006  | 0.026  | 0.026  | 568.299  | 0.02   |
| Scrapers       | 2035 | 251    | 500     | 2.356    | 0.226  | 1.123   | 0.674   | 0.005  | 0.025  | 0.025  | 568.3    | 0.02   |
| Scrapers       | 2035 | 501    | 750     | 4.075    | 0.226  | 1.123   | 0.682   | 0.005  | 0.025  | 0.025  | 568.299  | 0.02   |
| Scrapers       | 2040 | 51     | 120     | 0.962    | 0.316  | 3.833   | 1.715   | 0.006  | 0.04   | 0.04   | 568.299  | 0.028  |
| Scrapers       | 2040 | 121    | 175     | 1.063    | 0.221  | 3.381   | 0.549   | 0.006  | 0.026  | 0.026  | 568.299  | 0.02   |
| Scrapers       | 2040 | 176    | 250     | 1.425    | 0.21   | 1.159   | 0.498   | 0.006  | 0.018  | 0.018  | 568.3    | 0.018  |
| Scrapers       | 2040 | 251    | 500     | 2.175    | 0.209  | 1.1     | 0.475   | 0.005  | 0.017  | 0.017  | 568.299  | 0.018  |
| Scrapers       | 2040 | 501    | 750     | 3.76     | 0.209  | 1.1     | 0.48    | 0.005  | 0.017  | 0.017  | 568.299  | 0.018  |
| Signal Boards  | 1990 | 6      | 15      | 2.838    | 1.804  | 4.999   | 9.999   | 1.049  | 0.975  | 0.975  | 568.299  | 0.162  |
| Signal Boards  | 1990 | 26     | 50      | 33.688   | 3.65   | 7.626   | 7.518   | 0.871  | 1.035  | 1.035  | 568.299  | 0.329  |
| Signal Boards  | 1990 | 51     | 120     | 41.675   | 2.037  | 5.201   | 13.738  | 0.791  | 1.095  | 1.095  | 568.3    | 0.183  |
| Signal Boards  | 1990 | 121    | 175     | 54.982   | 1.395  | 4.603   | 12.364  | 0.758  | 0.728  | 0.728  | 568.3    | 0.125  |
| Signal Boards  | 1990 | 176    | 250     | 90.827   | 1.685  | 5.563   | 14.94   | 0.917  | 0.88   | 0.88   | 686.695  | 0.152  |
| Signal Boards  | 2000 | 6      | 15      | 2.085    | 1.325  | 4.257   | 7.675   | 0.079  | 0.61   | 0.61   | 568.299  | 0.119  |
| Signal Boards  | 2000 | 26     | 50      | 31.608   | 3.424  | 7.268   | 6.709   | 0.066  | 0.765  | 0.765  | 568.299  | 0.309  |
| Signal Boards  | 2000 | 51     | 120     | 33.68    | 1.646  | 4.338   | 9.835   | 0.06   | 0.756  | 0.756  | 568.299  | 0.148  |
| Signal Boards  | 2000 | 121    | 175     | 43.484   | 1.103  | 3.53    | 8.941   | 0.057  | 0.447  | 0.447  | 568.299  | 0.099  |
| Signal Boards  | 2000 | 176    | 250     | 59.587   | 1.105  | 3.359   | 10.385  | 0.069  | 0.438  | 0.438  | 686.695  | 0.099  |
| Signal Boards  | 2005 | 6      | 15      | 1.168    | 0.742  | 3.469   | 4.981   | 0.079  | 0.35   | 0.35   | 568.299  | 0.066  |
| Signal Boards  | 2005 | 26     | 50      | 27.711   | 3.002  | 6.663   | 6.227   | 0.066  | 0.704  | 0.704  | 568.299  | 0.27   |
| Signal Boards  | 2005 | 51     | 120     | 28.596   | 1.398  | 4       | 8.234   | 0.06   | 0.695  | 0.695  | 568.299  | 0.126  |
| Signal Boards  | 2005 | 121    | 175     | 35.881   | 0.91   | 3.185   | 7.528   | 0.057  | 0.383  | 0.383  | 568.3    | 0.082  |
| Signal Boards  | 2005 | 176    | 250     | 41.93    | 0.778  | 2.245   | 8.577   | 0.069  | 0.303  | 0.303  | 686.695  | 0.07   |
| Signal Boards  | 2010 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.155  | 0.155  | 568.299  | 0.059  |
| Signal Boards  | 2010 | 26     | 50      | 21.63    | 2.343  | 6.009   | 5.792   | 0.007  | 0.571  | 0.571  | 568.299  | 0.211  |
| Signal Boards  | 2010 | 51     | 120     | 21.667   | 1.059  | 3.811   | 6.693   | 0.006  | 0.56   | 0.56   | 568.299  | 0.095  |
| Signal Boards  | 2010 | 121    | 175     | 27.641   | 0.701  | 3.102   | 5.958   | 0.006  | 0.311  | 0.311  | 568.299  | 0.063  |
| Signal Boards  | 2010 | 176    | 250     | 29.698   | 0.551  | 1.651   | 6.749   | 0.007  | 0.212  | 0.212  | 686.695  | 0.049  |
| Signal Boards  | 2011 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.156  | 0.156  | 568.299  | 0.059  |
| Signal Boards  | 2011 | 26     | 50      | 20.109   | 2.178  | 5.834   | 5.698   | 0.007  | 0.541  | 0.541  | 568.299  | 0.196  |
| Signal Boards  | 2011 | 51     | 120     | 20.187   | 0.986  | 3.774   | 6.327   | 0.006  | 0.535  | 0.535  | 568.299  | 0.089  |
| Signal Boards  | 2011 | 121    | 175     | 25.933   | 0.658  | 3.09    | 5.615   | 0.006  | 0.298  | 0.298  | 568.299  | 0.059  |
| Signal Boards  | 2011 | 176    | 250     | 27.264   | 0.506  | 1.548   | 6.272   | 0.007  | 0.19   | 0.19   | 686.695  | 0.045  |
| Signal Boards  | 2012 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.16   | 0.16   | 568.299  | 0.059  |
| Signal Boards  | 2012 | 26     | 50      | 18.413   | 1.995  | 5.632   | 5.596   | 0.007  | 0.508  | 0.508  | 568.299  | 0.18   |
| Signal Boards  | 2012 | 51     | 120     | 18.605   | 0.909  | 3.733   | 5.923   | 0.006  | 0.498  | 0.498  | 568.299  | 0.082  |
| Signal Boards  | 2012 | 121    | 175     | 24.082   | 0.611  | 3.077   | 5.246   | 0.006  | 0.275  | 0.275  | 568.3    | 0.055  |
| Signal Boards  | 2012 | 176    | 250     | 25.308   | 0.469  | 1.483   | 5.81    | 0.007  | 0.171  | 0.171  | 686.695  | 0.042  |
| Signal Boards  | 2013 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards  | 2013 | 26     | 50      | 16.687   | 1.808  | 5.427   | 5.362   | 0.007  | 0.465  | 0.465  | 568.299  | 0.163  |
| Signal Boards  | 2013 | 51     | 120     | 17.043   | 0.833  | 3.694   | 5.532   | 0.006  | 0.456  | 0.456  | 568.299  | 0.075  |
| Signal Boards  | 2013 | 121    | 175     | 22.253   | 0.564  | 3.067   | 4.903   | 0.006  | 0.252  | 0.252  | 568.3    | 0.05   |
| Signal Boards  | 2013 | 176    | 250     | 23.66    | 0.439  | 1.439   | 5.369   | 0.007  | 0.156  | 0.156  | 686.695  | 0.039  |
| Signal Boards  | 2014 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards  | 2014 | 26     | 50      | 15.005   | 1.625  | 5.231   | 5.139   | 0.007  | 0.422  | 0.422  | 568.299  | 0.146  |
| Signal Boards  | 2014 | 51     | 120     | 15.539   | 0.759  | 3.658   | 5.186   | 0.006  | 0.414  | 0.414  | 568.299  | 0.068  |
| Signal Boards  | 2014 | 121    | 175     | 20.512   | 0.52   | 3.058   | 4.582   | 0.006  | 0.228  | 0.228  | 568.299  | 0.046  |
| Signal Boards  | 2014 | 176    | 250     | 22.034   | 0.408  | 1.402   | 4.857   | 0.007  | 0.141  | 0.141  | 686.695  | 0.036  |
| Signal Boards  | 2015 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards  | 2015 | 26     | 50      | 13.489   | 1.461  | 5.068   | 4.943   | 0.007  | 0.382  | 0.382  | 568.299  | 0.131  |
| Signal Boards  | 2015 | 51     | 120     | 14.067   | 0.687  | 3.624   | 4.791   | 0.006  | 0.371  | 0.371  | 568.299  | 0.062  |
| Signal Boards  | 2015 | 121    | 175     | 18.694   | 0.474  | 3.052   | 4.136   | 0.006  | 0.205  | 0.205  | 568.299  | 0.042  |
| Signal Boards  | 2015 | 176    | 250     | 20.523   | 0.38   | 1.371   | 4.365   | 0.007  | 0.127  | 0.127  | 686.695  | 0.034  |
| Signal Boards  | 2016 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards  | 2016 | 26     | 50      | 12.061   | 1.306  | 4.921   | 4.761   | 0.007  | 0.343  | 0.343  | 568.299  | 0.117  |
| Signal Boards  | 2016 | 51     | 120     | 12.653   | 0.618  | 3.594   | 4.414   | 0.006  | 0.33   | 0.33   | 568.299  | 0.055  |
| Signal Boards  | 2016 | 121    | 175     | 16.949   | 0.43   | 3.047   | 3.708   | 0.006  | 0.183  | 0.183  | 568.299  | 0.038  |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type     | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|--------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Signal Boards      | 2016 | 176    | 250     | 19.106   | 0.354  | 1.344   | 3.894   | 0.007  | 0.114  | 0.114  | 686.695  | 0.031  |
| Signal Boards      | 2017 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2017 | 26     | 50      | 10.695   | 1.158  | 4.785   | 4.59    | 0.007  | 0.306  | 0.306  | 568.299  | 0.104  |
| Signal Boards      | 2017 | 51     | 120     | 11.32    | 0.553  | 3.566   | 4.059   | 0.006  | 0.29   | 0.29   | 568.299  | 0.049  |
| Signal Boards      | 2017 | 121    | 175     | 15.322   | 0.388  | 3.044   | 3.305   | 0.006  | 0.161  | 0.161  | 568.299  | 0.035  |
| Signal Boards      | 2017 | 176    | 250     | 17.83    | 0.33   | 1.323   | 3.452   | 0.007  | 0.101  | 0.101  | 686.695  | 0.029  |
| Signal Boards      | 2018 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2018 | 26     | 50      | 9.4      | 1.018  | 4.657   | 4.427   | 0.007  | 0.27   | 0.27   | 568.299  | 0.091  |
| Signal Boards      | 2018 | 51     | 120     | 10.078   | 0.492  | 3.541   | 3.723   | 0.006  | 0.252  | 0.252  | 568.299  | 0.044  |
| Signal Boards      | 2018 | 121    | 175     | 13.836   | 0.351  | 3.043   | 2.93    | 0.006  | 0.141  | 0.141  | 568.299  | 0.031  |
| Signal Boards      | 2018 | 176    | 250     | 16.678   | 0.309  | 1.306   | 3.04    | 0.007  | 0.09   | 0.09   | 686.695  | 0.027  |
| Signal Boards      | 2019 | 6      | 15      | 1.04     | 0.661  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2019 | 26     | 50      | 8.189    | 0.887  | 4.538   | 4.272   | 0.007  | 0.236  | 0.236  | 568.3    | 0.08   |
| Signal Boards      | 2019 | 51     | 120     | 8.938    | 0.437  | 3.519   | 3.41    | 0.006  | 0.216  | 0.216  | 568.299  | 0.039  |
| Signal Boards      | 2019 | 121    | 175     | 12.677   | 0.321  | 3.043   | 2.601   | 0.006  | 0.125  | 0.125  | 568.299  | 0.029  |
| Signal Boards      | 2019 | 176    | 250     | 15.682   | 0.291  | 1.292   | 2.676   | 0.007  | 0.08   | 0.08   | 686.695  | 0.026  |
| Signal Boards      | 2020 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2020 | 26     | 50      | 7.28     | 0.788  | 4.448   | 4.132   | 0.007  | 0.206  | 0.206  | 568.299  | 0.071  |
| Signal Boards      | 2020 | 51     | 120     | 8.081    | 0.395  | 3.504   | 3.134   | 0.006  | 0.187  | 0.187  | 568.299  | 0.035  |
| Signal Boards      | 2020 | 121    | 175     | 11.756   | 0.298  | 3.043   | 2.309   | 0.006  | 0.11   | 0.11   | 568.299  | 0.026  |
| Signal Boards      | 2020 | 176    | 250     | 14.813   | 0.274  | 1.281   | 2.35    | 0.007  | 0.071  | 0.071  | 686.695  | 0.024  |
| Signal Boards      | 2021 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2021 | 26     | 50      | 6.598    | 0.714  | 4.38    | 4.002   | 0.007  | 0.179  | 0.179  | 568.299  | 0.064  |
| Signal Boards      | 2021 | 51     | 120     | 7.434    | 0.363  | 3.493   | 2.889   | 0.006  | 0.162  | 0.162  | 568.299  | 0.032  |
| Signal Boards      | 2021 | 121    | 175     | 10.965   | 0.278  | 3.043   | 2.043   | 0.006  | 0.098  | 0.098  | 568.299  | 0.025  |
| Signal Boards      | 2021 | 176    | 250     | 14.033   | 0.26   | 1.273   | 2.053   | 0.007  | 0.063  | 0.063  | 686.695  | 0.023  |
| Signal Boards      | 2022 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.3    | 0.059  |
| Signal Boards      | 2022 | 26     | 50      | 6.047    | 0.655  | 4.325   | 3.88    | 0.007  | 0.154  | 0.154  | 568.299  | 0.059  |
| Signal Boards      | 2022 | 51     | 120     | 6.908    | 0.337  | 3.484   | 2.668   | 0.006  | 0.141  | 0.141  | 568.299  | 0.03   |
| Signal Boards      | 2022 | 121    | 175     | 10.249   | 0.26   | 3.044   | 1.801   | 0.006  | 0.086  | 0.086  | 568.299  | 0.023  |
| Signal Boards      | 2022 | 176    | 250     | 13.317   | 0.247  | 1.266   | 1.782   | 0.007  | 0.055  | 0.055  | 686.695  | 0.022  |
| Signal Boards      | 2023 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2023 | 26     | 50      | 5.57     | 0.603  | 4.282   | 3.767   | 0.007  | 0.132  | 0.132  | 568.299  | 0.054  |
| Signal Boards      | 2023 | 51     | 120     | 6.449    | 0.315  | 3.478   | 2.472   | 0.006  | 0.122  | 0.122  | 568.299  | 0.028  |
| Signal Boards      | 2023 | 121    | 175     | 9.619    | 0.244  | 3.045   | 1.602   | 0.006  | 0.075  | 0.075  | 568.299  | 0.022  |
| Signal Boards      | 2023 | 176    | 250     | 12.678   | 0.235  | 1.263   | 1.562   | 0.007  | 0.048  | 0.048  | 686.695  | 0.021  |
| Signal Boards      | 2024 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2024 | 26     | 50      | 5.168    | 0.559  | 4.247   | 3.662   | 0.007  | 0.114  | 0.114  | 568.299  | 0.05   |
| Signal Boards      | 2024 | 51     | 120     | 6.055    | 0.296  | 3.474   | 2.315   | 0.006  | 0.105  | 0.105  | 568.299  | 0.026  |
| Signal Boards      | 2024 | 121    | 175     | 9.047    | 0.229  | 3.047   | 1.427   | 0.006  | 0.065  | 0.065  | 568.299  | 0.02   |
| Signal Boards      | 2024 | 176    | 250     | 12.079   | 0.224  | 1.259   | 1.37    | 0.007  | 0.041  | 0.041  | 686.695  | 0.02   |
| Signal Boards      | 2025 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2025 | 26     | 50      | 4.819    | 0.522  | 4.217   | 3.561   | 0.007  | 0.098  | 0.098  | 568.299  | 0.047  |
| Signal Boards      | 2025 | 51     | 120     | 5.705    | 0.278  | 3.47    | 2.179   | 0.006  | 0.089  | 0.089  | 568.299  | 0.025  |
| Signal Boards      | 2025 | 121    | 175     | 8.5      | 0.215  | 3.049   | 1.262   | 0.006  | 0.055  | 0.055  | 568.299  | 0.019  |
| Signal Boards      | 2025 | 176    | 250     | 11.509   | 0.213  | 1.257   | 1.192   | 0.007  | 0.035  | 0.035  | 686.695  | 0.019  |
| Signal Boards      | 2030 | 6      | 15      | 1.04     | 0.661  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2030 | 26     | 50      | 3.631    | 0.393  | 4.099   | 3.193   | 0.007  | 0.04   | 0.04   | 568.299  | 0.035  |
| Signal Boards      | 2030 | 51     | 120     | 4.366    | 0.213  | 3.451   | 1.657   | 0.006  | 0.035  | 0.035  | 568.3    | 0.019  |
| Signal Boards      | 2030 | 121    | 175     | 6.201    | 0.157  | 3.048   | 0.586   | 0.006  | 0.024  | 0.024  | 568.299  | 0.014  |
| Signal Boards      | 2030 | 176    | 250     | 9.484    | 0.176  | 1.255   | 0.594   | 0.007  | 0.019  | 0.019  | 686.695  | 0.015  |
| Signal Boards      | 2035 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2035 | 26     | 50      | 3.294    | 0.356  | 4.067   | 3.082   | 0.007  | 0.02   | 0.02   | 568.299  | 0.032  |
| Signal Boards      | 2035 | 51     | 120     | 3.929    | 0.192  | 3.445   | 1.482   | 0.006  | 0.018  | 0.018  | 568.299  | 0.017  |
| Signal Boards      | 2035 | 121    | 175     | 5.439    | 0.138  | 3.048   | 0.372   | 0.006  | 0.014  | 0.014  | 568.299  | 0.012  |
| Signal Boards      | 2035 | 176    | 250     | 8.75     | 0.162  | 1.254   | 0.401   | 0.007  | 0.014  | 0.014  | 686.695  | 0.014  |
| Signal Boards      | 2040 | 6      | 15      | 1.04     | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Signal Boards      | 2040 | 26     | 50      | 3.289    | 0.356  | 4.074   | 3.037   | 0.007  | 0.014  | 0.014  | 568.299  | 0.032  |
| Signal Boards      | 2040 | 51     | 120     | 3.848    | 0.188  | 3.447   | 1.428   | 0.006  | 0.013  | 0.013  | 568.299  | 0.016  |
| Signal Boards      | 2040 | 121    | 175     | 5.177    | 0.131  | 3.05    | 0.296   | 0.006  | 0.011  | 0.011  | 568.299  | 0.011  |
| Signal Boards      | 2040 | 176    | 250     | 8.473    | 0.157  | 1.255   | 0.341   | 0.007  | 0.012  | 0.012  | 686.695  | 0.014  |
| Skid Steer Loaders | 1990 | 16     | 25      | 4.928    | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Skid Steer Loaders | 1990 | 26     | 50      | 18.4     | 4.466  | 9.113   | 7.821   | 0.871  | 1.202  | 1.202  | 568.299  | 0.403  |
| Skid Steer Loaders | 1990 | 51     | 120     | 15.551   | 2.252  | 5.536   | 14.506  | 0.791  | 1.262  | 1.262  | 568.299  | 0.203  |
| Skid Steer Loaders | 2000 | 16     | 25      | 4.659    | 2.092  | 4.777   | 6.403   | 0.065  | 0.568  | 0.568  | 568.299  | 0.188  |
| Skid Steer Loaders | 2000 | 26     | 50      | 15.338   | 3.723  | 7.849   | 6.733   | 0.066  | 0.816  | 0.816  | 568.299  | 0.335  |
| Skid Steer Loaders | 2000 | 51     | 120     | 10.902   | 1.579  | 4.162   | 9.028   | 0.06   | 0.779  | 0.779  | 568.299  | 0.142  |
| Skid Steer Loaders | 2005 | 16     | 25      | 3.352    | 1.505  | 3.709   | 5.913   | 0.065  | 0.461  | 0.461  | 568.299  | 0.135  |
| Skid Steer Loaders | 2005 | 26     | 50      | 12.458   | 3.024  | 6.864   | 6.068   | 0.066  | 0.716  | 0.716  | 568.3    | 0.272  |
| Skid Steer Loaders | 2005 | 51     | 120     | 9.248    | 1.339  | 3.988   | 7.653   | 0.06   | 0.712  | 0.712  | 568.299  | 0.12   |
| Skid Steer Loaders | 2010 | 16     | 25      | 1.189544 | 0.9995 | 4.48486 | 5.29745 | 0.0054 | 0.4354 | 0.4006 | 586.3356 | 0.1707 |
| Skid Steer Loaders | 2010 | 26     | 50      | 1.189544 | 0.9995 | 4.48486 | 5.29745 | 0.0054 | 0.4354 | 0.4006 | 586.3356 | 0.1707 |
| Skid Steer Loaders | 2010 | 51     | 120     | 0.504832 | 0.4242 | 3.40768 | 5.19396 | 0.0049 | 0.3441 | 0.3166 | 525.6915 | 0.153  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type      | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|---------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Skid Steer Loaders  | 2011 | 16     | 25      | 1.055747 | 0.8871 | 4.32754 | 5.2163  | 0.0054 | 0.402  | 0.3698 | 584.7285 | 0.1706 |
| Skid Steer Loaders  | 2011 | 26     | 50      | 1.055747 | 0.8871 | 4.32754 | 5.2163  | 0.0054 | 0.402  | 0.3698 | 584.7285 | 0.1706 |
| Skid Steer Loaders  | 2011 | 51     | 120     | 0.460213 | 0.3867 | 3.38539 | 4.88341 | 0.0049 | 0.3163 | 0.291  | 524.0915 | 0.1529 |
| Skid Steer Loaders  | 2012 | 16     | 25      | 1.031332 | 0.8666 | 4.33156 | 5.12974 | 0.0054 | 0.3877 | 0.3567 | 583.1258 | 0.1706 |
| Skid Steer Loaders  | 2012 | 26     | 50      | 1.031332 | 0.8666 | 4.33156 | 5.12974 | 0.0054 | 0.3877 | 0.3567 | 583.1258 | 0.1706 |
| Skid Steer Loaders  | 2012 | 51     | 120     | 0.443294 | 0.3725 | 3.38462 | 4.73478 | 0.0049 | 0.3031 | 0.2788 | 522.5357 | 0.1529 |
| Skid Steer Loaders  | 2013 | 16     | 25      | 0.908612 | 0.7635 | 4.17576 | 4.84472 | 0.0054 | 0.3375 | 0.3105 | 580.0144 | 0.1705 |
| Skid Steer Loaders  | 2013 | 26     | 50      | 0.908612 | 0.7635 | 4.17576 | 4.84472 | 0.0054 | 0.3375 | 0.3105 | 580.0144 | 0.1705 |
| Skid Steer Loaders  | 2013 | 51     | 120     | 0.404938 | 0.3403 | 3.36337 | 4.44237 | 0.0049 | 0.271  | 0.2494 | 519.6388 | 0.1528 |
| Skid Steer Loaders  | 2014 | 16     | 25      | 0.790746 | 0.6644 | 4.01585 | 4.54075 | 0.0054 | 0.2856 | 0.2628 | 577.0757 | 0.1705 |
| Skid Steer Loaders  | 2014 | 26     | 50      | 0.790746 | 0.6644 | 4.01585 | 4.54075 | 0.0054 | 0.2856 | 0.2628 | 577.0757 | 0.1705 |
| Skid Steer Loaders  | 2014 | 51     | 120     | 0.361873 | 0.3041 | 3.33829 | 4.0133  | 0.0049 | 0.2345 | 0.2158 | 517.0621 | 0.1528 |
| Skid Steer Loaders  | 2015 | 16     | 25      | 0.760751 | 0.6392 | 4.00436 | 4.43612 | 0.0054 | 0.2674 | 0.246  | 571.4195 | 0.1706 |
| Skid Steer Loaders  | 2015 | 26     | 50      | 0.760751 | 0.6392 | 4.00436 | 4.43612 | 0.0054 | 0.2674 | 0.246  | 571.4195 | 0.1706 |
| Skid Steer Loaders  | 2015 | 51     | 120     | 0.349713 | 0.2939 | 3.33751 | 3.8106  | 0.0049 | 0.2202 | 0.2026 | 511.595  | 0.1527 |
| Skid Steer Loaders  | 2016 | 16     | 25      | 0.713135 | 0.5992 | 3.95661 | 4.26784 | 0.0054 | 0.2406 | 0.2213 | 565.2281 | 0.1705 |
| Skid Steer Loaders  | 2016 | 26     | 50      | 0.713135 | 0.5992 | 3.95661 | 4.26784 | 0.0054 | 0.2406 | 0.2213 | 565.2281 | 0.1705 |
| Skid Steer Loaders  | 2016 | 51     | 120     | 0.325064 | 0.2731 | 3.32767 | 3.53439 | 0.0049 | 0.1974 | 0.1816 | 506.2971 | 0.1527 |
| Skid Steer Loaders  | 2017 | 16     | 25      | 0.676461 | 0.5684 | 3.91907 | 4.11272 | 0.0054 | 0.2175 | 0.2001 | 556.7144 | 0.1706 |
| Skid Steer Loaders  | 2017 | 26     | 50      | 0.676461 | 0.5684 | 3.91907 | 4.11272 | 0.0054 | 0.2175 | 0.2001 | 556.7144 | 0.1706 |
| Skid Steer Loaders  | 2017 | 51     | 120     | 0.303772 | 0.2553 | 3.31863 | 3.28618 | 0.0049 | 0.1766 | 0.1625 | 498.3256 | 0.1527 |
| Skid Steer Loaders  | 2018 | 16     | 25      | 0.579635 | 0.4871 | 3.78725 | 3.88962 | 0.0054 | 0.1783 | 0.164  | 547.5575 | 0.1705 |
| Skid Steer Loaders  | 2018 | 26     | 50      | 0.579635 | 0.4871 | 3.78725 | 3.88962 | 0.0054 | 0.1783 | 0.164  | 547.5575 | 0.1705 |
| Skid Steer Loaders  | 2018 | 51     | 120     | 0.256853 | 0.2158 | 3.28204 | 2.86    | 0.0049 | 0.1398 | 0.1286 | 490.0935 | 0.1526 |
| Skid Steer Loaders  | 2019 | 16     | 25      | 0.531282 | 0.4464 | 3.73957 | 3.75009 | 0.0054 | 0.1536 | 0.1413 | 539.2667 | 0.1706 |
| Skid Steer Loaders  | 2019 | 26     | 50      | 0.531282 | 0.4464 | 3.73957 | 3.75009 | 0.0054 | 0.1536 | 0.1413 | 539.2667 | 0.1706 |
| Skid Steer Loaders  | 2019 | 51     | 120     | 0.2373   | 0.1994 | 3.27736 | 2.65586 | 0.0049 | 0.1217 | 0.1119 | 482.3844 | 0.1526 |
| Skid Steer Loaders  | 2020 | 16     | 25      | 0.522771 | 0.4393 | 3.76397 | 3.69113 | 0.0054 | 0.1447 | 0.1331 | 527.7577 | 0.1707 |
| Skid Steer Loaders  | 2020 | 26     | 50      | 0.522771 | 0.4393 | 3.76397 | 3.69113 | 0.0054 | 0.1447 | 0.1331 | 527.7577 | 0.1707 |
| Skid Steer Loaders  | 2020 | 51     | 120     | 0.224183 | 0.1884 | 3.2771  | 2.5046  | 0.0049 | 0.1084 | 0.0997 | 471.9075 | 0.1526 |
| Skid Steer Loaders  | 2021 | 16     | 25      | 0.486515 | 0.4088 | 3.73158 | 3.57304 | 0.0054 | 0.1263 | 0.1162 | 527.4501 | 0.1706 |
| Skid Steer Loaders  | 2021 | 26     | 50      | 0.486515 | 0.4088 | 3.73158 | 3.57304 | 0.0054 | 0.1263 | 0.1162 | 527.4501 | 0.1706 |
| Skid Steer Loaders  | 2021 | 51     | 120     | 0.211817 | 0.178  | 3.27687 | 2.36588 | 0.0049 | 0.0963 | 0.0886 | 471.9774 | 0.1526 |
| Skid Steer Loaders  | 2022 | 16     | 25      | 0.434318 | 0.3649 | 3.65597 | 3.43256 | 0.0054 | 0.103  | 0.0947 | 527.2726 | 0.1705 |
| Skid Steer Loaders  | 2022 | 26     | 50      | 0.434318 | 0.3649 | 3.65597 | 3.43256 | 0.0054 | 0.103  | 0.0947 | 527.2726 | 0.1705 |
| Skid Steer Loaders  | 2022 | 51     | 120     | 0.195311 | 0.1641 | 3.27037 | 2.18922 | 0.0049 | 0.0814 | 0.0748 | 472.4321 | 0.1528 |
| Skid Steer Loaders  | 2023 | 16     | 25      | 0.420524 | 0.3534 | 3.65358 | 3.37057 | 0.0054 | 0.0933 | 0.0858 | 527.4231 | 0.1706 |
| Skid Steer Loaders  | 2023 | 26     | 50      | 0.420524 | 0.3534 | 3.65358 | 3.37057 | 0.0054 | 0.0933 | 0.0858 | 527.4231 | 0.1706 |
| Skid Steer Loaders  | 2023 | 51     | 120     | 0.182613 | 0.1534 | 3.26613 | 2.03854 | 0.0049 | 0.069  | 0.0634 | 472.656  | 0.1529 |
| Skid Steer Loaders  | 2024 | 16     | 25      | 0.415881 | 0.3495 | 3.67076 | 3.34552 | 0.0054 | 0.0887 | 0.0816 | 527.8005 | 0.1707 |
| Skid Steer Loaders  | 2024 | 26     | 50      | 0.415881 | 0.3495 | 3.67076 | 3.34552 | 0.0054 | 0.0887 | 0.0816 | 527.8005 | 0.1707 |
| Skid Steer Loaders  | 2024 | 51     | 120     | 0.174841 | 0.1469 | 3.26403 | 1.94841 | 0.0049 | 0.0626 | 0.0576 | 472.847  | 0.1529 |
| Skid Steer Loaders  | 2025 | 16     | 25      | 0.406183 | 0.3413 | 3.6601  | 3.30934 | 0.0055 | 0.0839 | 0.0772 | 527.8608 | 0.1707 |
| Skid Steer Loaders  | 2025 | 26     | 50      | 0.406183 | 0.3413 | 3.6601  | 3.30934 | 0.0055 | 0.0839 | 0.0772 | 527.8608 | 0.1707 |
| Skid Steer Loaders  | 2025 | 51     | 120     | 0.166357 | 0.1398 | 3.25156 | 1.86736 | 0.0049 | 0.0567 | 0.0521 | 472.6295 | 0.1529 |
| Skid Steer Loaders  | 2030 | 16     | 25      | 1.526    | 0.685  | 2.34    | 4.332   | 0.007  | 0.162  | 0.162  | 568.299  | 0.061  |
| Skid Steer Loaders  | 2030 | 26     | 50      | 1.694    | 0.411  | 4.386   | 3.128   | 0.007  | 0.018  | 0.018  | 568.299  | 0.037  |
| Skid Steer Loaders  | 2030 | 51     | 120     | 1.478    | 0.214  | 3.538   | 1.477   | 0.006  | 0.017  | 0.017  | 568.299  | 0.019  |
| Skid Steer Loaders  | 2035 | 16     | 25      | 1.526    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Skid Steer Loaders  | 2035 | 26     | 50      | 1.694    | 0.411  | 4.39    | 3.097   | 0.007  | 0.015  | 0.015  | 568.299  | 0.037  |
| Skid Steer Loaders  | 2035 | 51     | 120     | 1.459    | 0.211  | 3.54    | 1.442   | 0.006  | 0.014  | 0.014  | 568.299  | 0.019  |
| Skid Steer Loaders  | 2040 | 16     | 25      | 1.526    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Skid Steer Loaders  | 2040 | 26     | 50      | 1.696    | 0.411  | 4.392   | 3.093   | 0.007  | 0.014  | 0.014  | 568.299  | 0.037  |
| Skid Steer Loaders  | 2040 | 51     | 120     | 1.456    | 0.211  | 3.54    | 1.435   | 0.006  | 0.013  | 0.013  | 568.3    | 0.019  |
| Surfacing Equipment | 1990 | 26     | 50      | 8.011    | 4.203  | 8.629   | 7.726   | 0.871  | 1.147  | 1.147  | 568.299  | 0.379  |
| Surfacing Equipment | 1990 | 51     | 120     | 18.985   | 2.203  | 5.473   | 14.403  | 0.791  | 1.214  | 1.214  | 568.299  | 0.198  |
| Surfacing Equipment | 1990 | 121    | 175     | 19.781   | 1.707  | 4.883   | 13.91   | 0.758  | 0.927  | 0.927  | 568.3    | 0.154  |
| Surfacing Equipment | 1990 | 176    | 250     | 31.103   | 1.707  | 4.883   | 13.91   | 0.758  | 0.927  | 0.927  | 568.299  | 0.154  |
| Surfacing Equipment | 1990 | 251    | 500     | 45.625   | 1.526  | 9.66    | 13.316  | 0.662  | 0.805  | 0.805  | 568.299  | 0.137  |
| Surfacing Equipment | 1990 | 501    | 750     | 71.58    | 1.526  | 9.66    | 13.316  | 1.018  | 0.82   | 0.82   | 568.299  | 0.137  |
| Surfacing Equipment | 2000 | 26     | 50      | 6.689    | 3.509  | 7.426   | 6.755   | 0.066  | 0.779  | 0.779  | 568.299  | 0.316  |
| Surfacing Equipment | 2000 | 51     | 120     | 14.399   | 1.671  | 4.385   | 9.991   | 0.06   | 0.768  | 0.768  | 568.299  | 0.15   |
| Surfacing Equipment | 2000 | 121    | 175     | 13.132   | 1.133  | 3.583   | 9.132   | 0.057  | 0.458  | 0.458  | 568.299  | 0.102  |
| Surfacing Equipment | 2000 | 176    | 250     | 17.689   | 0.97   | 2.937   | 8.84    | 0.057  | 0.385  | 0.385  | 568.299  | 0.087  |
| Surfacing Equipment | 2000 | 251    | 500     | 26.875   | 0.899  | 4.584   | 8.551   | 0.05   | 0.347  | 0.347  | 568.299  | 0.081  |
| Surfacing Equipment | 2000 | 501    | 750     | 42.164   | 0.899  | 4.584   | 8.551   | 0.052  | 0.347  | 0.347  | 568.299  | 0.081  |
| Surfacing Equipment | 2005 | 26     | 50      | 6.001    | 3.148  | 6.936   | 6.318   | 0.066  | 0.727  | 0.727  | 568.3    | 0.284  |
| Surfacing Equipment | 2005 | 51     | 120     | 12.568   | 1.458  | 4.122   | 8.636   | 0.06   | 0.718  | 0.718  | 568.299  | 0.131  |
| Surfacing Equipment | 2005 | 121    | 175     | 11.032   | 0.952  | 3.316   | 7.874   | 0.057  | 0.402  | 0.402  | 568.3    | 0.085  |
| Surfacing Equipment | 2005 | 176    | 250     | 13.31    | 0.73   | 2.16    | 7.529   | 0.057  | 0.29   | 0.29   | 568.299  | 0.065  |
| Surfacing Equipment | 2005 | 251    | 500     | 19.448   | 0.65   | 3.023   | 6.988   | 0.05   | 0.26   | 0.26   | 568.299  | 0.058  |
| Surfacing Equipment | 2005 | 501    | 750     | 31.164   | 0.664  | 3.019   | 7.132   | 0.052  | 0.262  | 0.262  | 568.299  | 0.059  |
| Surfacing Equipment | 2010 | 26     | 50      | 1.528976 | 1.2848 | 4.99949 | 5.66618 | 0.0055 | 0.4788 | 0.4405 | 593.0498 | 0.1726 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type      | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|---------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Surfacing Equipment | 2010 | 51     | 120     | 0.730908 | 0.6142 | 3.59404 | 6.16537 | 0.0049 | 0.4366 | 0.4017 | 524.0289 | 0.1525 |
| Surfacing Equipment | 2010 | 121    | 175     | 0.662829 | 0.557  | 3.09066 | 6.60554 | 0.0048 | 0.3178 | 0.2924 | 522.4909 | 0.1521 |
| Surfacing Equipment | 2010 | 176    | 250     | 0.488779 | 0.4107 | 1.7501  | 6.37687 | 0.0049 | 0.2119 | 0.195  | 530.3611 | 0.1544 |
| Surfacing Equipment | 2010 | 251    | 500     | 0.29849  | 0.2508 | 1.5491  | 4.43284 | 0.0049 | 0.1443 | 0.1327 | 522.9659 | 0.1522 |
| Surfacing Equipment | 2010 | 501    | 750     | 0.208991 | 0.1756 | 1.09654 | 3.5514  | 0.0049 | 0.1116 | 0.1027 | 524.8847 | 0.1528 |
| Surfacing Equipment | 2011 | 26     | 50      | 1.476255 | 1.2405 | 4.95391 | 5.62022 | 0.0055 | 0.4673 | 0.4299 | 590.2612 | 0.1722 |
| Surfacing Equipment | 2011 | 51     | 120     | 0.710662 | 0.5972 | 3.58797 | 5.98734 | 0.0049 | 0.4274 | 0.3932 | 522.8446 | 0.1526 |
| Surfacing Equipment | 2011 | 121    | 175     | 0.6472   | 0.5438 | 3.07389 | 6.46356 | 0.0048 | 0.3119 | 0.287  | 521.1883 | 0.1521 |
| Surfacing Equipment | 2011 | 176    | 250     | 0.481299 | 0.4044 | 1.72048 | 6.2863  | 0.0049 | 0.2075 | 0.1909 | 529.0217 | 0.1544 |
| Surfacing Equipment | 2011 | 251    | 500     | 0.289572 | 0.2433 | 1.48634 | 4.26701 | 0.0048 | 0.1358 | 0.125  | 520.4212 | 0.1519 |
| Surfacing Equipment | 2011 | 501    | 750     | 0.214952 | 0.1806 | 1.10325 | 3.56055 | 0.0049 | 0.1128 | 0.1038 | 523.5482 | 0.1528 |
| Surfacing Equipment | 2012 | 26     | 50      | 1.500607 | 1.2609 | 5.03037 | 5.63914 | 0.0055 | 0.4725 | 0.4347 | 588.7118 | 0.1722 |
| Surfacing Equipment | 2012 | 51     | 120     | 0.709653 | 0.5963 | 3.59999 | 5.94999 | 0.0049 | 0.4261 | 0.392  | 521.4233 | 0.1525 |
| Surfacing Equipment | 2012 | 121    | 175     | 0.653605 | 0.5492 | 3.0893  | 6.48747 | 0.0048 | 0.3154 | 0.2902 | 519.886  | 0.1521 |
| Surfacing Equipment | 2012 | 176    | 250     | 0.481696 | 0.4048 | 1.72816 | 6.22653 | 0.0049 | 0.2072 | 0.1907 | 527.6815 | 0.1544 |
| Surfacing Equipment | 2012 | 251    | 500     | 0.290035 | 0.2437 | 1.49574 | 4.20283 | 0.0048 | 0.1343 | 0.1236 | 519.0487 | 0.1518 |
| Surfacing Equipment | 2012 | 501    | 750     | 0.210249 | 0.1767 | 1.04051 | 3.45723 | 0.0049 | 0.1086 | 0.0999 | 521.0672 | 0.1524 |
| Surfacing Equipment | 2013 | 26     | 50      | 1.455428 | 1.223  | 4.99596 | 5.53803 | 0.0055 | 0.4571 | 0.4205 | 585.7193 | 0.1722 |
| Surfacing Equipment | 2013 | 51     | 120     | 0.69949  | 0.5878 | 3.60266 | 5.8163  | 0.0049 | 0.415  | 0.3818 | 518.7481 | 0.1525 |
| Surfacing Equipment | 2013 | 121    | 175     | 0.588968 | 0.4949 | 3.00889 | 5.94134 | 0.0049 | 0.2862 | 0.2633 | 518.4738 | 0.1524 |
| Surfacing Equipment | 2013 | 176    | 250     | 0.441295 | 0.3708 | 1.62196 | 5.8812  | 0.0049 | 0.187  | 0.172  | 524.5301 | 0.1542 |
| Surfacing Equipment | 2013 | 251    | 500     | 0.288988 | 0.2428 | 1.50462 | 4.09243 | 0.0048 | 0.1314 | 0.1209 | 516.1488 | 0.1518 |
| Surfacing Equipment | 2013 | 501    | 750     | 0.215353 | 0.181  | 1.04387 | 3.46124 | 0.0049 | 0.1095 | 0.1008 | 518.3853 | 0.1524 |
| Surfacing Equipment | 2014 | 26     | 50      | 1.358041 | 1.1411 | 4.87668 | 5.42525 | 0.0055 | 0.4342 | 0.3995 | 582.7249 | 0.1722 |
| Surfacing Equipment | 2014 | 51     | 120     | 0.665267 | 0.559  | 3.58043 | 5.52029 | 0.0049 | 0.3908 | 0.3595 | 516.3377 | 0.1526 |
| Surfacing Equipment | 2014 | 121    | 175     | 0.561853 | 0.4721 | 3.01212 | 5.71146 | 0.0049 | 0.2727 | 0.2508 | 515.8203 | 0.1524 |
| Surfacing Equipment | 2014 | 176    | 250     | 0.364211 | 0.306  | 1.43363 | 5.10182 | 0.0049 | 0.1493 | 0.1374 | 521.4518 | 0.1541 |
| Surfacing Equipment | 2014 | 251    | 500     | 0.2821   | 0.237  | 1.50147 | 3.8952  | 0.0048 | 0.1255 | 0.1155 | 513.6157 | 0.1518 |
| Surfacing Equipment | 2014 | 501    | 750     | 0.206755 | 0.1737 | 1.02007 | 3.28435 | 0.0049 | 0.1032 | 0.0949 | 516.3212 | 0.1526 |
| Surfacing Equipment | 2015 | 26     | 50      | 1.223408 | 1.028  | 4.69178 | 5.25471 | 0.0055 | 0.4019 | 0.3698 | 576.7706 | 0.1722 |
| Surfacing Equipment | 2015 | 51     | 120     | 0.651534 | 0.5475 | 3.57496 | 5.37414 | 0.0049 | 0.378  | 0.3478 | 510.1417 | 0.1523 |
| Surfacing Equipment | 2015 | 121    | 175     | 0.568    | 0.4773 | 3.02727 | 5.73307 | 0.0049 | 0.2756 | 0.2536 | 510.5481 | 0.1524 |
| Surfacing Equipment | 2015 | 176    | 250     | 0.36864  | 0.3098 | 1.44156 | 5.11205 | 0.0049 | 0.1506 | 0.1385 | 516.058  | 0.1541 |
| Surfacing Equipment | 2015 | 251    | 500     | 0.286581 | 0.2408 | 1.51303 | 3.90037 | 0.0048 | 0.1265 | 0.1164 | 508.3985 | 0.1518 |
| Surfacing Equipment | 2015 | 501    | 750     | 0.211433 | 0.1777 | 1.02353 | 3.28678 | 0.0049 | 0.104  | 0.0957 | 511.1157 | 0.1526 |
| Surfacing Equipment | 2016 | 26     | 50      | 1.243319 | 1.0447 | 4.7626  | 5.27275 | 0.0055 | 0.4061 | 0.3736 | 570.8145 | 0.1722 |
| Surfacing Equipment | 2016 | 51     | 120     | 0.621267 | 0.522  | 3.54977 | 5.05142 | 0.0049 | 0.3486 | 0.3207 | 505.0873 | 0.1524 |
| Surfacing Equipment | 2016 | 121    | 175     | 0.544572 | 0.4576 | 3.00649 | 5.45794 | 0.0049 | 0.2651 | 0.2439 | 504.5576 | 0.1522 |
| Surfacing Equipment | 2016 | 176    | 250     | 0.365495 | 0.3071 | 1.42946 | 5.04791 | 0.0049 | 0.1483 | 0.1365 | 510.7058 | 0.154  |
| Surfacing Equipment | 2016 | 251    | 500     | 0.258417 | 0.2171 | 1.42484 | 3.46816 | 0.0048 | 0.1111 | 0.1022 | 502.4709 | 0.1516 |
| Surfacing Equipment | 2016 | 501    | 750     | 0.192579 | 0.1618 | 0.99966 | 2.87955 | 0.0049 | 0.0926 | 0.0852 | 506.967  | 0.1529 |
| Surfacing Equipment | 2017 | 26     | 50      | 1.10469  | 0.9282 | 4.60324 | 5.0643  | 0.0055 | 0.3651 | 0.3359 | 564.4772 | 0.173  |
| Surfacing Equipment | 2017 | 51     | 120     | 0.604716 | 0.5081 | 3.55587 | 4.94212 | 0.0049 | 0.3373 | 0.3103 | 498.36   | 0.1527 |
| Surfacing Equipment | 2017 | 121    | 175     | 0.541755 | 0.4552 | 3.00273 | 5.39296 | 0.0049 | 0.2638 | 0.2427 | 496.2741 | 0.1521 |
| Surfacing Equipment | 2017 | 176    | 250     | 0.325463 | 0.2735 | 1.3431  | 4.46793 | 0.0049 | 0.1291 | 0.1187 | 501.8465 | 0.1538 |
| Surfacing Equipment | 2017 | 251    | 500     | 0.242435 | 0.2037 | 1.3962  | 3.10636 | 0.0049 | 0.1026 | 0.0944 | 496.885  | 0.1522 |
| Surfacing Equipment | 2017 | 501    | 750     | 0.190932 | 0.1604 | 1.00272 | 2.76955 | 0.0049 | 0.0904 | 0.0832 | 499.7117 | 0.1531 |
| Surfacing Equipment | 2018 | 26     | 50      | 0.927049 | 0.779  | 4.35302 | 4.81982 | 0.0055 | 0.3198 | 0.2942 | 555.7363 | 0.173  |
| Surfacing Equipment | 2018 | 51     | 120     | 0.49279  | 0.4141 | 3.48871 | 4.28388 | 0.0049 | 0.2685 | 0.247  | 491.3172 | 0.153  |
| Surfacing Equipment | 2018 | 121    | 175     | 0.44632  | 0.375  | 2.97609 | 4.47527 | 0.0049 | 0.2151 | 0.1979 | 488.4406 | 0.1521 |
| Surfacing Equipment | 2018 | 176    | 250     | 0.286758 | 0.241  | 1.234   | 3.98866 | 0.0049 | 0.1127 | 0.1037 | 494.1388 | 0.1538 |
| Surfacing Equipment | 2018 | 251    | 500     | 0.187325 | 0.1574 | 1.22557 | 2.20389 | 0.0049 | 0.0761 | 0.07   | 487.8722 | 0.1519 |
| Surfacing Equipment | 2018 | 501    | 750     | 0.169556 | 0.1425 | 0.99347 | 2.26863 | 0.0049 | 0.0783 | 0.072  | 488.86   | 0.1522 |
| Surfacing Equipment | 2019 | 26     | 50      | 0.765383 | 0.6431 | 4.0998  | 4.41999 | 0.0055 | 0.2503 | 0.2303 | 547.0462 | 0.1731 |
| Surfacing Equipment | 2019 | 51     | 120     | 0.42278  | 0.3553 | 3.44856 | 3.82306 | 0.0049 | 0.2256 | 0.2076 | 484.0757 | 0.1532 |
| Surfacing Equipment | 2019 | 121    | 175     | 0.425034 | 0.3571 | 2.97177 | 4.23866 | 0.0048 | 0.2036 | 0.1873 | 479.6717 | 0.1518 |
| Surfacing Equipment | 2019 | 176    | 250     | 0.257694 | 0.2165 | 1.21576 | 3.39993 | 0.0049 | 0.1007 | 0.0927 | 486.8417 | 0.154  |
| Surfacing Equipment | 2019 | 251    | 500     | 0.173135 | 0.1455 | 1.2143  | 1.89944 | 0.0049 | 0.0681 | 0.0626 | 481.8965 | 0.1525 |
| Surfacing Equipment | 2019 | 501    | 750     | 0.168821 | 0.1419 | 0.99372 | 2.17879 | 0.0049 | 0.0763 | 0.0702 | 480.166  | 0.1519 |
| Surfacing Equipment | 2020 | 26     | 50      | 0.637406 | 0.5356 | 3.93357 | 4.23906 | 0.0055 | 0.2164 | 0.1991 | 535.5275 | 0.1732 |
| Surfacing Equipment | 2020 | 51     | 120     | 0.392345 | 0.3297 | 3.43932 | 3.61216 | 0.0049 | 0.2063 | 0.1898 | 473.8188 | 0.1532 |
| Surfacing Equipment | 2020 | 121    | 175     | 0.365927 | 0.3075 | 2.93068 | 3.67232 | 0.0048 | 0.1745 | 0.1606 | 469.2079 | 0.1518 |
| Surfacing Equipment | 2020 | 176    | 250     | 0.252128 | 0.2119 | 1.21774 | 3.22243 | 0.0049 | 0.0972 | 0.0894 | 476.4261 | 0.1541 |
| Surfacing Equipment | 2020 | 251    | 500     | 0.173203 | 0.1455 | 1.21902 | 1.83755 | 0.0049 | 0.0669 | 0.0615 | 471.6331 | 0.1525 |
| Surfacing Equipment | 2020 | 501    | 750     | 0.168871 | 0.1419 | 0.99569 | 2.09374 | 0.0049 | 0.0744 | 0.0684 | 469.6252 | 0.1519 |
| Surfacing Equipment | 2021 | 26     | 50      | 0.60314  | 0.5068 | 3.93231 | 4.18875 | 0.0055 | 0.204  | 0.1876 | 535.784  | 0.1733 |
| Surfacing Equipment | 2021 | 51     | 120     | 0.370907 | 0.3117 | 3.43619 | 3.46112 | 0.0049 | 0.1905 | 0.1753 | 474.0906 | 0.1533 |
| Surfacing Equipment | 2021 | 121    | 175     | 0.307112 | 0.2581 | 2.91895 | 3.09858 | 0.0048 | 0.1454 | 0.1337 | 469.1687 | 0.1517 |
| Surfacing Equipment | 2021 | 176    | 250     | 0.245986 | 0.2067 | 1.21854 | 2.99364 | 0.0049 | 0.0923 | 0.0849 | 476.8023 | 0.1542 |
| Surfacing Equipment | 2021 | 251    | 500     | 0.167588 | 0.1408 | 1.20226 | 1.75282 | 0.0049 | 0.0635 | 0.0584 | 471.7484 | 0.1526 |
| Surfacing Equipment | 2021 | 501    | 750     | 0.148862 | 0.1251 | 0.99181 | 1.59712 | 0.0049 | 0.0615 | 0.0566 | 470.4087 | 0.1521 |
| Surfacing Equipment | 2022 | 26     | 50      | 0.509163 | 0.4278 | 3.77243 | 3.9114  | 0.0055 | 0.1544 | 0.1421 | 535.8364 | 0.1733 |
| Surfacing Equipment | 2022 | 51     | 120     | 0.34882  | 0.2931 | 3.40936 | 3.24974 | 0.0049 | 0.1747 | 0.1607 | 473.6362 | 0.1532 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type      | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|---------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Surfacing Equipment | 2022 | 121    | 175     | 0.283918 | 0.2386 | 2.90957 | 2.70137 | 0.0048 | 0.1302 | 0.1198 | 469.1259 | 0.1517 |
| Surfacing Equipment | 2022 | 176    | 250     | 0.233135 | 0.1959 | 1.21737 | 2.66709 | 0.0049 | 0.0852 | 0.0784 | 476.9511 | 0.1543 |
| Surfacing Equipment | 2022 | 251    | 500     | 0.157417 | 0.1323 | 1.16047 | 1.5573  | 0.0049 | 0.0574 | 0.0528 | 470.5248 | 0.1522 |
| Surfacing Equipment | 2022 | 501    | 750     | 0.136805 | 0.115  | 0.98819 | 1.35503 | 0.0049 | 0.0523 | 0.0481 | 470.4004 | 0.1521 |
| Surfacing Equipment | 2023 | 26     | 50      | 0.51987  | 0.4368 | 3.83184 | 3.92432 | 0.0055 | 0.1555 | 0.143  | 535.9295 | 0.1733 |
| Surfacing Equipment | 2023 | 51     | 120     | 0.321277 | 0.27   | 3.39556 | 3.05811 | 0.0049 | 0.1566 | 0.1441 | 474.4698 | 0.1535 |
| Surfacing Equipment | 2023 | 121    | 175     | 0.267066 | 0.2244 | 2.91383 | 2.45516 | 0.0049 | 0.1191 | 0.1095 | 470.0141 | 0.152  |
| Surfacing Equipment | 2023 | 176    | 250     | 0.22795  | 0.1915 | 1.21946 | 2.50162 | 0.0049 | 0.0817 | 0.0752 | 476.9606 | 0.1543 |
| Surfacing Equipment | 2023 | 251    | 500     | 0.156473 | 0.1315 | 1.16329 | 1.47556 | 0.0049 | 0.0556 | 0.0512 | 470.3746 | 0.1521 |
| Surfacing Equipment | 2023 | 501    | 750     | 0.119512 | 0.1004 | 0.98543 | 1.08063 | 0.0049 | 0.0403 | 0.0371 | 472.4466 | 0.1528 |
| Surfacing Equipment | 2024 | 26     | 50      | 0.396453 | 0.3331 | 3.66193 | 3.72069 | 0.0055 | 0.1161 | 0.1068 | 536.0304 | 0.1734 |
| Surfacing Equipment | 2024 | 51     | 120     | 0.29879  | 0.2511 | 3.3893  | 2.8828  | 0.0049 | 0.1424 | 0.131  | 475.3806 | 0.1537 |
| Surfacing Equipment | 2024 | 121    | 175     | 0.271298 | 0.228  | 2.92962 | 2.46372 | 0.0049 | 0.1201 | 0.1105 | 470.0767 | 0.152  |
| Surfacing Equipment | 2024 | 176    | 250     | 0.209166 | 0.1758 | 1.18272 | 2.23638 | 0.0049 | 0.071  | 0.0653 | 477.096  | 0.1543 |
| Surfacing Equipment | 2024 | 251    | 500     | 0.159183 | 0.1338 | 1.16767 | 1.47769 | 0.0049 | 0.0559 | 0.0514 | 470.2521 | 0.1521 |
| Surfacing Equipment | 2024 | 501    | 750     | 0.112194 | 0.0943 | 0.98493 | 0.94669 | 0.0049 | 0.0345 | 0.0317 | 472.9833 | 0.153  |
| Surfacing Equipment | 2025 | 26     | 50      | 0.279239 | 0.2346 | 3.53733 | 3.57642 | 0.0055 | 0.0816 | 0.075  | 536.14   | 0.1734 |
| Surfacing Equipment | 2025 | 51     | 120     | 0.276433 | 0.2323 | 3.38535 | 2.6591  | 0.0049 | 0.1243 | 0.1143 | 476.7656 | 0.1542 |
| Surfacing Equipment | 2025 | 121    | 175     | 0.222452 | 0.1869 | 2.92602 | 1.9987  | 0.0049 | 0.0942 | 0.0867 | 471.0403 | 0.1523 |
| Surfacing Equipment | 2025 | 176    | 250     | 0.176026 | 0.1479 | 1.14337 | 1.74736 | 0.0049 | 0.0549 | 0.0505 | 477.11   | 0.1543 |
| Surfacing Equipment | 2025 | 251    | 500     | 0.152175 | 0.1279 | 1.16861 | 1.3268  | 0.0049 | 0.051  | 0.0469 | 470.2827 | 0.1521 |
| Surfacing Equipment | 2025 | 501    | 750     | 0.101486 | 0.0853 | 0.9776  | 0.76806 | 0.0049 | 0.0267 | 0.0245 | 470.5508 | 0.1522 |
| Surfacing Equipment | 2030 | 26     | 50      | 0.988    | 0.518  | 4.295   | 3.4     | 0.007  | 0.075  | 0.075  | 568.299  | 0.046  |
| Surfacing Equipment | 2030 | 51     | 120     | 2.281    | 0.264  | 3.492   | 1.959   | 0.006  | 0.068  | 0.068  | 568.299  | 0.023  |
| Surfacing Equipment | 2030 | 121    | 175     | 2.286    | 0.197  | 3.071   | 0.939   | 0.006  | 0.043  | 0.043  | 568.299  | 0.017  |
| Surfacing Equipment | 2030 | 176    | 250     | 3.134    | 0.172  | 1.064   | 0.789   | 0.006  | 0.026  | 0.026  | 568.299  | 0.015  |
| Surfacing Equipment | 2030 | 251    | 500     | 5.062    | 0.169  | 1.032   | 0.738   | 0.005  | 0.025  | 0.025  | 568.299  | 0.015  |
| Surfacing Equipment | 2030 | 501    | 750     | 7.953    | 0.169  | 1.032   | 0.749   | 0.005  | 0.025  | 0.025  | 568.299  | 0.015  |
| Surfacing Equipment | 2035 | 26     | 50      | 0.836    | 0.439  | 4.221   | 3.193   | 0.007  | 0.041  | 0.041  | 568.299  | 0.039  |
| Surfacing Equipment | 2035 | 51     | 120     | 1.954    | 0.226  | 3.482   | 1.659   | 0.006  | 0.038  | 0.038  | 568.299  | 0.02   |
| Surfacing Equipment | 2035 | 121    | 175     | 1.887    | 0.162  | 3.072   | 0.567   | 0.006  | 0.025  | 0.025  | 568.299  | 0.014  |
| Surfacing Equipment | 2035 | 176    | 250     | 2.725    | 0.149  | 1.05    | 0.497   | 0.006  | 0.016  | 0.016  | 568.299  | 0.013  |
| Surfacing Equipment | 2035 | 251    | 500     | 4.436    | 0.148  | 1.018   | 0.471   | 0.005  | 0.016  | 0.016  | 568.299  | 0.013  |
| Surfacing Equipment | 2035 | 501    | 750     | 6.967    | 0.148  | 1.018   | 0.477   | 0.005  | 0.016  | 0.016  | 568.3    | 0.013  |
| Surfacing Equipment | 2040 | 26     | 50      | 0.753    | 0.395  | 4.183   | 3.114   | 0.007  | 0.025  | 0.025  | 568.299  | 0.035  |
| Surfacing Equipment | 2040 | 51     | 120     | 1.782    | 0.206  | 3.477   | 1.521   | 0.006  | 0.024  | 0.024  | 568.299  | 0.018  |
| Surfacing Equipment | 2040 | 121    | 175     | 1.691    | 0.146  | 3.073   | 0.397   | 0.006  | 0.017  | 0.017  | 568.299  | 0.013  |
| Surfacing Equipment | 2040 | 176    | 250     | 2.566    | 0.14   | 1.047   | 0.37    | 0.006  | 0.013  | 0.013  | 568.299  | 0.012  |
| Surfacing Equipment | 2040 | 251    | 500     | 4.197    | 0.14   | 1.015   | 0.358   | 0.005  | 0.012  | 0.012  | 568.299  | 0.012  |
| Surfacing Equipment | 2040 | 501    | 750     | 6.59     | 0.14   | 1.015   | 0.361   | 0.005  | 0.013  | 0.013  | 568.299  | 0.012  |
| Sweepers/Scrubbers  | 1990 | 6      | 15      | 4.971    | 1.804  | 5       | 9.999   | 0.833  | 0.968  | 0.968  | 568.299  | 0.162  |
| Sweepers/Scrubbers  | 1990 | 16     | 25      | 10.019   | 2.213  | 5       | 6.92    | 0.679  | 0.735  | 0.735  | 568.299  | 0.199  |
| Sweepers/Scrubbers  | 1990 | 26     | 50      | 32.867   | 4.512  | 9.199   | 7.836   | 0.692  | 1.202  | 1.202  | 568.299  | 0.407  |
| Sweepers/Scrubbers  | 1990 | 51     | 120     | 39.044   | 2.254  | 5.53    | 14.467  | 0.628  | 1.259  | 1.259  | 568.299  | 0.203  |
| Sweepers/Scrubbers  | 1990 | 121    | 175     | 48.318   | 1.505  | 4.861   | 12.813  | 0.602  | 0.818  | 0.818  | 568.299  | 0.135  |
| Sweepers/Scrubbers  | 1990 | 176    | 250     | 56.322   | 1.505  | 4.861   | 12.813  | 0.602  | 0.818  | 0.818  | 568.299  | 0.135  |
| Sweepers/Scrubbers  | 2000 | 6      | 15      | 2.886    | 1.047  | 4.258   | 7.362   | 0.079  | 0.428  | 0.428  | 568.299  | 0.094  |
| Sweepers/Scrubbers  | 2000 | 16     | 25      | 4.933    | 1.089  | 4.438   | 6.325   | 0.064  | 0.442  | 0.442  | 568.299  | 0.098  |
| Sweepers/Scrubbers  | 2000 | 26     | 50      | 30.182   | 4.144  | 8.622   | 6.934   | 0.065  | 0.882  | 0.882  | 568.299  | 0.373  |
| Sweepers/Scrubbers  | 2000 | 51     | 120     | 29.565   | 1.706  | 4.394   | 9.702   | 0.059  | 0.84   | 0.84   | 568.299  | 0.154  |
| Sweepers/Scrubbers  | 2000 | 121    | 175     | 37.084   | 1.155  | 3.49    | 8.929   | 0.057  | 0.481  | 0.481  | 568.299  | 0.104  |
| Sweepers/Scrubbers  | 2000 | 176    | 250     | 34.578   | 0.924  | 2.598   | 8.516   | 0.057  | 0.371  | 0.371  | 568.3    | 0.083  |
| Sweepers/Scrubbers  | 2005 | 6      | 15      | 1.951    | 0.708  | 3.469   | 4.985   | 0.079  | 0.35   | 0.35   | 568.299  | 0.063  |
| Sweepers/Scrubbers  | 2005 | 16     | 25      | 3.505    | 0.774  | 2.526   | 5.326   | 0.064  | 0.323  | 0.323  | 568.299  | 0.069  |
| Sweepers/Scrubbers  | 2005 | 26     | 50      | 28.008   | 3.845  | 8.25    | 6.52    | 0.065  | 0.844  | 0.844  | 568.299  | 0.346  |
| Sweepers/Scrubbers  | 2005 | 51     | 120     | 27.009   | 1.559  | 4.253   | 8.538   | 0.059  | 0.826  | 0.826  | 568.299  | 0.14   |
| Sweepers/Scrubbers  | 2005 | 121    | 175     | 32.779   | 1.021  | 3.349   | 7.851   | 0.057  | 0.45   | 0.45   | 568.3    | 0.092  |
| Sweepers/Scrubbers  | 2005 | 176    | 250     | 25.002   | 0.668  | 1.76    | 7.318   | 0.057  | 0.258  | 0.258  | 568.299  | 0.06   |
| Sweepers/Scrubbers  | 2010 | 6      | 15      | 2.154395 | 1.8103 | 6.34286 | 5.8263  | 0.0054 | 0.6149 | 0.5657 | 583.6982 | 0.1699 |
| Sweepers/Scrubbers  | 2010 | 16     | 25      | 2.154395 | 1.8103 | 6.34286 | 5.8263  | 0.0054 | 0.6149 | 0.5657 | 583.6982 | 0.1699 |
| Sweepers/Scrubbers  | 2010 | 26     | 50      | 2.154395 | 1.8103 | 6.34286 | 5.8263  | 0.0054 | 0.6149 | 0.5657 | 583.6982 | 0.1699 |
| Sweepers/Scrubbers  | 2010 | 51     | 120     | 1.093749 | 0.9191 | 4.10149 | 7.68967 | 0.0049 | 0.657  | 0.6044 | 526.7953 | 0.1533 |
| Sweepers/Scrubbers  | 2010 | 121    | 175     | 1.189152 | 0.9992 | 4.21032 | 10.3895 | 0.0049 | 0.5781 | 0.5318 | 525.6912 | 0.153  |
| Sweepers/Scrubbers  | 2010 | 176    | 250     | 0.69332  | 0.5826 | 2.35018 | 7.47446 | 0.0048 | 0.3194 | 0.2939 | 522.3625 | 0.152  |
| Sweepers/Scrubbers  | 2011 | 6      | 15      | 2.104606 | 1.7685 | 6.34227 | 5.80317 | 0.0054 | 0.6056 | 0.5572 | 582.239  | 0.1699 |
| Sweepers/Scrubbers  | 2011 | 16     | 25      | 2.104606 | 1.7685 | 6.34227 | 5.80317 | 0.0054 | 0.6056 | 0.5572 | 582.239  | 0.1699 |
| Sweepers/Scrubbers  | 2011 | 26     | 50      | 2.104606 | 1.7685 | 6.34227 | 5.80317 | 0.0054 | 0.6056 | 0.5572 | 582.239  | 0.1699 |
| Sweepers/Scrubbers  | 2011 | 51     | 120     | 1.070043 | 0.8991 | 4.08877 | 7.49949 | 0.0049 | 0.6513 | 0.5992 | 525.4783 | 0.1533 |
| Sweepers/Scrubbers  | 2011 | 121    | 175     | 1.134336 | 0.9532 | 4.14616 | 9.92737 | 0.0049 | 0.5535 | 0.5092 | 524.377  | 0.153  |
| Sweepers/Scrubbers  | 2011 | 176    | 250     | 0.623199 | 0.5237 | 2.16425 | 7.01091 | 0.0048 | 0.2836 | 0.2609 | 521.0566 | 0.152  |
| Sweepers/Scrubbers  | 2012 | 6      | 15      | 2.177617 | 1.8298 | 6.54958 | 5.85015 | 0.0054 | 0.621  | 0.5713 | 580.7797 | 0.1699 |
| Sweepers/Scrubbers  | 2012 | 16     | 25      | 2.177617 | 1.8298 | 6.54958 | 5.85015 | 0.0054 | 0.621  | 0.5713 | 580.7797 | 0.1699 |
| Sweepers/Scrubbers  | 2012 | 26     | 50      | 2.177617 | 1.8298 | 6.54958 | 5.85015 | 0.0054 | 0.621  | 0.5713 | 580.7797 | 0.1699 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type     | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|--------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Sweepers/Scrubbers | 2012 | 51     | 120     | 1.078889 | 0.9066 | 4.12474 | 7.50259 | 0.0049 | 0.6585 | 0.6058 | 524.1613 | 0.1533 |
| Sweepers/Scrubbers | 2012 | 121    | 175     | 1.141423 | 0.9591 | 4.16243 | 9.95689 | 0.0049 | 0.5577 | 0.5131 | 523.0627 | 0.153  |
| Sweepers/Scrubbers | 2012 | 176    | 250     | 0.63315  | 0.532  | 2.17716 | 7.05573 | 0.0048 | 0.2865 | 0.2636 | 519.7507 | 0.152  |
| Sweepers/Scrubbers | 2013 | 6      | 15      | 2.124198 | 1.7849 | 6.54294 | 5.78778 | 0.0054 | 0.608  | 0.5593 | 577.8612 | 0.1699 |
| Sweepers/Scrubbers | 2013 | 16     | 25      | 2.124198 | 1.7849 | 6.54294 | 5.78778 | 0.0054 | 0.608  | 0.5593 | 577.8612 | 0.1699 |
| Sweepers/Scrubbers | 2013 | 26     | 50      | 2.124198 | 1.7849 | 6.54294 | 5.78778 | 0.0054 | 0.608  | 0.5593 | 577.8612 | 0.1699 |
| Sweepers/Scrubbers | 2013 | 51     | 120     | 1.019559 | 0.8567 | 4.07918 | 7.14773 | 0.0049 | 0.6258 | 0.5757 | 521.5273 | 0.1533 |
| Sweepers/Scrubbers | 2013 | 121    | 175     | 1.122038 | 0.9428 | 4.12302 | 9.76352 | 0.0049 | 0.5467 | 0.503  | 520.4343 | 0.153  |
| Sweepers/Scrubbers | 2013 | 176    | 250     | 0.590836 | 0.4965 | 2.05413 | 6.66337 | 0.0048 | 0.263  | 0.2419 | 517.1389 | 0.152  |
| Sweepers/Scrubbers | 2014 | 6      | 15      | 2.103399 | 1.7674 | 6.59249 | 5.75157 | 0.0054 | 0.6028 | 0.5546 | 574.9427 | 0.1699 |
| Sweepers/Scrubbers | 2014 | 16     | 25      | 2.103399 | 1.7674 | 6.59249 | 5.75157 | 0.0054 | 0.6028 | 0.5546 | 574.9427 | 0.1699 |
| Sweepers/Scrubbers | 2014 | 26     | 50      | 2.103399 | 1.7674 | 6.59249 | 5.75157 | 0.0054 | 0.6028 | 0.5546 | 574.9427 | 0.1699 |
| Sweepers/Scrubbers | 2014 | 51     | 120     | 0.990916 | 0.8326 | 4.07085 | 6.93387 | 0.0049 | 0.6104 | 0.5615 | 518.8933 | 0.1533 |
| Sweepers/Scrubbers | 2014 | 121    | 175     | 1.041854 | 0.8754 | 4.04161 | 9.10792 | 0.0049 | 0.5033 | 0.463  | 517.8058 | 0.153  |
| Sweepers/Scrubbers | 2014 | 176    | 250     | 0.600544 | 0.5046 | 2.06593 | 6.70399 | 0.0048 | 0.2653 | 0.2441 | 514.5271 | 0.152  |
| Sweepers/Scrubbers | 2015 | 6      | 15      | 2.151059 | 1.8075 | 6.75408 | 5.77191 | 0.0054 | 0.6111 | 0.5622 | 569.1058 | 0.1699 |
| Sweepers/Scrubbers | 2015 | 16     | 25      | 2.151059 | 1.8075 | 6.75408 | 5.77191 | 0.0054 | 0.6111 | 0.5622 | 569.1058 | 0.1699 |
| Sweepers/Scrubbers | 2015 | 26     | 50      | 2.151059 | 1.8075 | 6.75408 | 5.77191 | 0.0054 | 0.6111 | 0.5622 | 569.1058 | 0.1699 |
| Sweepers/Scrubbers | 2015 | 51     | 120     | 0.991855 | 0.8334 | 4.09682 | 6.8863  | 0.0049 | 0.6103 | 0.5614 | 513.6254 | 0.1533 |
| Sweepers/Scrubbers | 2015 | 121    | 175     | 0.998266 | 0.8388 | 3.98239 | 8.69682 | 0.0049 | 0.4792 | 0.4409 | 512.5489 | 0.153  |
| Sweepers/Scrubbers | 2015 | 176    | 250     | 0.610252 | 0.5128 | 2.07774 | 6.7446  | 0.0048 | 0.2676 | 0.2462 | 509.3035 | 0.152  |
| Sweepers/Scrubbers | 2016 | 6      | 15      | 2.119969 | 1.7814 | 6.78514 | 5.72609 | 0.0054 | 0.6029 | 0.5547 | 563.2688 | 0.1699 |
| Sweepers/Scrubbers | 2016 | 16     | 25      | 2.119969 | 1.7814 | 6.78514 | 5.72609 | 0.0054 | 0.6029 | 0.5547 | 563.2688 | 0.1699 |
| Sweepers/Scrubbers | 2016 | 26     | 50      | 2.119969 | 1.7814 | 6.78514 | 5.72609 | 0.0054 | 0.6029 | 0.5547 | 563.2688 | 0.1699 |
| Sweepers/Scrubbers | 2016 | 51     | 120     | 0.931404 | 0.7826 | 4.05916 | 6.45405 | 0.0049 | 0.5707 | 0.525  | 508.3574 | 0.1533 |
| Sweepers/Scrubbers | 2016 | 121    | 175     | 0.887319 | 0.7456 | 3.83865 | 7.78746 | 0.0049 | 0.4188 | 0.3853 | 507.292  | 0.153  |
| Sweepers/Scrubbers | 2016 | 176    | 250     | 0.61965  | 0.5207 | 2.08905 | 6.78244 | 0.0048 | 0.2698 | 0.2483 | 504.0799 | 0.152  |
| Sweepers/Scrubbers | 2017 | 6      | 15      | 2.037349 | 1.7119 | 6.7185  | 5.62558 | 0.0054 | 0.5817 | 0.5352 | 554.5133 | 0.1699 |
| Sweepers/Scrubbers | 2017 | 16     | 25      | 2.037349 | 1.7119 | 6.7185  | 5.62558 | 0.0054 | 0.5817 | 0.5352 | 554.5133 | 0.1699 |
| Sweepers/Scrubbers | 2017 | 26     | 50      | 2.037349 | 1.7119 | 6.7185  | 5.62558 | 0.0054 | 0.5817 | 0.5352 | 554.5133 | 0.1699 |
| Sweepers/Scrubbers | 2017 | 51     | 120     | 0.857444 | 0.7205 | 4.01005 | 6.0202  | 0.0049 | 0.5202 | 0.4786 | 500.4555 | 0.1533 |
| Sweepers/Scrubbers | 2017 | 121    | 175     | 0.845582 | 0.7105 | 3.78429 | 7.42433 | 0.0049 | 0.3946 | 0.363  | 499.4066 | 0.153  |
| Sweepers/Scrubbers | 2017 | 176    | 250     | 0.610026 | 0.5126 | 2.08973 | 6.50894 | 0.0048 | 0.2642 | 0.2431 | 496.2444 | 0.152  |
| Sweepers/Scrubbers | 2018 | 6      | 15      | 1.838607 | 1.5449 | 6.4442  | 5.39866 | 0.0054 | 0.5307 | 0.4882 | 545.7578 | 0.1699 |
| Sweepers/Scrubbers | 2018 | 16     | 25      | 1.838607 | 1.5449 | 6.4442  | 5.39866 | 0.0054 | 0.5307 | 0.4882 | 545.7578 | 0.1699 |
| Sweepers/Scrubbers | 2018 | 26     | 50      | 1.838607 | 1.5449 | 6.4442  | 5.39866 | 0.0054 | 0.5307 | 0.4882 | 545.7578 | 0.1699 |
| Sweepers/Scrubbers | 2018 | 51     | 120     | 0.713411 | 0.5995 | 3.88173 | 5.13595 | 0.0049 | 0.4283 | 0.3941 | 492.5536 | 0.1533 |
| Sweepers/Scrubbers | 2018 | 121    | 175     | 0.700892 | 0.5889 | 3.58832 | 6.07101 | 0.0049 | 0.3197 | 0.2942 | 491.5213 | 0.153  |
| Sweepers/Scrubbers | 2018 | 176    | 250     | 0.415916 | 0.3495 | 1.60478 | 4.30158 | 0.0049 | 0.1691 | 0.1556 | 488.409  | 0.152  |
| Sweepers/Scrubbers | 2019 | 6      | 15      | 1.703052 | 1.431  | 6.26782 | 5.22487 | 0.0054 | 0.4912 | 0.4519 | 537.0023 | 0.1699 |
| Sweepers/Scrubbers | 2019 | 16     | 25      | 1.703052 | 1.431  | 6.26782 | 5.22487 | 0.0054 | 0.4912 | 0.4519 | 537.0023 | 0.1699 |
| Sweepers/Scrubbers | 2019 | 26     | 50      | 1.703052 | 1.431  | 6.26782 | 5.22487 | 0.0054 | 0.4912 | 0.4519 | 537.0023 | 0.1699 |
| Sweepers/Scrubbers | 2019 | 51     | 120     | 0.654062 | 0.5496 | 3.84602 | 4.77259 | 0.0049 | 0.3872 | 0.3563 | 484.6516 | 0.1533 |
| Sweepers/Scrubbers | 2019 | 121    | 175     | 0.62277  | 0.5233 | 3.4491  | 5.30082 | 0.0049 | 0.2772 | 0.255  | 483.6359 | 0.153  |
| Sweepers/Scrubbers | 2019 | 176    | 250     | 0.279258 | 0.2347 | 1.23013 | 2.86598 | 0.0049 | 0.0989 | 0.091  | 480.5735 | 0.152  |
| Sweepers/Scrubbers | 2020 | 6      | 15      | 1.599203 | 1.3438 | 6.1554  | 5.09515 | 0.0054 | 0.4629 | 0.4259 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2020 | 16     | 25      | 1.599203 | 1.3438 | 6.1554  | 5.09515 | 0.0054 | 0.4629 | 0.4259 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2020 | 26     | 50      | 1.599203 | 1.3438 | 6.1554  | 5.09515 | 0.0054 | 0.4629 | 0.4259 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2020 | 51     | 120     | 0.618762 | 0.5199 | 3.82752 | 4.4821  | 0.0049 | 0.3601 | 0.3313 | 474.1157 | 0.1533 |
| Sweepers/Scrubbers | 2020 | 121    | 175     | 0.549287 | 0.4616 | 3.35909 | 4.60809 | 0.0049 | 0.2371 | 0.2181 | 473.1221 | 0.153  |
| Sweepers/Scrubbers | 2020 | 176    | 250     | 0.246498 | 0.2071 | 1.13655 | 2.4856  | 0.0049 | 0.079  | 0.0727 | 470.1263 | 0.152  |
| Sweepers/Scrubbers | 2021 | 6      | 15      | 1.450842 | 1.2191 | 5.89996 | 4.84946 | 0.0054 | 0.4117 | 0.3788 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2021 | 16     | 25      | 1.450842 | 1.2191 | 5.89996 | 4.84946 | 0.0054 | 0.4117 | 0.3788 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2021 | 26     | 50      | 1.450842 | 1.2191 | 5.89996 | 4.84946 | 0.0054 | 0.4117 | 0.3788 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2021 | 51     | 120     | 0.523878 | 0.4402 | 3.75746 | 3.96194 | 0.0049 | 0.2914 | 0.2681 | 474.1157 | 0.1533 |
| Sweepers/Scrubbers | 2021 | 121    | 175     | 0.457963 | 0.3848 | 3.24726 | 3.70723 | 0.0049 | 0.1872 | 0.1722 | 473.1221 | 0.153  |
| Sweepers/Scrubbers | 2021 | 176    | 250     | 0.195441 | 0.1642 | 1.1084  | 1.75821 | 0.0049 | 0.055  | 0.0506 | 470.1263 | 0.152  |
| Sweepers/Scrubbers | 2022 | 6      | 15      | 1.199805 | 1.0082 | 5.45118 | 4.49049 | 0.0054 | 0.3346 | 0.3078 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2022 | 16     | 25      | 1.199805 | 1.0082 | 5.45118 | 4.49049 | 0.0054 | 0.3346 | 0.3078 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2022 | 26     | 50      | 1.199805 | 1.0082 | 5.45118 | 4.49049 | 0.0054 | 0.3346 | 0.3078 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2022 | 51     | 120     | 0.443216 | 0.3724 | 3.69196 | 3.47218 | 0.0049 | 0.2321 | 0.2135 | 474.1157 | 0.1533 |
| Sweepers/Scrubbers | 2022 | 121    | 175     | 0.382446 | 0.3214 | 3.22176 | 3.00243 | 0.0049 | 0.1446 | 0.133  | 473.1221 | 0.153  |
| Sweepers/Scrubbers | 2022 | 176    | 250     | 0.181362 | 0.1524 | 1.10147 | 1.60484 | 0.0049 | 0.0499 | 0.0459 | 470.1263 | 0.152  |
| Sweepers/Scrubbers | 2023 | 6      | 15      | 0.903476 | 0.7592 | 4.97095 | 4.12735 | 0.0054 | 0.2485 | 0.2286 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2023 | 16     | 25      | 0.903476 | 0.7592 | 4.97095 | 4.12735 | 0.0054 | 0.2485 | 0.2286 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2023 | 26     | 50      | 0.903476 | 0.7592 | 4.97095 | 4.12735 | 0.0054 | 0.2485 | 0.2286 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2023 | 51     | 120     | 0.417244 | 0.3506 | 3.69499 | 3.28536 | 0.0049 | 0.2095 | 0.1928 | 474.1157 | 0.1533 |
| Sweepers/Scrubbers | 2023 | 121    | 175     | 0.347747 | 0.2922 | 3.22298 | 2.60853 | 0.0049 | 0.1259 | 0.1158 | 473.1221 | 0.153  |
| Sweepers/Scrubbers | 2023 | 176    | 250     | 0.188622 | 0.1585 | 1.11413 | 1.61028 | 0.0049 | 0.0503 | 0.0463 | 470.1263 | 0.152  |
| Sweepers/Scrubbers | 2024 | 6      | 15      | 0.887865 | 0.7461 | 5.00321 | 4.0788  | 0.0054 | 0.2385 | 0.2194 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2024 | 16     | 25      | 0.887865 | 0.7461 | 5.00321 | 4.0788  | 0.0054 | 0.2385 | 0.2194 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2024 | 26     | 50      | 0.887865 | 0.7461 | 5.00321 | 4.0788  | 0.0054 | 0.2385 | 0.2194 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers | 2024 | 51     | 120     | 0.395131 | 0.332  | 3.69288 | 3.09846 | 0.0049 | 0.1885 | 0.1734 | 474.1157 | 0.1533 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type            | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|---------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Sweepers/Scrubbers        | 2024 | 121    | 175     | 0.316819 | 0.2662 | 3.23374 | 2.2533  | 0.0049 | 0.1072 | 0.0986 | 473.1221 | 0.153  |
| Sweepers/Scrubbers        | 2024 | 176    | 250     | 0.195631 | 0.1644 | 1.12729 | 1.61357 | 0.0049 | 0.0505 | 0.0465 | 470.1263 | 0.152  |
| Sweepers/Scrubbers        | 2025 | 6      | 15      | 0.740656 | 0.6224 | 4.76791 | 3.85568 | 0.0054 | 0.1914 | 0.1761 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers        | 2025 | 16     | 25      | 0.740656 | 0.6224 | 4.76791 | 3.85568 | 0.0054 | 0.1914 | 0.1761 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers        | 2025 | 26     | 50      | 0.740656 | 0.6224 | 4.76791 | 3.85568 | 0.0054 | 0.1914 | 0.1761 | 525.3284 | 0.1699 |
| Sweepers/Scrubbers        | 2025 | 51     | 120     | 0.360743 | 0.3031 | 3.66402 | 2.81733 | 0.0049 | 0.1597 | 0.1469 | 474.1157 | 0.1533 |
| Sweepers/Scrubbers        | 2025 | 121    | 175     | 0.25385  | 0.2133 | 3.201   | 1.63811 | 0.0049 | 0.0722 | 0.0664 | 473.1221 | 0.153  |
| Sweepers/Scrubbers        | 2025 | 176    | 250     | 0.202235 | 0.1699 | 1.14005 | 1.61588 | 0.0049 | 0.0507 | 0.0466 | 470.1263 | 0.152  |
| Sweepers/Scrubbers        | 2030 | 6      | 15      | 1.624    | 0.589  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.053  |
| Sweepers/Scrubbers        | 2030 | 16     | 25      | 3.103    | 0.685  | 2.34    | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Sweepers/Scrubbers        | 2030 | 26     | 50      | 3.714    | 0.509  | 4.947   | 3.294   | 0.007  | 0.026  | 0.026  | 568.299  | 0.046  |
| Sweepers/Scrubbers        | 2030 | 51     | 120     | 4.528    | 0.261  | 3.703   | 1.569   | 0.006  | 0.023  | 0.023  | 568.299  | 0.023  |
| Sweepers/Scrubbers        | 2030 | 121    | 175     | 6.02     | 0.187  | 3.275   | 0.431   | 0.006  | 0.017  | 0.017  | 568.299  | 0.016  |
| Sweepers/Scrubbers        | 2030 | 176    | 250     | 6.813    | 0.182  | 1.116   | 0.37    | 0.006  | 0.013  | 0.013  | 568.299  | 0.016  |
| Sweepers/Scrubbers        | 2035 | 6      | 15      | 1.624    | 0.589  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.053  |
| Sweepers/Scrubbers        | 2035 | 16     | 25      | 3.103    | 0.685  | 2.34    | 4.332   | 0.007  | 0.161  | 0.161  | 568.3    | 0.061  |
| Sweepers/Scrubbers        | 2035 | 26     | 50      | 3.681    | 0.505  | 4.929   | 3.214   | 0.007  | 0.017  | 0.017  | 568.299  | 0.045  |
| Sweepers/Scrubbers        | 2035 | 51     | 120     | 4.386    | 0.253  | 3.698   | 1.486   | 0.006  | 0.016  | 0.016  | 568.299  | 0.022  |
| Sweepers/Scrubbers        | 2035 | 121    | 175     | 5.628    | 0.175  | 3.271   | 0.313   | 0.006  | 0.012  | 0.012  | 568.299  | 0.015  |
| Sweepers/Scrubbers        | 2035 | 176    | 250     | 6.501    | 0.173  | 1.114   | 0.294   | 0.006  | 0.011  | 0.011  | 568.299  | 0.015  |
| Sweepers/Scrubbers        | 2040 | 6      | 15      | 1.624    | 0.589  | 3.47    | 4.142   | 0.008  | 0.161  | 0.161  | 568.3    | 0.053  |
| Sweepers/Scrubbers        | 2040 | 16     | 25      | 3.103    | 0.685  | 2.34    | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Sweepers/Scrubbers        | 2040 | 26     | 50      | 3.675    | 0.504  | 4.925   | 3.203   | 0.007  | 0.016  | 0.016  | 568.3    | 0.045  |
| Sweepers/Scrubbers        | 2040 | 51     | 120     | 4.354    | 0.251  | 3.697   | 1.469   | 0.006  | 0.015  | 0.015  | 568.299  | 0.022  |
| Sweepers/Scrubbers        | 2040 | 121    | 175     | 5.537    | 0.172  | 3.27    | 0.284   | 0.006  | 0.011  | 0.011  | 568.299  | 0.015  |
| Sweepers/Scrubbers        | 2040 | 176    | 250     | 6.454    | 0.172  | 1.114   | 0.284   | 0.006  | 0.011  | 0.011  | 568.299  | 0.015  |
| Tractors/Loaders/Backhoes | 1990 | 16     | 25      | 5.699    | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.299  | 0.199  |
| Tractors/Loaders/Backhoes | 1990 | 26     | 50      | 23.587   | 4.787  | 9.698   | 7.939   | 0.871  | 1.267  | 1.267  | 568.299  | 0.431  |
| Tractors/Loaders/Backhoes | 1990 | 51     | 120     | 19.595   | 2.333  | 5.659   | 14.779  | 0.791  | 1.327  | 1.327  | 568.299  | 0.21   |
| Tractors/Loaders/Backhoes | 1990 | 121    | 175     | 28.833   | 1.751  | 5.008   | 14.021  | 0.758  | 0.974  | 0.974  | 568.299  | 0.158  |
| Tractors/Loaders/Backhoes | 1990 | 176    | 250     | 48.841   | 1.751  | 5.008   | 14.021  | 0.758  | 0.974  | 0.974  | 568.299  | 0.158  |
| Tractors/Loaders/Backhoes | 1990 | 251    | 500     | 86.854   | 1.551  | 10.967  | 13.298  | 0.758  | 0.834  | 0.834  | 568.3    | 0.139  |
| Tractors/Loaders/Backhoes | 1990 | 501    | 750     | 130.281  | 1.551  | 10.967  | 13.298  | 1.139  | 0.85   | 0.85   | 568.299  | 0.139  |
| Tractors/Loaders/Backhoes | 2000 | 16     | 25      | 5.225    | 2.029  | 4.66    | 6.391   | 0.065  | 0.57   | 0.57   | 568.299  | 0.183  |
| Tractors/Loaders/Backhoes | 2000 | 26     | 50      | 21.043   | 4.271  | 8.855   | 6.964   | 0.066  | 0.903  | 0.903  | 568.299  | 0.385  |
| Tractors/Loaders/Backhoes | 2000 | 51     | 120     | 14.597   | 1.738  | 4.448   | 9.784   | 0.06   | 0.862  | 0.862  | 568.299  | 0.156  |
| Tractors/Loaders/Backhoes | 2000 | 121    | 175     | 19.393   | 1.178  | 3.534   | 9.027   | 0.057  | 0.494  | 0.494  | 568.299  | 0.106  |
| Tractors/Loaders/Backhoes | 2000 | 176    | 250     | 26.283   | 0.942  | 2.634   | 8.625   | 0.057  | 0.38   | 0.38   | 568.299  | 0.085  |
| Tractors/Loaders/Backhoes | 2000 | 251    | 500     | 48.341   | 0.863  | 3.629   | 8.225   | 0.057  | 0.339  | 0.339  | 568.299  | 0.077  |
| Tractors/Loaders/Backhoes | 2000 | 501    | 750     | 72.512   | 0.863  | 3.629   | 8.225   | 0.059  | 0.339  | 0.339  | 568.299  | 0.077  |
| Tractors/Loaders/Backhoes | 2005 | 16     | 25      | 3.067    | 1.191  | 3.137   | 5.648   | 0.065  | 0.404  | 0.404  | 568.299  | 0.107  |
| Tractors/Loaders/Backhoes | 2005 | 26     | 50      | 18.069   | 3.667  | 8.018   | 6.405   | 0.066  | 0.819  | 0.819  | 568.299  | 0.33   |
| Tractors/Loaders/Backhoes | 2005 | 51     | 120     | 12.595   | 1.499  | 4.22    | 8.325   | 0.06   | 0.802  | 0.802  | 568.299  | 0.135  |
| Tractors/Loaders/Backhoes | 2005 | 121    | 175     | 16.035   | 0.974  | 3.341   | 7.629   | 0.057  | 0.432  | 0.432  | 568.3    | 0.087  |
| Tractors/Loaders/Backhoes | 2005 | 176    | 250     | 18.392   | 0.659  | 1.774   | 7.181   | 0.057  | 0.256  | 0.256  | 568.3    | 0.059  |
| Tractors/Loaders/Backhoes | 2005 | 251    | 500     | 32.511   | 0.58   | 1.993   | 6.451   | 0.057  | 0.23   | 0.23   | 568.299  | 0.052  |
| Tractors/Loaders/Backhoes | 2005 | 501    | 750     | 49.91    | 0.594  | 1.99    | 6.656   | 0.059  | 0.234  | 0.234  | 568.299  | 0.053  |
| Tractors/Loaders/Backhoes | 2010 | 16     | 25      | 1.894649 | 1.592  | 5.95576 | 5.63221 | 0.0053 | 0.5614 | 0.5165 | 569.9866 | 0.1659 |
| Tractors/Loaders/Backhoes | 2010 | 26     | 50      | 1.894649 | 1.592  | 5.95576 | 5.63221 | 0.0053 | 0.5614 | 0.5165 | 569.9866 | 0.1659 |
| Tractors/Loaders/Backhoes | 2010 | 51     | 120     | 0.792369 | 0.6658 | 3.83197 | 6.31224 | 0.0049 | 0.5039 | 0.4636 | 533.5879 | 0.1553 |
| Tractors/Loaders/Backhoes | 2010 | 121    | 175     | 0.559066 | 0.4698 | 3.20391 | 5.68573 | 0.0048 | 0.2855 | 0.2626 | 521.9624 | 0.1519 |
| Tractors/Loaders/Backhoes | 2010 | 176    | 250     | 0.408454 | 0.3432 | 1.44044 | 5.58586 | 0.0049 | 0.1775 | 0.1633 | 522.8516 | 0.1522 |
| Tractors/Loaders/Backhoes | 2010 | 251    | 500     | 0.391383 | 0.3289 | 2.07689 | 5.18517 | 0.0049 | 0.1722 | 0.1585 | 526.5923 | 0.1533 |
| Tractors/Loaders/Backhoes | 2010 | 501    | 750     | 0.330642 | 0.2778 | 1.80487 | 4.39795 | 0.0048 | 0.1531 | 0.1408 | 517.4169 | 0.1506 |
| Tractors/Loaders/Backhoes | 2011 | 16     | 25      | 1.788969 | 1.5032 | 5.86306 | 5.58613 | 0.0053 | 0.54   | 0.4968 | 569.4176 | 0.1662 |
| Tractors/Loaders/Backhoes | 2011 | 26     | 50      | 1.788969 | 1.5032 | 5.86306 | 5.58613 | 0.0053 | 0.54   | 0.4968 | 569.4176 | 0.1662 |
| Tractors/Loaders/Backhoes | 2011 | 51     | 120     | 0.766159 | 0.6438 | 3.83083 | 6.12981 | 0.0049 | 0.4906 | 0.4513 | 531.2907 | 0.155  |
| Tractors/Loaders/Backhoes | 2011 | 121    | 175     | 0.544391 | 0.4574 | 3.21464 | 5.49667 | 0.0048 | 0.2774 | 0.2552 | 520.8772 | 0.152  |
| Tractors/Loaders/Backhoes | 2011 | 176    | 250     | 0.400263 | 0.3363 | 1.41416 | 5.38873 | 0.0049 | 0.1717 | 0.158  | 521.7143 | 0.1522 |
| Tractors/Loaders/Backhoes | 2011 | 251    | 500     | 0.383321 | 0.3221 | 2.01155 | 4.98779 | 0.0049 | 0.1669 | 0.1536 | 525.0356 | 0.1532 |
| Tractors/Loaders/Backhoes | 2011 | 501    | 750     | 0.337174 | 0.2833 | 1.80098 | 4.35896 | 0.0048 | 0.1527 | 0.1405 | 516.0241 | 0.1506 |
| Tractors/Loaders/Backhoes | 2012 | 16     | 25      | 1.778006 | 1.494  | 5.92961 | 5.57167 | 0.0053 | 0.537  | 0.494  | 568.1171 | 0.1662 |
| Tractors/Loaders/Backhoes | 2012 | 26     | 50      | 1.778006 | 1.494  | 5.92961 | 5.57167 | 0.0053 | 0.537  | 0.494  | 568.1171 | 0.1662 |
| Tractors/Loaders/Backhoes | 2012 | 51     | 120     | 0.765477 | 0.6432 | 3.85825 | 6.07938 | 0.0049 | 0.4896 | 0.4504 | 529.8013 | 0.155  |
| Tractors/Loaders/Backhoes | 2012 | 121    | 175     | 0.55208  | 0.4639 | 3.24733 | 5.48812 | 0.0048 | 0.2794 | 0.257  | 519.5807 | 0.152  |
| Tractors/Loaders/Backhoes | 2012 | 176    | 250     | 0.408595 | 0.3433 | 1.42415 | 5.3794  | 0.0049 | 0.1729 | 0.1591 | 520.5233 | 0.1523 |
| Tractors/Loaders/Backhoes | 2012 | 251    | 500     | 0.391545 | 0.329  | 2.03631 | 4.9585  | 0.0049 | 0.1675 | 0.1541 | 523.6066 | 0.1532 |
| Tractors/Loaders/Backhoes | 2012 | 501    | 750     | 0.34578  | 0.2906 | 1.81138 | 4.30593 | 0.0048 | 0.1528 | 0.1406 | 514.6158 | 0.1505 |
| Tractors/Loaders/Backhoes | 2013 | 16     | 25      | 1.710175 | 1.437  | 5.8983  | 5.50692 | 0.0053 | 0.5196 | 0.4781 | 566.4101 | 0.1665 |
| Tractors/Loaders/Backhoes | 2013 | 26     | 50      | 1.710175 | 1.437  | 5.8983  | 5.50692 | 0.0053 | 0.5196 | 0.4781 | 566.4101 | 0.1665 |
| Tractors/Loaders/Backhoes | 2013 | 51     | 120     | 0.736849 | 0.6192 | 3.85259 | 5.88177 | 0.0049 | 0.4685 | 0.431  | 526.7149 | 0.1549 |
| Tractors/Loaders/Backhoes | 2013 | 121    | 175     | 0.53894  | 0.4529 | 3.25593 | 5.32658 | 0.0048 | 0.2695 | 0.2479 | 516.748  | 0.1519 |
| Tractors/Loaders/Backhoes | 2013 | 176    | 250     | 0.404183 | 0.3396 | 1.40715 | 5.22143 | 0.0049 | 0.168  | 0.1546 | 517.9916 | 0.1523 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type            | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|---------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Tractors/Loaders/Backhoes | 2013 | 251    | 500     | 0.386263 | 0.3246 | 1.98237 | 4.77348 | 0.0049 | 0.1621 | 0.1492 | 520.6472 | 0.1531 |
| Tractors/Loaders/Backhoes | 2013 | 501    | 750     | 0.357231 | 0.3002 | 1.8218  | 4.31599 | 0.0048 | 0.155  | 0.1426 | 511.8955 | 0.1505 |
| Tractors/Loaders/Backhoes | 2014 | 16     | 25      | 1.58953  | 1.3356 | 5.77182 | 5.36869 | 0.0053 | 0.4882 | 0.4491 | 564.0421 | 0.1667 |
| Tractors/Loaders/Backhoes | 2014 | 26     | 50      | 1.58953  | 1.3356 | 5.77182 | 5.36869 | 0.0053 | 0.4882 | 0.4491 | 564.0421 | 0.1667 |
| Tractors/Loaders/Backhoes | 2014 | 51     | 120     | 0.692813 | 0.5822 | 3.82724 | 5.58081 | 0.0049 | 0.4384 | 0.4033 | 523.0168 | 0.1546 |
| Tractors/Loaders/Backhoes | 2014 | 121    | 175     | 0.503298 | 0.4229 | 3.23863 | 4.93788 | 0.0048 | 0.2483 | 0.2285 | 513.8903 | 0.1519 |
| Tractors/Loaders/Backhoes | 2014 | 176    | 250     | 0.389056 | 0.3269 | 1.37555 | 4.92175 | 0.0049 | 0.1587 | 0.146  | 515.1747 | 0.1522 |
| Tractors/Loaders/Backhoes | 2014 | 251    | 500     | 0.371559 | 0.3122 | 1.87787 | 4.48819 | 0.0049 | 0.1518 | 0.1397 | 517.1237 | 0.1528 |
| Tractors/Loaders/Backhoes | 2014 | 501    | 750     | 0.362599 | 0.3047 | 1.8331  | 4.24344 | 0.0048 | 0.1536 | 0.1413 | 511.3367 | 0.1511 |
| Tractors/Loaders/Backhoes | 2015 | 16     | 25      | 1.555682 | 1.3072 | 5.79091 | 5.32019 | 0.0053 | 0.477  | 0.4389 | 558.7085 | 0.1668 |
| Tractors/Loaders/Backhoes | 2015 | 26     | 50      | 1.555682 | 1.3072 | 5.79091 | 5.32019 | 0.0053 | 0.477  | 0.4389 | 558.7085 | 0.1668 |
| Tractors/Loaders/Backhoes | 2015 | 51     | 120     | 0.677539 | 0.5693 | 3.83198 | 5.4221  | 0.0049 | 0.4244 | 0.3904 | 517.3652 | 0.1545 |
| Tractors/Loaders/Backhoes | 2015 | 121    | 175     | 0.501434 | 0.4213 | 3.2559  | 4.83599 | 0.0048 | 0.2443 | 0.2248 | 508.6819 | 0.1519 |
| Tractors/Loaders/Backhoes | 2015 | 176    | 250     | 0.387795 | 0.3259 | 1.37366 | 4.7831  | 0.0049 | 0.1554 | 0.1429 | 509.6269 | 0.1521 |
| Tractors/Loaders/Backhoes | 2015 | 251    | 500     | 0.371246 | 0.3119 | 1.88403 | 4.34833 | 0.0049 | 0.1491 | 0.1372 | 511.8685 | 0.1528 |
| Tractors/Loaders/Backhoes | 2015 | 501    | 750     | 0.36596  | 0.3075 | 1.823   | 4.1848  | 0.0048 | 0.152  | 0.1399 | 506.1469 | 0.1511 |
| Tractors/Loaders/Backhoes | 2016 | 16     | 25      | 1.488115 | 1.2504 | 5.74113 | 5.21373 | 0.0053 | 0.4547 | 0.4183 | 553.3996 | 0.1669 |
| Tractors/Loaders/Backhoes | 2016 | 26     | 50      | 1.488115 | 1.2504 | 5.74113 | 5.21373 | 0.0053 | 0.4547 | 0.4183 | 553.3996 | 0.1669 |
| Tractors/Loaders/Backhoes | 2016 | 51     | 120     | 0.640315 | 0.538  | 3.81146 | 5.14235 | 0.0049 | 0.3959 | 0.3643 | 511.3456 | 0.1542 |
| Tractors/Loaders/Backhoes | 2016 | 121    | 175     | 0.46319  | 0.3892 | 3.23229 | 4.37945 | 0.0048 | 0.222  | 0.2042 | 502.6294 | 0.1516 |
| Tractors/Loaders/Backhoes | 2016 | 176    | 250     | 0.369743 | 0.3107 | 1.34719 | 4.42611 | 0.0049 | 0.1449 | 0.1333 | 504.4014 | 0.1521 |
| Tractors/Loaders/Backhoes | 2016 | 251    | 500     | 0.337794 | 0.2838 | 1.78642 | 3.7866  | 0.0049 | 0.131  | 0.1206 | 505.2698 | 0.1524 |
| Tractors/Loaders/Backhoes | 2016 | 501    | 750     | 0.357237 | 0.3002 | 1.67424 | 4.0216  | 0.0048 | 0.1444 | 0.1328 | 500.955  | 0.1511 |
| Tractors/Loaders/Backhoes | 2017 | 16     | 25      | 1.421071 | 1.1941 | 5.68921 | 5.10958 | 0.0053 | 0.4331 | 0.3985 | 544.9286 | 0.167  |
| Tractors/Loaders/Backhoes | 2017 | 26     | 50      | 1.421071 | 1.1941 | 5.68921 | 5.10958 | 0.0053 | 0.4331 | 0.3985 | 544.9286 | 0.167  |
| Tractors/Loaders/Backhoes | 2017 | 51     | 120     | 0.595595 | 0.5005 | 3.7818  | 4.8087  | 0.0049 | 0.3616 | 0.3327 | 502.7952 | 0.1541 |
| Tractors/Loaders/Backhoes | 2017 | 121    | 175     | 0.420865 | 0.3536 | 3.19961 | 3.87876 | 0.0048 | 0.1973 | 0.1815 | 493.912  | 0.1513 |
| Tractors/Loaders/Backhoes | 2017 | 176    | 250     | 0.346619 | 0.2913 | 1.30369 | 4.04062 | 0.0049 | 0.1318 | 0.1213 | 496.8449 | 0.1522 |
| Tractors/Loaders/Backhoes | 2017 | 251    | 500     | 0.323689 | 0.272  | 1.73851 | 3.48988 | 0.0049 | 0.122  | 0.1123 | 497.1129 | 0.1523 |
| Tractors/Loaders/Backhoes | 2017 | 501    | 750     | 0.35268  | 0.2963 | 1.64567 | 3.86196 | 0.0048 | 0.1394 | 0.1283 | 492.9529 | 0.151  |
| Tractors/Loaders/Backhoes | 2018 | 16     | 25      | 1.180685 | 0.9921 | 5.31043 | 4.76441 | 0.0053 | 0.3625 | 0.3335 | 536.1115 | 0.1669 |
| Tractors/Loaders/Backhoes | 2018 | 26     | 50      | 1.180685 | 0.9921 | 5.31043 | 4.76441 | 0.0053 | 0.3625 | 0.3335 | 536.1115 | 0.1669 |
| Tractors/Loaders/Backhoes | 2018 | 51     | 120     | 0.5003   | 0.4204 | 3.69155 | 4.15444 | 0.0049 | 0.2943 | 0.2708 | 494.1237 | 0.1538 |
| Tractors/Loaders/Backhoes | 2018 | 121    | 175     | 0.353485 | 0.297  | 3.13727 | 3.16806 | 0.0048 | 0.1595 | 0.1467 | 485.7754 | 0.1512 |
| Tractors/Loaders/Backhoes | 2018 | 176    | 250     | 0.308076 | 0.2589 | 1.24197 | 3.45965 | 0.0049 | 0.1116 | 0.1027 | 489.4562 | 0.1524 |
| Tractors/Loaders/Backhoes | 2018 | 251    | 500     | 0.264454 | 0.2222 | 1.44545 | 2.66877 | 0.0048 | 0.0922 | 0.0848 | 486.2939 | 0.1514 |
| Tractors/Loaders/Backhoes | 2018 | 501    | 750     | 0.322751 | 0.2712 | 1.60068 | 3.40235 | 0.0048 | 0.1243 | 0.1143 | 485.0099 | 0.151  |
| Tractors/Loaders/Backhoes | 2019 | 16     | 25      | 1.095082 | 0.9202 | 5.20327 | 4.60928 | 0.0053 | 0.33   | 0.3036 | 527.6843 | 0.167  |
| Tractors/Loaders/Backhoes | 2019 | 26     | 50      | 1.095082 | 0.9202 | 5.20327 | 4.60928 | 0.0053 | 0.33   | 0.3036 | 527.6843 | 0.167  |
| Tractors/Loaders/Backhoes | 2019 | 51     | 120     | 0.437701 | 0.3678 | 3.63777 | 3.69257 | 0.0049 | 0.2465 | 0.2268 | 485.8548 | 0.1537 |
| Tractors/Loaders/Backhoes | 2019 | 121    | 175     | 0.321856 | 0.2704 | 3.12158 | 2.78412 | 0.0048 | 0.1401 | 0.1289 | 477.9151 | 0.1512 |
| Tractors/Loaders/Backhoes | 2019 | 176    | 250     | 0.291458 | 0.2449 | 1.22027 | 3.14683 | 0.0049 | 0.102  | 0.0938 | 481.4206 | 0.1523 |
| Tractors/Loaders/Backhoes | 2019 | 251    | 500     | 0.245176 | 0.206  | 1.38918 | 2.34458 | 0.0048 | 0.0816 | 0.0751 | 479.0826 | 0.1516 |
| Tractors/Loaders/Backhoes | 2019 | 501    | 750     | 0.311873 | 0.2621 | 1.6025  | 3.12046 | 0.0048 | 0.1168 | 0.1074 | 478.9216 | 0.1515 |
| Tractors/Loaders/Backhoes | 2020 | 16     | 25      | 0.987255 | 0.8296 | 5.03491 | 4.39784 | 0.0053 | 0.2878 | 0.2648 | 515.874  | 0.1668 |
| Tractors/Loaders/Backhoes | 2020 | 26     | 50      | 0.987255 | 0.8296 | 5.03491 | 4.39784 | 0.0053 | 0.2878 | 0.2648 | 515.874  | 0.1668 |
| Tractors/Loaders/Backhoes | 2020 | 51     | 120     | 0.393883 | 0.331  | 3.60147 | 3.32571 | 0.0049 | 0.2103 | 0.1935 | 475.1543 | 0.1537 |
| Tractors/Loaders/Backhoes | 2020 | 121    | 175     | 0.29217  | 0.2455 | 3.10518 | 2.41467 | 0.0048 | 0.1217 | 0.1119 | 467.5132 | 0.1512 |
| Tractors/Loaders/Backhoes | 2020 | 176    | 250     | 0.268036 | 0.2252 | 1.19592 | 2.73794 | 0.0049 | 0.0898 | 0.0826 | 470.4998 | 0.1522 |
| Tractors/Loaders/Backhoes | 2020 | 251    | 500     | 0.230511 | 0.1937 | 1.35815 | 2.07976 | 0.0048 | 0.073  | 0.0672 | 468.2447 | 0.1514 |
| Tractors/Loaders/Backhoes | 2020 | 501    | 750     | 0.318709 | 0.2678 | 1.60984 | 3.11926 | 0.0048 | 0.1174 | 0.108  | 468.6602 | 0.1516 |
| Tractors/Loaders/Backhoes | 2021 | 16     | 25      | 0.899672 | 0.756  | 4.90172 | 4.22643 | 0.0053 | 0.2545 | 0.2341 | 515.1213 | 0.1666 |
| Tractors/Loaders/Backhoes | 2021 | 26     | 50      | 0.899672 | 0.756  | 4.90172 | 4.22643 | 0.0053 | 0.2545 | 0.2341 | 515.1213 | 0.1666 |
| Tractors/Loaders/Backhoes | 2021 | 51     | 120     | 0.35209  | 0.2959 | 3.57072 | 2.995   | 0.0049 | 0.1766 | 0.1625 | 475.3621 | 0.1537 |
| Tractors/Loaders/Backhoes | 2021 | 121    | 175     | 0.263016 | 0.221  | 3.0907  | 2.06221 | 0.0048 | 0.1041 | 0.0958 | 467.5285 | 0.1512 |
| Tractors/Loaders/Backhoes | 2021 | 176    | 250     | 0.249239 | 0.2094 | 1.18606 | 2.36922 | 0.0049 | 0.08   | 0.0736 | 470.5716 | 0.1522 |
| Tractors/Loaders/Backhoes | 2021 | 251    | 500     | 0.213479 | 0.1794 | 1.34147 | 1.776   | 0.0048 | 0.064  | 0.0589 | 469.3025 | 0.1518 |
| Tractors/Loaders/Backhoes | 2021 | 501    | 750     | 0.294477 | 0.2474 | 1.43254 | 2.75417 | 0.0048 | 0.1041 | 0.0958 | 466.4564 | 0.1509 |
| Tractors/Loaders/Backhoes | 2022 | 16     | 25      | 0.818675 | 0.6879 | 4.75954 | 4.03024 | 0.0053 | 0.2177 | 0.2003 | 514.4613 | 0.1664 |
| Tractors/Loaders/Backhoes | 2022 | 26     | 50      | 0.818675 | 0.6879 | 4.75954 | 4.03024 | 0.0053 | 0.2177 | 0.2003 | 514.4613 | 0.1664 |
| Tractors/Loaders/Backhoes | 2022 | 51     | 120     | 0.309669 | 0.2602 | 3.53551 | 2.64718 | 0.0049 | 0.1424 | 0.131  | 475.8975 | 0.1539 |
| Tractors/Loaders/Backhoes | 2022 | 121    | 175     | 0.237945 | 0.1999 | 3.07944 | 1.75274 | 0.0048 | 0.0892 | 0.082  | 467.8004 | 0.1513 |
| Tractors/Loaders/Backhoes | 2022 | 176    | 250     | 0.222521 | 0.187  | 1.16248 | 1.94251 | 0.0049 | 0.067  | 0.0617 | 470.1236 | 0.152  |
| Tractors/Loaders/Backhoes | 2022 | 251    | 500     | 0.190771 | 0.1603 | 1.28026 | 1.43694 | 0.0048 | 0.0529 | 0.0487 | 469.2562 | 0.1518 |
| Tractors/Loaders/Backhoes | 2022 | 501    | 750     | 0.276438 | 0.2323 | 1.35272 | 2.4532  | 0.0048 | 0.0943 | 0.0868 | 466.6327 | 0.1509 |
| Tractors/Loaders/Backhoes | 2023 | 16     | 25      | 0.738634 | 0.6207 | 4.62935 | 3.85698 | 0.0053 | 0.1845 | 0.1698 | 513.7962 | 0.1662 |
| Tractors/Loaders/Backhoes | 2023 | 26     | 50      | 0.738634 | 0.6207 | 4.62935 | 3.85698 | 0.0053 | 0.1845 | 0.1698 | 513.7962 | 0.1662 |
| Tractors/Loaders/Backhoes | 2023 | 51     | 120     | 0.284572 | 0.2391 | 3.52504 | 2.42607 | 0.0049 | 0.1198 | 0.1102 | 476.4307 | 0.1541 |
| Tractors/Loaders/Backhoes | 2023 | 121    | 175     | 0.219196 | 0.1842 | 3.0777  | 1.52095 | 0.0048 | 0.0765 | 0.0704 | 468.821  | 0.1516 |
| Tractors/Loaders/Backhoes | 2023 | 176    | 250     | 0.201205 | 0.1691 | 1.14809 | 1.58768 | 0.0049 | 0.0576 | 0.053  | 469.7518 | 0.1519 |
| Tractors/Loaders/Backhoes | 2023 | 251    | 500     | 0.180818 | 0.1519 | 1.27923 | 1.24708 | 0.0049 | 0.0472 | 0.0434 | 469.4652 | 0.1518 |
| Tractors/Loaders/Backhoes | 2023 | 501    | 750     | 0.278685 | 0.2342 | 1.36081 | 2.41861 | 0.0048 | 0.0945 | 0.0869 | 466.6756 | 0.1509 |
| Tractors/Loaders/Backhoes | 2024 | 16     | 25      | 0.701609 | 0.5895 | 4.60899 | 3.76811 | 0.0053 | 0.1659 | 0.1526 | 513.8517 | 0.1662 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type            | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|---------------------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Tractors/Loaders/Backhoes | 2024 | 26     | 50      | 0.701609 | 0.5895 | 4.60899 | 3.76811 | 0.0053 | 0.1659 | 0.1526 | 513.8517 | 0.1662 |
| Tractors/Loaders/Backhoes | 2024 | 51     | 120     | 0.270597 | 0.2274 | 3.5318  | 2.28795 | 0.0049 | 0.105  | 0.0966 | 476.7313 | 0.1542 |
| Tractors/Loaders/Backhoes | 2024 | 121    | 175     | 0.209421 | 0.176  | 3.08913 | 1.37643 | 0.0049 | 0.0685 | 0.063  | 469.4029 | 0.1518 |
| Tractors/Loaders/Backhoes | 2024 | 176    | 250     | 0.199431 | 0.1676 | 1.15125 | 1.49113 | 0.0049 | 0.0545 | 0.0501 | 469.9143 | 0.152  |
| Tractors/Loaders/Backhoes | 2024 | 251    | 500     | 0.178929 | 0.1504 | 1.277   | 1.16321 | 0.0049 | 0.0444 | 0.0408 | 470.0841 | 0.152  |
| Tractors/Loaders/Backhoes | 2024 | 501    | 750     | 0.262816 | 0.2208 | 1.31051 | 2.21548 | 0.0048 | 0.0854 | 0.0786 | 466.6381 | 0.1509 |
| Tractors/Loaders/Backhoes | 2025 | 16     | 25      | 0.654585 | 0.55   | 4.55974 | 3.66186 | 0.0053 | 0.145  | 0.1334 | 513.8025 | 0.1662 |
| Tractors/Loaders/Backhoes | 2025 | 26     | 50      | 0.654585 | 0.55   | 4.55974 | 3.66186 | 0.0053 | 0.145  | 0.1334 | 513.8025 | 0.1662 |
| Tractors/Loaders/Backhoes | 2025 | 51     | 120     | 0.248412 | 0.2087 | 3.52242 | 2.10918 | 0.0049 | 0.0855 | 0.0786 | 477.188  | 0.1543 |
| Tractors/Loaders/Backhoes | 2025 | 121    | 175     | 0.192617 | 0.1619 | 3.08323 | 1.18039 | 0.0048 | 0.0585 | 0.0538 | 469.3289 | 0.1518 |
| Tractors/Loaders/Backhoes | 2025 | 176    | 250     | 0.183368 | 0.1541 | 1.14554 | 1.23458 | 0.0049 | 0.0473 | 0.0435 | 470.5976 | 0.1522 |
| Tractors/Loaders/Backhoes | 2025 | 251    | 500     | 0.171862 | 0.1444 | 1.23405 | 1.04575 | 0.0049 | 0.0393 | 0.0362 | 470.9102 | 0.1523 |
| Tractors/Loaders/Backhoes | 2025 | 501    | 750     | 0.222943 | 0.1873 | 1.26139 | 1.64868 | 0.0048 | 0.0674 | 0.062  | 466.4517 | 0.1509 |
| Tractors/Loaders/Backhoes | 2030 | 16     | 25      | 1.765    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Tractors/Loaders/Backhoes | 2030 | 26     | 50      | 2.657    | 0.539  | 4.966   | 3.299   | 0.007  | 0.033  | 0.033  | 568.299  | 0.048  |
| Tractors/Loaders/Backhoes | 2030 | 51     | 120     | 2.285    | 0.272  | 3.705   | 1.624   | 0.006  | 0.03   | 0.03   | 568.299  | 0.024  |
| Tractors/Loaders/Backhoes | 2030 | 121    | 175     | 3.178    | 0.193  | 3.273   | 0.485   | 0.006  | 0.02   | 0.02   | 568.299  | 0.017  |
| Tractors/Loaders/Backhoes | 2030 | 176    | 250     | 5.112    | 0.183  | 1.115   | 0.418   | 0.006  | 0.014  | 0.014  | 568.299  | 0.016  |
| Tractors/Loaders/Backhoes | 2030 | 251    | 500     | 10.236   | 0.182  | 1.066   | 0.403   | 0.006  | 0.014  | 0.014  | 568.299  | 0.016  |
| Tractors/Loaders/Backhoes | 2030 | 501    | 750     | 15.363   | 0.182  | 1.066   | 0.407   | 0.006  | 0.014  | 0.014  | 568.299  | 0.016  |
| Tractors/Loaders/Backhoes | 2035 | 16     | 25      | 1.765    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Tractors/Loaders/Backhoes | 2035 | 26     | 50      | 2.538    | 0.515  | 4.949   | 3.244   | 0.007  | 0.022  | 0.022  | 568.299  | 0.046  |
| Tractors/Loaders/Backhoes | 2035 | 51     | 120     | 2.17     | 0.258  | 3.703   | 1.521   | 0.006  | 0.02   | 0.02   | 568.299  | 0.023  |
| Tractors/Loaders/Backhoes | 2035 | 121    | 175     | 2.956    | 0.179  | 3.275   | 0.348   | 0.006  | 0.015  | 0.015  | 568.299  | 0.016  |
| Tractors/Loaders/Backhoes | 2035 | 176    | 250     | 4.945    | 0.177  | 1.115   | 0.331   | 0.006  | 0.012  | 0.012  | 568.299  | 0.016  |
| Tractors/Loaders/Backhoes | 2035 | 251    | 500     | 9.922    | 0.177  | 1.066   | 0.326   | 0.006  | 0.012  | 0.012  | 568.299  | 0.015  |
| Tractors/Loaders/Backhoes | 2035 | 501    | 750     | 14.886   | 0.177  | 1.066   | 0.327   | 0.006  | 0.012  | 0.012  | 568.299  | 0.015  |
| Tractors/Loaders/Backhoes | 2040 | 16     | 25      | 1.765    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Tractors/Loaders/Backhoes | 2040 | 26     | 50      | 2.506    | 0.508  | 4.946   | 3.22    | 0.007  | 0.018  | 0.018  | 568.299  | 0.045  |
| Tractors/Loaders/Backhoes | 2040 | 51     | 120     | 2.135    | 0.254  | 3.703   | 1.485   | 0.006  | 0.016  | 0.016  | 568.299  | 0.022  |
| Tractors/Loaders/Backhoes | 2040 | 121    | 175     | 2.891    | 0.175  | 3.276   | 0.305   | 0.006  | 0.012  | 0.012  | 568.299  | 0.015  |
| Tractors/Loaders/Backhoes | 2040 | 176    | 250     | 4.877    | 0.174  | 1.116   | 0.297   | 0.006  | 0.011  | 0.011  | 568.3    | 0.015  |
| Tractors/Loaders/Backhoes | 2040 | 251    | 500     | 9.794    | 0.174  | 1.066   | 0.297   | 0.006  | 0.011  | 0.011  | 568.299  | 0.015  |
| Tractors/Loaders/Backhoes | 2040 | 501    | 750     | 14.69    | 0.174  | 1.066   | 0.297   | 0.006  | 0.011  | 0.011  | 568.299  | 0.015  |
| Trenchers                 | 1990 | 6      | 15      | 3.844    | 1.804  | 4.999   | 9.999   | 1.049  | 0.975  | 0.975  | 568.299  | 0.162  |
| Trenchers                 | 1990 | 16     | 25      | 18.341   | 2.213  | 4.999   | 6.919   | 0.855  | 0.741  | 0.741  | 568.3    | 0.199  |
| Trenchers                 | 1990 | 26     | 50      | 37.589   | 4.535  | 9.232   | 7.849   | 0.871  | 1.215  | 1.215  | 568.3    | 0.409  |
| Trenchers                 | 1990 | 51     | 120     | 37.519   | 2.296  | 5.621   | 14.752  | 0.791  | 1.284  | 1.284  | 568.299  | 0.207  |
| Trenchers                 | 1990 | 121    | 175     | 63.364   | 1.748  | 5.014   | 14.125  | 0.758  | 0.96   | 0.96   | 568.299  | 0.157  |
| Trenchers                 | 1990 | 176    | 250     | 98.152   | 1.748  | 5.014   | 14.125  | 0.758  | 0.96   | 0.96   | 568.299  | 0.157  |
| Trenchers                 | 1990 | 251    | 500     | 121.775  | 1.553  | 10.572  | 13.45   | 0.662  | 0.827  | 0.827  | 568.299  | 0.14   |
| Trenchers                 | 1990 | 501    | 750     | 229.57   | 1.553  | 10.572  | 13.45   | 1.018  | 0.843  | 0.843  | 568.299  | 0.14   |
| Trenchers                 | 2000 | 6      | 15      | 2.824    | 1.325  | 4.257   | 7.675   | 0.079  | 0.61   | 0.61   | 568.299  | 0.119  |
| Trenchers                 | 2000 | 16     | 25      | 15.815   | 1.908  | 4.438   | 6.326   | 0.065  | 0.555  | 0.555  | 568.299  | 0.172  |
| Trenchers                 | 2000 | 26     | 50      | 34.945   | 4.216  | 8.713   | 7.029   | 0.066  | 0.89   | 0.89   | 568.299  | 0.38   |
| Trenchers                 | 2000 | 51     | 120     | 30.939   | 1.893  | 4.777   | 10.98   | 0.06   | 0.882  | 0.882  | 568.299  | 0.17   |
| Trenchers                 | 2000 | 121    | 175     | 46.959   | 1.296  | 3.969   | 10.057  | 0.057  | 0.541  | 0.541  | 568.299  | 0.116  |
| Trenchers                 | 2000 | 176    | 250     | 64.645   | 1.151  | 3.402   | 9.8     | 0.057  | 0.474  | 0.474  | 568.299  | 0.103  |
| Trenchers                 | 2000 | 251    | 500     | 81.678   | 1.042  | 6.221   | 9.354   | 0.05   | 0.416  | 0.416  | 568.299  | 0.094  |
| Trenchers                 | 2000 | 501    | 750     | 153.98   | 1.042  | 6.221   | 9.354   | 0.052  | 0.416  | 0.416  | 568.299  | 0.094  |
| Trenchers                 | 2005 | 6      | 15      | 1.582    | 0.742  | 3.469   | 4.981   | 0.079  | 0.35   | 0.35   | 568.299  | 0.066  |
| Trenchers                 | 2005 | 16     | 25      | 7.043    | 0.849  | 2.519   | 5.321   | 0.065  | 0.333  | 0.333  | 568.3    | 0.076  |
| Trenchers                 | 2005 | 26     | 50      | 32.497   | 3.921  | 8.33    | 6.674   | 0.066  | 0.849  | 0.849  | 568.299  | 0.353  |
| Trenchers                 | 2005 | 51     | 120     | 27.751   | 1.698  | 4.526   | 9.727   | 0.06   | 0.839  | 0.839  | 568.299  | 0.153  |
| Trenchers                 | 2005 | 121    | 175     | 40.799   | 1.126  | 3.695   | 8.861   | 0.057  | 0.487  | 0.487  | 568.299  | 0.101  |
| Trenchers                 | 2005 | 176    | 250     | 51.63    | 0.92   | 2.668   | 8.545   | 0.057  | 0.379  | 0.379  | 568.299  | 0.083  |
| Trenchers                 | 2005 | 251    | 500     | 63.694   | 0.812  | 4.395   | 7.903   | 0.05   | 0.332  | 0.332  | 568.299  | 0.073  |
| Trenchers                 | 2005 | 501    | 750     | 121.568  | 0.822  | 4.387   | 8.023   | 0.052  | 0.333  | 0.333  | 568.299  | 0.074  |
| Trenchers                 | 2010 | 6      | 15      | 1.531711 | 1.2871 | 5.11336 | 5.52761 | 0.0054 | 0.509  | 0.4683 | 586.297  | 0.1707 |
| Trenchers                 | 2010 | 16     | 25      | 1.531711 | 1.2871 | 5.11336 | 5.52761 | 0.0054 | 0.509  | 0.4683 | 586.297  | 0.1707 |
| Trenchers                 | 2010 | 26     | 50      | 1.531711 | 1.2871 | 5.11336 | 5.52761 | 0.0054 | 0.509  | 0.4683 | 586.297  | 0.1707 |
| Trenchers                 | 2010 | 51     | 120     | 1.099287 | 0.9237 | 4.07421 | 7.99924 | 0.0049 | 0.6203 | 0.5707 | 529.306  | 0.1541 |
| Trenchers                 | 2010 | 121    | 175     | 0.922781 | 0.7754 | 3.7406  | 8.65095 | 0.0048 | 0.441  | 0.4058 | 519.6876 | 0.1513 |
| Trenchers                 | 2010 | 176    | 250     | 0.705197 | 0.5926 | 2.36576 | 7.86432 | 0.0049 | 0.3135 | 0.2885 | 527.3537 | 0.1535 |
| Trenchers                 | 2010 | 251    | 500     | 0.380701 | 0.3199 | 2.10547 | 4.85363 | 0.0049 | 0.1763 | 0.1622 | 523.7828 | 0.1525 |
| Trenchers                 | 2010 | 501    | 750     | 0.194919 | 0.1638 | 1.33412 | 3.20501 | 0.0049 | 0.1132 | 0.1041 | 525.788  | 0.153  |
| Trenchers                 | 2011 | 6      | 15      | 1.520162 | 1.2774 | 5.14932 | 5.52336 | 0.0054 | 0.5072 | 0.4666 | 585.033  | 0.1707 |
| Trenchers                 | 2011 | 16     | 25      | 1.520162 | 1.2774 | 5.14932 | 5.52336 | 0.0054 | 0.5072 | 0.4666 | 585.033  | 0.1707 |
| Trenchers                 | 2011 | 26     | 50      | 1.520162 | 1.2774 | 5.14932 | 5.52336 | 0.0054 | 0.5072 | 0.4666 | 585.033  | 0.1707 |
| Trenchers                 | 2011 | 51     | 120     | 1.045215 | 0.8783 | 4.02646 | 7.67483 | 0.0049 | 0.5977 | 0.5499 | 527.7187 | 0.154  |
| Trenchers                 | 2011 | 121    | 175     | 0.916044 | 0.7697 | 3.73004 | 8.56359 | 0.0048 | 0.4382 | 0.4031 | 518.4008 | 0.1513 |
| Trenchers                 | 2011 | 176    | 250     | 0.655301 | 0.5506 | 2.19702 | 7.41222 | 0.0049 | 0.2902 | 0.267  | 525.9543 | 0.1535 |
| Trenchers                 | 2011 | 251    | 500     | 0.372561 | 0.3131 | 2.04569 | 4.66474 | 0.0049 | 0.1712 | 0.1575 | 522.8418 | 0.1526 |



Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Trenchers      | 2011 | 501    | 750     | 0.180473 | 0.1516 | 1.33856 | 2.67369 | 0.0049 | 0.0969 | 0.0892 | 525.691  | 0.1534 |
| Trenchers      | 2012 | 6      | 15      | 1.545009 | 1.2982 | 5.24421 | 5.53504 | 0.0054 | 0.5122 | 0.4712 | 583.5639 | 0.1707 |
| Trenchers      | 2012 | 16     | 25      | 1.545009 | 1.2982 | 5.24421 | 5.53504 | 0.0054 | 0.5122 | 0.4712 | 583.5639 | 0.1707 |
| Trenchers      | 2012 | 26     | 50      | 1.545009 | 1.2982 | 5.24421 | 5.53504 | 0.0054 | 0.5122 | 0.4712 | 583.5639 | 0.1707 |
| Trenchers      | 2012 | 51     | 120     | 1.052636 | 0.8845 | 4.05076 | 7.69459 | 0.0049 | 0.6038 | 0.5555 | 526.3562 | 0.154  |
| Trenchers      | 2012 | 121    | 175     | 0.907539 | 0.7626 | 3.7162  | 8.45762 | 0.0048 | 0.436  | 0.4011 | 517.1147 | 0.1513 |
| Trenchers      | 2012 | 176    | 250     | 0.662356 | 0.5566 | 2.20863 | 7.44867 | 0.0049 | 0.2932 | 0.2698 | 524.572  | 0.1535 |
| Trenchers      | 2012 | 251    | 500     | 0.369046 | 0.3101 | 2.03349 | 4.58546 | 0.0049 | 0.1681 | 0.1547 | 521.6264 | 0.1526 |
| Trenchers      | 2012 | 501    | 750     | 0.135931 | 0.1142 | 0.95532 | 2.04792 | 0.0049 | 0.0694 | 0.0638 | 524.8533 | 0.1535 |
| Trenchers      | 2013 | 6      | 15      | 1.53809  | 1.2924 | 5.2883  | 5.51013 | 0.0054 | 0.5092 | 0.4685 | 580.7693 | 0.1708 |
| Trenchers      | 2013 | 16     | 25      | 1.53809  | 1.2924 | 5.2883  | 5.51013 | 0.0054 | 0.5092 | 0.4685 | 580.7693 | 0.1708 |
| Trenchers      | 2013 | 26     | 50      | 1.53809  | 1.2924 | 5.2883  | 5.51013 | 0.0054 | 0.5092 | 0.4685 | 580.7693 | 0.1708 |
| Trenchers      | 2013 | 51     | 120     | 1.010936 | 0.8495 | 4.02389 | 7.45031 | 0.0049 | 0.5824 | 0.5358 | 523.4236 | 0.1539 |
| Trenchers      | 2013 | 121    | 175     | 0.916392 | 0.77   | 3.73732 | 8.49431 | 0.0048 | 0.4409 | 0.4056 | 514.53   | 0.1513 |
| Trenchers      | 2013 | 176    | 250     | 0.626949 | 0.5268 | 2.13383 | 7.03951 | 0.0049 | 0.2761 | 0.254  | 520.4335 | 0.153  |
| Trenchers      | 2013 | 251    | 500     | 0.376293 | 0.3162 | 2.04997 | 4.60225 | 0.0049 | 0.1699 | 0.1563 | 519.043  | 0.1526 |
| Trenchers      | 2013 | 501    | 750     | 0.144323 | 0.1213 | 0.96183 | 2.05561 | 0.0049 | 0.0704 | 0.0648 | 522.2778 | 0.1536 |
| Trenchers      | 2014 | 6      | 15      | 1.508934 | 1.2679 | 5.29329 | 5.45539 | 0.0054 | 0.5005 | 0.4605 | 577.7275 | 0.1707 |
| Trenchers      | 2014 | 16     | 25      | 1.508934 | 1.2679 | 5.29329 | 5.45539 | 0.0054 | 0.5005 | 0.4605 | 577.7275 | 0.1707 |
| Trenchers      | 2014 | 26     | 50      | 1.508934 | 1.2679 | 5.29329 | 5.45539 | 0.0054 | 0.5005 | 0.4605 | 577.7275 | 0.1707 |
| Trenchers      | 2014 | 51     | 120     | 0.973633 | 0.8181 | 3.99876 | 7.2172  | 0.0049 | 0.5629 | 0.5179 | 520.7658 | 0.1539 |
| Trenchers      | 2014 | 121    | 175     | 0.824366 | 0.6927 | 3.66799 | 7.69921 | 0.0048 | 0.3951 | 0.3635 | 512.1475 | 0.1513 |
| Trenchers      | 2014 | 176    | 250     | 0.591196 | 0.4968 | 2.07009 | 6.48427 | 0.0049 | 0.2579 | 0.2372 | 517.7188 | 0.153  |
| Trenchers      | 2014 | 251    | 500     | 0.364023 | 0.3059 | 2.03515 | 4.37019 | 0.0048 | 0.1611 | 0.1482 | 513.7439 | 0.1518 |
| Trenchers      | 2014 | 501    | 750     | 0.140019 | 0.1177 | 0.96403 | 1.825   | 0.0049 | 0.0613 | 0.0564 | 519.6576 | 0.1536 |
| Trenchers      | 2015 | 6      | 15      | 1.498018 | 1.2588 | 5.32346 | 5.40567 | 0.0054 | 0.4934 | 0.4539 | 571.6674 | 0.1707 |
| Trenchers      | 2015 | 16     | 25      | 1.498018 | 1.2588 | 5.32346 | 5.40567 | 0.0054 | 0.4934 | 0.4539 | 571.6674 | 0.1707 |
| Trenchers      | 2015 | 26     | 50      | 1.498018 | 1.2588 | 5.32346 | 5.40567 | 0.0054 | 0.4934 | 0.4539 | 571.6674 | 0.1707 |
| Trenchers      | 2015 | 51     | 120     | 0.972367 | 0.8171 | 4.01434 | 7.17857 | 0.0049 | 0.5616 | 0.5167 | 515.3955 | 0.1539 |
| Trenchers      | 2015 | 121    | 175     | 0.829448 | 0.697  | 3.68389 | 7.67382 | 0.0048 | 0.3958 | 0.3642 | 506.9434 | 0.1513 |
| Trenchers      | 2015 | 176    | 250     | 0.597101 | 0.5017 | 2.0797  | 6.50988 | 0.0049 | 0.26   | 0.2392 | 512.4325 | 0.153  |
| Trenchers      | 2015 | 251    | 500     | 0.370644 | 0.3114 | 2.05093 | 4.38344 | 0.0048 | 0.1626 | 0.1496 | 508.3296 | 0.1518 |
| Trenchers      | 2015 | 501    | 750     | 0.135272 | 0.1137 | 0.96532 | 1.62336 | 0.0049 | 0.0531 | 0.0489 | 514.4002 | 0.1536 |
| Trenchers      | 2016 | 6      | 15      | 1.450442 | 1.2188 | 5.28497 | 5.29818 | 0.0054 | 0.4747 | 0.4368 | 565.9942 | 0.1707 |
| Trenchers      | 2016 | 16     | 25      | 1.450442 | 1.2188 | 5.28497 | 5.29818 | 0.0054 | 0.4747 | 0.4368 | 565.9942 | 0.1707 |
| Trenchers      | 2016 | 26     | 50      | 1.450442 | 1.2188 | 5.28497 | 5.29818 | 0.0054 | 0.4747 | 0.4368 | 565.9942 | 0.1707 |
| Trenchers      | 2016 | 51     | 120     | 0.937737 | 0.788  | 3.98822 | 6.90219 | 0.0049 | 0.5413 | 0.498  | 509.9027 | 0.1538 |
| Trenchers      | 2016 | 121    | 175     | 0.693219 | 0.5825 | 3.50717 | 6.50303 | 0.0048 | 0.3277 | 0.3015 | 501.7809 | 0.1514 |
| Trenchers      | 2016 | 176    | 250     | 0.58008  | 0.4874 | 2.03007 | 6.31168 | 0.0049 | 0.2514 | 0.2313 | 507.1448 | 0.153  |
| Trenchers      | 2016 | 251    | 500     | 0.351818 | 0.2956 | 1.96649 | 4.09912 | 0.0049 | 0.1497 | 0.1377 | 504.4103 | 0.1521 |
| Trenchers      | 2016 | 501    | 750     | 0.142468 | 0.1197 | 0.97148 | 1.63008 | 0.0049 | 0.0539 | 0.0495 | 509.1433 | 0.1536 |
| Trenchers      | 2017 | 6      | 15      | 1.367315 | 1.1489 | 5.19682 | 5.16614 | 0.0054 | 0.4488 | 0.4129 | 557.4601 | 0.1708 |
| Trenchers      | 2017 | 16     | 25      | 1.367315 | 1.1489 | 5.19682 | 5.16614 | 0.0054 | 0.4488 | 0.4129 | 557.4601 | 0.1708 |
| Trenchers      | 2017 | 26     | 50      | 1.367315 | 1.1489 | 5.19682 | 5.16614 | 0.0054 | 0.4488 | 0.4129 | 557.4601 | 0.1708 |
| Trenchers      | 2017 | 51     | 120     | 0.906302 | 0.7615 | 3.96827 | 6.67876 | 0.0049 | 0.5232 | 0.4813 | 501.9916 | 0.1538 |
| Trenchers      | 2017 | 121    | 175     | 0.638299 | 0.5363 | 3.43391 | 5.92725 | 0.0048 | 0.3003 | 0.2763 | 493.7642 | 0.1513 |
| Trenchers      | 2017 | 176    | 250     | 0.577948 | 0.4856 | 2.03655 | 6.19428 | 0.0049 | 0.2501 | 0.2301 | 499.2281 | 0.153  |
| Trenchers      | 2017 | 251    | 500     | 0.315778 | 0.2653 | 1.96603 | 3.44157 | 0.0049 | 0.1289 | 0.1186 | 497.0197 | 0.1523 |
| Trenchers      | 2017 | 501    | 750     | 0.135465 | 0.1138 | 0.97168 | 1.42958 | 0.0049 | 0.0457 | 0.0421 | 501.1831 | 0.1536 |
| Trenchers      | 2018 | 6      | 15      | 1.236195 | 1.0387 | 5.01831 | 4.95997 | 0.0054 | 0.4093 | 0.3766 | 548.3607 | 0.1707 |
| Trenchers      | 2018 | 16     | 25      | 1.236195 | 1.0387 | 5.01831 | 4.95997 | 0.0054 | 0.4093 | 0.3766 | 548.3607 | 0.1707 |
| Trenchers      | 2018 | 26     | 50      | 1.236195 | 1.0387 | 5.01831 | 4.95997 | 0.0054 | 0.4093 | 0.3766 | 548.3607 | 0.1707 |
| Trenchers      | 2018 | 51     | 120     | 0.78315  | 0.6581 | 3.85487 | 5.91527 | 0.0049 | 0.45   | 0.414  | 493.715  | 0.1537 |
| Trenchers      | 2018 | 121    | 175     | 0.559787 | 0.4704 | 3.33134 | 5.12742 | 0.0048 | 0.2613 | 0.2404 | 485.9254 | 0.1513 |
| Trenchers      | 2018 | 176    | 250     | 0.498602 | 0.419  | 1.84856 | 5.29554 | 0.0049 | 0.2119 | 0.1949 | 491.5649 | 0.153  |
| Trenchers      | 2018 | 251    | 500     | 0.30464  | 0.256  | 1.97444 | 3.21114 | 0.0049 | 0.1212 | 0.1115 | 489.6281 | 0.1524 |
| Trenchers      | 2018 | 501    | 750     | 0.111849 | 0.094  | 0.96632 | 1.02523 | 0.0049 | 0.0286 | 0.0263 | 494.6426 | 0.154  |
| Trenchers      | 2019 | 6      | 15      | 1.136688 | 0.9551 | 4.89183 | 4.78464 | 0.0054 | 0.3767 | 0.3466 | 539.1037 | 0.1706 |
| Trenchers      | 2019 | 16     | 25      | 1.136688 | 0.9551 | 4.89183 | 4.78464 | 0.0054 | 0.3767 | 0.3466 | 539.1037 | 0.1706 |
| Trenchers      | 2019 | 26     | 50      | 1.136688 | 0.9551 | 4.89183 | 4.78464 | 0.0054 | 0.3767 | 0.3466 | 539.1037 | 0.1706 |
| Trenchers      | 2019 | 51     | 120     | 0.751452 | 0.6314 | 3.83677 | 5.69508 | 0.0049 | 0.4306 | 0.3961 | 485.3635 | 0.1536 |
| Trenchers      | 2019 | 121    | 175     | 0.547248 | 0.4598 | 3.34151 | 4.95976 | 0.0048 | 0.2547 | 0.2343 | 478.1294 | 0.1513 |
| Trenchers      | 2019 | 176    | 250     | 0.481784 | 0.4048 | 1.81019 | 5.04653 | 0.0049 | 0.2032 | 0.187  | 484.1167 | 0.1532 |
| Trenchers      | 2019 | 251    | 500     | 0.302803 | 0.2544 | 1.98689 | 3.12824 | 0.0049 | 0.1181 | 0.1086 | 482.1648 | 0.1526 |
| Trenchers      | 2019 | 501    | 750     | 0.09296  | 0.0781 | 0.95644 | 0.70662 | 0.0049 | 0.0152 | 0.014  | 484.5422 | 0.1533 |
| Trenchers      | 2020 | 6      | 15      | 1.076913 | 0.9049 | 4.8331  | 4.67651 | 0.0054 | 0.3561 | 0.3276 | 527.0962 | 0.1705 |
| Trenchers      | 2020 | 16     | 25      | 1.076913 | 0.9049 | 4.8331  | 4.67651 | 0.0054 | 0.3561 | 0.3276 | 527.0962 | 0.1705 |
| Trenchers      | 2020 | 26     | 50      | 1.076913 | 0.9049 | 4.8331  | 4.67651 | 0.0054 | 0.3561 | 0.3276 | 527.0962 | 0.1705 |
| Trenchers      | 2020 | 51     | 120     | 0.726229 | 0.6102 | 3.83272 | 5.51952 | 0.0049 | 0.4132 | 0.3802 | 475.1265 | 0.1537 |
| Trenchers      | 2020 | 121    | 175     | 0.500709 | 0.4207 | 3.32968 | 4.46042 | 0.0048 | 0.2281 | 0.2098 | 467.7348 | 0.1513 |
| Trenchers      | 2020 | 176    | 250     | 0.466499 | 0.392  | 1.77405 | 4.8091  | 0.0049 | 0.1949 | 0.1793 | 473.5951 | 0.1532 |
| Trenchers      | 2020 | 251    | 500     | 0.276702 | 0.2325 | 1.85932 | 2.775   | 0.0049 | 0.1052 | 0.0968 | 470.6367 | 0.1522 |
| Trenchers      | 2020 | 501    | 750     | 0.083454 | 0.0701 | 0.95004 | 0.56006 | 0.0049 | 0.009  | 0.0083 | 472.6556 | 0.1529 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG      | ROG    | CO      | NOX     | SO2    | PM10   | PM2.5  | CO2      | CH4    |
|----------------|------|--------|---------|----------|--------|---------|---------|--------|--------|--------|----------|--------|
| Trenchers      | 2021 | 6      | 15      | 0.962829 | 0.809  | 4.66576 | 4.45891 | 0.0054 | 0.3133 | 0.2882 | 527.0165 | 0.1704 |
| Trenchers      | 2021 | 16     | 25      | 0.962829 | 0.809  | 4.66576 | 4.45891 | 0.0054 | 0.3133 | 0.2882 | 527.0165 | 0.1704 |
| Trenchers      | 2021 | 26     | 50      | 0.962829 | 0.809  | 4.66576 | 4.45891 | 0.0054 | 0.3133 | 0.2882 | 527.0165 | 0.1704 |
| Trenchers      | 2021 | 51     | 120     | 0.661739 | 0.556  | 3.78912 | 5.10594 | 0.0049 | 0.3707 | 0.3411 | 475.287  | 0.1537 |
| Trenchers      | 2021 | 121    | 175     | 0.483838 | 0.4066 | 3.30363 | 4.27237 | 0.0048 | 0.2188 | 0.2013 | 467.7343 | 0.1513 |
| Trenchers      | 2021 | 176    | 250     | 0.42408  | 0.3563 | 1.66826 | 4.36036 | 0.0049 | 0.1718 | 0.1581 | 473.8538 | 0.1533 |
| Trenchers      | 2021 | 251    | 500     | 0.263326 | 0.2213 | 1.86493 | 2.49105 | 0.0049 | 0.1002 | 0.0922 | 470.701  | 0.1522 |
| Trenchers      | 2021 | 501    | 750     | 0.078358 | 0.0658 | 0.94677 | 0.47513 | 0.0049 | 0.009  | 0.0083 | 472.5289 | 0.1528 |
| Trenchers      | 2022 | 6      | 15      | 0.859634 | 0.7223 | 4.51833 | 4.26873 | 0.0054 | 0.2754 | 0.2534 | 527.0258 | 0.1705 |
| Trenchers      | 2022 | 16     | 25      | 0.859634 | 0.7223 | 4.51833 | 4.26873 | 0.0054 | 0.2754 | 0.2534 | 527.0258 | 0.1705 |
| Trenchers      | 2022 | 26     | 50      | 0.859634 | 0.7223 | 4.51833 | 4.26873 | 0.0054 | 0.2754 | 0.2534 | 527.0258 | 0.1705 |
| Trenchers      | 2022 | 51     | 120     | 0.629528 | 0.529  | 3.77843 | 4.91345 | 0.0049 | 0.3481 | 0.3203 | 475.3262 | 0.1537 |
| Trenchers      | 2022 | 121    | 175     | 0.470645 | 0.3955 | 3.31289 | 4.10333 | 0.0048 | 0.2115 | 0.1945 | 467.7337 | 0.1513 |
| Trenchers      | 2022 | 176    | 250     | 0.398562 | 0.3349 | 1.66329 | 3.85292 | 0.0049 | 0.1605 | 0.1476 | 473.8512 | 0.1533 |
| Trenchers      | 2022 | 251    | 500     | 0.252168 | 0.2119 | 1.87233 | 2.21226 | 0.0049 | 0.0937 | 0.0862 | 470.5845 | 0.1522 |
| Trenchers      | 2022 | 501    | 750     | 0.067683 | 0.0569 | 0.94489 | 0.30138 | 0.0049 | 0.0089 | 0.0082 | 474.2887 | 0.1534 |
| Trenchers      | 2023 | 6      | 15      | 0.763609 | 0.6416 | 4.30164 | 3.95873 | 0.0054 | 0.22   | 0.2024 | 527.0954 | 0.1705 |
| Trenchers      | 2023 | 16     | 25      | 0.763609 | 0.6416 | 4.30164 | 3.95873 | 0.0054 | 0.22   | 0.2024 | 527.0954 | 0.1705 |
| Trenchers      | 2023 | 26     | 50      | 0.763609 | 0.6416 | 4.30164 | 3.95873 | 0.0054 | 0.22   | 0.2024 | 527.0954 | 0.1705 |
| Trenchers      | 2023 | 51     | 120     | 0.599816 | 0.504  | 3.76842 | 4.70045 | 0.0049 | 0.3261 | 0.3    | 475.6903 | 0.1538 |
| Trenchers      | 2023 | 121    | 175     | 0.427489 | 0.3592 | 3.29061 | 3.65725 | 0.0048 | 0.1855 | 0.1706 | 467.7332 | 0.1513 |
| Trenchers      | 2023 | 176    | 250     | 0.390278 | 0.3279 | 1.6386  | 3.7365  | 0.0049 | 0.1551 | 0.1427 | 473.8485 | 0.1533 |
| Trenchers      | 2023 | 251    | 500     | 0.236268 | 0.1985 | 1.72273 | 2.00504 | 0.0049 | 0.0845 | 0.0778 | 471.6125 | 0.1525 |
| Trenchers      | 2023 | 501    | 750     | 0.071688 | 0.0602 | 0.95111 | 0.30278 | 0.0049 | 0.009  | 0.0083 | 474.4705 | 0.1535 |
| Trenchers      | 2024 | 6      | 15      | 0.714783 | 0.6006 | 4.23326 | 3.83415 | 0.0054 | 0.1965 | 0.1808 | 527.0216 | 0.1704 |
| Trenchers      | 2024 | 16     | 25      | 0.714783 | 0.6006 | 4.23326 | 3.83415 | 0.0054 | 0.1965 | 0.1808 | 527.0216 | 0.1704 |
| Trenchers      | 2024 | 26     | 50      | 0.714783 | 0.6006 | 4.23326 | 3.83415 | 0.0054 | 0.1965 | 0.1808 | 527.0216 | 0.1704 |
| Trenchers      | 2024 | 51     | 120     | 0.588274 | 0.4943 | 3.76854 | 4.59319 | 0.0049 | 0.3178 | 0.2924 | 475.6324 | 0.1538 |
| Trenchers      | 2024 | 121    | 175     | 0.432612 | 0.3635 | 3.31073 | 3.66715 | 0.0048 | 0.1867 | 0.1718 | 467.7326 | 0.1513 |
| Trenchers      | 2024 | 176    | 250     | 0.370794 | 0.3116 | 1.59847 | 3.48285 | 0.0049 | 0.1455 | 0.1338 | 473.8455 | 0.1533 |
| Trenchers      | 2024 | 251    | 500     | 0.228039 | 0.1916 | 1.66789 | 1.85871 | 0.0049 | 0.0799 | 0.0735 | 469.9942 | 0.152  |
| Trenchers      | 2024 | 501    | 750     | 0.076605 | 0.0644 | 0.95838 | 0.30435 | 0.0049 | 0.0092 | 0.0084 | 474.4782 | 0.1535 |
| Trenchers      | 2025 | 6      | 15      | 0.645012 | 0.542  | 4.11956 | 3.65681 | 0.0054 | 0.163  | 0.1499 | 527.1603 | 0.1705 |
| Trenchers      | 2025 | 16     | 25      | 0.645012 | 0.542  | 4.11956 | 3.65681 | 0.0054 | 0.163  | 0.1499 | 527.1603 | 0.1705 |
| Trenchers      | 2025 | 26     | 50      | 0.645012 | 0.542  | 4.11956 | 3.65681 | 0.0054 | 0.163  | 0.1499 | 527.1603 | 0.1705 |
| Trenchers      | 2025 | 51     | 120     | 0.5433   | 0.4565 | 3.73437 | 4.279   | 0.0049 | 0.285  | 0.2622 | 475.9014 | 0.1539 |
| Trenchers      | 2025 | 121    | 175     | 0.426125 | 0.3581 | 3.30907 | 3.54907 | 0.0048 | 0.1792 | 0.1648 | 467.732  | 0.1513 |
| Trenchers      | 2025 | 176    | 250     | 0.365033 | 0.3067 | 1.60076 | 3.31521 | 0.0049 | 0.144  | 0.1325 | 473.9168 | 0.1533 |
| Trenchers      | 2025 | 251    | 500     | 0.227307 | 0.191  | 1.67595 | 1.82613 | 0.0049 | 0.0787 | 0.0724 | 470.4394 | 0.1521 |
| Trenchers      | 2025 | 501    | 750     | 0.079299 | 0.0666 | 0.96233 | 0.30526 | 0.0049 | 0.0092 | 0.0085 | 474.4863 | 0.1535 |
| Trenchers      | 2030 | 6      | 15      | 1.409    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Trenchers      | 2030 | 16     | 25      | 5.681    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Trenchers      | 2030 | 26     | 50      | 7.055    | 0.851  | 5.208   | 3.835   | 0.007  | 0.144  | 0.144  | 568.299  | 0.076  |
| Trenchers      | 2030 | 51     | 120     | 6.697    | 0.409  | 3.743   | 2.559   | 0.006  | 0.132  | 0.132  | 568.299  | 0.036  |
| Trenchers      | 2030 | 121    | 175     | 10.904   | 0.3    | 3.273   | 1.529   | 0.006  | 0.08   | 0.08   | 568.3    | 0.027  |
| Trenchers      | 2030 | 176    | 250     | 14.406   | 0.256  | 1.188   | 1.348   | 0.006  | 0.049  | 0.049  | 568.3    | 0.023  |
| Trenchers      | 2030 | 251    | 500     | 19.534   | 0.249  | 1.209   | 1.231   | 0.005  | 0.046  | 0.046  | 568.299  | 0.022  |
| Trenchers      | 2030 | 501    | 750     | 36.902   | 0.249  | 1.209   | 1.254   | 0.005  | 0.047  | 0.047  | 568.299  | 0.022  |
| Trenchers      | 2035 | 6      | 15      | 1.409    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Trenchers      | 2035 | 16     | 25      | 5.681    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Trenchers      | 2035 | 26     | 50      | 5.645    | 0.681  | 5.055   | 3.548   | 0.007  | 0.084  | 0.084  | 568.299  | 0.061  |
| Trenchers      | 2035 | 51     | 120     | 5.437    | 0.332  | 3.713   | 2.049   | 0.006  | 0.076  | 0.076  | 568.3    | 0.03   |
| Trenchers      | 2035 | 121    | 175     | 8.756    | 0.241  | 3.264   | 0.966   | 0.006  | 0.048  | 0.048  | 568.299  | 0.021  |
| Trenchers      | 2035 | 176    | 250     | 12.171   | 0.216  | 1.149   | 0.847   | 0.006  | 0.031  | 0.031  | 568.299  | 0.019  |
| Trenchers      | 2035 | 251    | 500     | 16.707   | 0.213  | 1.126   | 0.79    | 0.005  | 0.029  | 0.029  | 568.299  | 0.019  |
| Trenchers      | 2035 | 501    | 750     | 31.529   | 0.213  | 1.126   | 0.801   | 0.005  | 0.029  | 0.029  | 568.3    | 0.019  |
| Trenchers      | 2040 | 6      | 15      | 1.409    | 0.661  | 3.469   | 4.142   | 0.008  | 0.161  | 0.161  | 568.299  | 0.059  |
| Trenchers      | 2040 | 16     | 25      | 5.681    | 0.685  | 2.339   | 4.332   | 0.007  | 0.161  | 0.161  | 568.299  | 0.061  |
| Trenchers      | 2040 | 26     | 50      | 4.961    | 0.598  | 4.98    | 3.374   | 0.007  | 0.052  | 0.052  | 568.299  | 0.054  |
| Trenchers      | 2040 | 51     | 120     | 4.791    | 0.293  | 3.699   | 1.767   | 0.006  | 0.047  | 0.047  | 568.299  | 0.026  |
| Trenchers      | 2040 | 121    | 175     | 7.533    | 0.207  | 3.26    | 0.639   | 0.006  | 0.03   | 0.03   | 568.3    | 0.018  |
| Trenchers      | 2040 | 176    | 250     | 10.853   | 0.193  | 1.126   | 0.573   | 0.006  | 0.02   | 0.02   | 568.3    | 0.017  |
| Trenchers      | 2040 | 251    | 500     | 15.011   | 0.191  | 1.081   | 0.542   | 0.005  | 0.02   | 0.02   | 568.3    | 0.017  |
| Trenchers      | 2040 | 501    | 750     | 28.323   | 0.191  | 1.081   | 0.549   | 0.005  | 0.02   | 0.02   | 568.299  | 0.017  |
| Welders        | 1990 | 6      | 15      | 4.525    | 1.804  | 4.999   | 9.999   | 1.018  | 0.974  | 0.974  | 568.299  | 0.162  |
| Welders        | 1990 | 16     | 25      | 10.092   | 2.213  | 4.999   | 6.919   | 0.83   | 0.74   | 0.74   | 568.299  | 0.199  |
| Welders        | 1990 | 26     | 50      | 40.899   | 3.899  | 8.078   | 7.611   | 0.846  | 1.085  | 1.085  | 568.3    | 0.351  |
| Welders        | 1990 | 51     | 120     | 33.632   | 2.107  | 5.312   | 13.999  | 0.768  | 1.146  | 1.146  | 568.3    | 0.19   |
| Welders        | 1990 | 121    | 175     | 57.219   | 1.442  | 4.703   | 12.598  | 0.736  | 0.761  | 0.761  | 568.299  | 0.13   |
| Welders        | 1990 | 176    | 250     | 69.387   | 1.442  | 4.703   | 12.598  | 0.736  | 0.761  | 0.761  | 568.299  | 0.13   |
| Welders        | 1990 | 251    | 500     | 88.323   | 1.304  | 8.704   | 12.141  | 0.642  | 0.672  | 0.672  | 568.3    | 0.117  |
| Welders        | 2000 | 6      | 15      | 4.323    | 1.723  | 4.875   | 9.08    | 0.079  | 0.747  | 0.747  | 568.299  | 0.155  |
| Welders        | 2000 | 16     | 25      | 9.556    | 2.095  | 4.783   | 6.405   | 0.065  | 0.569  | 0.569  | 568.299  | 0.189  |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG    | ROG   | CO    | NOX    | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|----------------|------|--------|---------|--------|-------|-------|--------|-------|-------|-------|---------|-------|
| Welders        | 2000 | 26     | 50      | 38.432 | 3.664 | 7.708 | 6.797  | 0.066 | 0.803 | 0.803 | 568.299 | 0.33  |
| Welders        | 2000 | 51     | 120     | 27.201 | 1.704 | 4.433 | 10.046 | 0.06  | 0.791 | 0.791 | 568.3   | 0.153 |
| Welders        | 2000 | 121    | 175     | 45.269 | 1.14  | 3.61  | 9.126  | 0.057 | 0.468 | 0.468 | 568.299 | 0.102 |
| Welders        | 2000 | 176    | 250     | 45.901 | 0.954 | 2.869 | 8.783  | 0.057 | 0.384 | 0.384 | 568.299 | 0.086 |
| Welders        | 2000 | 251    | 500     | 59.514 | 0.878 | 4.719 | 8.466  | 0.05  | 0.344 | 0.344 | 568.299 | 0.079 |
| Welders        | 2005 | 6      | 15      | 3.497  | 1.394 | 4.38  | 7.817  | 0.079 | 0.621 | 0.621 | 568.299 | 0.125 |
| Welders        | 2005 | 16     | 25      | 7.401  | 1.622 | 3.922 | 6.014  | 0.065 | 0.483 | 0.483 | 568.299 | 0.146 |
| Welders        | 2005 | 26     | 50      | 34.243 | 3.264 | 7.144 | 6.342  | 0.066 | 0.746 | 0.746 | 568.299 | 0.294 |
| Welders        | 2005 | 51     | 120     | 23.288 | 1.459 | 4.096 | 8.459  | 0.06  | 0.733 | 0.733 | 568.299 | 0.131 |
| Welders        | 2005 | 121    | 175     | 37.837 | 0.953 | 3.26  | 7.736  | 0.057 | 0.405 | 0.405 | 568.299 | 0.086 |
| Welders        | 2005 | 176    | 250     | 32.839 | 0.682 | 1.941 | 7.302  | 0.057 | 0.268 | 0.268 | 568.299 | 0.061 |
| Welders        | 2005 | 251    | 500     | 41.097 | 0.606 | 2.566 | 6.755  | 0.05  | 0.241 | 0.241 | 568.299 | 0.054 |
| Welders        | 2010 | 6      | 15      | 2.82   | 1.124 | 4.027 | 6.554  | 0.008 | 0.473 | 0.473 | 568.3   | 0.101 |
| Welders        | 2010 | 16     | 25      | 5.78   | 1.267 | 3.309 | 5.477  | 0.007 | 0.384 | 0.384 | 568.299 | 0.114 |
| Welders        | 2010 | 26     | 50      | 27.885 | 2.658 | 6.571 | 5.944  | 0.007 | 0.623 | 0.623 | 568.299 | 0.239 |
| Welders        | 2010 | 51     | 120     | 18.341 | 1.149 | 3.928 | 6.999  | 0.006 | 0.61  | 0.61  | 568.299 | 0.103 |
| Welders        | 2010 | 121    | 175     | 30.26  | 0.762 | 3.185 | 6.255  | 0.006 | 0.338 | 0.338 | 568.299 | 0.068 |
| Welders        | 2010 | 176    | 250     | 23.908 | 0.496 | 1.433 | 5.857  | 0.006 | 0.189 | 0.189 | 568.299 | 0.044 |
| Welders        | 2010 | 251    | 500     | 30.15  | 0.445 | 1.621 | 5.26   | 0.005 | 0.174 | 0.174 | 568.299 | 0.04  |
| Welders        | 2011 | 6      | 15      | 2.677  | 1.067 | 3.952 | 6.283  | 0.008 | 0.441 | 0.441 | 568.299 | 0.096 |
| Welders        | 2011 | 16     | 25      | 5.436  | 1.192 | 3.179 | 5.36   | 0.007 | 0.361 | 0.361 | 568.3   | 0.107 |
| Welders        | 2011 | 26     | 50      | 26.104 | 2.488 | 6.392 | 5.85   | 0.007 | 0.593 | 0.593 | 568.299 | 0.224 |
| Welders        | 2011 | 51     | 120     | 17.199 | 1.077 | 3.891 | 6.632  | 0.006 | 0.584 | 0.584 | 568.3   | 0.097 |
| Welders        | 2011 | 121    | 175     | 28.559 | 0.719 | 3.173 | 5.91   | 0.006 | 0.325 | 0.325 | 568.299 | 0.064 |
| Welders        | 2011 | 176    | 250     | 22.03  | 0.457 | 1.34  | 5.462  | 0.006 | 0.17  | 0.17  | 568.299 | 0.041 |
| Welders        | 2011 | 251    | 500     | 27.869 | 0.411 | 1.473 | 4.886  | 0.005 | 0.157 | 0.157 | 568.299 | 0.037 |
| Welders        | 2012 | 6      | 15      | 2.527  | 1.007 | 3.874 | 5.999  | 0.008 | 0.407 | 0.407 | 568.299 | 0.09  |
| Welders        | 2012 | 16     | 25      | 5.076  | 1.113 | 3.043 | 5.239  | 0.007 | 0.337 | 0.337 | 568.299 | 0.1   |
| Welders        | 2012 | 26     | 50      | 24.122 | 2.299 | 6.185 | 5.749  | 0.007 | 0.56  | 0.56  | 568.299 | 0.207 |
| Welders        | 2012 | 51     | 120     | 15.992 | 1.001 | 3.852 | 6.232  | 0.006 | 0.549 | 0.549 | 568.299 | 0.09  |
| Welders        | 2012 | 121    | 175     | 26.736 | 0.673 | 3.161 | 5.543  | 0.006 | 0.303 | 0.303 | 568.299 | 0.06  |
| Welders        | 2012 | 176    | 250     | 20.583 | 0.427 | 1.281 | 5.087  | 0.006 | 0.154 | 0.154 | 568.299 | 0.038 |
| Welders        | 2012 | 251    | 500     | 26.151 | 0.386 | 1.369 | 4.532  | 0.005 | 0.144 | 0.144 | 568.299 | 0.034 |
| Welders        | 2013 | 6      | 15      | 2.378  | 0.948 | 3.796 | 5.716  | 0.008 | 0.373 | 0.373 | 568.299 | 0.085 |
| Welders        | 2013 | 16     | 25      | 4.718  | 1.034 | 2.907 | 5.117  | 0.007 | 0.314 | 0.314 | 568.299 | 0.093 |
| Welders        | 2013 | 26     | 50      | 22.037 | 2.101 | 5.967 | 5.526  | 0.007 | 0.517 | 0.517 | 568.299 | 0.189 |
| Welders        | 2013 | 51     | 120     | 14.766 | 0.925 | 3.813 | 5.836  | 0.006 | 0.507 | 0.507 | 568.3   | 0.083 |
| Welders        | 2013 | 121    | 175     | 24.884 | 0.627 | 3.151 | 5.195  | 0.006 | 0.279 | 0.279 | 568.299 | 0.056 |
| Welders        | 2013 | 176    | 250     | 19.36  | 0.402 | 1.241 | 4.723  | 0.006 | 0.141 | 0.141 | 568.299 | 0.036 |
| Welders        | 2013 | 251    | 500     | 24.728 | 0.365 | 1.291 | 4.191  | 0.005 | 0.131 | 0.131 | 568.299 | 0.032 |
| Welders        | 2014 | 6      | 15      | 2.237  | 0.891 | 3.723 | 5.445  | 0.008 | 0.341 | 0.341 | 568.3   | 0.08  |
| Welders        | 2014 | 16     | 25      | 4.381  | 0.96  | 2.78  | 5      | 0.007 | 0.291 | 0.291 | 568.299 | 0.086 |
| Welders        | 2014 | 26     | 50      | 19.935 | 1.9   | 5.749 | 5.308  | 0.007 | 0.473 | 0.473 | 568.3   | 0.171 |
| Welders        | 2014 | 51     | 120     | 13.552 | 0.849 | 3.774 | 5.481  | 0.006 | 0.464 | 0.464 | 568.299 | 0.076 |
| Welders        | 2014 | 121    | 175     | 23.067 | 0.581 | 3.141 | 4.862  | 0.006 | 0.255 | 0.255 | 568.299 | 0.052 |
| Welders        | 2014 | 176    | 250     | 18.135 | 0.376 | 1.207 | 4.297  | 0.006 | 0.128 | 0.128 | 568.299 | 0.034 |
| Welders        | 2014 | 251    | 500     | 23.294 | 0.343 | 1.227 | 3.788  | 0.005 | 0.119 | 0.119 | 568.299 | 0.031 |
| Welders        | 2015 | 6      | 15      | 2.109  | 0.84  | 3.658 | 5.196  | 0.008 | 0.311 | 0.311 | 568.299 | 0.075 |
| Welders        | 2015 | 16     | 25      | 4.078  | 0.894 | 2.666 | 4.89   | 0.007 | 0.27  | 0.27  | 568.299 | 0.08  |
| Welders        | 2015 | 26     | 50      | 17.994 | 1.715 | 5.562 | 5.113  | 0.007 | 0.43  | 0.43  | 568.3   | 0.154 |
| Welders        | 2015 | 51     | 120     | 12.337 | 0.772 | 3.738 | 5.077  | 0.006 | 0.419 | 0.419 | 568.299 | 0.069 |
| Welders        | 2015 | 121    | 175     | 21.139 | 0.532 | 3.133 | 4.408  | 0.006 | 0.23  | 0.23  | 568.299 | 0.048 |
| Welders        | 2015 | 176    | 250     | 16.976 | 0.352 | 1.178 | 3.88   | 0.006 | 0.116 | 0.116 | 568.299 | 0.031 |
| Welders        | 2015 | 251    | 500     | 21.953 | 0.324 | 1.176 | 3.398  | 0.005 | 0.108 | 0.108 | 568.299 | 0.029 |
| Welders        | 2016 | 6      | 15      | 2.03   | 0.809 | 3.622 | 5.023  | 0.008 | 0.289 | 0.289 | 568.299 | 0.073 |
| Welders        | 2016 | 16     | 25      | 3.903  | 0.855 | 2.604 | 4.803  | 0.007 | 0.255 | 0.255 | 568.299 | 0.077 |
| Welders        | 2016 | 26     | 50      | 16.155 | 1.54  | 5.395 | 4.936  | 0.007 | 0.389 | 0.389 | 568.299 | 0.138 |
| Welders        | 2016 | 51     | 120     | 11.165 | 0.699 | 3.705 | 4.692  | 0.006 | 0.375 | 0.375 | 568.3   | 0.063 |
| Welders        | 2016 | 121    | 175     | 19.285 | 0.486 | 3.128 | 3.973  | 0.006 | 0.206 | 0.206 | 568.299 | 0.043 |
| Welders        | 2016 | 176    | 250     | 15.901 | 0.33  | 1.153 | 3.481  | 0.006 | 0.104 | 0.104 | 568.299 | 0.029 |
| Welders        | 2016 | 251    | 500     | 20.731 | 0.306 | 1.134 | 3.032  | 0.005 | 0.097 | 0.097 | 568.299 | 0.027 |
| Welders        | 2017 | 6      | 15      | 1.973  | 0.786 | 3.599 | 4.887  | 0.008 | 0.272 | 0.272 | 568.299 | 0.07  |
| Welders        | 2017 | 16     | 25      | 3.785  | 0.83  | 2.564 | 4.729  | 0.007 | 0.243 | 0.243 | 568.299 | 0.074 |
| Welders        | 2017 | 26     | 50      | 14.392 | 1.372 | 5.239 | 4.768  | 0.007 | 0.35  | 0.35  | 568.299 | 0.123 |
| Welders        | 2017 | 51     | 120     | 10.06  | 0.63  | 3.675 | 4.328  | 0.006 | 0.332 | 0.332 | 568.299 | 0.056 |
| Welders        | 2017 | 121    | 175     | 17.561 | 0.442 | 3.124 | 3.562  | 0.006 | 0.183 | 0.183 | 568.299 | 0.039 |
| Welders        | 2017 | 176    | 250     | 14.942 | 0.31  | 1.133 | 3.105  | 0.006 | 0.094 | 0.094 | 568.299 | 0.028 |
| Welders        | 2017 | 251    | 500     | 19.705 | 0.29  | 1.102 | 2.713  | 0.005 | 0.088 | 0.088 | 568.299 | 0.026 |
| Welders        | 2018 | 6      | 15      | 1.923  | 0.766 | 3.58  | 4.762  | 0.008 | 0.256 | 0.256 | 568.3   | 0.069 |
| Welders        | 2018 | 16     | 25      | 3.684  | 0.807 | 2.531 | 4.661  | 0.007 | 0.232 | 0.232 | 568.299 | 0.072 |
| Welders        | 2018 | 26     | 50      | 12.698 | 1.21  | 5.092 | 4.607  | 0.007 | 0.311 | 0.311 | 568.299 | 0.109 |
| Welders        | 2018 | 51     | 120     | 9.016  | 0.564 | 3.648 | 3.98   | 0.006 | 0.29  | 0.29  | 568.299 | 0.05  |
| Welders        | 2018 | 121    | 175     | 15.966 | 0.402 | 3.123 | 3.176  | 0.006 | 0.162 | 0.162 | 568.299 | 0.036 |

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

| Equipment Type | Year | Low HP | High HP | TOG    | ROG   | CO    | NOX   | SO2   | PM10  | PM2.5 | CO2     | CH4   |
|----------------|------|--------|---------|--------|-------|-------|-------|-------|-------|-------|---------|-------|
| Welders        | 2018 | 176    | 250     | 14.068 | 0.292 | 1.118 | 2.751 | 0.006 | 0.084 | 0.084 | 568.299 | 0.026 |
| Welders        | 2018 | 251    | 500     | 18.804 | 0.277 | 1.08  | 2.43  | 0.005 | 0.08  | 0.08  | 568.299 | 0.025 |
| Welders        | 2019 | 6      | 15      | 1.877  | 0.748 | 3.562 | 4.647 | 0.008 | 0.241 | 0.241 | 568.299 | 0.067 |
| Welders        | 2019 | 16     | 25      | 3.592  | 0.787 | 2.501 | 4.596 | 0.007 | 0.222 | 0.222 | 568.299 | 0.071 |
| Welders        | 2019 | 26     | 50      | 11.071 | 1.055 | 4.95  | 4.449 | 0.007 | 0.273 | 0.273 | 568.299 | 0.095 |
| Welders        | 2019 | 51     | 120     | 8.032  | 0.503 | 3.623 | 3.648 | 0.006 | 0.25  | 0.25  | 568.299 | 0.045 |
| Welders        | 2019 | 121    | 175     | 14.693 | 0.37  | 3.122 | 2.832 | 0.006 | 0.143 | 0.143 | 568.3   | 0.033 |
| Welders        | 2019 | 176    | 250     | 13.284 | 0.276 | 1.104 | 2.432 | 0.006 | 0.075 | 0.075 | 568.299 | 0.024 |
| Welders        | 2019 | 251    | 500     | 17.937 | 0.264 | 1.065 | 2.163 | 0.005 | 0.072 | 0.072 | 568.3   | 0.023 |
| Welders        | 2020 | 6      | 15      | 1.835  | 0.731 | 3.546 | 4.542 | 0.008 | 0.227 | 0.227 | 568.299 | 0.066 |
| Welders        | 2020 | 16     | 25      | 3.507  | 0.769 | 2.473 | 4.538 | 0.007 | 0.212 | 0.212 | 568.299 | 0.069 |
| Welders        | 2020 | 26     | 50      | 9.83   | 0.937 | 4.84  | 4.304 | 0.007 | 0.238 | 0.238 | 568.299 | 0.084 |
| Welders        | 2020 | 51     | 120     | 7.278  | 0.455 | 3.605 | 3.351 | 0.006 | 0.216 | 0.216 | 568.299 | 0.041 |
| Welders        | 2020 | 121    | 175     | 13.663 | 0.344 | 3.122 | 2.523 | 0.006 | 0.127 | 0.127 | 568.299 | 0.031 |
| Welders        | 2020 | 176    | 250     | 12.577 | 0.261 | 1.093 | 2.143 | 0.006 | 0.066 | 0.066 | 568.299 | 0.023 |
| Welders        | 2020 | 251    | 500     | 17.094 | 0.252 | 1.055 | 1.91  | 0.005 | 0.064 | 0.064 | 568.299 | 0.022 |
| Welders        | 2021 | 6      | 15      | 1.8    | 0.717 | 3.531 | 4.462 | 0.008 | 0.214 | 0.214 | 568.299 | 0.064 |
| Welders        | 2021 | 16     | 25      | 3.431  | 0.752 | 2.446 | 4.497 | 0.007 | 0.201 | 0.201 | 568.299 | 0.067 |
| Welders        | 2021 | 26     | 50      | 8.704  | 0.829 | 4.708 | 4.133 | 0.007 | 0.203 | 0.203 | 568.299 | 0.074 |
| Welders        | 2021 | 51     | 120     | 6.572  | 0.411 | 3.579 | 3.042 | 0.006 | 0.184 | 0.184 | 568.299 | 0.037 |
| Welders        | 2021 | 121    | 175     | 12.512 | 0.315 | 3.112 | 2.189 | 0.006 | 0.11  | 0.11  | 568.299 | 0.028 |
| Welders        | 2021 | 176    | 250     | 11.711 | 0.243 | 1.081 | 1.836 | 0.006 | 0.057 | 0.057 | 568.299 | 0.021 |
| Welders        | 2021 | 251    | 500     | 15.998 | 0.236 | 1.044 | 1.642 | 0.005 | 0.055 | 0.055 | 568.299 | 0.021 |
| Welders        | 2022 | 6      | 15      | 1.774  | 0.707 | 3.519 | 4.408 | 0.008 | 0.203 | 0.203 | 568.3   | 0.063 |
| Welders        | 2022 | 16     | 25      | 3.374  | 0.739 | 2.426 | 4.47  | 0.007 | 0.193 | 0.193 | 568.299 | 0.066 |
| Welders        | 2022 | 26     | 50      | 7.959  | 0.758 | 4.645 | 4.007 | 0.007 | 0.175 | 0.175 | 568.299 | 0.068 |
| Welders        | 2022 | 51     | 120     | 6.112  | 0.382 | 3.57  | 2.808 | 0.006 | 0.16  | 0.16  | 568.299 | 0.034 |
| Welders        | 2022 | 121    | 175     | 11.714 | 0.295 | 3.113 | 1.935 | 0.006 | 0.097 | 0.097 | 568.3   | 0.026 |
| Welders        | 2022 | 176    | 250     | 11.128 | 0.231 | 1.074 | 1.598 | 0.006 | 0.05  | 0.05  | 568.299 | 0.02  |
| Welders        | 2022 | 251    | 500     | 15.267 | 0.225 | 1.038 | 1.454 | 0.005 | 0.049 | 0.049 | 568.3   | 0.02  |
| Welders        | 2023 | 6      | 15      | 1.751  | 0.698 | 3.508 | 4.359 | 0.008 | 0.194 | 0.194 | 568.3   | 0.063 |
| Welders        | 2023 | 16     | 25      | 3.322  | 0.728 | 2.407 | 4.447 | 0.007 | 0.186 | 0.186 | 568.299 | 0.065 |
| Welders        | 2023 | 26     | 50      | 7.318  | 0.697 | 4.596 | 3.891 | 0.007 | 0.151 | 0.151 | 568.299 | 0.062 |
| Welders        | 2023 | 51     | 120     | 5.713  | 0.357 | 3.564 | 2.599 | 0.006 | 0.139 | 0.139 | 568.299 | 0.032 |
| Welders        | 2023 | 121    | 175     | 11.013 | 0.277 | 3.115 | 1.726 | 0.006 | 0.085 | 0.085 | 568.299 | 0.025 |
| Welders        | 2023 | 176    | 250     | 10.606 | 0.22  | 1.071 | 1.404 | 0.006 | 0.044 | 0.044 | 568.299 | 0.019 |
| Welders        | 2023 | 251    | 500     | 14.602 | 0.215 | 1.034 | 1.289 | 0.005 | 0.042 | 0.042 | 568.299 | 0.019 |
| Welders        | 2024 | 6      | 15      | 1.731  | 0.69  | 3.499 | 4.316 | 0.008 | 0.188 | 0.188 | 568.299 | 0.062 |
| Welders        | 2024 | 16     | 25      | 3.276  | 0.718 | 2.39  | 4.426 | 0.007 | 0.181 | 0.181 | 568.299 | 0.064 |
| Welders        | 2024 | 26     | 50      | 6.78   | 0.646 | 4.557 | 3.782 | 0.007 | 0.13  | 0.13  | 568.299 | 0.058 |
| Welders        | 2024 | 51     | 120     | 5.366  | 0.336 | 3.56  | 2.43  | 0.006 | 0.12  | 0.12  | 568.299 | 0.03  |
| Welders        | 2024 | 121    | 175     | 10.369 | 0.261 | 3.118 | 1.541 | 0.006 | 0.074 | 0.074 | 568.299 | 0.023 |
| Welders        | 2024 | 176    | 250     | 10.107 | 0.21  | 1.068 | 1.234 | 0.006 | 0.038 | 0.038 | 568.299 | 0.018 |
| Welders        | 2024 | 251    | 500     | 13.957 | 0.206 | 1.032 | 1.135 | 0.005 | 0.037 | 0.037 | 568.299 | 0.018 |
| Welders        | 2025 | 6      | 15      | 1.713  | 0.683 | 3.491 | 4.278 | 0.008 | 0.183 | 0.183 | 568.3   | 0.061 |
| Welders        | 2025 | 16     | 25      | 3.237  | 0.709 | 2.376 | 4.407 | 0.007 | 0.177 | 0.177 | 568.299 | 0.064 |
| Welders        | 2025 | 26     | 50      | 6.315  | 0.602 | 4.524 | 3.676 | 0.007 | 0.112 | 0.112 | 568.299 | 0.054 |
| Welders        | 2025 | 51     | 120     | 5.055  | 0.316 | 3.557 | 2.283 | 0.006 | 0.102 | 0.102 | 568.299 | 0.028 |
| Welders        | 2025 | 121    | 175     | 9.743  | 0.245 | 3.121 | 1.365 | 0.006 | 0.063 | 0.063 | 568.299 | 0.022 |
| Welders        | 2025 | 176    | 250     | 9.621  | 0.199 | 1.065 | 1.075 | 0.006 | 0.032 | 0.032 | 568.299 | 0.018 |
| Welders        | 2025 | 251    | 500     | 13.325 | 0.196 | 1.029 | 0.99  | 0.005 | 0.031 | 0.031 | 568.299 | 0.017 |
| Welders        | 2030 | 6      | 15      | 1.665  | 0.663 | 3.47  | 4.164 | 0.008 | 0.166 | 0.166 | 568.299 | 0.059 |
| Welders        | 2030 | 16     | 25      | 3.133  | 0.687 | 2.34  | 4.347 | 0.007 | 0.165 | 0.165 | 568.299 | 0.061 |
| Welders        | 2030 | 26     | 50      | 4.719  | 0.449 | 4.387 | 3.273 | 0.007 | 0.045 | 0.045 | 568.299 | 0.04  |
| Welders        | 2030 | 51     | 120     | 3.827  | 0.239 | 3.535 | 1.707 | 0.006 | 0.04  | 0.04  | 568.299 | 0.021 |
| Welders        | 2030 | 121    | 175     | 7.011  | 0.176 | 3.121 | 0.628 | 0.006 | 0.027 | 0.027 | 568.299 | 0.015 |
| Welders        | 2030 | 176    | 250     | 7.829  | 0.162 | 1.063 | 0.525 | 0.006 | 0.017 | 0.017 | 568.299 | 0.014 |
| Welders        | 2030 | 251    | 500     | 10.967 | 0.161 | 1.027 | 0.495 | 0.005 | 0.017 | 0.017 | 568.299 | 0.014 |
| Welders        | 2035 | 6      | 15      | 1.659  | 0.661 | 3.469 | 4.143 | 0.008 | 0.162 | 0.162 | 568.299 | 0.059 |
| Welders        | 2035 | 16     | 25      | 3.126  | 0.685 | 2.339 | 4.332 | 0.007 | 0.162 | 0.162 | 568.299 | 0.061 |
| Welders        | 2035 | 26     | 50      | 4.262  | 0.406 | 4.349 | 3.147 | 0.007 | 0.022 | 0.022 | 568.299 | 0.036 |
| Welders        | 2035 | 51     | 120     | 3.418  | 0.214 | 3.528 | 1.509 | 0.006 | 0.019 | 0.019 | 568.299 | 0.019 |
| Welders        | 2035 | 121    | 175     | 6.087  | 0.153 | 3.121 | 0.387 | 0.006 | 0.015 | 0.015 | 568.299 | 0.013 |
| Welders        | 2035 | 176    | 250     | 7.189  | 0.149 | 1.063 | 0.343 | 0.006 | 0.012 | 0.012 | 568.299 | 0.013 |
| Welders        | 2035 | 251    | 500     | 10.118 | 0.149 | 1.027 | 0.339 | 0.005 | 0.012 | 0.012 | 568.299 | 0.013 |
| Welders        | 2040 | 6      | 15      | 1.659  | 0.661 | 3.469 | 4.142 | 0.008 | 0.161 | 0.161 | 568.299 | 0.059 |
| Welders        | 2040 | 16     | 25      | 3.126  | 0.685 | 2.339 | 4.332 | 0.007 | 0.161 | 0.161 | 568.299 | 0.061 |
| Welders        | 2040 | 26     | 50      | 4.218  | 0.402 | 4.336 | 3.093 | 0.007 | 0.015 | 0.015 | 568.3   | 0.036 |
| Welders        | 2040 | 51     | 120     | 3.322  | 0.208 | 3.524 | 1.447 | 0.006 | 0.014 | 0.014 | 568.299 | 0.018 |
| Welders        | 2040 | 121    | 175     | 5.753  | 0.145 | 3.118 | 0.303 | 0.006 | 0.011 | 0.011 | 568.299 | 0.013 |
| Welders        | 2040 | 176    | 250     | 6.911  | 0.143 | 1.062 | 0.287 | 0.006 | 0.01  | 0.01  | 568.3   | 0.012 |
| Welders        | 2040 | 251    | 500     | 9.728  | 0.143 | 1.026 | 0.287 | 0.005 | 0.01  | 0.01  | 568.299 | 0.012 |

**Table 3.5 OFFROAD Emission Factor Based on Engine Tier**

| Tier           | Low HP | High HP | CO,<br>g/bhp-hr | NOx,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | ROG,<br>g/bhp-hr |
|----------------|--------|---------|-----------------|------------------|-------------------|--------------------|------------------|
| Tier 1         | 25     | 49      | 4.1             | 5.26             | 0.48              | 0.48               | 1.74             |
|                | 50     | 74      | 6.9             | 6.54             | 0.552             | 0.552              | 1.19             |
|                | 75     | 119     | 6.9             | 6.54             | 0.552             | 0.552              | 1.19             |
|                | 120    | 174     | 6.9             | 6.54             | 0.274             | 0.274              | 0.82             |
|                | 175    | 299     | 6.9             | 5.93             | 0.108             | 0.108              | 0.38             |
|                | 300    | 599     | 6.9             | 5.93             | 0.108             | 0.108              | 0.38             |
|                | 600    | 750     | 6.9             | 5.93             | 0.108             | 0.108              | 0.38             |
|                | 751    | 2000    | 6.9             | 5.93             | 0.108             | 0.108              | 0.38             |
| Tier 2         | 25     | 49      | 4.1             | 4.63             | 0.28              | 0.28               | 0.29             |
|                | 50     | 74      | 3.7             | 4.75             | 0.192             | 0.192              | 0.23             |
|                | 75     | 119     | 3.7             | 4.75             | 0.192             | 0.192              | 0.23             |
|                | 120    | 174     | 3.7             | 4.17             | 0.128             | 0.128              | 0.19             |
|                | 175    | 299     | 2.6             | 4.15             | 0.088             | 0.088              | 0.12             |
|                | 300    | 599     | 2.6             | 3.79             | 0.088             | 0.088              | 0.12             |
|                | 600    | 750     | 2.6             | 3.79             | 0.088             | 0.088              | 0.12             |
|                | 751    | 2000    | 2.6             | 3.79             | 0.088             | 0.088              | 0.12             |
| Tier 3         | 25     | 49      | 4.1             | 4.63             | 0.28              | 0.28               | 0.29             |
|                | 50     | 74      | 3.7             | 2.74             | 0.192             | 0.192              | 0.12             |
|                | 75     | 119     | 3.7             | 2.74             | 0.192             | 0.192              | 0.12             |
|                | 120    | 174     | 3.7             | 2.32             | 0.112             | 0.112              | 0.12             |
|                | 175    | 299     | 2.6             | 2.32             | 0.088             | 0.088              | 0.12             |
|                | 300    | 599     | 2.6             | 2.32             | 0.088             | 0.088              | 0.12             |
|                | 600    | 750     | 2.6             | 2.32             | 0.088             | 0.088              | 0.12             |
|                | 751    | 2000    | 2.6             | 2.32             | 0.088             | 0.088              | 0.12             |
| Tier 4 Interim | 25     | 49      | 4.1             | 4.55             | 0.128             | 0.128              | 0.12             |
|                | 50     | 74      | 3.7             | 2.74             | 0.112             | 0.112              | 0.12             |
|                | 75     | 119     | 3.7             | 2.14             | 0.008             | 0.008              | 0.11             |
|                | 120    | 174     | 3.7             | 2.15             | 0.008             | 0.008              | 0.06             |
|                | 175    | 299     | 2.6             | 1.29             | 0.008             | 0.008              | 0.08             |
|                | 300    | 599     | 2.6             | 1.29             | 0.008             | 0.008              | 0.08             |
|                | 600    | 750     | 2.6             | 1.29             | 0.008             | 0.008              | 0.08             |
|                | 751    | 2000    | 2.6             | 2.24             | 0.048             | 0.048              | 0.12             |
| Tier 4 Final   | 25     | 49      | 4.1             | 2.75             | 0.008             | 0.008              | 0.12             |
|                | 50     | 74      | 3.7             | 2.74             | 0.008             | 0.008              | 0.12             |
|                | 75     | 119     | 3.7             | 0.26             | 0.008             | 0.008              | 0.06             |
|                | 120    | 174     | 3.7             | 0.26             | 0.008             | 0.008              | 0.06             |
|                | 175    | 299     | 2.2             | 0.26             | 0.008             | 0.008              | 0.06             |
|                | 300    | 599     | 2.2             | 0.26             | 0.008             | 0.008              | 0.06             |
|                | 600    | 750     | 2.2             | 0.26             | 0.008             | 0.008              | 0.06             |
|                | 751    | 2000    | 2.6             | 2.24             | 0.016             | 0.016              | 0.06             |

**Source:**

ARB. 2011. The Carl Moyer Program Guidelines. Available at:

[http://www.arb.ca.gov/msprog/moyer/guidelines/2011gl/2011cmpgl\\_3\\_27\\_13.pdf](http://www.arb.ca.gov/msprog/moyer/guidelines/2011gl/2011cmpgl_3_27_13.pdf)

**Table 3.6 Percent Reduction in Diesel Emission Factors For Compressed Natural Gas Equipment  
Based on Data Available in OFFROAD2011**

| Equipment Type  | MinYear | MaxYear | Low HP | High HP | CO     | CO2E     | NOX    | PM10    | PM2.5     | ROG    | SO2 | TOG    |
|-----------------|---------|---------|--------|---------|--------|----------|--------|---------|-----------|--------|-----|--------|
| Aerial Lifts    | 1990    | 2009    | 0      | 15      | -27.49 | -0.27    | 0.55   | 0.36    | 0.36      | 0.73   | 1   | 0.73   |
| Aerial Lifts    | 1990    | 2009    | 16     | 25      | -29.12 | -0.31    | 0.46   | 0.26    | 0.26      | 0.74   | 1   | 0.74   |
| Air Conditioner | 1990    | 2009    | 0      | 175     | -4.51  | -0.21    | -0.3   | 0.84    | 0.84      | 0.87   | 1   | 0.87   |
| Baggage Tug     | 1990    | 2009    | 0      | 120     | -5.07  | -0.24    | 0.1    | 0.94    | 0.94      | 0.88   | 1   | 0.88   |
| Belt Loader     | 1990    | 2009    | 0      | 120     | -4.69  | -0.23    | 0.06   | 0.93    | 0.93      | 0.89   | 1   | 0.89   |
| Bobtail         | 1990    | 2009    | 0      | 120     | -4.41  | -0.22    | 0.23   | 0.93    | 0.93      | 0.91   | 1   | 0.91   |
| Cargo Loader    | 1990    | 2009    | 0      | 120     | -6.25  | -0.25    | -0.04  | 0.93    | 0.93      | 0.84   | 1   | 0.84   |
| Catering Truck  | 1990    | 2009    | 0      | 250     | -11.52 | -0.22    | -0.44  | 0.7     | 0.7       | 0.78   | 1   | 0.78   |
| Forklifts       | 1990    | 2009    | 0      | 50      | -0.21  | -0.23    | -0.51  | 0.93    | 0.93      | 0.95   | 1   | 0.95   |
| Forklifts       | 1990    | 2009    | 51     | 120     | -5.94  | -0.25    | 0.05   | 0.93    | 0.93      | 0.87   | 1   | 0.87   |
| Forklifts       | 1990    | 2009    | 121    | 175     | -5.81  | -0.22    | -0.02  | 0.88    | 0.88      | 0.89   | 1   | 0.89   |
| Generator Sets  | 1990    | 2009    | 0      | 120     | -3.97  | -0.12    | -0.02  | 0.92    | 0.92      | 0.91   | 1   | 0.91   |
| Generator Sets  | 1990    | 2009    | 121    | 175     | -4.15  | -0.12    | -0.11  | 0.85    | 0.85      | 0.89   | 1   | 0.89   |
| Lav Truck       | 1990    | 2009    | 0      | 175     | -4.57  | -0.22    | -0.11  | 0.88    | 0.88      | 0.89   | 1   | 0.89   |
| Lift            | 1990    | 2009    | 0      | 120     | -4.65  | -0.23    | -0.05  | 0.92    | 0.92      | 0.89   | 1   | 0.89   |
| Aerial Lifts    | 2010    | 2014    | 0      | 15      | -30.37 | -0.27    | 0.31   | -0.29   | -0.29     | 0.59   | 1   | 0.59   |
| Aerial Lifts    | 2010    | 2014    | 16     | 25      | -37.55 | -0.32    | 0.4    | -0.03   | -0.03     | 0.6    | 1   | 0.6    |
| Air Conditioner | 2010    | 2014    | 0      | 175     | -4.5   | -0.2     | -0.36  | 0.73    | 0.73      | 0.85   | 1   | 0.85   |
| Baggage Tug     | 2010    | 2014    | 0      | 120     | -5.56  | -0.22    | 0.22   | 0.92    | 0.92      | 0.88   | 1   | 0.88   |
| Belt Loader     | 2010    | 2014    | 0      | 120     | -5.13  | -0.22    | 0.21   | 0.92    | 0.92      | 0.9    | 1   | 0.9    |
| Bobtail         | 2010    | 2014    | 0      | 120     | -4.8   | -0.19    | 0.64   | 0.91    | 0.91      | 0.96   | 1   | 0.96   |
| Cargo Loader    | 2010    | 2014    | 0      | 120     | -6.78  | -0.24    | 0.06   | 0.91    | 0.91      | 0.84   | 1   | 0.84   |
| Catering Truck  | 2010    | 2014    | 0      | 250     | -17.32 | -0.21    | -0.38  | 0.53    | 0.53      | 0.73   | 1   | 0.73   |
| Forklifts       | 2010    | 2014    | 0      | 50      | -0.421 | -0.18053 | 0.3063 | 0.91412 | 0.9066507 | 0.9572 | 1   | 0.9118 |
| Forklifts       | 2010    | 2014    | 51     | 120     | -6.412 | -0.32006 | 0.4354 | 0.90105 | 0.8924417 | 0.8764 | 1   | 0.4569 |
| Forklifts       | 2010    | 2014    | 121    | 175     | -5.588 | -0.30615 | 0.5219 | 0.84295 | 0.8292897 | 0.8844 | 1   | 0.0884 |
| Generator Sets  | 2010    | 2014    | 0      | 120     | -4.3   | -0.11    | 0.11   | 0.89    | 0.89      | 0.91   | 1   | 0.91   |
| Generator Sets  | 2010    | 2014    | 121    | 175     | -4.36  | -0.11    | 0      | 0.81    | 0.81      | 0.89   | 1   | 0.89   |
| Lav Truck       | 2010    | 2014    | 0      | 175     | -4.77  | -0.21    | 0.01   | 0.84    | 0.84      | 0.9    | 1   | 0.9    |
| Lift            | 2010    | 2014    | 0      | 120     | -5.03  | -0.22    | 0.09   | 0.9     | 0.9       | 0.89   | 1   | 0.89   |
| Aerial Lifts    | 2015    | 2019    | 0      | 15      | -30.4  | -0.27    | 0.28   | -0.86   | -0.86     | 0.57   | 1   | 0.57   |
| Aerial Lifts    | 2015    | 2019    | 16     | 25      | -44.65 | -0.32    | 0.32   | -0.48   | -0.48     | 0.46   | 1   | 0.46   |
| Air Conditioner | 2015    | 2019    | 0      | 175     | -4.5   | -0.19    | -0.41  | 0.47    | 0.47      | 0.85   | 1   | 0.85   |
| Baggage Tug     | 2015    | 2019    | 0      | 120     | -5.9   | -0.21    | 0.3    | 0.91    | 0.91      | 0.89   | 1   | 0.89   |
| Belt Loader     | 2015    | 2019    | 0      | 120     | -5.41  | -0.21    | 0.31   | 0.9     | 0.9       | 0.91   | 1   | 0.91   |
| Bobtail         | 2015    | 2019    | 0      | 120     | -5.05  | -0.19    | 0.65   | 0.89    | 0.89      | 0.96   | 1   | 0.96   |
| Cargo Loader    | 2015    | 2019    | 0      | 120     | -7.2   | -0.22    | 0.04   | 0.88    | 0.88      | 0.83   | 1   | 0.83   |
| Catering Truck  | 2015    | 2019    | 0      | 250     | -18.99 | -0.2     | -0.54  | 0.16    | 0.16      | 0.72   | 1   | 0.72   |

**Table 3.6 Percent Reduction in Diesel Emission Factors For Compressed Natural Gas Equipment  
Based on Data Available in OFFROAD2011**

| Equipment Type  | MinYear | MaxYear | Low HP | High HP | CO     | CO2E     | NOX    | PM10    | PM2.5     | ROG    | SO2 | TOG    |
|-----------------|---------|---------|--------|---------|--------|----------|--------|---------|-----------|--------|-----|--------|
| Forklifts       | 2015    | 2019    | 0      | 50      | -0.486 | -0.16566 | 0.4918 | 0.90744 | 0.899394  | 0.9643 | 1   | 0.9263 |
| Forklifts       | 2015    | 2019    | 51     | 120     | -6.492 | -0.30722 | 0.5103 | 0.89309 | 0.8837969 | 0.9112 | 1   | 0.6099 |
| Forklifts       | 2015    | 2019    | 121    | 175     | -5.638 | -0.29426 | 0.6395 | 0.82031 | 0.8046898 | 0.9225 | 1   | 0.3883 |
| Generator Sets  | 2015    | 2019    | 0      | 120     | -4.56  | -0.11    | 0.22   | 0.84    | 0.84      | 0.91   | 1   | 0.91   |
| Generator Sets  | 2015    | 2019    | 121    | 175     | -4.44  | -0.1     | 0.12   | 0.71    | 0.71      | 0.9    | 1   | 0.9    |
| Lav Truck       | 2015    | 2019    | 0      | 175     | -4.83  | -0.2     | 0.1    | 0.76    | 0.76      | 0.91   | 1   | 0.91   |
| Lift            | 2015    | 2019    | 0      | 120     | -5.31  | -0.21    | 0.17   | 0.85    | 0.85      | 0.89   | 1   | 0.89   |
| Aerial Lifts    | 2020    | 2024    | 0      | 15      | -30.4  | -0.27    | 0.28   | -0.91   | -0.91     | 0.57   | 1   | 0.57   |
| Aerial Lifts    | 2020    | 2024    | 16     | 25      | -47.22 | -0.32    | 0.29   | -0.91   | -0.91     | 0.39   | 1   | 0.39   |
| Air Conditioner | 2020    | 2024    | 0      | 175     | -4.49  | -0.19    | -1.04  | -0.81   | -0.81     | 0.88   | 1   | 0.88   |
| Baggage Tug     | 2020    | 2024    | 0      | 120     | -6.21  | -0.2     | 0.31   | 0.87    | 0.87      | 0.9    | 1   | 0.9    |
| Belt Loader     | 2020    | 2024    | 0      | 120     | -5.69  | -0.2     | 0.31   | 0.85    | 0.85      | 0.91   | 1   | 0.91   |
| Bobtail         | 2020    | 2024    | 0      | 120     | -5.26  | -0.19    | 0.53   | 0.84    | 0.84      | 0.95   | 1   | 0.95   |
| Cargo Loader    | 2020    | 2024    | 0      | 120     | -7.57  | -0.21    | -0.09  | 0.78    | 0.78      | 0.81   | 1   | 0.81   |
| Catering Truck  | 2020    | 2024    | 0      | 250     | -19.46 | -0.2     | -1.2   | -0.75   | -0.75     | 0.73   | 1   | 0.73   |
| Forklifts       | 2020    | 2024    | 0      | 50      | -0.898 | -0.16373 | 0.3924 | 0.83451 | 0.8201159 | 0.9414 | 1   | 0.8791 |
| Forklifts       | 2020    | 2024    | 51     | 120     | -7.096 | -0.30625 | 0.2609 | 0.80708 | 0.7903095 | 0.858  | 1   | 0.3757 |
| Forklifts       | 2020    | 2024    | 121    | 175     | -6.198 | -0.29359 | 0.3988 | 0.66593 | 0.63688   | 0.89   | 1   | 0.1317 |
| Generator Sets  | 2020    | 2024    | 0      | 120     | -4.76  | -0.1     | 0.25   | 0.69    | 0.69      | 0.91   | 1   | 0.91   |
| Generator Sets  | 2020    | 2024    | 121    | 175     | -4.46  | -0.1     | 0.05   | 0.48    | 0.48      | 0.9    | 1   | 0.9    |
| Lav Truck       | 2020    | 2024    | 0      | 175     | -4.85  | -0.19    | -0.03  | 0.56    | 0.56      | 0.91   | 1   | 0.91   |
| Lift            | 2020    | 2024    | 0      | 120     | -5.53  | -0.2     | 0.13   | 0.72    | 0.72      | 0.89   | 1   | 0.89   |
| Aerial Lifts    | 2025    | 2040    | 0      | 15      | -30.4  | -0.27    | 0.28   | -0.91   | -0.91     | 0.57   | 1   | 0.57   |
| Aerial Lifts    | 2025    | 2040    | 16     | 25      | -48.03 | -0.32    | 0.27   | -1.09   | -1.09     | 0.37   | 1   | 0.37   |
| Air Conditioner | 2025    | 2040    | 0      | 175     | -4.5   | -0.19    | -3.46  | -3.31   | -3.31     | 0.88   | 1   | 0.88   |
| Baggage Tug     | 2025    | 2040    | 0      | 120     | -6.4   | -0.19    | 0.17   | 0.79    | 0.79      | 0.89   | 1   | 0.89   |
| Belt Loader     | 2025    | 2040    | 0      | 120     | -5.87  | -0.2     | 0.16   | 0.72    | 0.72      | 0.9    | 1   | 0.9    |
| Bobtail         | 2025    | 2040    | 0      | 120     | -5.48  | -0.19    | 0.32   | 0.72    | 0.72      | 0.93   | 1   | 0.93   |
| Cargo Loader    | 2025    | 2040    | 0      | 120     | -7.63  | -0.2     | -0.4   | 0.56    | 0.56      | 0.78   | 1   | 0.78   |
| Catering Truck  | 2025    | 2040    | 0      | 250     | -19.36 | -0.2     | -3.3   | -2.94   | -2.94     | 0.72   | 1   | 0.72   |
| Forklifts       | 2025    | 2040    | 0      | 50      | -1.152 | -0.16313 | 0.2811 | 0.6679  | 0.6390223 | 0.9001 | 1   | 0.7938 |
| Forklifts       | 2025    | 2040    | 51     | 120     | -7.432 | -0.30582 | -0.17  | 0.57587 | 0.5389851 | 0.7693 | 1   | -0.014 |
| Forklifts       | 2025    | 2040    | 121    | 175     | -6.368 | -0.29311 | -0.205 | 0.30273 | 0.2420976 | 0.8135 | 1   | -0.476 |
| Generator Sets  | 2025    | 2040    | 0      | 120     | -4.83  | -0.1     | 0.13   | 0.37    | 0.37      | 0.9    | 1   | 0.9    |
| Generator Sets  | 2025    | 2040    | 121    | 175     | -4.46  | -0.1     | -0.37  | -0.03   | -0.03     | 0.9    | 1   | 0.9    |
| Lav Truck       | 2025    | 2040    | 0      | 175     | -4.86  | -0.19    | -0.57  | 0.05    | 0.05      | 0.9    | 1   | 0.9    |
| Lift            | 2025    | 2040    | 0      | 120     | -5.6   | -0.2     | -0.08  | 0.37    | 0.37      | 0.87   | 1   | 0.87   |

**Table 3.7 Grading Equipment Acres Per Day**

| <b>Equipment Type</b> | <b>Acres per 8-hour Day</b> |
|-----------------------|-----------------------------|
| Crawler Tractors      | 0.5                         |
| Graders               | 0.5                         |
| Rubber Tired Dozers   | 0                           |
| Scrapers              | 1                           |

**Notes:**

1. Based on Walker's Building Estimator's Reference Book and determinations by SCAQMD.



Table 4.1 Road Characteristics

| Location Type | Name                            | Average Vehicle Weight | Percent of Paved Roads |                      |                     |                    |
|---------------|---------------------------------|------------------------|------------------------|----------------------|---------------------|--------------------|
|               |                                 |                        | Construction Worker    | Construction Hauling | Construction Vendor | Operational Mobile |
| Air Basin     | Great Basin Valleys             | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Lake County                     | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Lake Tahoe                      | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Mojave Desert                   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Mountain Counties               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | North Central Coast             | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | North Coast                     | 2.4                    | 55                     | 55                   | 55                  | 55                 |
|               | Northeast Plateau               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Sacramento Valley               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Salton Sea                      | 2.4                    | 50                     | 50                   | 50                  | 50                 |
|               | San Diego                       | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Francisco Bay Area          | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Joaquin Valley              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | South Central Coast             | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | South Coast                     | 2.4                    | 100                    | 100                  | 100                 | 100                |
| Air District  | Amador County APCD              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Antelope Valley APCD            | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Bay Area AQMD                   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Butte County AQMD               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Calaveras County AQMD           | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Colusa County APCD              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | El Dorado County APCD           | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Feather River AQMD              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Glenn County APCD               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Great Basin UAPCD               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Imperial County APCD            | 2.4                    | 50                     | 50                   | 50                  | 50                 |
|               | Kern County APCD                | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Lake County AQMD                | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Lassen County APCD              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Mariposa County APCD            | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Mendocino County AQMD           | 2.4                    | 55                     | 55                   | 55                  | 55                 |
|               | Modoc County APCD               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Mojave Desert AQMD              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Monterey Bay Unified APCD       | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | North Coast Unified APCD        | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Northern Sierra AQMD            | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Northern Sonoma County APCD     | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Placer County APCD              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Sacramento Metropolitan AQMD    | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Diego County APCD           | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Joaquin Valley Unified APCD | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Luis Obispo County APCD     | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Santa Barbara County APCD       | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Shasta County AQMD              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Siskiyou County APCD            | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | South Coast AQMD                | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Tehama County APCD              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Tuolumne County APCD            | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Ventura County APCD             | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Yolo/Solano AQMD                | 2.4                    | 94                     | 94                   | 94                  | 94                 |

Table 4.1 Road Characteristics

| Location Type | Name                                    | Average Vehicle Weight | Percent of Paved Roads |                      |                     |                    |
|---------------|-----------------------------------------|------------------------|------------------------|----------------------|---------------------|--------------------|
|               |                                         |                        | Construction Worker    | Construction Hauling | Construction Vendor | Operational Mobile |
| Counties      | Alameda                                 | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Alpine                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Amador                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Butte                                   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Calaveras                               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Colusa                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Contra Costa                            | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Del Norte                               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | El Dorado-Lake Tahoe                    | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | El Dorado-Mountain County               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Fresno                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Glenn                                   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Humboldt                                | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Imperial                                | 2.4                    | 50                     | 50                   | 50                  | 50                 |
|               | Inyo                                    | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Kern-Mojave Desert                      | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Kern-San Joaquin                        | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Kings                                   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Lake                                    | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Lassen                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Los Angeles-Mojave Desert               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Los Angeles-South Coast                 | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Madera                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Marin                                   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Mariposa                                | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Mendocino-Coastal                       | 2.4                    | 70                     | 70                   | 70                  | 70                 |
|               | Mendocino-Inland                        | 2.4                    | 80                     | 80                   | 80                  | 80                 |
|               | Mendocino-Rural Inland North            | 2.4                    | 30                     | 30                   | 30                  | 30                 |
|               | Mendocino-Rural Inland South            | 2.4                    | 40                     | 40                   | 40                  | 40                 |
|               | Merced                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Modoc                                   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Mono                                    | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Monterey                                | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Napa                                    | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Nevada                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Orange                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Placer-Lake Tahoe                       | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Placer-Mountain Counties                | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Placer-Sacramento                       | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Plumas                                  | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Riverside-Mojave Desert MDAQMD          | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Riverside-Mojave Desert SCAQMD          | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Riverside-Salton Sea                    | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Riverside-South Coast                   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Sacramento                              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Benito                              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Bernardino-Mojave Desert            | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Bernardino-South Coast              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Diego                               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Francisco                           | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Joaquin                             | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Luis Obispo                         | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | San Mateo                               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Santa Barbara-North of Santa Ynez       | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Santa Barbara-South of Santa Ynez Range | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Santa Clara                             | 2.4                    | 100                    | 100                  | 100                 | 100                |

**Table 4.1 Road Characteristics**

| Location Type | Name                 | Average Vehicle Weight | Percent of Paved Roads |                      |                     |                    |
|---------------|----------------------|------------------------|------------------------|----------------------|---------------------|--------------------|
|               |                      |                        | Construction Worker    | Construction Hauling | Construction Vendor | Operational Mobile |
|               | Santa Cruz           | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Shasta               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Sierra               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Siskiyou             | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Solano-San Francisco | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Solano-San Joaquin   | 2.4                    | 100                    | 100                  | 100                 | 94                 |
|               | Sonoma-North Coast   | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Sonoma-San Francisco | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Stanislaus           | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Sutter               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Tehama               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Trinity              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Tulare               | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Tuolumne             | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Ventura              | 2.4                    | 100                    | 100                  | 100                 | 100                |
|               | Yolo                 | 2.4                    | 94                     | 94                   | 94                  | 94                 |
|               | Yuba                 | 2.4                    | 100                    | 100                  | 100                 | 100                |
| Statewide     | Statewide            | 2.4                    | 100                    | 100                  | 100                 | 100                |

Notes:

1. Average Vehicle Weight is based on average for vehicles in California on all Roads.
2. Percent paved roads was set to 100% by default unless the district supplied a different

Table 4.2 Mobile Trip Characteristics Dependent on Location

| Location Type | Name                            | Rural Trip Length (miles) |       |      |      |      |       | Urban Trip Length (miles) |       |       |      |      |       | Residential Trip Type Percentage |      |      |
|---------------|---------------------------------|---------------------------|-------|------|------|------|-------|---------------------------|-------|-------|------|------|-------|----------------------------------|------|------|
|               |                                 | C-C                       | C-NW  | C-W  | H-O  | H-S  | H-W   | C-C                       | C-NW  | C-W   | H-O  | H-S  | H-W   | H-W                              | H-S  | H-O  |
| Air Basin     | Great Basin Valleys             | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Lake County                     | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Lake Tahoe                      | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Mojave Desert                   | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 40.2                             | 19.2 | 40.6 |
|               | Mountain Counties               | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | North Central Coast             | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 44                               | 18.8 | 37.2 |
|               | North Coast                     | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Northeast Plateau               | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Sacramento Valley               | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 32.9                             | 18   | 49.1 |
|               | Salton Sea                      | 6.2                       | 6.2   | 13.8 | 8.1  | 6.9  | 14.6  | 4.2                       | 5.4   | 12.5  | 4.5  | 3.5  | 11    | 40.2                             | 19.2 | 40.6 |
|               | San Diego                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 41.6                             | 18.8 | 39.6 |
|               | San Francisco Bay Area          | 6.6                       | 6.6   | 14.7 | 5.4  | 4.3  | 12.4  | 7.3                       | 7.3   | 9.5   | 5.4  | 4.3  | 12.4  | 26.1                             | 29.1 | 44.8 |
|               | San Joaquin Valley              | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 45.6                             | 19   | 35.4 |
|               | South Central Coast             | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.5                             | 15   | 47.5 |
|               | South Coast                     | 10.1                      | 7.9   | 18.5 | 12.9 | 9.6  | 19.8  | 8.4                       | 6.9   | 16.6  | 8.7  | 5.9  | 14.7  | 40.2                             | 19.2 | 40.6 |
| Air District  | Amador County APCD              | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | Antelope Valley APCD            | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 40.2                             | 19.2 | 40.6 |
|               | Bay Area AQMD                   | 6.6                       | 6.6   | 14.7 | 5.4  | 4.3  | 12.4  | 7.3                       | 7.3   | 9.5   | 5.4  | 4.3  | 12.4  | 26.1                             | 29.1 | 44.8 |
|               | Butte County AQMD               | 10.52                     | 10.52 | 10.5 | 7.22 | 7.22 | 12.54 | 10.5                      | 10.52 | 10.52 | 7.22 | 7.22 | 12.54 | 35                               | 17   | 48   |
|               | Calaveras County AQMD           | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | Colusa County APCD              | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | El Dorado County APCD           | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.6                             | 21   | 36.4 |
|               | Feather River AQMD              | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.6                             | 21   | 36.4 |
|               | Glenn County APCD               | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Great Basin UAPCD               | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Imperial County APCD            | 9.5                       | 11.9  | 16.4 | 8.1  | 11.7 | 10.2  | 5                         | 8.9   | 6.7   | 3.7  | 3.9  | 7.3   | 40.2                             | 19.2 | 40.6 |
|               | Kern County APCD                | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 46.4                             | 16.4 | 37.2 |
|               | Lake County AQMD                | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Lassen County APCD              | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Mariposa County APCD            | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | Mendocino County AQMD           | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Modoc County APCD               | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Mojave Desert AQMD              | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 40.2                             | 19.2 | 40.6 |
|               | Monterey Bay Unified APCD       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 44                               | 18.8 | 37.2 |
|               | North Coast Unified APCD        | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Northern Sierra AQMD            | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | Northern Sonoma County APCD     | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.9                             | 19.5 | 37.6 |
|               | Placer County APCD              | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.6                             | 21   | 36.4 |
|               | Sacramento Metropolitan AQMD    | 7.5                       | 8.5   | 15   | 8.5  | 7.5  | 15    | 5                         | 6.5   | 10    | 6.5  | 5    | 10    | 46.5                             | 12.5 | 41   |
|               | San Diego County APCD           | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 41.6                             | 18.8 | 39.6 |
|               | San Joaquin Valley Unified APCD | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 45.6                             | 19   | 35.4 |
|               | San Luis Obispo County APCD     | 13                        | 13    | 13   | 13   | 13   | 13    | 5                         | 5     | 13    | 5    | 5    | 13    | 35.8                             | 21   | 43.2 |
|               | Santa Barbara County APCD       | 4.6                       | 4.6   | 8.8  | 6.4  | 5.9  | 12.3  | 4.6                       | 4.6   | 8.8   | 6.4  | 5.9  | 12.3  | 37.5                             | 15   | 47.5 |
|               | Shasta County AQMD              | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42                               | 21.2 | 37.8 |

Table 4.2 Mobile Trip Characteristics Dependent on Location

| Location Type | Name                         | Rural Trip Length (miles) |       |      |      |      |       | Urban Trip Length (miles) |       |       |      |      |       | Residential Trip Type Percentage |      |      |
|---------------|------------------------------|---------------------------|-------|------|------|------|-------|---------------------------|-------|-------|------|------|-------|----------------------------------|------|------|
|               |                              | C-C                       | C-NW  | C-W  | H-O  | H-S  | H-W   | C-C                       | C-NW  | C-W   | H-O  | H-S  | H-W   | H-W                              | H-S  | H-O  |
|               | Siskiyou County APCD         | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | South Coast AQMD             | 10.1                      | 7.9   | 18.5 | 12.9 | 9.6  | 19.8  | 8.4                       | 6.9   | 16.6  | 8.7  | 5.9  | 14.7  | 40.2                             | 19.2 | 40.6 |
|               | Tehama County APCD           | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 41                               | 21.2 | 37.8 |
|               | Tuolumne County APCD         | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | Ventura County APCD          | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 32.9                             | 18   | 49.1 |
|               | Yolo/Solano AQMD             | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.6                             | 21   | 36.4 |
| Counties      | Alameda                      | 6.6                       | 6.6   | 14.7 | 5.4  | 4.3  | 12.4  | 7.3                       | 7.3   | 9.5   | 5.4  | 4.3  | 12.4  | 26.1                             | 29.1 | 44.8 |
|               | Alpine                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Amador                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | Butte                        | 10.52                     | 10.52 | 10.5 | 7.22 | 7.22 | 12.54 | 10.5                      | 10.52 | 10.52 | 7.22 | 7.22 | 12.54 | 35                               | 17   | 48   |
|               | Calaveras                    | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | Colusa                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Contra Costa                 | 6.6                       | 6.6   | 14.7 | 5.4  | 4.3  | 12.4  | 7.3                       | 7.3   | 9.5   | 5.4  | 4.3  | 12.4  | 26.1                             | 29.1 | 44.8 |
|               | Del Norte                    | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | El Dorado-Lake Tahoe         | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.6                             | 21   | 36.4 |
|               | El Dorado-Mountain County    | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.6                             | 21   | 36.4 |
|               | Fresno                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 48.4                             | 15.9 | 35.7 |
|               | Glenn                        | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Humboldt                     | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Imperial                     | 9.5                       | 11.9  | 16.4 | 8.1  | 11.7 | 10.2  | 5                         | 8.9   | 6.7   | 3.7  | 3.9  | 7.3   | 40.2                             | 19.2 | 40.6 |
|               | Inyo                         | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Kern-Mojave Desert           | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 46.4                             | 16.4 | 37.2 |
|               | Kern-San Joaquin             | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 46.4                             | 16.4 | 37.2 |
|               | Kings                        | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Lake                         | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Lassen                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Los Angeles-Mojave Desert    | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 40.2                             | 19.2 | 40.6 |
|               | Los Angeles-South Coast      | 10.1                      | 7.9   | 18.5 | 12.9 | 9.6  | 19.8  | 8.4                       | 6.9   | 16.6  | 8.7  | 5.9  | 14.7  | 40.2                             | 19.2 | 40.6 |
|               | Madera                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Marin                        | 6.6                       | 6.6   | 14.7 | 5.4  | 4.3  | 12.4  | 7.3                       | 7.3   | 9.5   | 5.4  | 4.3  | 12.4  | 26.1                             | 29.1 | 44.8 |
|               | Mariposa                     | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 37.3                             | 20.7 | 42   |
|               | Mendocino-Coastal            | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Mendocino-Inland             | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Mendocino-Rural Inland North | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Mendocino-Rural Inland South | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Merced                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 46.9                             | 17.4 | 35.7 |
|               | Modoc                        | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Mono                         | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Monterey                     | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 44                               | 18.8 | 37.2 |
|               | Napa                         | 6.6                       | 6.6   | 14.7 | 5.4  | 4.3  | 12.4  | 7.3                       | 7.3   | 9.5   | 5.4  | 4.3  | 12.4  | 26.1                             | 29.1 | 44.8 |
|               | Nevada                       | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.3                             | 19.6 | 38.1 |
|               | Orange                       | 10.1                      | 7.9   | 18.5 | 12.9 | 9.6  | 19.8  | 8.4                       | 6.9   | 16.6  | 8.7  | 5.9  | 14.7  | 40.2                             | 19.2 | 40.6 |
|               | Placer-Lake Tahoe            | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.6                             | 21   | 36.4 |
|               | Placer-Mountain Counties     | 6.6                       | 6.6   | 14.7 | 7.9  | 7.1  | 16.8  | 7.3                       | 7.3   | 9.5   | 7.5  | 7.3  | 10.8  | 42.6                             | 21   | 36.4 |

Table 4.2 Mobile Trip Characteristics Dependent on Location

| Location Type | Name                                    | Rural Trip Length (miles) |      |      |      |     |      | Urban Trip Length (miles) |      |      |     |     |      | Residential Trip Type Percentage |      |      |
|---------------|-----------------------------------------|---------------------------|------|------|------|-----|------|---------------------------|------|------|-----|-----|------|----------------------------------|------|------|
|               |                                         | C-C                       | C-NW | C-W  | H-O  | H-S | H-W  | C-C                       | C-NW | C-W  | H-O | H-S | H-W  | H-W                              | H-S  | H-O  |
|               | Placer-Sacramento                       | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.6                             | 21   | 36.4 |
|               | Plumas                                  | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.3                             | 19.6 | 38.1 |
|               | Riverside-Mojave Desert MDAQMD          | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 40.2                             | 19.2 | 40.6 |
|               | Riverside-Mojave Desert SCAQMD          | 10.1                      | 7.9  | 18.5 | 12.9 | 9.6 | 19.8 | 8.4                       | 6.9  | 16.6 | 8.7 | 5.9 | 14.7 | 40.2                             | 19.2 | 40.6 |
|               | Riverside-Salton Sea                    | 6.2                       | 6.2  | 13.8 | 8.1  | 6.9 | 14.6 | 4.2                       | 5.4  | 12.5 | 4.5 | 3.5 | 11   | 40.2                             | 19.2 | 40.6 |
|               | Riverside-South Coast                   | 10.1                      | 7.9  | 18.5 | 12.9 | 9.6 | 19.8 | 8.4                       | 6.9  | 16.6 | 8.7 | 5.9 | 14.7 | 40.2                             | 19.2 | 40.6 |
|               | Sacramento                              | 7.5                       | 8.5  | 15   | 8.5  | 7.5 | 15   | 5                         | 6.5  | 10   | 6.5 | 5   | 10   | 46.5                             | 12.5 | 41   |
|               | San Benito                              | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 44                               | 18.8 | 37.2 |
|               | San Bernardino-Mojave Desert            | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 40.2                             | 19.2 | 40.6 |
|               | San Bernardino-South Coast              | 10.1                      | 7.9  | 18.5 | 12.9 | 9.6 | 19.8 | 8.4                       | 6.9  | 16.6 | 8.7 | 5.9 | 14.7 | 40.2                             | 19.2 | 40.6 |
|               | San Diego                               | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 41.6                             | 18.8 | 39.6 |
|               | San Francisco                           | 6.6                       | 6.6  | 14.7 | 5.4  | 4.3 | 12.4 | 7.3                       | 7.3  | 9.5  | 5.4 | 4.3 | 12.4 | 26.1                             | 29.1 | 44.8 |
|               | San Joaquin                             | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 45.6                             | 19   | 35.4 |
|               | San Luis Obispo                         | 13                        | 13   | 13   | 13   | 13  | 13   | 5                         | 5    | 13   | 5   | 5   | 13   | 35.8                             | 21   | 43.2 |
|               | San Mateo                               | 6.6                       | 6.6  | 14.7 | 5.4  | 4.3 | 12.4 | 7.3                       | 7.3  | 9.5  | 5.4 | 4.3 | 12.4 | 26.1                             | 29.1 | 44.8 |
|               | Santa Barbara-North of Santa Ynez       | 4.6                       | 4.6  | 8.8  | 6.4  | 5.9 | 12.3 | 4.6                       | 4.6  | 8.8  | 6.4 | 5.9 | 12.3 | 37.5                             | 15   | 47.5 |
|               | Santa Barbara-South of Santa Ynez Range | 4.6                       | 4.6  | 8.8  | 6.4  | 5.9 | 12.3 | 4.6                       | 4.6  | 8.8  | 6.4 | 5.9 | 12.3 | 37.5                             | 15   | 47.5 |
|               | Santa Clara                             | 6.6                       | 6.6  | 14.7 | 5.4  | 4.3 | 12.4 | 7.3                       | 7.3  | 9.5  | 5.4 | 4.3 | 12.4 | 26.1                             | 29.1 | 44.8 |
|               | Santa Cruz                              | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 44                               | 18.8 | 37.2 |
|               | Shasta                                  | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 41                               | 21.2 | 37.8 |
|               | Sierra                                  | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.3                             | 19.6 | 38.1 |
|               | Siskiyou                                | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.3                             | 19.6 | 38.1 |
|               | Solano-San Francisco                    | 6.6                       | 6.6  | 14.7 | 5.4  | 4.3 | 12.4 | 7.3                       | 7.3  | 9.5  | 5.4 | 4.3 | 12.4 | 26.1                             | 29.1 | 44.8 |
|               | Solano-Sacramento                       | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.9                             | 19.5 | 37.6 |
|               | Sonoma-North Coast                      | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.9                             | 19.5 | 37.6 |
|               | Sonoma-San Francisco                    | 6.6                       | 6.6  | 14.7 | 5.4  | 4.3 | 12.4 | 7.3                       | 7.3  | 9.5  | 5.4 | 4.3 | 12.4 | 26.1                             | 29.1 | 44.8 |
|               | Stanislaus                              | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 48.4                             | 13.9 | 37.7 |
|               | Sutter                                  | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.6                             | 21   | 36.4 |
|               | Tehama                                  | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 41                               | 21.2 | 37.8 |
|               | Trinity                                 | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.3                             | 19.6 | 38.1 |
|               | Tulare                                  | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 38.4                             | 22.6 | 39   |
|               | Tuolumne                                | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 37.3                             | 20.7 | 42   |
|               | Ventura                                 | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 32.9                             | 18   | 49.1 |
|               | Yolo                                    | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.6                             | 21   | 36.4 |
|               | Yuba                                    | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 42.6                             | 21   | 36.4 |
| Statewide     | Statewide                               | 6.6                       | 6.6  | 14.7 | 7.9  | 7.1 | 16.8 | 7.3                       | 7.3  | 9.5  | 7.5 | 7.3 | 10.8 | 41.4                             | 19.3 | 39.3 |

Table 4.3 Mobile Trip Rates, Trip Purpose, Trip Type by Land Use

| Land Use Type | Land Use Sub Type                    | Size Metric   | Trip Rate |          |          | Primary % | Diverted % | PassBy % | Trip Type |       |        |
|---------------|--------------------------------------|---------------|-----------|----------|----------|-----------|------------|----------|-----------|-------|--------|
|               |                                      |               | Week day  | Saturday | Sunday   |           |            |          | C-C %     | C-W % | C-NW % |
| Residential   | Single Family Housing                | Dwelling Unit | 9.57      | 10.08    | 8.77     | 86        | 11         | 3        | 0         | 0     | 0      |
| Residential   | Apartments Low Rise                  | Dwelling Unit | 6.59      | 7.16     | 6.07     | 86        | 11         | 3        | 0         | 0     | 0      |
| Residential   | Apartments Mid Rise                  | Dwelling Unit | 6.59      | 7.16     | 6.07     | 86        | 11         | 3        | 0         | 0     | 0      |
| Residential   | Apartments High Rise                 | Dwelling Unit | 6.59      | 7.16     | 6.07     | 86        | 11         | 3        | 0         | 0     | 0      |
| Residential   | Condo/Townhouse                      | Dwelling Unit | 6.59      | 7.16     | 6.07     | 86        | 11         | 3        | 0         | 0     | 0      |
| Residential   | Condo/Townhouse High Rise            | Dwelling Unit | 6.59      | 7.16     | 6.07     | 86        | 11         | 3        | 0         | 0     | 0      |
| Residential   | Mobile Home Park                     | Dwelling Unit | 4.99      | 5        | 4.36     | 86        | 11         | 3        | 0         | 0     | 0      |
| Residential   | Retirement Community                 | Dwelling Unit | 2.81      | 2.81     | 2.81     | 86        | 11         | 3        | 0         | 0     | 0      |
| Residential   | Congregate Care (Assisted Living)    | Dwelling Unit | 2.74      | 2.2      | 2.44     | 86        | 11         | 3        | 0         | 0     | 0      |
| Educational   | Day-Care Center                      | Student       | 4.48      | 0.39     | 0.37     | 28        | 58         | 14       | 82.3      | 12.7  | 5      |
| Educational   | Day-Care Center                      | 1000sqft      | 79.26     | 6.21     | 5.83     | 28        | 58         | 14       | 82.3      | 12.7  | 5      |
| Educational   | Day-Care Center                      | Employee      | 28.13     | 2.61     | 2.45     | 28        | 58         | 14       | 82.3      | 12.7  | 5      |
| Educational   | Elementary School                    | Student       | 1.29      |          |          | 63        | 25         | 12       | 30        | 65    | 5      |
| Educational   | Elementary School                    | 1000sqft      | 15.43     |          |          | 63        | 25         | 12       | 30        | 65    | 5      |
| Educational   | Elementary School                    | Employee      | 15.71     |          |          | 63        | 25         | 12       | 30        | 65    | 5      |
| Educational   | Junior High School                   | Student       | 1.62      |          |          | 63        | 25         | 12       | 22.2      | 72.8  | 5      |
| Educational   | Junior High School                   | 1000sqft      | 13.78     |          |          | 63        | 25         | 12       | 22.2      | 72.8  | 5      |
| Educational   | Junior High School                   | Employee      | 16.39     |          |          | 63        | 25         | 12       | 22.2      | 72.8  | 5      |
| Educational   | High School                          | Student       | 1.71      | 0.61     | 0.25     | 75        | 19         | 6        | 17.2      | 77.8  | 5      |
| Educational   | High School                          | 1000sqft      | 12.89     | 4.37     | 1.79     | 75        | 19         | 6        | 17.2      | 77.8  | 5      |
| Educational   | High School                          | Employee      | 19.74     | 6.57     | 2.68     | 75        | 19         | 6        | 17.2      | 77.8  | 5      |
| Educational   | Junior College (2yr)                 | Student       | 1.2       | 0.42     | 0.04     | 92        | 7          | 1        | 88.6      | 6.4   | 5      |
| Educational   | Junior College (2yr)                 | 1000sqft      | 27.49     | 11.23    | 1.21     | 92        | 7          | 1        | 88.6      | 6.4   | 5      |
| Educational   | Junior College (2yr)                 | Employee      | 15.55     | 6.16     | 0.66     | 92        | 7          | 1        | 88.6      | 6.4   | 5      |
| Educational   | University/College (4yr)             | Student       | 2.38      | 1.3      |          | 91        | 9          | 0        | 88.6      | 6.4   | 5      |
| Educational   | University/College (4yr)             | Employee      | 9.13      | 3.12     |          | 91        | 9          | 0        | 88.6      | 6.4   | 5      |
| Educational   | Library                              | Employee      | 52.52     | 47.68    | 23.54    | 44        | 44         | 12       | 43        | 52    | 5      |
| Educational   | Library                              | 1000sqft      | 56.24     | 46.55    | 25.49    | 44        | 44         | 12       | 43        | 52    | 5      |
| Educational   | Place of Worship                     | Seat          | 0.61      | 0.9      | 1.85     | 64        | 25         | 11       | 95        | 0     | 5      |
| Educational   | Place of Worship                     | 1000sqft      | 9.11      | 10.37    | 36.63    | 64        | 25         | 11       | 95        | 0     | 5      |
| Recreational  | City Park                            | Acre          | 1.59      | 1.59     | 1.59     | 66        | 28         | 6        | 48        | 33    | 19     |
| Recreational  | Golf Course                          | Acre          | 5.04      | 5.82     | 5.88     | 52        | 39         | 9        | 48        | 33    | 19     |
| Recreational  | Golf Course                          | Hole          | 35.74     | 40.63    | 39.53    | 52        | 39         | 9        | 48        | 33    | 19     |
| Recreational  | Recreational Swimming Pool           | 1000sqft      | 32.93     | 20.87    | 26.73    | 52        | 39         | 9        | 48        | 33    | 19     |
| Recreational  | Racquet Club                         | 1000sqft      | 32.93     | 20.87    | 26.73    | 52        | 39         | 9        | 69.5      | 11.5  | 19     |
| Recreational  | Health Club                          | 1000sqft      | 32.93     | 20.87    | 26.73    | 52        | 39         | 9        | 64.1      | 16.9  | 19     |
| Recreational  | Movie Theater (No Matinee)           | Screen        | 220       | 376      | 314      | 66        | 17         | 17       | 79.2      | 1.8   | 19     |
| Recreational  | Movie Theater (No Matinee)           | Seat          | 1.8       | 1.8      | 1.8      | 66        | 17         | 17       | 79.2      | 1.8   | 19     |
| Recreational  | Movie Theater (No Matinee)           | 1000sqft      | 80        | 80       | 80       | 66        | 17         | 17       | 79.2      | 1.8   | 19     |
| Recreational  | Arena                                | Acre          | 33.33     |          |          | 0.66      | 0.28       | 0.6      | 81        | 0     | 19     |
| Recreational  | Arena                                | 1000sqft      | 10.713214 | 10.71321 | 10.71321 | 0.66      | 0.28       | 0.6      | 81        | 0     | 19     |
| Recreational  | Quality Restaurant                   | 1000sqft      | 89.95     | 94.36    | 72.16    | 38        | 18         | 44       | 69        | 12    | 19     |
| Recreational  | High Turnover (Sit Down Restaurant)  | 1000sqft      | 127.15    | 158.37   | 131.84   | 37        | 20         | 43       | 72.5      | 8.5   | 19     |
| Recreational  | Fast Food Restaurant with Drive Thru | 1000sqft      | 496.12    | 722.03   | 542.72   | 29        | 21         | 50       | 78.8      | 2.2   | 19     |
| Recreational  | Fast Food Restaurant w/o Drive Thru  | 1000sqft      | 716       | 696      | 500      | 51        | 37         | 12       | 79.5      | 1.5   | 19     |
| Recreational  | Hotel                                | Room          | 8.17      | 8.19     | 5.95     | 58        | 38         | 4        | 61.6      | 19.4  | 19     |
| Recreational  | Motel                                | Room          | 5.63      | 5.63     | 5.63     | 58        | 38         | 4        | 62        | 19    | 19     |
| Parking       | Parking Lot                          | Space         | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Parking Lot                          | Acre          | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Parking Lot                          | 1000sqft      | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Unenclosed Parking Structure         | Space         | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Unenclosed Parking Structure         | Acre          | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Unenclosed Parking Structure         | 1000sqft      | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Enclosed Parking Structure           | Space         | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Enclosed Parking Structure           | Acre          | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Enclosed Parking Structure           | 1000sqft      | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Unenclosed Parking with Elevator     | Space         | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Unenclosed Parking with Elevator     | Acre          | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Unenclosed Parking with Elevator     | 1000sqft      | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Enclosed Parking with Elevator       | Space         | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Enclosed Parking with Elevator       | Acre          | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Enclosed Parking with Elevator       | 1000sqft      | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Other Non-Asphalt Surfaces           | Acre          | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Other Asphalt Surfaces               | 1000sqft      | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Other Non-Asphalt Surfaces           | 1000sqft      | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Parking       | Other Asphalt Surfaces               | Acre          | 0         | 0        | 0        | 0         | 0          | 0        | 0         | 0     | 0      |
| Retail        | Free-Standing Discount store         | 1000sqft      | 57.24     | 71.07    | 56.36    | 47.5      | 35.5       | 17       | 68.8      | 12.2  | 19     |
| Retail        | Free-Standing Discount Superstore    | 1000sqft      | 53.13     | 64.07    | 56.12    | 47.5      | 35.5       | 17       | 67.8      | 13.2  | 19     |
| Retail        | Discount Club                        | 1000sqft      | 41.8      | 53.75    | 33.67    | 45        | 40         | 15       | 64.3      | 16.7  | 19     |
| Retail        | Regional Shopping Center             | 1000sqft      | 42.94     | 49.97    | 25.24    | 54        | 35         | 11       | 64.7      | 16.3  | 19     |
| Retail        | Electronic Superstore                | 1000sqft      | 45.04     | 45.04    | 45.04    | 27        | 33         | 40       | 65.5      | 15.5  | 19     |
| Retail        | Home Improvement Superstore          | 1000sqft      | 29.8      | 56.72    | 55.8     | 32        | 20         | 48       | 57.6      | 23.4  | 19     |
| Retail        | Strip Mall                           | 1000sqft      | 44.32     | 42.04    | 20.43    | 45        | 40         | 15       | 64.4      | 16.6  | 19     |
| Retail        | Hardware/Paint Store                 | 1000sqft      | 51.29     | 82.52    | 68.65    | 45        | 29         | 26       | 67.4      | 13.6  | 19     |
| Retail        | Supermarket                          | 1000sqft      | 102.24    | 177.59   | 166.44   | 34        | 30         | 36       | 74.5      | 6.5   | 19     |
| Retail        | Convenience Market (24 hour)         | 1000sqft      | 737.99    | 863.1    | 758.45   | 24        | 15         | 61       | 80.1      | 0.9   | 19     |
| Retail        | Convenience Market with Gas Pumps    | 1000sqft      | 845.6     | 1448.33  | 1182.08  | 14        | 21         | 65       | 80.2      | 0.8   | 19     |
| Retail        | Convenience Market with Gas Pumps    | Pump          | 542.6     | 204.47   | 166.88   | 14        | 21         | 65       | 80.2      | 0.8   | 19     |
| Retail        | Automobile Care Center               | 1000sqft      | 62        | 62       | 62       | 21        | 51         | 28       | 48        | 33    | 19     |
| Retail        | Gasoline/Service Station             | Pump          | 162.78    | 162.78   | 162.78   | 14        | 27         | 59       | 79        | 2     | 19     |
| Commercial    | Bank (with Drive-Through)            | 1000sqft      | 148.15    | 86.32    | 31.9     | 27        | 26         | 47       | 74.4      | 6.6   | 19     |

Table 4.3 Mobile Trip Rates, Trip Purpose, Trip Type by Land Use

| Land Use Type | Land Use Sub Type                  | Size Metric | Trip Rate |          |        | Primary % | Diverted % | PassBy % | Trip Type |       |        |
|---------------|------------------------------------|-------------|-----------|----------|--------|-----------|------------|----------|-----------|-------|--------|
|               |                                    |             | Week day  | Saturday | Sunday |           |            |          | C-C %     | C-W % | C-NW % |
| Commercial    | General Office Building            | 1000sqft    | 11.01     | 2.37     | 0.98   | 77        | 19         | 4        | 48        | 33    | 19     |
| Commercial    | Office Park                        | 1000sqft    | 11.42     | 1.64     | 0.76   | 82        | 15         | 3        | 48        | 33    | 19     |
| Commercial    | Research & Development             | 1000sqft    | 8.11      | 1.9      | 1.11   | 82        | 15         | 3        | 48        | 33    | 19     |
| Commercial    | Government Office Building         | 1000sqft    | 68.93     | 0        | 0      | 50        | 34         | 16       | 62        | 33    | 5      |
| Commercial    | Government (Civic Center)          | 1000sqft    | 27.92     |          |        | 50        | 34         | 16       | 20        | 75    | 5      |
| Commercial    | Pharmacy/Drugstore with Drive Thru | 1000sqft    | 88.16     | 88.16    | 88.16  | 38        | 13         | 49       | 73.5      | 7.5   | 19     |
| Commercial    | Pharmacy/Drugstore w/o Drive Thru  | 1000sqft    | 90.06     | 90.06    | 90.06  | 41        | 6          | 53       | 73.6      | 7.4   | 19     |
| Commercial    | Medical Office Building            | 1000sqft    | 36.13     | 8.96     | 1.55   | 60        | 30         | 10       | 51.4      | 29.6  | 19     |
| Commercial    | Hospital                           | 1000sqft    | 16.5      | 10.18    | 8.91   | 73        | 25         | 2        | 16.1      | 64.9  | 19     |
| Commercial    | Hospital                           | Bed         | 11.81     | 8.14     | 7.19   | 73        | 25         | 2        | 16.1      | 64.9  | 19     |
| Industrial    | Unrefrigerated Warehouse-No Rail   | 1000sqft    | 2.59      | 2.59     | 2.59   | 92        | 5          | 3        | 0         | 59    | 41     |
| Industrial    | Unrefrigerated Warehouse-Rail      | 1000sqft    | 1.63      | 1.63     | 1.63   | 92        | 5          | 3        | 0         | 59    | 41     |
| Industrial    | Refrigerated Warehouse-No Rail     | 1000sqft    | 2.59      | 2.59     | 2.59   | 92        | 5          | 3        | 0         | 59    | 41     |
| Industrial    | Refrigerated Warehouse-Rail        | 1000sqft    | 1.63      | 1.63     | 1.63   | 92        | 5          | 3        | 0         | 59    | 41     |
| Industrial    | General Light Industry             | 1000sqft    | 6.97      | 1.32     | 0.68   | 92        | 5          | 3        | 28        | 59    | 13     |
| Industrial    | General Heavy Industry             | 1000sqft    | 1.5       | 1.5      | 1.5    | 92        | 5          | 3        | 28        | 59    | 13     |
| Industrial    | Industrial Park                    | 1000sqft    | 6.96      | 2.49     | 0.73   | 79        | 19         | 2        | 28        | 59    | 13     |
| Industrial    | Manufacturing                      | 1000sqft    | 3.82      | 1.49     | 0.62   | 92        | 5          | 3        | 28        | 59    | 13     |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                      | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                               |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Great Basin Valleys Air Basin | Annual | 2010 | 351.71              | 410.12 | 479.62 | 598.88 | 74.54                 | 91.99 | 101.41 | 124.88 |
| AB | Great Basin Valleys Air Basin | Annual | 2011 | 351.58              | 409.65 | 479.10 | 599.56 | 74.30                 | 90.81 | 101.24 | 125.01 |
| AB | Great Basin Valleys Air Basin | Annual | 2012 | 351.55              | 409.23 | 478.69 | 600.33 | 74.12                 | 89.78 | 101.13 | 125.19 |
| AB | Great Basin Valleys Air Basin | Annual | 2013 | 351.50              | 408.84 | 478.36 | 601.12 | 73.86                 | 88.90 | 101.03 | 125.40 |
| AB | Great Basin Valleys Air Basin | Annual | 2014 | 351.45              | 408.49 | 478.12 | 601.90 | 73.59                 | 88.09 | 100.88 | 125.62 |
| AB | Great Basin Valleys Air Basin | Annual | 2015 | 351.50              | 408.21 | 477.92 | 602.74 | 73.49                 | 87.37 | 100.88 | 125.86 |
| AB | Great Basin Valleys Air Basin | Annual | 2016 | 351.62              | 407.99 | 477.76 | 603.56 | 73.49                 | 86.82 | 100.85 | 126.11 |
| AB | Great Basin Valleys Air Basin | Annual | 2017 | 351.64              | 407.78 | 477.63 | 604.31 | 73.40                 | 86.29 | 100.83 | 126.37 |
| AB | Great Basin Valleys Air Basin | Annual | 2018 | 351.66              | 407.60 | 477.52 | 604.96 | 73.33                 | 85.85 | 100.80 | 126.61 |
| AB | Great Basin Valleys Air Basin | Annual | 2019 | 351.69              | 407.52 | 477.42 | 605.53 | 73.29                 | 85.59 | 100.75 | 126.84 |
| AB | Great Basin Valleys Air Basin | Annual | 2020 | 351.72              | 407.45 | 477.34 | 606.03 | 73.36                 | 85.50 | 100.79 | 127.06 |
| AB | Great Basin Valleys Air Basin | Annual | 2021 | 351.66              | 407.35 | 477.26 | 606.36 | 73.36                 | 85.50 | 100.84 | 127.21 |
| AB | Great Basin Valleys Air Basin | Annual | 2022 | 351.57              | 407.28 | 477.17 | 606.67 | 73.35                 | 85.52 | 100.88 | 127.36 |
| AB | Great Basin Valleys Air Basin | Annual | 2023 | 351.48              | 407.18 | 477.10 | 606.89 | 73.33                 | 85.53 | 100.90 | 127.53 |
| AB | Great Basin Valleys Air Basin | Annual | 2024 | 351.41              | 407.09 | 477.03 | 607.04 | 73.32                 | 85.55 | 100.92 | 127.69 |
| AB | Great Basin Valleys Air Basin | Annual | 2025 | 351.37              | 407.16 | 477.00 | 607.21 | 73.31                 | 85.62 | 100.95 | 127.84 |
| AB | Great Basin Valleys Air Basin | Annual | 2026 | 351.39              | 407.29 | 476.94 | 607.42 | 73.33                 | 85.71 | 100.97 | 127.99 |
| AB | Great Basin Valleys Air Basin | Annual | 2027 | 351.40              | 407.43 | 476.89 | 607.63 | 73.34                 | 85.79 | 100.99 | 128.14 |
| AB | Great Basin Valleys Air Basin | Annual | 2028 | 351.40              | 407.56 | 476.84 | 607.84 | 73.35                 | 85.87 | 101.00 | 128.27 |
| AB | Great Basin Valleys Air Basin | Annual | 2029 | 351.39              | 407.69 | 476.77 | 608.06 | 73.36                 | 85.94 | 101.00 | 128.39 |
| AB | Great Basin Valleys Air Basin | Annual | 2030 | 351.38              | 407.82 | 476.71 | 608.27 | 73.36                 | 86.00 | 101.00 | 128.51 |
| AB | Great Basin Valleys Air Basin | Annual | 2031 | 351.38              | 407.96 | 476.68 | 608.50 | 73.36                 | 86.07 | 101.01 | 128.63 |
| AB | Great Basin Valleys Air Basin | Annual | 2032 | 351.38              | 408.09 | 476.65 | 608.73 | 73.37                 | 86.13 | 101.01 | 128.74 |
| AB | Great Basin Valleys Air Basin | Annual | 2033 | 351.38              | 408.21 | 476.62 | 608.94 | 73.37                 | 86.18 | 101.01 | 128.84 |
| AB | Great Basin Valleys Air Basin | Annual | 2034 | 351.37              | 408.32 | 476.60 | 609.12 | 73.38                 | 86.23 | 101.02 | 128.94 |
| AB | Great Basin Valleys Air Basin | Annual | 2035 | 351.37              | 408.41 | 476.58 | 609.28 | 73.38                 | 86.28 | 101.02 | 129.02 |
| AB | Great Basin Valleys Air Basin | Summer | 2010 | 368.80              | 426.31 | 499.33 | 622.32 | 74.54                 | 91.99 | 101.41 | 124.88 |
| AB | Great Basin Valleys Air Basin | Summer | 2011 | 368.81              | 426.47 | 498.98 | 623.07 | 74.30                 | 90.81 | 101.24 | 125.01 |
| AB | Great Basin Valleys Air Basin | Summer | 2012 | 368.86              | 426.56 | 498.74 | 623.95 | 74.12                 | 89.78 | 101.13 | 125.19 |
| AB | Great Basin Valleys Air Basin | Summer | 2013 | 368.89              | 426.59 | 498.57 | 624.87 | 73.86                 | 88.90 | 101.03 | 125.40 |
| AB | Great Basin Valleys Air Basin | Summer | 2014 | 368.92              | 426.59 | 498.50 | 625.78 | 73.59                 | 88.09 | 100.88 | 125.62 |
| AB | Great Basin Valleys Air Basin | Summer | 2015 | 369.01              | 426.63 | 498.39 | 626.79 | 73.49                 | 87.37 | 100.88 | 125.86 |
| AB | Great Basin Valleys Air Basin | Summer | 2016 | 369.15              | 426.65 | 498.34 | 627.79 | 73.49                 | 86.82 | 100.85 | 126.11 |
| AB | Great Basin Valleys Air Basin | Summer | 2017 | 369.19              | 426.65 | 498.29 | 628.71 | 73.40                 | 86.29 | 100.83 | 126.37 |
| AB | Great Basin Valleys Air Basin | Summer | 2018 | 369.21              | 426.63 | 498.22 | 629.47 | 73.33                 | 85.85 | 100.80 | 126.61 |
| AB | Great Basin Valleys Air Basin | Summer | 2019 | 369.25              | 426.71 | 498.16 | 630.15 | 73.29                 | 85.59 | 100.75 | 126.84 |
| AB | Great Basin Valleys Air Basin | Summer | 2020 | 369.30              | 426.76 | 498.11 | 630.75 | 73.36                 | 85.50 | 100.79 | 127.06 |
| AB | Great Basin Valleys Air Basin | Summer | 2021 | 369.22              | 426.73 | 498.07 | 631.17 | 73.36                 | 85.50 | 100.84 | 127.21 |
| AB | Great Basin Valleys Air Basin | Summer | 2022 | 369.14              | 426.72 | 498.03 | 631.56 | 73.35                 | 85.52 | 100.88 | 127.36 |
| AB | Great Basin Valleys Air Basin | Summer | 2023 | 369.04              | 426.67 | 498.01 | 631.85 | 73.33                 | 85.53 | 100.90 | 127.53 |
| AB | Great Basin Valleys Air Basin | Summer | 2024 | 368.98              | 426.64 | 498.01 | 632.03 | 73.32                 | 85.55 | 100.92 | 127.69 |
| AB | Great Basin Valleys Air Basin | Summer | 2025 | 368.96              | 426.73 | 498.02 | 632.24 | 73.31                 | 85.62 | 100.95 | 127.84 |
| AB | Great Basin Valleys Air Basin | Summer | 2026 | 368.99              | 426.89 | 497.97 | 632.46 | 73.33                 | 85.71 | 100.97 | 127.99 |
| AB | Great Basin Valleys Air Basin | Summer | 2027 | 369.03              | 427.08 | 497.94 | 632.69 | 73.34                 | 85.79 | 100.99 | 128.14 |
| AB | Great Basin Valleys Air Basin | Summer | 2028 | 369.05              | 427.25 | 497.90 | 632.94 | 73.35                 | 85.87 | 101.00 | 128.27 |
| AB | Great Basin Valleys Air Basin | Summer | 2029 | 369.06              | 427.42 | 497.85 | 633.19 | 73.36                 | 85.94 | 101.00 | 128.39 |
| AB | Great Basin Valleys Air Basin | Summer | 2030 | 369.07              | 427.57 | 497.80 | 633.43 | 73.36                 | 86.00 | 101.00 | 128.51 |
| AB | Great Basin Valleys Air Basin | Summer | 2031 | 369.06              | 427.77 | 497.77 | 633.69 | 73.36                 | 86.07 | 101.01 | 128.63 |
| AB | Great Basin Valleys Air Basin | Summer | 2032 | 369.06              | 427.93 | 497.74 | 633.93 | 73.37                 | 86.13 | 101.01 | 128.74 |
| AB | Great Basin Valleys Air Basin | Summer | 2033 | 369.06              | 428.08 | 497.72 | 634.18 | 73.37                 | 86.18 | 101.01 | 128.84 |
| AB | Great Basin Valleys Air Basin | Summer | 2034 | 369.05              | 428.21 | 497.70 | 634.38 | 73.38                 | 86.23 | 101.02 | 128.94 |
| AB | Great Basin Valleys Air Basin | Summer | 2035 | 369.04              | 428.32 | 497.68 | 634.56 | 73.38                 | 86.28 | 101.02 | 129.02 |
| AB | Great Basin Valleys Air Basin | Winter | 2010 | 367.72              | 425.30 | 498.12 | 620.89 | 74.54                 | 91.99 | 101.41 | 124.88 |
| AB | Great Basin Valleys Air Basin | Winter | 2011 | 367.73              | 425.41 | 497.76 | 621.64 | 74.30                 | 90.81 | 101.24 | 125.01 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Great Basin Valleys Air Basin | Winter | 2012 | 367.77             | 425.48 | 497.51 | 622.51 | 74.12                 | 89.78 | 101.13 | 125.19 |
| AB | Great Basin Valleys Air Basin | Winter | 2013 | 367.80             | 425.47 | 497.33 | 623.43 | 73.86                 | 88.90 | 101.03 | 125.40 |
| AB | Great Basin Valleys Air Basin | Winter | 2014 | 367.82             | 425.45 | 497.25 | 624.33 | 73.59                 | 88.09 | 100.88 | 125.62 |
| AB | Great Basin Valleys Air Basin | Winter | 2015 | 367.92             | 425.48 | 497.13 | 625.32 | 73.49                 | 87.37 | 100.88 | 125.86 |
| AB | Great Basin Valleys Air Basin | Winter | 2016 | 368.05             | 425.48 | 497.08 | 626.32 | 73.49                 | 86.82 | 100.85 | 126.11 |
| AB | Great Basin Valleys Air Basin | Winter | 2017 | 368.09             | 425.46 | 497.03 | 627.23 | 73.40                 | 86.29 | 100.83 | 126.37 |
| AB | Great Basin Valleys Air Basin | Winter | 2018 | 368.11             | 425.44 | 496.95 | 627.98 | 73.33                 | 85.85 | 100.80 | 126.61 |
| AB | Great Basin Valleys Air Basin | Winter | 2019 | 368.14             | 425.50 | 496.89 | 628.66 | 73.29                 | 85.59 | 100.75 | 126.84 |
| AB | Great Basin Valleys Air Basin | Winter | 2020 | 368.19             | 425.55 | 496.84 | 629.25 | 73.36                 | 85.50 | 100.79 | 127.06 |
| AB | Great Basin Valleys Air Basin | Winter | 2021 | 368.12             | 425.51 | 496.80 | 629.66 | 73.36                 | 85.50 | 100.84 | 127.21 |
| AB | Great Basin Valleys Air Basin | Winter | 2022 | 368.04             | 425.50 | 496.75 | 630.05 | 73.35                 | 85.52 | 100.88 | 127.36 |
| AB | Great Basin Valleys Air Basin | Winter | 2023 | 367.94             | 425.45 | 496.73 | 630.33 | 73.33                 | 85.53 | 100.90 | 127.53 |
| AB | Great Basin Valleys Air Basin | Winter | 2024 | 367.88             | 425.41 | 496.72 | 630.51 | 73.32                 | 85.55 | 100.92 | 127.69 |
| AB | Great Basin Valleys Air Basin | Winter | 2025 | 367.85             | 425.50 | 496.73 | 630.71 | 73.31                 | 85.62 | 100.95 | 127.84 |
| AB | Great Basin Valleys Air Basin | Winter | 2026 | 367.89             | 425.66 | 496.68 | 630.94 | 73.33                 | 85.71 | 100.97 | 127.99 |
| AB | Great Basin Valleys Air Basin | Winter | 2027 | 367.93             | 425.85 | 496.65 | 631.16 | 73.34                 | 85.79 | 100.99 | 128.14 |
| AB | Great Basin Valleys Air Basin | Winter | 2028 | 367.95             | 426.02 | 496.61 | 631.41 | 73.35                 | 85.87 | 101.00 | 128.27 |
| AB | Great Basin Valleys Air Basin | Winter | 2029 | 367.95             | 426.19 | 496.56 | 631.66 | 73.36                 | 85.94 | 101.00 | 128.39 |
| AB | Great Basin Valleys Air Basin | Winter | 2030 | 367.96             | 426.33 | 496.51 | 631.90 | 73.36                 | 86.00 | 101.00 | 128.51 |
| AB | Great Basin Valleys Air Basin | Winter | 2031 | 367.95             | 426.53 | 496.47 | 632.15 | 73.36                 | 86.07 | 101.01 | 128.63 |
| AB | Great Basin Valleys Air Basin | Winter | 2032 | 367.95             | 426.69 | 496.45 | 632.40 | 73.37                 | 86.13 | 101.01 | 128.74 |
| AB | Great Basin Valleys Air Basin | Winter | 2033 | 367.95             | 426.84 | 496.42 | 632.64 | 73.37                 | 86.18 | 101.01 | 128.84 |
| AB | Great Basin Valleys Air Basin | Winter | 2034 | 367.94             | 426.96 | 496.41 | 632.84 | 73.38                 | 86.23 | 101.02 | 128.94 |
| AB | Great Basin Valleys Air Basin | Winter | 2035 | 367.94             | 427.07 | 496.38 | 633.02 | 73.38                 | 86.28 | 101.02 | 129.02 |
| AB | Lake County Air Basin         | Annual | 2010 | 342.07             | 393.50 | 467.77 | 584.22 | 74.77                 | 89.34 | 101.91 | 124.46 |
| AB | Lake County Air Basin         | Annual | 2011 | 342.02             | 394.05 | 467.30 | 584.79 | 74.52                 | 88.47 | 101.71 | 124.54 |
| AB | Lake County Air Basin         | Annual | 2012 | 342.06             | 394.51 | 466.93 | 585.54 | 74.36                 | 87.81 | 101.56 | 124.69 |
| AB | Lake County Air Basin         | Annual | 2013 | 342.12             | 394.89 | 466.63 | 586.41 | 74.20                 | 87.25 | 101.40 | 124.90 |
| AB | Lake County Air Basin         | Annual | 2014 | 342.14             | 395.21 | 466.41 | 587.25 | 73.98                 | 86.77 | 101.22 | 125.12 |
| AB | Lake County Air Basin         | Annual | 2015 | 342.23             | 395.51 | 466.24 | 588.17 | 73.90                 | 86.33 | 101.09 | 125.37 |
| AB | Lake County Air Basin         | Annual | 2016 | 342.33             | 395.78 | 466.10 | 589.06 | 73.88                 | 85.99 | 101.00 | 125.66 |
| AB | Lake County Air Basin         | Annual | 2017 | 342.36             | 396.00 | 465.97 | 589.89 | 73.79                 | 85.60 | 100.88 | 125.95 |
| AB | Lake County Air Basin         | Annual | 2018 | 342.39             | 396.17 | 465.87 | 590.62 | 73.73                 | 85.27 | 100.83 | 126.22 |
| AB | Lake County Air Basin         | Annual | 2019 | 342.41             | 396.35 | 465.79 | 591.26 | 73.69                 | 85.13 | 100.79 | 126.48 |
| AB | Lake County Air Basin         | Annual | 2020 | 342.44             | 396.52 | 465.72 | 591.82 | 73.77                 | 85.14 | 100.79 | 126.73 |
| AB | Lake County Air Basin         | Annual | 2021 | 342.39             | 396.64 | 465.65 | 592.21 | 73.79                 | 85.21 | 100.84 | 126.90 |
| AB | Lake County Air Basin         | Annual | 2022 | 342.31             | 396.75 | 465.57 | 592.55 | 73.78                 | 85.27 | 100.85 | 127.07 |
| AB | Lake County Air Basin         | Annual | 2023 | 342.19             | 396.83 | 465.51 | 592.77 | 73.76                 | 85.32 | 100.87 | 127.26 |
| AB | Lake County Air Basin         | Annual | 2024 | 342.07             | 396.89 | 465.44 | 592.97 | 73.71                 | 85.36 | 100.88 | 127.45 |
| AB | Lake County Air Basin         | Annual | 2025 | 342.01             | 396.99 | 465.40 | 593.14 | 73.71                 | 85.45 | 100.91 | 127.61 |
| AB | Lake County Air Basin         | Annual | 2026 | 342.02             | 397.10 | 465.36 | 593.32 | 73.73                 | 85.55 | 100.93 | 127.78 |
| AB | Lake County Air Basin         | Annual | 2027 | 342.03             | 397.21 | 465.31 | 593.53 | 73.74                 | 85.64 | 100.94 | 127.94 |
| AB | Lake County Air Basin         | Annual | 2028 | 342.03             | 397.32 | 465.27 | 593.73 | 73.75                 | 85.72 | 100.95 | 128.09 |
| AB | Lake County Air Basin         | Annual | 2029 | 342.02             | 397.43 | 465.24 | 593.93 | 73.75                 | 85.80 | 100.96 | 128.22 |
| AB | Lake County Air Basin         | Annual | 2030 | 342.00             | 397.54 | 465.21 | 594.14 | 73.75                 | 85.88 | 100.95 | 128.35 |
| AB | Lake County Air Basin         | Annual | 2031 | 342.00             | 397.66 | 465.19 | 594.38 | 73.76                 | 85.96 | 100.95 | 128.48 |
| AB | Lake County Air Basin         | Annual | 2032 | 341.99             | 397.76 | 465.18 | 594.62 | 73.76                 | 86.03 | 100.96 | 128.61 |
| AB | Lake County Air Basin         | Annual | 2033 | 341.99             | 397.84 | 465.18 | 594.84 | 73.77                 | 86.09 | 100.96 | 128.72 |
| AB | Lake County Air Basin         | Annual | 2034 | 341.98             | 397.92 | 465.17 | 595.03 | 73.77                 | 86.15 | 100.97 | 128.82 |
| AB | Lake County Air Basin         | Annual | 2035 | 341.97             | 397.97 | 465.16 | 595.21 | 73.78                 | 86.20 | 100.97 | 128.92 |
| AB | Lake County Air Basin         | Summer | 2010 | 365.54             | 417.38 | 498.77 | 621.97 | 74.77                 | 89.34 | 101.91 | 124.46 |
| AB | Lake County Air Basin         | Summer | 2011 | 365.78             | 418.72 | 498.60 | 622.61 | 74.52                 | 88.47 | 101.71 | 124.54 |
| AB | Lake County Air Basin         | Summer | 2012 | 366.03             | 419.77 | 498.49 | 623.54 | 74.36                 | 87.81 | 101.56 | 124.69 |
| AB | Lake County Air Basin         | Summer | 2013 | 366.25             | 420.60 | 498.41 | 624.68 | 74.20                 | 87.25 | 101.40 | 124.90 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                       |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Lake County Air Basin | Summer | 2014 | 366.39              | 421.26 | 498.37 | 625.78 | 73.98                 | 86.77 | 101.22 | 125.12 |
| AB | Lake County Air Basin | Summer | 2015 | 366.55              | 421.85 | 498.36 | 627.02 | 73.90                 | 86.33 | 101.09 | 125.37 |
| AB | Lake County Air Basin | Summer | 2016 | 366.69              | 422.33 | 498.33 | 628.23 | 73.88                 | 85.99 | 101.00 | 125.66 |
| AB | Lake County Air Basin | Summer | 2017 | 366.75              | 422.72 | 498.28 | 629.33 | 73.79                 | 85.60 | 100.88 | 125.95 |
| AB | Lake County Air Basin | Summer | 2018 | 366.77              | 423.03 | 498.21 | 630.31 | 73.73                 | 85.27 | 100.83 | 126.22 |
| AB | Lake County Air Basin | Summer | 2019 | 366.79              | 423.31 | 498.14 | 631.16 | 73.69                 | 85.13 | 100.79 | 126.48 |
| AB | Lake County Air Basin | Summer | 2020 | 366.81              | 423.55 | 498.08 | 631.89 | 73.77                 | 85.14 | 100.79 | 126.73 |
| AB | Lake County Air Basin | Summer | 2021 | 366.76              | 423.74 | 498.00 | 632.43 | 73.79                 | 85.21 | 100.84 | 126.90 |
| AB | Lake County Air Basin | Summer | 2022 | 366.67              | 423.91 | 497.93 | 632.88 | 73.78                 | 85.27 | 100.85 | 127.07 |
| AB | Lake County Air Basin | Summer | 2023 | 366.57              | 424.04 | 497.87 | 633.19 | 73.76                 | 85.32 | 100.87 | 127.26 |
| AB | Lake County Air Basin | Summer | 2024 | 366.46              | 424.16 | 497.81 | 633.47 | 73.71                 | 85.36 | 100.88 | 127.45 |
| AB | Lake County Air Basin | Summer | 2025 | 366.41              | 424.28 | 497.76 | 633.69 | 73.71                 | 85.45 | 100.91 | 127.61 |
| AB | Lake County Air Basin | Summer | 2026 | 366.43              | 424.42 | 497.70 | 633.89 | 73.73                 | 85.55 | 100.93 | 127.78 |
| AB | Lake County Air Basin | Summer | 2027 | 366.46              | 424.56 | 497.65 | 634.10 | 73.74                 | 85.64 | 100.94 | 127.94 |
| AB | Lake County Air Basin | Summer | 2028 | 366.47              | 424.70 | 497.62 | 634.32 | 73.75                 | 85.72 | 100.95 | 128.09 |
| AB | Lake County Air Basin | Summer | 2029 | 366.48              | 424.86 | 497.59 | 634.55 | 73.75                 | 85.80 | 100.96 | 128.22 |
| AB | Lake County Air Basin | Summer | 2030 | 366.48              | 425.00 | 497.56 | 634.80 | 73.75                 | 85.88 | 100.95 | 128.35 |
| AB | Lake County Air Basin | Summer | 2031 | 366.48              | 425.18 | 497.58 | 635.06 | 73.76                 | 85.96 | 100.95 | 128.48 |
| AB | Lake County Air Basin | Summer | 2032 | 366.47              | 425.33 | 497.59 | 635.34 | 73.76                 | 86.03 | 100.96 | 128.61 |
| AB | Lake County Air Basin | Summer | 2033 | 366.46              | 425.44 | 497.60 | 635.60 | 73.77                 | 86.09 | 100.96 | 128.72 |
| AB | Lake County Air Basin | Summer | 2034 | 366.45              | 425.54 | 497.60 | 635.84 | 73.77                 | 86.15 | 100.97 | 128.82 |
| AB | Lake County Air Basin | Summer | 2035 | 366.44              | 425.60 | 497.60 | 636.06 | 73.78                 | 86.20 | 100.97 | 128.92 |
| AB | Lake County Air Basin | Winter | 2010 | 355.28              | 406.94 | 485.21 | 605.47 | 74.77                 | 89.34 | 101.91 | 124.46 |
| AB | Lake County Air Basin | Winter | 2011 | 355.39              | 407.93 | 484.91 | 606.07 | 74.52                 | 88.47 | 101.71 | 124.54 |
| AB | Lake County Air Basin | Winter | 2012 | 355.55              | 408.73 | 484.69 | 606.93 | 74.36                 | 87.81 | 101.56 | 124.69 |
| AB | Lake County Air Basin | Winter | 2013 | 355.70              | 409.36 | 484.52 | 607.95 | 74.20                 | 87.25 | 101.40 | 124.90 |
| AB | Lake County Air Basin | Winter | 2014 | 355.79              | 409.87 | 484.39 | 608.93 | 73.98                 | 86.77 | 101.22 | 125.12 |
| AB | Lake County Air Basin | Winter | 2015 | 355.91              | 410.33 | 484.31 | 610.03 | 73.90                 | 86.33 | 101.09 | 125.37 |
| AB | Lake County Air Basin | Winter | 2016 | 356.04              | 410.72 | 484.24 | 611.10 | 73.88                 | 85.99 | 101.00 | 125.66 |
| AB | Lake County Air Basin | Winter | 2017 | 356.08              | 411.04 | 484.15 | 612.08 | 73.79                 | 85.60 | 100.88 | 125.95 |
| AB | Lake County Air Basin | Winter | 2018 | 356.11              | 411.29 | 484.07 | 612.96 | 73.73                 | 85.27 | 100.83 | 126.22 |
| AB | Lake County Air Basin | Winter | 2019 | 356.13              | 411.52 | 484.00 | 613.71 | 73.69                 | 85.13 | 100.79 | 126.48 |
| AB | Lake County Air Basin | Winter | 2020 | 356.15              | 411.73 | 483.93 | 614.36 | 73.77                 | 85.14 | 100.79 | 126.73 |
| AB | Lake County Air Basin | Winter | 2021 | 356.11              | 411.89 | 483.85 | 614.84 | 73.79                 | 85.21 | 100.84 | 126.90 |
| AB | Lake County Air Basin | Winter | 2022 | 356.02              | 412.03 | 483.78 | 615.25 | 73.78                 | 85.27 | 100.85 | 127.07 |
| AB | Lake County Air Basin | Winter | 2023 | 355.91              | 412.15 | 483.72 | 615.52 | 73.76                 | 85.32 | 100.87 | 127.26 |
| AB | Lake County Air Basin | Winter | 2024 | 355.79              | 412.24 | 483.66 | 615.76 | 73.71                 | 85.36 | 100.88 | 127.45 |
| AB | Lake County Air Basin | Winter | 2025 | 355.74              | 412.35 | 483.61 | 615.96 | 73.71                 | 85.45 | 100.91 | 127.61 |
| AB | Lake County Air Basin | Winter | 2026 | 355.76              | 412.47 | 483.56 | 616.15 | 73.73                 | 85.55 | 100.93 | 127.78 |
| AB | Lake County Air Basin | Winter | 2027 | 355.78              | 412.60 | 483.51 | 616.36 | 73.74                 | 85.64 | 100.94 | 127.94 |
| AB | Lake County Air Basin | Winter | 2028 | 355.78              | 412.73 | 483.47 | 616.58 | 73.75                 | 85.72 | 100.95 | 128.09 |
| AB | Lake County Air Basin | Winter | 2029 | 355.78              | 412.87 | 483.44 | 616.79 | 73.75                 | 85.80 | 100.96 | 128.22 |
| AB | Lake County Air Basin | Winter | 2030 | 355.78              | 412.99 | 483.41 | 617.02 | 73.75                 | 85.88 | 100.95 | 128.35 |
| AB | Lake County Air Basin | Winter | 2031 | 355.77              | 413.15 | 483.42 | 617.27 | 73.76                 | 85.96 | 100.95 | 128.48 |
| AB | Lake County Air Basin | Winter | 2032 | 355.77              | 413.27 | 483.42 | 617.53 | 73.76                 | 86.03 | 100.96 | 128.61 |
| AB | Lake County Air Basin | Winter | 2033 | 355.76              | 413.37 | 483.42 | 617.77 | 73.77                 | 86.09 | 100.96 | 128.72 |
| AB | Lake County Air Basin | Winter | 2034 | 355.75              | 413.46 | 483.42 | 618.00 | 73.77                 | 86.15 | 100.97 | 128.82 |
| AB | Lake County Air Basin | Winter | 2035 | 355.74              | 413.52 | 483.42 | 618.20 | 73.78                 | 86.20 | 100.97 | 128.92 |
| AB | Lake Tahoe Air Basin  | Annual | 2010 | 356.47              | 412.59 | 488.71 | 604.93 | 74.34                 | 87.24 | 99.87  | 123.01 |
| AB | Lake Tahoe Air Basin  | Annual | 2011 | 356.51              | 412.59 | 488.19 | 605.81 | 74.16                 | 86.67 | 99.91  | 123.23 |
| AB | Lake Tahoe Air Basin  | Annual | 2012 | 356.56              | 412.72 | 487.78 | 606.86 | 73.99                 | 86.30 | 99.99  | 123.52 |
| AB | Lake Tahoe Air Basin  | Annual | 2013 | 356.68              | 412.85 | 487.47 | 608.00 | 73.92                 | 86.00 | 100.07 | 123.86 |
| AB | Lake Tahoe Air Basin  | Annual | 2014 | 356.72              | 412.95 | 487.22 | 609.08 | 73.71                 | 85.68 | 100.13 | 124.20 |
| AB | Lake Tahoe Air Basin  | Annual | 2015 | 356.81              | 413.11 | 487.02 | 610.25 | 73.64                 | 85.47 | 100.21 | 124.57 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Lake Tahoe Air Basin | Annual | 2016 | 356.94              | 413.27 | 486.89 | 611.36 | 73.65                 | 85.26 | 100.29 | 124.95 |
| AB | Lake Tahoe Air Basin | Annual | 2017 | 356.99              | 413.40 | 486.78 | 612.39 | 73.62                 | 85.07 | 100.35 | 125.32 |
| AB | Lake Tahoe Air Basin | Annual | 2018 | 357.02              | 413.53 | 486.70 | 613.30 | 73.52                 | 84.96 | 100.42 | 125.67 |
| AB | Lake Tahoe Air Basin | Annual | 2019 | 357.02              | 413.71 | 486.65 | 614.10 | 73.44                 | 84.95 | 100.50 | 126.01 |
| AB | Lake Tahoe Air Basin | Annual | 2020 | 357.04              | 413.87 | 486.61 | 614.78 | 73.51                 | 85.01 | 100.60 | 126.32 |
| AB | Lake Tahoe Air Basin | Annual | 2021 | 356.98              | 413.98 | 486.59 | 615.36 | 73.53                 | 85.12 | 100.68 | 126.59 |
| AB | Lake Tahoe Air Basin | Annual | 2022 | 356.93              | 414.08 | 486.56 | 615.86 | 73.53                 | 85.21 | 100.75 | 126.83 |
| AB | Lake Tahoe Air Basin | Annual | 2023 | 356.85              | 414.11 | 486.52 | 616.25 | 73.53                 | 85.29 | 100.80 | 127.07 |
| AB | Lake Tahoe Air Basin | Annual | 2024 | 356.72              | 414.14 | 486.45 | 616.56 | 73.48                 | 85.36 | 100.85 | 127.28 |
| AB | Lake Tahoe Air Basin | Annual | 2025 | 356.68              | 414.26 | 486.40 | 616.85 | 73.48                 | 85.46 | 100.89 | 127.48 |
| AB | Lake Tahoe Air Basin | Annual | 2026 | 356.67              | 414.44 | 486.37 | 617.11 | 73.50                 | 85.57 | 100.93 | 127.67 |
| AB | Lake Tahoe Air Basin | Annual | 2027 | 356.66              | 414.59 | 486.34 | 617.37 | 73.52                 | 85.66 | 100.95 | 127.84 |
| AB | Lake Tahoe Air Basin | Annual | 2028 | 356.66              | 414.75 | 486.32 | 617.64 | 73.52                 | 85.75 | 100.97 | 128.00 |
| AB | Lake Tahoe Air Basin | Annual | 2029 | 356.64              | 414.90 | 486.29 | 617.91 | 73.53                 | 85.84 | 100.98 | 128.15 |
| AB | Lake Tahoe Air Basin | Annual | 2030 | 356.63              | 415.05 | 486.24 | 618.17 | 73.53                 | 85.92 | 100.99 | 128.30 |
| AB | Lake Tahoe Air Basin | Annual | 2031 | 356.65              | 415.20 | 486.20 | 618.44 | 73.54                 | 85.99 | 100.99 | 128.44 |
| AB | Lake Tahoe Air Basin | Annual | 2032 | 356.65              | 415.33 | 486.17 | 618.72 | 73.54                 | 86.06 | 101.00 | 128.57 |
| AB | Lake Tahoe Air Basin | Annual | 2033 | 356.66              | 415.45 | 486.15 | 618.96 | 73.55                 | 86.13 | 101.00 | 128.69 |
| AB | Lake Tahoe Air Basin | Annual | 2034 | 356.66              | 415.57 | 486.12 | 619.18 | 73.55                 | 86.19 | 101.01 | 128.81 |
| AB | Lake Tahoe Air Basin | Annual | 2035 | 356.66              | 415.65 | 486.10 | 619.37 | 73.56                 | 86.24 | 101.01 | 128.91 |
| AB | Lake Tahoe Air Basin | Summer | 2010 | 355.60              | 411.74 | 487.57 | 603.46 | 74.34                 | 87.24 | 99.87  | 123.01 |
| AB | Lake Tahoe Air Basin | Summer | 2011 | 355.64              | 411.71 | 487.04 | 604.33 | 74.16                 | 86.67 | 99.91  | 123.23 |
| AB | Lake Tahoe Air Basin | Summer | 2012 | 355.68              | 411.82 | 486.63 | 605.37 | 73.99                 | 86.30 | 99.99  | 123.52 |
| AB | Lake Tahoe Air Basin | Summer | 2013 | 355.79              | 411.94 | 486.31 | 606.50 | 73.92                 | 86.00 | 100.07 | 123.86 |
| AB | Lake Tahoe Air Basin | Summer | 2014 | 355.83              | 412.02 | 486.05 | 607.58 | 73.71                 | 85.68 | 100.13 | 124.20 |
| AB | Lake Tahoe Air Basin | Summer | 2015 | 355.92              | 412.17 | 485.85 | 608.73 | 73.64                 | 85.47 | 100.21 | 124.57 |
| AB | Lake Tahoe Air Basin | Summer | 2016 | 356.05              | 412.33 | 485.71 | 609.83 | 73.65                 | 85.26 | 100.29 | 124.95 |
| AB | Lake Tahoe Air Basin | Summer | 2017 | 356.10              | 412.44 | 485.60 | 610.85 | 73.62                 | 85.07 | 100.35 | 125.32 |
| AB | Lake Tahoe Air Basin | Summer | 2018 | 356.13              | 412.57 | 485.52 | 611.75 | 73.52                 | 84.96 | 100.42 | 125.67 |
| AB | Lake Tahoe Air Basin | Summer | 2019 | 356.13              | 412.74 | 485.46 | 612.55 | 73.44                 | 84.95 | 100.50 | 126.01 |
| AB | Lake Tahoe Air Basin | Summer | 2020 | 356.15              | 412.89 | 485.43 | 613.23 | 73.51                 | 85.01 | 100.60 | 126.32 |
| AB | Lake Tahoe Air Basin | Summer | 2021 | 356.09              | 413.00 | 485.41 | 613.80 | 73.53                 | 85.12 | 100.68 | 126.59 |
| AB | Lake Tahoe Air Basin | Summer | 2022 | 356.03              | 413.09 | 485.38 | 614.30 | 73.53                 | 85.21 | 100.75 | 126.83 |
| AB | Lake Tahoe Air Basin | Summer | 2023 | 355.96              | 413.13 | 485.34 | 614.69 | 73.53                 | 85.29 | 100.80 | 127.07 |
| AB | Lake Tahoe Air Basin | Summer | 2024 | 355.83              | 413.15 | 485.27 | 615.00 | 73.48                 | 85.36 | 100.85 | 127.28 |
| AB | Lake Tahoe Air Basin | Summer | 2025 | 355.78              | 413.27 | 485.22 | 615.29 | 73.48                 | 85.46 | 100.89 | 127.48 |
| AB | Lake Tahoe Air Basin | Summer | 2026 | 355.77              | 413.44 | 485.19 | 615.55 | 73.50                 | 85.57 | 100.93 | 127.67 |
| AB | Lake Tahoe Air Basin | Summer | 2027 | 355.77              | 413.59 | 485.16 | 615.81 | 73.52                 | 85.66 | 100.95 | 127.84 |
| AB | Lake Tahoe Air Basin | Summer | 2028 | 355.76              | 413.76 | 485.14 | 616.07 | 73.52                 | 85.75 | 100.97 | 128.00 |
| AB | Lake Tahoe Air Basin | Summer | 2029 | 355.74              | 413.90 | 485.10 | 616.34 | 73.53                 | 85.84 | 100.98 | 128.15 |
| AB | Lake Tahoe Air Basin | Summer | 2030 | 355.74              | 414.05 | 485.06 | 616.61 | 73.53                 | 85.92 | 100.99 | 128.30 |
| AB | Lake Tahoe Air Basin | Summer | 2031 | 355.75              | 414.20 | 485.02 | 616.87 | 73.54                 | 85.99 | 100.99 | 128.44 |
| AB | Lake Tahoe Air Basin | Summer | 2032 | 355.76              | 414.33 | 484.99 | 617.14 | 73.54                 | 86.06 | 101.00 | 128.57 |
| AB | Lake Tahoe Air Basin | Summer | 2033 | 355.76              | 414.45 | 484.96 | 617.39 | 73.55                 | 86.13 | 101.00 | 128.69 |
| AB | Lake Tahoe Air Basin | Summer | 2034 | 355.76              | 414.56 | 484.94 | 617.61 | 73.55                 | 86.19 | 101.01 | 128.81 |
| AB | Lake Tahoe Air Basin | Summer | 2035 | 355.76              | 414.64 | 484.92 | 617.79 | 73.56                 | 86.24 | 101.01 | 128.91 |
| AB | Lake Tahoe Air Basin | Winter | 2010 | 355.55              | 411.69 | 487.51 | 603.37 | 74.34                 | 87.24 | 99.87  | 123.01 |
| AB | Lake Tahoe Air Basin | Winter | 2011 | 355.59              | 411.66 | 486.98 | 604.24 | 74.16                 | 86.67 | 99.91  | 123.23 |
| AB | Lake Tahoe Air Basin | Winter | 2012 | 355.64              | 411.77 | 486.56 | 605.28 | 73.99                 | 86.30 | 99.99  | 123.52 |
| AB | Lake Tahoe Air Basin | Winter | 2013 | 355.74              | 411.89 | 486.25 | 606.41 | 73.92                 | 86.00 | 100.07 | 123.86 |
| AB | Lake Tahoe Air Basin | Winter | 2014 | 355.78              | 411.97 | 485.98 | 607.48 | 73.71                 | 85.68 | 100.13 | 124.20 |
| AB | Lake Tahoe Air Basin | Winter | 2015 | 355.87              | 412.11 | 485.78 | 608.63 | 73.64                 | 85.47 | 100.21 | 124.57 |
| AB | Lake Tahoe Air Basin | Winter | 2016 | 356.00              | 412.27 | 485.65 | 609.74 | 73.65                 | 85.26 | 100.29 | 124.95 |
| AB | Lake Tahoe Air Basin | Winter | 2017 | 356.05              | 412.39 | 485.53 | 610.76 | 73.62                 | 85.07 | 100.35 | 125.32 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                         |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Lake Tahoe Air Basin    | Winter | 2018 | 356.08              | 412.52 | 485.45 | 611.66 | 73.52                 | 84.96 | 100.42 | 125.67 |
| AB | Lake Tahoe Air Basin    | Winter | 2019 | 356.08              | 412.69 | 485.40 | 612.46 | 73.44                 | 84.95 | 100.50 | 126.01 |
| AB | Lake Tahoe Air Basin    | Winter | 2020 | 356.10              | 412.84 | 485.37 | 613.13 | 73.51                 | 85.01 | 100.60 | 126.32 |
| AB | Lake Tahoe Air Basin    | Winter | 2021 | 356.04              | 412.95 | 485.35 | 613.70 | 73.53                 | 85.12 | 100.68 | 126.59 |
| AB | Lake Tahoe Air Basin    | Winter | 2022 | 355.98              | 413.04 | 485.31 | 614.20 | 73.53                 | 85.21 | 100.75 | 126.83 |
| AB | Lake Tahoe Air Basin    | Winter | 2023 | 355.91              | 413.07 | 485.28 | 614.59 | 73.53                 | 85.29 | 100.80 | 127.07 |
| AB | Lake Tahoe Air Basin    | Winter | 2024 | 355.78              | 413.10 | 485.21 | 614.90 | 73.48                 | 85.36 | 100.85 | 127.28 |
| AB | Lake Tahoe Air Basin    | Winter | 2025 | 355.73              | 413.22 | 485.16 | 615.19 | 73.48                 | 85.46 | 100.89 | 127.48 |
| AB | Lake Tahoe Air Basin    | Winter | 2026 | 355.72              | 413.39 | 485.13 | 615.45 | 73.50                 | 85.57 | 100.93 | 127.67 |
| AB | Lake Tahoe Air Basin    | Winter | 2027 | 355.72              | 413.54 | 485.10 | 615.71 | 73.52                 | 85.66 | 100.95 | 127.84 |
| AB | Lake Tahoe Air Basin    | Winter | 2028 | 355.71              | 413.70 | 485.07 | 615.98 | 73.52                 | 85.75 | 100.97 | 128.00 |
| AB | Lake Tahoe Air Basin    | Winter | 2029 | 355.70              | 413.85 | 485.04 | 616.24 | 73.53                 | 85.84 | 100.98 | 128.15 |
| AB | Lake Tahoe Air Basin    | Winter | 2030 | 355.69              | 414.00 | 484.99 | 616.51 | 73.53                 | 85.92 | 100.99 | 128.30 |
| AB | Lake Tahoe Air Basin    | Winter | 2031 | 355.70              | 414.15 | 484.96 | 616.78 | 73.54                 | 85.99 | 100.99 | 128.44 |
| AB | Lake Tahoe Air Basin    | Winter | 2032 | 355.71              | 414.28 | 484.93 | 617.05 | 73.54                 | 86.06 | 101.00 | 128.57 |
| AB | Lake Tahoe Air Basin    | Winter | 2033 | 355.71              | 414.39 | 484.90 | 617.29 | 73.55                 | 86.13 | 101.00 | 128.69 |
| AB | Lake Tahoe Air Basin    | Winter | 2034 | 355.71              | 414.51 | 484.88 | 617.51 | 73.55                 | 86.19 | 101.01 | 128.81 |
| AB | Lake Tahoe Air Basin    | Winter | 2035 | 355.71              | 414.59 | 484.85 | 617.70 | 73.56                 | 86.24 | 101.01 | 128.91 |
| AB | Mojave Desert Air Basin | Annual | 2010 | 343.11              | 394.68 | 468.99 | 590.86 | 73.72                 | 86.74 | 100.30 | 125.32 |
| AB | Mojave Desert Air Basin | Annual | 2011 | 343.64              | 395.54 | 469.03 | 592.03 | 73.66                 | 86.21 | 100.29 | 125.53 |
| AB | Mojave Desert Air Basin | Annual | 2012 | 343.83              | 396.10 | 468.85 | 592.82 | 73.64                 | 85.86 | 100.31 | 125.76 |
| AB | Mojave Desert Air Basin | Annual | 2013 | 343.61              | 395.96 | 468.10 | 592.75 | 73.63                 | 85.55 | 100.34 | 126.01 |
| AB | Mojave Desert Air Basin | Annual | 2014 | 343.79              | 396.35 | 468.03 | 593.54 | 73.61                 | 85.26 | 100.36 | 126.25 |
| AB | Mojave Desert Air Basin | Annual | 2015 | 343.46              | 395.74 | 466.94 | 593.04 | 73.61                 | 85.08 | 100.41 | 126.51 |
| AB | Mojave Desert Air Basin | Annual | 2016 | 343.59              | 396.07 | 466.87 | 593.71 | 73.64                 | 84.97 | 100.46 | 126.76 |
| AB | Mojave Desert Air Basin | Annual | 2017 | 343.70              | 396.36 | 466.83 | 594.35 | 73.64                 | 84.82 | 100.48 | 127.01 |
| AB | Mojave Desert Air Basin | Annual | 2018 | 343.78              | 396.61 | 466.78 | 594.88 | 73.65                 | 84.74 | 100.50 | 127.24 |
| AB | Mojave Desert Air Basin | Annual | 2019 | 343.84              | 396.80 | 466.60 | 595.24 | 73.67                 | 84.82 | 100.55 | 127.46 |
| AB | Mojave Desert Air Basin | Annual | 2020 | 343.89              | 397.05 | 466.55 | 595.62 | 73.75                 | 84.94 | 100.63 | 127.66 |
| AB | Mojave Desert Air Basin | Annual | 2021 | 344.44              | 397.74 | 467.03 | 596.67 | 73.81                 | 85.09 | 100.70 | 127.82 |
| AB | Mojave Desert Air Basin | Annual | 2022 | 344.45              | 397.97 | 467.01 | 596.93 | 73.85                 | 85.23 | 100.76 | 127.94 |
| AB | Mojave Desert Air Basin | Annual | 2023 | 344.44              | 398.17 | 466.98 | 597.13 | 73.88                 | 85.35 | 100.81 | 128.10 |
| AB | Mojave Desert Air Basin | Annual | 2024 | 344.17              | 397.99 | 466.53 | 596.83 | 73.89                 | 85.45 | 100.85 | 128.24 |
| AB | Mojave Desert Air Basin | Annual | 2025 | 344.18              | 398.15 | 466.52 | 597.01 | 73.91                 | 85.55 | 100.89 | 128.37 |
| AB | Mojave Desert Air Basin | Annual | 2026 | 344.19              | 398.32 | 466.50 | 597.17 | 73.93                 | 85.65 | 100.91 | 128.50 |
| AB | Mojave Desert Air Basin | Annual | 2027 | 344.20              | 398.48 | 466.48 | 597.33 | 73.94                 | 85.73 | 100.93 | 128.62 |
| AB | Mojave Desert Air Basin | Annual | 2028 | 344.20              | 398.63 | 466.46 | 597.49 | 73.95                 | 85.81 | 100.95 | 128.72 |
| AB | Mojave Desert Air Basin | Annual | 2029 | 344.20              | 398.78 | 466.44 | 597.64 | 73.96                 | 85.88 | 100.96 | 128.81 |
| AB | Mojave Desert Air Basin | Annual | 2030 | 344.19              | 398.92 | 466.41 | 597.78 | 73.96                 | 85.94 | 100.96 | 128.90 |
| AB | Mojave Desert Air Basin | Annual | 2031 | 345.29              | 400.17 | 467.56 | 599.64 | 73.96                 | 86.01 | 100.97 | 128.98 |
| AB | Mojave Desert Air Basin | Annual | 2032 | 345.26              | 400.28 | 467.53 | 599.70 | 73.97                 | 86.07 | 100.98 | 129.06 |
| AB | Mojave Desert Air Basin | Annual | 2033 | 345.23              | 400.38 | 467.50 | 599.76 | 73.97                 | 86.12 | 100.98 | 129.12 |
| AB | Mojave Desert Air Basin | Annual | 2034 | 345.20              | 400.47 | 467.47 | 599.81 | 73.97                 | 86.16 | 100.99 | 129.19 |
| AB | Mojave Desert Air Basin | Annual | 2035 | 345.17              | 400.54 | 467.45 | 599.85 | 73.98                 | 86.20 | 100.99 | 129.24 |
| AB | Mojave Desert Air Basin | Summer | 2010 | 378.64              | 430.09 | 514.82 | 649.00 | 73.72                 | 86.74 | 100.30 | 125.32 |
| AB | Mojave Desert Air Basin | Summer | 2011 | 379.34              | 431.77 | 515.20 | 650.27 | 73.66                 | 86.21 | 100.29 | 125.53 |
| AB | Mojave Desert Air Basin | Summer | 2012 | 379.64              | 432.95 | 515.24 | 651.14 | 73.64                 | 85.86 | 100.31 | 125.76 |
| AB | Mojave Desert Air Basin | Summer | 2013 | 379.46              | 433.16 | 514.62 | 651.13 | 73.63                 | 85.55 | 100.34 | 126.01 |
| AB | Mojave Desert Air Basin | Summer | 2014 | 379.68              | 433.88 | 514.72 | 652.08 | 73.61                 | 85.26 | 100.36 | 126.25 |
| AB | Mojave Desert Air Basin | Summer | 2015 | 379.34              | 433.42 | 513.70 | 651.66 | 73.61                 | 85.08 | 100.41 | 126.51 |
| AB | Mojave Desert Air Basin | Summer | 2016 | 379.52              | 433.92 | 513.75 | 652.50 | 73.64                 | 84.97 | 100.46 | 126.76 |
| AB | Mojave Desert Air Basin | Summer | 2017 | 379.64              | 434.35 | 513.78 | 653.28 | 73.64                 | 84.82 | 100.48 | 127.01 |
| AB | Mojave Desert Air Basin | Summer | 2018 | 379.71              | 434.69 | 513.76 | 653.91 | 73.65                 | 84.74 | 100.50 | 127.24 |
| AB | Mojave Desert Air Basin | Summer | 2019 | 379.77              | 434.97 | 513.59 | 654.37 | 73.67                 | 84.82 | 100.55 | 127.46 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Mojave Desert Air Basin     | Summer | 2020 | 379.81             | 435.29 | 513.53 | 654.85 | 73.75                 | 84.94 | 100.63 | 127.66 |
| AB | Mojave Desert Air Basin     | Summer | 2021 | 380.43             | 436.16 | 514.08 | 656.10 | 73.81                 | 85.09 | 100.70 | 127.82 |
| AB | Mojave Desert Air Basin     | Summer | 2022 | 380.46             | 436.52 | 514.06 | 656.46 | 73.85                 | 85.23 | 100.76 | 127.94 |
| AB | Mojave Desert Air Basin     | Summer | 2023 | 380.45             | 436.83 | 514.04 | 656.72 | 73.88                 | 85.35 | 100.81 | 128.10 |
| AB | Mojave Desert Air Basin     | Summer | 2024 | 380.12             | 436.68 | 513.52 | 656.37 | 73.89                 | 85.45 | 100.85 | 128.24 |
| AB | Mojave Desert Air Basin     | Summer | 2025 | 380.13             | 436.95 | 513.52 | 656.58 | 73.91                 | 85.55 | 100.89 | 128.37 |
| AB | Mojave Desert Air Basin     | Summer | 2026 | 380.14             | 437.20 | 513.50 | 656.78 | 73.93                 | 85.65 | 100.91 | 128.50 |
| AB | Mojave Desert Air Basin     | Summer | 2027 | 380.15             | 437.43 | 513.49 | 656.96 | 73.94                 | 85.73 | 100.93 | 128.62 |
| AB | Mojave Desert Air Basin     | Summer | 2028 | 380.15             | 437.66 | 513.48 | 657.14 | 73.95                 | 85.81 | 100.95 | 128.72 |
| AB | Mojave Desert Air Basin     | Summer | 2029 | 380.14             | 437.88 | 513.47 | 657.31 | 73.96                 | 85.88 | 100.96 | 128.81 |
| AB | Mojave Desert Air Basin     | Summer | 2030 | 380.14             | 438.08 | 513.46 | 657.48 | 73.96                 | 85.94 | 100.96 | 128.90 |
| AB | Mojave Desert Air Basin     | Summer | 2031 | 381.35             | 439.55 | 514.76 | 659.57 | 73.96                 | 86.01 | 100.97 | 128.98 |
| AB | Mojave Desert Air Basin     | Summer | 2032 | 381.29             | 439.73 | 514.74 | 659.65 | 73.97                 | 86.07 | 100.98 | 129.06 |
| AB | Mojave Desert Air Basin     | Summer | 2033 | 381.25             | 439.88 | 514.72 | 659.74 | 73.97                 | 86.12 | 100.98 | 129.12 |
| AB | Mojave Desert Air Basin     | Summer | 2034 | 381.20             | 440.01 | 514.71 | 659.82 | 73.97                 | 86.16 | 100.99 | 129.19 |
| AB | Mojave Desert Air Basin     | Summer | 2035 | 381.17             | 440.11 | 514.69 | 659.90 | 73.98                 | 86.20 | 100.99 | 129.24 |
| AB | Mojave Desert Air Basin     | Winter | 2010 | 332.64             | 384.30 | 455.49 | 573.78 | 73.72                 | 86.74 | 100.30 | 125.32 |
| AB | Mojave Desert Air Basin     | Winter | 2011 | 333.12             | 384.93 | 455.44 | 574.92 | 73.66                 | 86.21 | 100.29 | 125.53 |
| AB | Mojave Desert Air Basin     | Winter | 2012 | 333.27             | 385.32 | 455.20 | 575.69 | 73.64                 | 85.86 | 100.31 | 125.76 |
| AB | Mojave Desert Air Basin     | Winter | 2013 | 333.05             | 385.06 | 454.41 | 575.60 | 73.63                 | 85.55 | 100.34 | 126.01 |
| AB | Mojave Desert Air Basin     | Winter | 2014 | 333.21             | 385.37 | 454.28 | 576.35 | 73.61                 | 85.26 | 100.36 | 126.25 |
| AB | Mojave Desert Air Basin     | Winter | 2015 | 332.88             | 384.72 | 453.17 | 575.82 | 73.61                 | 85.08 | 100.41 | 126.51 |
| AB | Mojave Desert Air Basin     | Winter | 2016 | 333.01             | 385.01 | 453.07 | 576.45 | 73.64                 | 84.97 | 100.46 | 126.76 |
| AB | Mojave Desert Air Basin     | Winter | 2017 | 333.11             | 385.25 | 453.01 | 577.05 | 73.64                 | 84.82 | 100.48 | 127.01 |
| AB | Mojave Desert Air Basin     | Winter | 2018 | 333.19             | 385.48 | 452.95 | 577.56 | 73.65                 | 84.74 | 100.50 | 127.24 |
| AB | Mojave Desert Air Basin     | Winter | 2019 | 333.26             | 385.66 | 452.78 | 577.90 | 73.67                 | 84.82 | 100.55 | 127.46 |
| AB | Mojave Desert Air Basin     | Winter | 2020 | 333.31             | 385.88 | 452.72 | 578.26 | 73.75                 | 84.94 | 100.63 | 127.66 |
| AB | Mojave Desert Air Basin     | Winter | 2021 | 333.84             | 386.51 | 453.18 | 579.23 | 73.81                 | 85.09 | 100.70 | 127.82 |
| AB | Mojave Desert Air Basin     | Winter | 2022 | 333.85             | 386.71 | 453.16 | 579.47 | 73.85                 | 85.23 | 100.76 | 127.94 |
| AB | Mojave Desert Air Basin     | Winter | 2023 | 333.84             | 386.88 | 453.13 | 579.65 | 73.88                 | 85.35 | 100.81 | 128.10 |
| AB | Mojave Desert Air Basin     | Winter | 2024 | 333.58             | 386.69 | 452.71 | 579.37 | 73.89                 | 85.45 | 100.85 | 128.24 |
| AB | Mojave Desert Air Basin     | Winter | 2025 | 333.59             | 386.82 | 452.70 | 579.54 | 73.91                 | 85.55 | 100.89 | 128.37 |
| AB | Mojave Desert Air Basin     | Winter | 2026 | 333.61             | 386.97 | 452.67 | 579.69 | 73.93                 | 85.65 | 100.91 | 128.50 |
| AB | Mojave Desert Air Basin     | Winter | 2027 | 333.62             | 387.10 | 452.64 | 579.84 | 73.94                 | 85.73 | 100.93 | 128.62 |
| AB | Mojave Desert Air Basin     | Winter | 2028 | 333.62             | 387.24 | 452.62 | 579.99 | 73.95                 | 85.81 | 100.95 | 128.72 |
| AB | Mojave Desert Air Basin     | Winter | 2029 | 333.62             | 387.37 | 452.60 | 580.13 | 73.96                 | 85.88 | 100.96 | 128.81 |
| AB | Mojave Desert Air Basin     | Winter | 2030 | 333.61             | 387.49 | 452.57 | 580.27 | 73.96                 | 85.94 | 100.96 | 128.90 |
| AB | Mojave Desert Air Basin     | Winter | 2031 | 334.68             | 388.66 | 453.66 | 582.05 | 73.96                 | 86.01 | 100.97 | 128.98 |
| AB | Mojave Desert Air Basin     | Winter | 2032 | 334.65             | 388.75 | 453.62 | 582.10 | 73.97                 | 86.07 | 100.98 | 129.06 |
| AB | Mojave Desert Air Basin     | Winter | 2033 | 334.62             | 388.83 | 453.59 | 582.15 | 73.97                 | 86.12 | 100.98 | 129.12 |
| AB | Mojave Desert Air Basin     | Winter | 2034 | 334.59             | 388.91 | 453.56 | 582.18 | 73.97                 | 86.16 | 100.99 | 129.19 |
| AB | Mojave Desert Air Basin     | Winter | 2035 | 334.57             | 388.97 | 453.53 | 582.21 | 73.98                 | 86.20 | 100.99 | 129.24 |
| AB | Mountain Counties Air Basin | Annual | 2010 | 337.73             | 394.74 | 462.55 | 581.26 | 74.08                 | 90.29 | 100.75 | 125.10 |
| AB | Mountain Counties Air Basin | Annual | 2011 | 337.82             | 394.79 | 462.03 | 581.86 | 73.91                 | 89.26 | 100.66 | 125.21 |
| AB | Mountain Counties Air Basin | Annual | 2012 | 337.95             | 394.82 | 461.63 | 582.55 | 73.76                 | 88.44 | 100.64 | 125.36 |
| AB | Mountain Counties Air Basin | Annual | 2013 | 338.09             | 394.86 | 461.34 | 583.31 | 73.65                 | 87.72 | 100.62 | 125.55 |
| AB | Mountain Counties Air Basin | Annual | 2014 | 338.21             | 394.89 | 461.12 | 584.05 | 73.52                 | 87.09 | 100.58 | 125.75 |
| AB | Mountain Counties Air Basin | Annual | 2015 | 338.36             | 394.93 | 460.94 | 584.84 | 73.48                 | 86.55 | 100.58 | 125.97 |
| AB | Mountain Counties Air Basin | Annual | 2016 | 338.51             | 394.99 | 460.82 | 585.57 | 73.47                 | 86.12 | 100.59 | 126.21 |
| AB | Mountain Counties Air Basin | Annual | 2017 | 338.61             | 395.01 | 460.71 | 586.27 | 73.44                 | 85.65 | 100.57 | 126.46 |
| AB | Mountain Counties Air Basin | Annual | 2018 | 338.67             | 395.04 | 460.64 | 586.87 | 73.40                 | 85.31 | 100.58 | 126.69 |
| AB | Mountain Counties Air Basin | Annual | 2019 | 337.56             | 394.13 | 459.45 | 585.79 | 73.39                 | 85.18 | 100.60 | 126.91 |
| AB | Mountain Counties Air Basin | Annual | 2020 | 337.62             | 394.23 | 459.40 | 586.24 | 73.48                 | 85.19 | 100.67 | 127.12 |
| AB | Mountain Counties Air Basin | Annual | 2021 | 337.66             | 394.34 | 459.35 | 586.55 | 73.54                 | 85.26 | 100.73 | 127.25 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                    | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Mountain Counties Air Basin | Annual | 2022 | 337.68              | 394.44 | 459.30 | 586.78 | 73.58                 | 85.34 | 100.79 | 127.34 |
| AB | Mountain Counties Air Basin | Annual | 2023 | 337.66              | 394.51 | 459.24 | 586.97 | 73.60                 | 85.39 | 100.83 | 127.51 |
| AB | Mountain Counties Air Basin | Annual | 2024 | 337.62              | 394.56 | 459.21 | 587.12 | 73.61                 | 85.45 | 100.87 | 127.66 |
| AB | Mountain Counties Air Basin | Annual | 2025 | 337.61              | 394.61 | 459.18 | 587.29 | 73.62                 | 85.53 | 100.90 | 127.82 |
| AB | Mountain Counties Air Basin | Annual | 2026 | 337.62              | 394.78 | 459.14 | 587.48 | 73.64                 | 85.62 | 100.93 | 127.97 |
| AB | Mountain Counties Air Basin | Annual | 2027 | 337.63              | 394.92 | 459.10 | 587.67 | 73.66                 | 85.70 | 100.95 | 128.11 |
| AB | Mountain Counties Air Basin | Annual | 2028 | 337.63              | 395.07 | 459.06 | 587.86 | 73.67                 | 85.78 | 100.96 | 128.23 |
| AB | Mountain Counties Air Basin | Annual | 2029 | 337.63              | 395.23 | 459.02 | 588.06 | 73.67                 | 85.85 | 100.96 | 128.35 |
| AB | Mountain Counties Air Basin | Annual | 2030 | 337.62              | 395.37 | 458.97 | 588.27 | 73.68                 | 85.92 | 100.96 | 128.47 |
| AB | Mountain Counties Air Basin | Annual | 2031 | 337.63              | 395.50 | 458.95 | 588.48 | 73.68                 | 85.98 | 100.97 | 128.58 |
| AB | Mountain Counties Air Basin | Annual | 2032 | 337.64              | 395.62 | 458.93 | 588.71 | 73.69                 | 86.04 | 100.97 | 128.70 |
| AB | Mountain Counties Air Basin | Annual | 2033 | 337.64              | 395.72 | 458.92 | 588.91 | 73.69                 | 86.10 | 100.98 | 128.80 |
| AB | Mountain Counties Air Basin | Annual | 2034 | 337.64              | 395.82 | 458.90 | 589.08 | 73.70                 | 86.15 | 100.98 | 128.89 |
| AB | Mountain Counties Air Basin | Annual | 2035 | 337.64              | 395.90 | 458.89 | 589.24 | 73.70                 | 86.20 | 100.98 | 128.98 |
| AB | Mountain Counties Air Basin | Summer | 2010 | 367.32              | 424.29 | 500.18 | 628.91 | 74.08                 | 90.29 | 100.75 | 125.10 |
| AB | Mountain Counties Air Basin | Summer | 2011 | 367.66              | 425.17 | 499.91 | 629.58 | 73.91                 | 89.26 | 100.66 | 125.21 |
| AB | Mountain Counties Air Basin | Summer | 2012 | 367.99              | 425.86 | 499.73 | 630.44 | 73.76                 | 88.44 | 100.64 | 125.36 |
| AB | Mountain Counties Air Basin | Summer | 2013 | 368.29              | 426.43 | 499.63 | 631.41 | 73.65                 | 87.72 | 100.62 | 125.55 |
| AB | Mountain Counties Air Basin | Summer | 2014 | 368.54              | 426.87 | 499.60 | 632.42 | 73.52                 | 87.09 | 100.58 | 125.75 |
| AB | Mountain Counties Air Basin | Summer | 2015 | 368.78              | 427.27 | 499.58 | 633.49 | 73.48                 | 86.55 | 100.58 | 125.97 |
| AB | Mountain Counties Air Basin | Summer | 2016 | 368.99              | 427.61 | 499.58 | 634.51 | 73.47                 | 86.12 | 100.59 | 126.21 |
| AB | Mountain Counties Air Basin | Summer | 2017 | 369.12              | 427.89 | 499.57 | 635.47 | 73.44                 | 85.65 | 100.57 | 126.46 |
| AB | Mountain Counties Air Basin | Summer | 2018 | 369.20              | 428.10 | 499.54 | 636.29 | 73.40                 | 85.31 | 100.58 | 126.69 |
| AB | Mountain Counties Air Basin | Summer | 2019 | 367.97              | 427.24 | 498.26 | 635.21 | 73.39                 | 85.18 | 100.60 | 126.91 |
| AB | Mountain Counties Air Basin | Summer | 2020 | 368.01              | 427.48 | 498.21 | 635.80 | 73.48                 | 85.19 | 100.67 | 127.12 |
| AB | Mountain Counties Air Basin | Summer | 2021 | 368.06              | 427.68 | 498.13 | 636.19 | 73.54                 | 85.26 | 100.73 | 127.25 |
| AB | Mountain Counties Air Basin | Summer | 2022 | 368.08              | 427.87 | 498.06 | 636.51 | 73.58                 | 85.34 | 100.79 | 127.34 |
| AB | Mountain Counties Air Basin | Summer | 2023 | 368.06              | 428.03 | 497.99 | 636.75 | 73.60                 | 85.39 | 100.83 | 127.51 |
| AB | Mountain Counties Air Basin | Summer | 2024 | 368.04              | 428.16 | 497.96 | 636.93 | 73.61                 | 85.45 | 100.87 | 127.66 |
| AB | Mountain Counties Air Basin | Summer | 2025 | 368.03              | 428.28 | 497.93 | 637.11 | 73.62                 | 85.53 | 100.90 | 127.82 |
| AB | Mountain Counties Air Basin | Summer | 2026 | 368.04              | 428.50 | 497.91 | 637.31 | 73.64                 | 85.62 | 100.93 | 127.97 |
| AB | Mountain Counties Air Basin | Summer | 2027 | 368.05              | 428.70 | 497.89 | 637.51 | 73.66                 | 85.70 | 100.95 | 128.11 |
| AB | Mountain Counties Air Basin | Summer | 2028 | 368.06              | 428.91 | 497.87 | 637.72 | 73.67                 | 85.78 | 100.96 | 128.23 |
| AB | Mountain Counties Air Basin | Summer | 2029 | 368.07              | 429.12 | 497.85 | 637.95 | 73.67                 | 85.85 | 100.96 | 128.35 |
| AB | Mountain Counties Air Basin | Summer | 2030 | 368.07              | 429.33 | 497.82 | 638.18 | 73.68                 | 85.92 | 100.96 | 128.47 |
| AB | Mountain Counties Air Basin | Summer | 2031 | 368.08              | 429.52 | 497.80 | 638.46 | 73.68                 | 85.98 | 100.97 | 128.58 |
| AB | Mountain Counties Air Basin | Summer | 2032 | 368.09              | 429.68 | 497.78 | 638.73 | 73.69                 | 86.04 | 100.97 | 128.70 |
| AB | Mountain Counties Air Basin | Summer | 2033 | 368.10              | 429.81 | 497.77 | 638.99 | 73.69                 | 86.10 | 100.98 | 128.80 |
| AB | Mountain Counties Air Basin | Summer | 2034 | 368.10              | 429.93 | 497.75 | 639.22 | 73.70                 | 86.15 | 100.98 | 128.89 |
| AB | Mountain Counties Air Basin | Summer | 2035 | 368.10              | 430.02 | 497.74 | 639.43 | 73.70                 | 86.20 | 100.98 | 128.98 |
| AB | Mountain Counties Air Basin | Winter | 2010 | 330.51              | 387.48 | 453.53 | 569.65 | 74.08                 | 90.29 | 100.75 | 125.10 |
| AB | Mountain Counties Air Basin | Winter | 2011 | 330.54              | 387.32 | 452.95 | 570.23 | 73.91                 | 89.26 | 100.66 | 125.21 |
| AB | Mountain Counties Air Basin | Winter | 2012 | 330.61              | 387.20 | 452.50 | 570.89 | 73.76                 | 88.44 | 100.64 | 125.36 |
| AB | Mountain Counties Air Basin | Winter | 2013 | 330.72              | 387.10 | 452.16 | 571.58 | 73.65                 | 87.72 | 100.62 | 125.55 |
| AB | Mountain Counties Air Basin | Winter | 2014 | 330.81              | 387.02 | 451.90 | 572.27 | 73.52                 | 87.09 | 100.58 | 125.75 |
| AB | Mountain Counties Air Basin | Winter | 2015 | 330.94              | 386.98 | 451.69 | 572.98 | 73.48                 | 86.55 | 100.58 | 125.97 |
| AB | Mountain Counties Air Basin | Winter | 2016 | 331.07              | 386.97 | 451.53 | 573.65 | 73.47                 | 86.12 | 100.59 | 126.21 |
| AB | Mountain Counties Air Basin | Winter | 2017 | 331.16              | 386.93 | 451.40 | 574.28 | 73.44                 | 85.65 | 100.57 | 126.46 |
| AB | Mountain Counties Air Basin | Winter | 2018 | 331.22              | 386.91 | 451.31 | 574.83 | 73.40                 | 85.31 | 100.58 | 126.69 |
| AB | Mountain Counties Air Basin | Winter | 2019 | 330.14              | 385.98 | 450.15 | 573.74 | 73.39                 | 85.18 | 100.60 | 126.91 |
| AB | Mountain Counties Air Basin | Winter | 2020 | 330.19              | 386.05 | 450.10 | 574.16 | 73.48                 | 85.19 | 100.67 | 127.12 |
| AB | Mountain Counties Air Basin | Winter | 2021 | 330.24              | 386.14 | 450.05 | 574.44 | 73.54                 | 85.26 | 100.73 | 127.25 |
| AB | Mountain Counties Air Basin | Winter | 2022 | 330.25              | 386.21 | 450.00 | 574.66 | 73.58                 | 85.34 | 100.79 | 127.34 |
| AB | Mountain Counties Air Basin | Winter | 2023 | 330.22              | 386.26 | 449.94 | 574.82 | 73.60                 | 85.39 | 100.83 | 127.51 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Mountain Counties Air Basin   | Winter | 2024 | 330.18             | 386.28 | 449.90 | 574.97 | 73.61                 | 85.45 | 100.87 | 127.66 |
| AB | Mountain Counties Air Basin   | Winter | 2025 | 330.17             | 386.33 | 449.87 | 575.13 | 73.62                 | 85.53 | 100.90 | 127.82 |
| AB | Mountain Counties Air Basin   | Winter | 2026 | 330.18             | 386.48 | 449.82 | 575.31 | 73.64                 | 85.62 | 100.93 | 127.97 |
| AB | Mountain Counties Air Basin   | Winter | 2027 | 330.19             | 386.60 | 449.78 | 575.50 | 73.66                 | 85.70 | 100.95 | 128.11 |
| AB | Mountain Counties Air Basin   | Winter | 2028 | 330.19             | 386.74 | 449.74 | 575.69 | 73.67                 | 85.78 | 100.96 | 128.23 |
| AB | Mountain Counties Air Basin   | Winter | 2029 | 330.18             | 386.88 | 449.69 | 575.87 | 73.67                 | 85.85 | 100.96 | 128.35 |
| AB | Mountain Counties Air Basin   | Winter | 2030 | 330.17             | 387.00 | 449.63 | 576.07 | 73.68                 | 85.92 | 100.96 | 128.47 |
| AB | Mountain Counties Air Basin   | Winter | 2031 | 330.18             | 387.12 | 449.61 | 576.27 | 73.68                 | 85.98 | 100.97 | 128.58 |
| AB | Mountain Counties Air Basin   | Winter | 2032 | 330.18             | 387.23 | 449.59 | 576.48 | 73.69                 | 86.04 | 100.97 | 128.70 |
| AB | Mountain Counties Air Basin   | Winter | 2033 | 330.18             | 387.32 | 449.58 | 576.66 | 73.69                 | 86.10 | 100.98 | 128.80 |
| AB | Mountain Counties Air Basin   | Winter | 2034 | 330.18             | 387.41 | 449.56 | 576.82 | 73.70                 | 86.15 | 100.98 | 128.89 |
| AB | Mountain Counties Air Basin   | Winter | 2035 | 330.18             | 387.48 | 449.55 | 576.96 | 73.70                 | 86.20 | 100.98 | 128.98 |
| AB | North Central Coast Air Basin | Annual | 2010 | 352.08             | 409.85 | 484.60 | 606.53 | 72.96                 | 88.37 | 99.87  | 123.92 |
| AB | North Central Coast Air Basin | Annual | 2011 | 352.06             | 409.40 | 483.84 | 606.61 | 72.93                 | 87.57 | 99.90  | 124.13 |
| AB | North Central Coast Air Basin | Annual | 2012 | 352.19             | 409.24 | 483.32 | 607.40 | 72.89                 | 86.90 | 99.95  | 124.37 |
| AB | North Central Coast Air Basin | Annual | 2013 | 352.37             | 409.19 | 482.92 | 608.27 | 72.92                 | 86.40 | 100.03 | 124.65 |
| AB | North Central Coast Air Basin | Annual | 2014 | 352.53             | 409.12 | 482.60 | 609.12 | 72.92                 | 85.94 | 100.10 | 124.93 |
| AB | North Central Coast Air Basin | Annual | 2015 | 352.73             | 409.11 | 482.36 | 609.99 | 72.98                 | 85.55 | 100.18 | 125.24 |
| AB | North Central Coast Air Basin | Annual | 2016 | 352.92             | 409.09 | 482.18 | 610.81 | 73.05                 | 85.20 | 100.28 | 125.55 |
| AB | North Central Coast Air Basin | Annual | 2017 | 353.06             | 409.10 | 482.04 | 611.59 | 73.09                 | 84.93 | 100.35 | 125.86 |
| AB | North Central Coast Air Basin | Annual | 2018 | 353.17             | 409.13 | 481.94 | 612.28 | 73.12                 | 84.71 | 100.43 | 126.15 |
| AB | North Central Coast Air Basin | Annual | 2019 | 353.27             | 409.25 | 481.87 | 612.89 | 73.16                 | 84.66 | 100.51 | 126.43 |
| AB | North Central Coast Air Basin | Annual | 2020 | 353.37             | 409.39 | 481.83 | 613.44 | 73.25                 | 84.73 | 100.59 | 126.69 |
| AB | North Central Coast Air Basin | Annual | 2021 | 354.32             | 410.59 | 483.10 | 615.32 | 73.33                 | 84.87 | 100.68 | 126.92 |
| AB | North Central Coast Air Basin | Annual | 2022 | 354.37             | 410.77 | 483.07 | 615.74 | 73.38                 | 84.99 | 100.74 | 127.10 |
| AB | North Central Coast Air Basin | Annual | 2023 | 354.37             | 410.92 | 483.04 | 616.07 | 73.42                 | 85.10 | 100.80 | 127.31 |
| AB | North Central Coast Air Basin | Annual | 2024 | 354.34             | 411.03 | 483.02 | 616.34 | 73.43                 | 85.19 | 100.84 | 127.49 |
| AB | North Central Coast Air Basin | Annual | 2025 | 354.34             | 411.14 | 483.01 | 616.61 | 73.45                 | 85.28 | 100.88 | 127.66 |
| AB | North Central Coast Air Basin | Annual | 2026 | 353.30             | 409.99 | 481.54 | 614.89 | 73.47                 | 85.37 | 100.91 | 127.83 |
| AB | North Central Coast Air Basin | Annual | 2027 | 353.33             | 410.12 | 481.49 | 615.18 | 73.49                 | 85.45 | 100.93 | 127.98 |
| AB | North Central Coast Air Basin | Annual | 2028 | 353.35             | 410.27 | 481.44 | 615.46 | 73.50                 | 85.52 | 100.94 | 128.12 |
| AB | North Central Coast Air Basin | Annual | 2029 | 353.36             | 410.41 | 481.37 | 615.73 | 73.51                 | 85.58 | 100.94 | 128.25 |
| AB | North Central Coast Air Basin | Annual | 2030 | 353.37             | 410.56 | 481.31 | 616.01 | 73.51                 | 85.65 | 100.94 | 128.38 |
| AB | North Central Coast Air Basin | Annual | 2031 | 353.39             | 410.72 | 481.27 | 616.28 | 73.52                 | 85.71 | 100.95 | 128.50 |
| AB | North Central Coast Air Basin | Annual | 2032 | 353.41             | 410.88 | 481.25 | 616.56 | 73.52                 | 85.77 | 100.96 | 128.62 |
| AB | North Central Coast Air Basin | Annual | 2033 | 353.43             | 411.02 | 481.23 | 616.82 | 73.53                 | 85.83 | 100.96 | 128.73 |
| AB | North Central Coast Air Basin | Annual | 2034 | 353.45             | 411.15 | 481.21 | 617.05 | 73.53                 | 85.88 | 100.96 | 128.83 |
| AB | North Central Coast Air Basin | Annual | 2035 | 353.47             | 411.25 | 481.20 | 617.25 | 73.54                 | 85.93 | 100.97 | 128.92 |
| AB | North Central Coast Air Basin | Summer | 2010 | 372.98             | 431.76 | 511.84 | 642.11 | 72.96                 | 88.37 | 99.87  | 123.92 |
| AB | North Central Coast Air Basin | Summer | 2011 | 373.14             | 431.60 | 511.31 | 642.11 | 72.93                 | 87.57 | 99.90  | 124.13 |
| AB | North Central Coast Air Basin | Summer | 2012 | 373.41             | 431.71 | 511.01 | 642.95 | 72.89                 | 86.90 | 99.95  | 124.37 |
| AB | North Central Coast Air Basin | Summer | 2013 | 373.71             | 431.90 | 510.79 | 643.91 | 72.92                 | 86.40 | 100.03 | 124.65 |
| AB | North Central Coast Air Basin | Summer | 2014 | 373.96             | 432.06 | 510.63 | 644.90 | 72.92                 | 85.94 | 100.10 | 124.93 |
| AB | North Central Coast Air Basin | Summer | 2015 | 374.21             | 432.22 | 510.51 | 645.93 | 72.98                 | 85.55 | 100.18 | 125.24 |
| AB | North Central Coast Air Basin | Summer | 2016 | 374.44             | 432.38 | 510.41 | 646.92 | 73.05                 | 85.20 | 100.28 | 125.55 |
| AB | North Central Coast Air Basin | Summer | 2017 | 374.60             | 432.55 | 510.33 | 647.86 | 73.09                 | 84.93 | 100.35 | 125.86 |
| AB | North Central Coast Air Basin | Summer | 2018 | 374.71             | 432.72 | 510.25 | 648.67 | 73.12                 | 84.71 | 100.43 | 126.15 |
| AB | North Central Coast Air Basin | Summer | 2019 | 374.81             | 432.96 | 510.19 | 649.38 | 73.16                 | 84.66 | 100.51 | 126.43 |
| AB | North Central Coast Air Basin | Summer | 2020 | 374.91             | 433.20 | 510.15 | 650.02 | 73.25                 | 84.73 | 100.59 | 126.69 |
| AB | North Central Coast Air Basin | Summer | 2021 | 375.91             | 434.52 | 511.49 | 652.05 | 73.33                 | 84.87 | 100.68 | 126.92 |
| AB | North Central Coast Air Basin | Summer | 2022 | 375.97             | 434.78 | 511.48 | 652.54 | 73.38                 | 84.99 | 100.74 | 127.10 |
| AB | North Central Coast Air Basin | Summer | 2023 | 375.98             | 434.99 | 511.46 | 652.91 | 73.42                 | 85.10 | 100.80 | 127.31 |
| AB | North Central Coast Air Basin | Summer | 2024 | 375.97             | 435.16 | 511.45 | 653.21 | 73.43                 | 85.19 | 100.84 | 127.49 |
| AB | North Central Coast Air Basin | Summer | 2025 | 375.98             | 435.32 | 511.45 | 653.50 | 73.45                 | 85.28 | 100.88 | 127.66 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                      | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                               |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | North Central Coast Air Basin | Summer | 2026 | 374.88              | 434.13 | 509.90 | 651.66 | 73.47                 | 85.37 | 100.91 | 127.83 |
| AB | North Central Coast Air Basin | Summer | 2027 | 374.91              | 434.30 | 509.87 | 651.96 | 73.49                 | 85.45 | 100.93 | 127.98 |
| AB | North Central Coast Air Basin | Summer | 2028 | 374.94              | 434.48 | 509.85 | 652.26 | 73.50                 | 85.52 | 100.94 | 128.12 |
| AB | North Central Coast Air Basin | Summer | 2029 | 374.97              | 434.67 | 509.80 | 652.55 | 73.51                 | 85.58 | 100.94 | 128.25 |
| AB | North Central Coast Air Basin | Summer | 2030 | 374.99              | 434.87 | 509.76 | 652.86 | 73.51                 | 85.65 | 100.94 | 128.38 |
| AB | North Central Coast Air Basin | Summer | 2031 | 375.02              | 435.07 | 509.74 | 653.15 | 73.52                 | 85.71 | 100.95 | 128.50 |
| AB | North Central Coast Air Basin | Summer | 2032 | 375.05              | 435.26 | 509.73 | 653.46 | 73.52                 | 85.77 | 100.96 | 128.62 |
| AB | North Central Coast Air Basin | Summer | 2033 | 375.08              | 435.43 | 509.73 | 653.75 | 73.53                 | 85.83 | 100.96 | 128.73 |
| AB | North Central Coast Air Basin | Summer | 2034 | 375.11              | 435.58 | 509.72 | 654.02 | 73.53                 | 85.88 | 100.96 | 128.83 |
| AB | North Central Coast Air Basin | Summer | 2035 | 375.13              | 435.71 | 509.72 | 654.27 | 73.54                 | 85.93 | 100.97 | 128.92 |
| AB | North Central Coast Air Basin | Winter | 2010 | 350.54              | 408.22 | 482.61 | 603.75 | 72.96                 | 88.37 | 99.87  | 123.92 |
| AB | North Central Coast Air Basin | Winter | 2011 | 350.51              | 407.75 | 481.84 | 603.84 | 72.93                 | 87.57 | 99.90  | 124.13 |
| AB | North Central Coast Air Basin | Winter | 2012 | 350.63              | 407.55 | 481.30 | 604.63 | 72.89                 | 86.90 | 99.95  | 124.37 |
| AB | North Central Coast Air Basin | Winter | 2013 | 350.80              | 407.48 | 480.89 | 605.48 | 72.92                 | 86.40 | 100.03 | 124.65 |
| AB | North Central Coast Air Basin | Winter | 2014 | 350.96              | 407.39 | 480.56 | 606.32 | 72.92                 | 85.94 | 100.10 | 124.93 |
| AB | North Central Coast Air Basin | Winter | 2015 | 351.15              | 407.36 | 480.31 | 607.18 | 72.98                 | 85.55 | 100.18 | 125.24 |
| AB | North Central Coast Air Basin | Winter | 2016 | 351.33              | 407.32 | 480.12 | 607.99 | 73.05                 | 85.20 | 100.28 | 125.55 |
| AB | North Central Coast Air Basin | Winter | 2017 | 351.48              | 407.33 | 479.98 | 608.75 | 73.09                 | 84.93 | 100.35 | 125.86 |
| AB | North Central Coast Air Basin | Winter | 2018 | 351.58              | 407.34 | 479.88 | 609.43 | 73.12                 | 84.71 | 100.43 | 126.15 |
| AB | North Central Coast Air Basin | Winter | 2019 | 351.68              | 407.44 | 479.81 | 610.03 | 73.16                 | 84.66 | 100.51 | 126.43 |
| AB | North Central Coast Air Basin | Winter | 2020 | 351.78              | 407.58 | 479.76 | 610.57 | 73.25                 | 84.73 | 100.59 | 126.69 |
| AB | North Central Coast Air Basin | Winter | 2021 | 352.73              | 408.76 | 481.03 | 612.44 | 73.33                 | 84.87 | 100.68 | 126.92 |
| AB | North Central Coast Air Basin | Winter | 2022 | 352.78              | 408.94 | 481.00 | 612.85 | 73.38                 | 84.99 | 100.74 | 127.10 |
| AB | North Central Coast Air Basin | Winter | 2023 | 352.78              | 409.08 | 480.97 | 613.18 | 73.42                 | 85.10 | 100.80 | 127.31 |
| AB | North Central Coast Air Basin | Winter | 2024 | 352.74              | 409.19 | 480.94 | 613.44 | 73.43                 | 85.19 | 100.84 | 127.49 |
| AB | North Central Coast Air Basin | Winter | 2025 | 352.74              | 409.30 | 480.93 | 613.72 | 73.45                 | 85.28 | 100.88 | 127.66 |
| AB | North Central Coast Air Basin | Winter | 2026 | 351.70              | 408.15 | 479.46 | 612.01 | 73.47                 | 85.37 | 100.91 | 127.83 |
| AB | North Central Coast Air Basin | Winter | 2027 | 351.73              | 408.27 | 479.41 | 612.29 | 73.49                 | 85.45 | 100.93 | 127.98 |
| AB | North Central Coast Air Basin | Winter | 2028 | 351.74              | 408.41 | 479.36 | 612.56 | 73.50                 | 85.52 | 100.94 | 128.12 |
| AB | North Central Coast Air Basin | Winter | 2029 | 351.75              | 408.56 | 479.28 | 612.84 | 73.51                 | 85.58 | 100.94 | 128.25 |
| AB | North Central Coast Air Basin | Winter | 2030 | 351.76              | 408.70 | 479.22 | 613.11 | 73.51                 | 85.65 | 100.94 | 128.38 |
| AB | North Central Coast Air Basin | Winter | 2031 | 351.78              | 408.85 | 479.18 | 613.38 | 73.52                 | 85.71 | 100.95 | 128.50 |
| AB | North Central Coast Air Basin | Winter | 2032 | 351.80              | 409.00 | 479.15 | 613.65 | 73.52                 | 85.77 | 100.96 | 128.62 |
| AB | North Central Coast Air Basin | Winter | 2033 | 351.82              | 409.14 | 479.13 | 613.90 | 73.53                 | 85.83 | 100.96 | 128.73 |
| AB | North Central Coast Air Basin | Winter | 2034 | 351.84              | 409.26 | 479.11 | 614.13 | 73.53                 | 85.88 | 100.96 | 128.83 |
| AB | North Central Coast Air Basin | Winter | 2035 | 351.85              | 409.37 | 479.10 | 614.33 | 73.54                 | 85.93 | 100.97 | 128.92 |
| AB | North Coast Air Basin         | Annual | 2010 | 346.03              | 400.52 | 475.28 | 596.35 | 73.12                 | 86.55 | 100.74 | 124.00 |
| AB | North Coast Air Basin         | Annual | 2011 | 345.93              | 400.69 | 474.62 | 597.04 | 73.06                 | 86.04 | 100.65 | 124.19 |
| AB | North Coast Air Basin         | Annual | 2012 | 345.88              | 400.89 | 474.07 | 597.81 | 73.00                 | 85.72 | 100.63 | 124.43 |
| AB | North Coast Air Basin         | Annual | 2013 | 345.91              | 401.05 | 473.63 | 598.65 | 72.98                 | 85.44 | 100.63 | 124.70 |
| AB | North Coast Air Basin         | Annual | 2014 | 345.92              | 401.20 | 473.28 | 599.46 | 72.94                 | 85.23 | 100.60 | 124.98 |
| AB | North Coast Air Basin         | Annual | 2015 | 345.95              | 401.33 | 472.95 | 600.24 | 72.94                 | 85.05 | 100.58 | 125.28 |
| AB | North Coast Air Basin         | Annual | 2016 | 345.81              | 401.21 | 472.40 | 600.55 | 72.98                 | 84.93 | 100.60 | 125.59 |
| AB | North Coast Air Basin         | Annual | 2017 | 345.82              | 401.32 | 472.15 | 601.21 | 72.98                 | 84.80 | 100.61 | 125.90 |
| AB | North Coast Air Basin         | Annual | 2018 | 345.82              | 401.41 | 471.93 | 601.76 | 72.98                 | 84.71 | 100.61 | 126.20 |
| AB | North Coast Air Basin         | Annual | 2019 | 345.82              | 401.53 | 471.77 | 602.23 | 72.99                 | 84.74 | 100.64 | 126.48 |
| AB | North Coast Air Basin         | Annual | 2020 | 345.82              | 401.63 | 471.60 | 602.62 | 73.08                 | 84.82 | 100.70 | 126.74 |
| AB | North Coast Air Basin         | Annual | 2021 | 345.79              | 401.71 | 471.46 | 602.93 | 73.14                 | 84.94 | 100.77 | 126.95 |
| AB | North Coast Air Basin         | Annual | 2022 | 345.72              | 401.75 | 471.32 | 603.19 | 73.17                 | 85.04 | 100.81 | 127.14 |
| AB | North Coast Air Basin         | Annual | 2023 | 345.59              | 401.76 | 471.18 | 603.35 | 73.18                 | 85.12 | 100.85 | 127.34 |
| AB | North Coast Air Basin         | Annual | 2024 | 345.43              | 401.81 | 471.02 | 603.47 | 73.17                 | 85.21 | 100.88 | 127.52 |
| AB | North Coast Air Basin         | Annual | 2025 | 345.31              | 401.90 | 470.89 | 603.58 | 73.18                 | 85.30 | 100.91 | 127.68 |
| AB | North Coast Air Basin         | Annual | 2026 | 345.13              | 401.82 | 470.57 | 603.35 | 73.20                 | 85.41 | 100.93 | 127.84 |
| AB | North Coast Air Basin         | Annual | 2027 | 345.10              | 401.94 | 470.44 | 603.43 | 73.21                 | 85.52 | 100.95 | 127.99 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | North Coast Air Basin | Annual | 2028 | 345.05             | 402.06 | 470.32 | 603.52 | 73.22                 | 85.61 | 100.96 | 128.14 |
| AB | North Coast Air Basin | Annual | 2029 | 345.00             | 402.17 | 470.19 | 603.61 | 73.23                 | 85.70 | 100.96 | 128.27 |
| AB | North Coast Air Basin | Annual | 2030 | 344.94             | 402.27 | 470.04 | 603.71 | 73.23                 | 85.78 | 100.96 | 128.39 |
| AB | North Coast Air Basin | Annual | 2031 | 344.89             | 402.39 | 469.96 | 603.89 | 73.24                 | 85.87 | 100.96 | 128.52 |
| AB | North Coast Air Basin | Annual | 2032 | 344.84             | 402.47 | 469.89 | 604.06 | 73.24                 | 85.94 | 100.97 | 128.64 |
| AB | North Coast Air Basin | Annual | 2033 | 344.80             | 402.54 | 469.82 | 604.20 | 73.25                 | 86.01 | 100.97 | 128.75 |
| AB | North Coast Air Basin | Annual | 2034 | 344.75             | 402.59 | 469.75 | 604.33 | 73.25                 | 86.07 | 100.97 | 128.85 |
| AB | North Coast Air Basin | Annual | 2035 | 344.70             | 402.62 | 469.68 | 604.43 | 73.26                 | 86.13 | 100.98 | 128.94 |
| AB | North Coast Air Basin | Summer | 2010 | 351.51             | 406.21 | 482.43 | 606.18 | 73.12                 | 86.55 | 100.74 | 124.00 |
| AB | North Coast Air Basin | Summer | 2011 | 351.45             | 406.55 | 481.82 | 606.87 | 73.06                 | 86.04 | 100.65 | 124.19 |
| AB | North Coast Air Basin | Summer | 2012 | 351.44             | 406.87 | 481.30 | 607.68 | 73.00                 | 85.72 | 100.63 | 124.43 |
| AB | North Coast Air Basin | Summer | 2013 | 351.49             | 407.13 | 480.89 | 608.55 | 72.98                 | 85.44 | 100.63 | 124.70 |
| AB | North Coast Air Basin | Summer | 2014 | 351.51             | 407.36 | 480.57 | 609.42 | 72.94                 | 85.23 | 100.60 | 124.98 |
| AB | North Coast Air Basin | Summer | 2015 | 351.54             | 407.54 | 480.27 | 610.23 | 72.94                 | 85.05 | 100.58 | 125.28 |
| AB | North Coast Air Basin | Summer | 2016 | 351.38             | 407.46 | 479.71 | 610.56 | 72.98                 | 84.93 | 100.60 | 125.59 |
| AB | North Coast Air Basin | Summer | 2017 | 351.39             | 407.61 | 479.45 | 611.26 | 72.98                 | 84.80 | 100.61 | 125.90 |
| AB | North Coast Air Basin | Summer | 2018 | 351.37             | 407.72 | 479.23 | 611.82 | 72.98                 | 84.71 | 100.61 | 126.20 |
| AB | North Coast Air Basin | Summer | 2019 | 351.35             | 407.87 | 479.06 | 612.30 | 72.99                 | 84.74 | 100.64 | 126.48 |
| AB | North Coast Air Basin | Summer | 2020 | 351.34             | 407.98 | 478.88 | 612.71 | 73.08                 | 84.82 | 100.70 | 126.74 |
| AB | North Coast Air Basin | Summer | 2021 | 351.30             | 408.08 | 478.72 | 613.02 | 73.14                 | 84.94 | 100.77 | 126.95 |
| AB | North Coast Air Basin | Summer | 2022 | 351.22             | 408.14 | 478.58 | 613.27 | 73.17                 | 85.04 | 100.81 | 127.14 |
| AB | North Coast Air Basin | Summer | 2023 | 351.08             | 408.16 | 478.43 | 613.43 | 73.18                 | 85.12 | 100.85 | 127.34 |
| AB | North Coast Air Basin | Summer | 2024 | 350.90             | 408.23 | 478.27 | 613.55 | 73.17                 | 85.21 | 100.88 | 127.52 |
| AB | North Coast Air Basin | Summer | 2025 | 350.77             | 408.33 | 478.13 | 613.64 | 73.18                 | 85.30 | 100.91 | 127.68 |
| AB | North Coast Air Basin | Summer | 2026 | 350.58             | 408.26 | 477.79 | 613.38 | 73.20                 | 85.41 | 100.93 | 127.84 |
| AB | North Coast Air Basin | Summer | 2027 | 350.54             | 408.38 | 477.65 | 613.43 | 73.21                 | 85.52 | 100.95 | 127.99 |
| AB | North Coast Air Basin | Summer | 2028 | 350.49             | 408.51 | 477.52 | 613.51 | 73.22                 | 85.61 | 100.96 | 128.14 |
| AB | North Coast Air Basin | Summer | 2029 | 350.43             | 408.63 | 477.38 | 613.58 | 73.23                 | 85.70 | 100.96 | 128.27 |
| AB | North Coast Air Basin | Summer | 2030 | 350.36             | 408.73 | 477.22 | 613.66 | 73.23                 | 85.78 | 100.96 | 128.39 |
| AB | North Coast Air Basin | Summer | 2031 | 350.30             | 408.86 | 477.13 | 613.84 | 73.24                 | 85.87 | 100.96 | 128.52 |
| AB | North Coast Air Basin | Summer | 2032 | 350.25             | 408.94 | 477.05 | 614.01 | 73.24                 | 85.94 | 100.97 | 128.64 |
| AB | North Coast Air Basin | Summer | 2033 | 350.19             | 409.01 | 476.97 | 614.15 | 73.25                 | 86.01 | 100.97 | 128.75 |
| AB | North Coast Air Basin | Summer | 2034 | 350.13             | 409.05 | 476.89 | 614.28 | 73.25                 | 86.07 | 100.97 | 128.85 |
| AB | North Coast Air Basin | Summer | 2035 | 350.07             | 409.06 | 476.81 | 614.38 | 73.26                 | 86.13 | 100.98 | 128.94 |
| AB | North Coast Air Basin | Winter | 2010 | 342.74             | 397.09 | 470.93 | 590.57 | 73.12                 | 86.55 | 100.74 | 124.00 |
| AB | North Coast Air Basin | Winter | 2011 | 342.60             | 397.17 | 470.23 | 591.24 | 73.06                 | 86.04 | 100.65 | 124.19 |
| AB | North Coast Air Basin | Winter | 2012 | 342.54             | 397.29 | 469.66 | 592.00 | 73.00                 | 85.72 | 100.63 | 124.43 |
| AB | North Coast Air Basin | Winter | 2013 | 342.55             | 397.39 | 469.20 | 592.80 | 72.98                 | 85.44 | 100.63 | 124.70 |
| AB | North Coast Air Basin | Winter | 2014 | 342.55             | 397.49 | 468.83 | 593.59 | 72.94                 | 85.23 | 100.60 | 124.98 |
| AB | North Coast Air Basin | Winter | 2015 | 342.58             | 397.57 | 468.49 | 594.34 | 72.94                 | 85.05 | 100.58 | 125.28 |
| AB | North Coast Air Basin | Winter | 2016 | 342.44             | 397.43 | 467.93 | 594.63 | 72.98                 | 84.93 | 100.60 | 125.59 |
| AB | North Coast Air Basin | Winter | 2017 | 342.46             | 397.52 | 467.68 | 595.27 | 72.98                 | 84.80 | 100.61 | 125.90 |
| AB | North Coast Air Basin | Winter | 2018 | 342.46             | 397.59 | 467.46 | 595.80 | 72.98                 | 84.71 | 100.61 | 126.20 |
| AB | North Coast Air Basin | Winter | 2019 | 342.46             | 397.69 | 467.30 | 596.26 | 72.99                 | 84.74 | 100.64 | 126.48 |
| AB | North Coast Air Basin | Winter | 2020 | 342.47             | 397.78 | 467.14 | 596.65 | 73.08                 | 84.82 | 100.70 | 126.74 |
| AB | North Coast Air Basin | Winter | 2021 | 342.45             | 397.84 | 467.00 | 596.95 | 73.14                 | 84.94 | 100.77 | 126.95 |
| AB | North Coast Air Basin | Winter | 2022 | 342.38             | 397.87 | 466.87 | 597.20 | 73.17                 | 85.04 | 100.81 | 127.14 |
| AB | North Coast Air Basin | Winter | 2023 | 342.26             | 397.88 | 466.74 | 597.36 | 73.18                 | 85.12 | 100.85 | 127.34 |
| AB | North Coast Air Basin | Winter | 2024 | 342.10             | 397.91 | 466.57 | 597.49 | 73.17                 | 85.21 | 100.88 | 127.52 |
| AB | North Coast Air Basin | Winter | 2025 | 341.99             | 397.99 | 466.45 | 597.60 | 73.18                 | 85.30 | 100.91 | 127.68 |
| AB | North Coast Air Basin | Winter | 2026 | 341.81             | 397.91 | 466.13 | 597.38 | 73.20                 | 85.41 | 100.93 | 127.84 |
| AB | North Coast Air Basin | Winter | 2027 | 341.78             | 398.02 | 466.02 | 597.47 | 73.21                 | 85.52 | 100.95 | 127.99 |
| AB | North Coast Air Basin | Winter | 2028 | 341.74             | 398.13 | 465.90 | 597.57 | 73.22                 | 85.61 | 100.96 | 128.14 |
| AB | North Coast Air Basin | Winter | 2029 | 341.69             | 398.24 | 465.77 | 597.67 | 73.23                 | 85.70 | 100.96 | 128.27 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                    | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | North Coast Air Basin       | Winter | 2030 | 341.63              | 398.33 | 465.62 | 597.77 | 73.23                 | 85.78 | 100.96 | 128.39 |
| AB | North Coast Air Basin       | Winter | 2031 | 341.59              | 398.44 | 465.55 | 597.95 | 73.24                 | 85.87 | 100.96 | 128.52 |
| AB | North Coast Air Basin       | Winter | 2032 | 341.55              | 398.52 | 465.48 | 598.12 | 73.24                 | 85.94 | 100.97 | 128.64 |
| AB | North Coast Air Basin       | Winter | 2033 | 341.50              | 398.60 | 465.41 | 598.26 | 73.25                 | 86.01 | 100.97 | 128.75 |
| AB | North Coast Air Basin       | Winter | 2034 | 341.46              | 398.65 | 465.35 | 598.38 | 73.25                 | 86.07 | 100.97 | 128.85 |
| AB | North Coast Air Basin       | Winter | 2035 | 341.41              | 398.68 | 465.29 | 598.48 | 73.26                 | 86.13 | 100.98 | 128.94 |
| AB | Northeast Plateau Air Basin | Annual | 2010 | 377.75              | 443.26 | 517.72 | 646.50 | 74.51                 | 94.16 | 102.11 | 125.01 |
| AB | Northeast Plateau Air Basin | Annual | 2011 | 377.64              | 442.37 | 517.03 | 647.16 | 74.33                 | 92.57 | 101.85 | 125.11 |
| AB | Northeast Plateau Air Basin | Annual | 2012 | 377.60              | 441.62 | 516.49 | 647.98 | 74.16                 | 91.28 | 101.68 | 125.24 |
| AB | Northeast Plateau Air Basin | Annual | 2013 | 377.56              | 441.00 | 516.04 | 648.87 | 73.94                 | 90.24 | 101.46 | 125.42 |
| AB | Northeast Plateau Air Basin | Annual | 2014 | 377.59              | 440.43 | 515.70 | 649.73 | 73.82                 | 89.19 | 101.27 | 125.61 |
| AB | Northeast Plateau Air Basin | Annual | 2015 | 377.66              | 439.94 | 515.40 | 650.62 | 73.75                 | 88.24 | 101.11 | 125.83 |
| AB | Northeast Plateau Air Basin | Annual | 2016 | 377.76              | 439.50 | 515.18 | 651.48 | 73.75                 | 87.42 | 101.02 | 126.07 |
| AB | Northeast Plateau Air Basin | Annual | 2017 | 377.77              | 439.13 | 514.99 | 652.27 | 73.65                 | 86.65 | 100.88 | 126.32 |
| AB | Northeast Plateau Air Basin | Annual | 2018 | 377.76              | 438.85 | 514.83 | 652.95 | 73.55                 | 86.12 | 100.80 | 126.56 |
| AB | Northeast Plateau Air Basin | Annual | 2019 | 377.78              | 438.67 | 514.70 | 653.55 | 73.52                 | 85.77 | 100.76 | 126.78 |
| AB | Northeast Plateau Air Basin | Annual | 2020 | 377.81              | 438.53 | 514.58 | 654.05 | 73.60                 | 85.62 | 100.80 | 127.00 |
| AB | Northeast Plateau Air Basin | Annual | 2021 | 377.76              | 438.41 | 514.47 | 654.40 | 73.63                 | 85.60 | 100.85 | 127.16 |
| AB | Northeast Plateau Air Basin | Annual | 2022 | 377.67              | 438.26 | 514.35 | 654.67 | 73.63                 | 85.57 | 100.87 | 127.26 |
| AB | Northeast Plateau Air Basin | Annual | 2023 | 377.54              | 438.15 | 514.25 | 654.84 | 73.62                 | 85.55 | 100.90 | 127.43 |
| AB | Northeast Plateau Air Basin | Annual | 2024 | 377.40              | 438.07 | 514.15 | 654.98 | 73.59                 | 85.56 | 100.92 | 127.59 |
| AB | Northeast Plateau Air Basin | Annual | 2025 | 377.34              | 438.12 | 514.08 | 655.10 | 73.60                 | 85.62 | 100.94 | 127.74 |
| AB | Northeast Plateau Air Basin | Annual | 2026 | 377.35              | 438.23 | 513.97 | 655.34 | 73.62                 | 85.71 | 100.97 | 127.89 |
| AB | Northeast Plateau Air Basin | Annual | 2027 | 377.35              | 438.35 | 513.87 | 655.58 | 73.63                 | 85.79 | 100.98 | 128.04 |
| AB | Northeast Plateau Air Basin | Annual | 2028 | 377.34              | 438.46 | 513.78 | 655.82 | 73.64                 | 85.87 | 100.99 | 128.18 |
| AB | Northeast Plateau Air Basin | Annual | 2029 | 377.32              | 438.58 | 513.68 | 656.05 | 73.64                 | 85.94 | 100.99 | 128.31 |
| AB | Northeast Plateau Air Basin | Annual | 2030 | 377.31              | 438.68 | 513.58 | 656.29 | 73.65                 | 86.00 | 100.99 | 128.43 |
| AB | Northeast Plateau Air Basin | Annual | 2031 | 377.30              | 438.81 | 513.55 | 656.54 | 73.65                 | 86.06 | 100.99 | 128.55 |
| AB | Northeast Plateau Air Basin | Annual | 2032 | 377.30              | 438.90 | 513.52 | 656.81 | 73.66                 | 86.12 | 100.99 | 128.68 |
| AB | Northeast Plateau Air Basin | Annual | 2033 | 377.29              | 438.99 | 513.49 | 657.04 | 73.66                 | 86.18 | 101.00 | 128.78 |
| AB | Northeast Plateau Air Basin | Annual | 2034 | 377.28              | 439.07 | 513.47 | 657.24 | 73.67                 | 86.22 | 101.00 | 128.89 |
| AB | Northeast Plateau Air Basin | Annual | 2035 | 377.27              | 439.12 | 513.45 | 657.42 | 73.67                 | 86.26 | 101.00 | 128.98 |
| AB | Northeast Plateau Air Basin | Summer | 2010 | 394.23              | 458.88 | 539.40 | 673.34 | 74.51                 | 94.16 | 102.11 | 125.01 |
| AB | Northeast Plateau Air Basin | Summer | 2011 | 394.34              | 458.69 | 538.93 | 674.13 | 74.33                 | 92.57 | 101.85 | 125.11 |
| AB | Northeast Plateau Air Basin | Summer | 2012 | 394.46              | 458.48 | 538.57 | 675.13 | 74.16                 | 91.28 | 101.68 | 125.24 |
| AB | Northeast Plateau Air Basin | Summer | 2013 | 394.54              | 458.28 | 538.29 | 676.23 | 73.94                 | 90.24 | 101.46 | 125.42 |
| AB | Northeast Plateau Air Basin | Summer | 2014 | 394.66              | 458.04 | 538.09 | 677.30 | 73.82                 | 89.19 | 101.27 | 125.61 |
| AB | Northeast Plateau Air Basin | Summer | 2015 | 394.79              | 457.86 | 537.92 | 678.42 | 73.75                 | 88.24 | 101.11 | 125.83 |
| AB | Northeast Plateau Air Basin | Summer | 2016 | 394.92              | 457.67 | 537.80 | 679.49 | 73.75                 | 87.42 | 101.02 | 126.07 |
| AB | Northeast Plateau Air Basin | Summer | 2017 | 394.95              | 457.50 | 537.69 | 680.48 | 73.65                 | 86.65 | 100.88 | 126.32 |
| AB | Northeast Plateau Air Basin | Summer | 2018 | 394.94              | 457.37 | 537.57 | 681.33 | 73.55                 | 86.12 | 100.80 | 126.56 |
| AB | Northeast Plateau Air Basin | Summer | 2019 | 394.96              | 457.30 | 537.48 | 682.08 | 73.52                 | 85.77 | 100.76 | 126.78 |
| AB | Northeast Plateau Air Basin | Summer | 2020 | 394.99              | 457.28 | 537.38 | 682.70 | 73.60                 | 85.62 | 100.80 | 127.00 |
| AB | Northeast Plateau Air Basin | Summer | 2021 | 394.94              | 457.25 | 537.27 | 683.15 | 73.63                 | 85.60 | 100.85 | 127.16 |
| AB | Northeast Plateau Air Basin | Summer | 2022 | 394.85              | 457.20 | 537.18 | 683.51 | 73.63                 | 85.57 | 100.87 | 127.26 |
| AB | Northeast Plateau Air Basin | Summer | 2023 | 394.73              | 457.17 | 537.08 | 683.76 | 73.62                 | 85.55 | 100.90 | 127.43 |
| AB | Northeast Plateau Air Basin | Summer | 2024 | 394.60              | 457.16 | 537.01 | 683.96 | 73.59                 | 85.56 | 100.92 | 127.59 |
| AB | Northeast Plateau Air Basin | Summer | 2025 | 394.55              | 457.25 | 536.94 | 684.14 | 73.60                 | 85.62 | 100.94 | 127.74 |
| AB | Northeast Plateau Air Basin | Summer | 2026 | 394.57              | 457.40 | 536.85 | 684.40 | 73.62                 | 85.71 | 100.97 | 127.89 |
| AB | Northeast Plateau Air Basin | Summer | 2027 | 394.58              | 457.55 | 536.76 | 684.67 | 73.63                 | 85.79 | 100.98 | 128.04 |
| AB | Northeast Plateau Air Basin | Summer | 2028 | 394.60              | 457.70 | 536.68 | 684.95 | 73.64                 | 85.87 | 100.99 | 128.18 |
| AB | Northeast Plateau Air Basin | Summer | 2029 | 394.59              | 457.87 | 536.60 | 685.23 | 73.64                 | 85.94 | 100.99 | 128.31 |
| AB | Northeast Plateau Air Basin | Summer | 2030 | 394.59              | 458.00 | 536.52 | 685.51 | 73.65                 | 86.00 | 100.99 | 128.43 |
| AB | Northeast Plateau Air Basin | Summer | 2031 | 394.59              | 458.17 | 536.50 | 685.81 | 73.65                 | 86.06 | 100.99 | 128.55 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Northeast Plateau Air Basin | Summer | 2032 | 394.59             | 458.30 | 536.49 | 686.12 | 73.66                 | 86.12 | 100.99 | 128.68 |
| AB | Northeast Plateau Air Basin | Summer | 2033 | 394.59             | 458.41 | 536.47 | 686.39 | 73.66                 | 86.18 | 101.00 | 128.78 |
| AB | Northeast Plateau Air Basin | Summer | 2034 | 394.58             | 458.50 | 536.45 | 686.63 | 73.67                 | 86.22 | 101.00 | 128.89 |
| AB | Northeast Plateau Air Basin | Summer | 2035 | 394.57             | 458.57 | 536.44 | 686.85 | 73.67                 | 86.26 | 101.00 | 128.98 |
| AB | Northeast Plateau Air Basin | Winter | 2010 | 372.12             | 437.93 | 510.31 | 637.33 | 74.51                 | 94.16 | 102.11 | 125.01 |
| AB | Northeast Plateau Air Basin | Winter | 2011 | 371.94             | 436.79 | 509.55 | 637.95 | 74.33                 | 92.57 | 101.85 | 125.11 |
| AB | Northeast Plateau Air Basin | Winter | 2012 | 371.85             | 435.86 | 508.94 | 638.70 | 74.16                 | 91.28 | 101.68 | 125.24 |
| AB | Northeast Plateau Air Basin | Winter | 2013 | 371.76             | 435.10 | 508.44 | 639.52 | 73.94                 | 90.24 | 101.46 | 125.42 |
| AB | Northeast Plateau Air Basin | Winter | 2014 | 371.76             | 434.41 | 508.05 | 640.31 | 73.82                 | 89.19 | 101.27 | 125.61 |
| AB | Northeast Plateau Air Basin | Winter | 2015 | 371.82             | 433.82 | 507.71 | 641.12 | 73.75                 | 88.24 | 101.11 | 125.83 |
| AB | Northeast Plateau Air Basin | Winter | 2016 | 371.90             | 433.30 | 507.45 | 641.90 | 73.75                 | 87.42 | 101.02 | 126.07 |
| AB | Northeast Plateau Air Basin | Winter | 2017 | 371.90             | 432.86 | 507.23 | 642.63 | 73.65                 | 86.65 | 100.88 | 126.32 |
| AB | Northeast Plateau Air Basin | Winter | 2018 | 371.89             | 432.53 | 507.06 | 643.25 | 73.55                 | 86.12 | 100.80 | 126.56 |
| AB | Northeast Plateau Air Basin | Winter | 2019 | 371.91             | 432.30 | 506.92 | 643.80 | 73.52                 | 85.77 | 100.76 | 126.78 |
| AB | Northeast Plateau Air Basin | Winter | 2020 | 371.94             | 432.13 | 506.80 | 644.25 | 73.60                 | 85.62 | 100.80 | 127.00 |
| AB | Northeast Plateau Air Basin | Winter | 2021 | 371.90             | 431.97 | 506.68 | 644.58 | 73.63                 | 85.60 | 100.85 | 127.16 |
| AB | Northeast Plateau Air Basin | Winter | 2022 | 371.79             | 431.80 | 506.56 | 644.81 | 73.63                 | 85.57 | 100.87 | 127.26 |
| AB | Northeast Plateau Air Basin | Winter | 2023 | 371.66             | 431.66 | 506.44 | 644.96 | 73.62                 | 85.55 | 100.90 | 127.43 |
| AB | Northeast Plateau Air Basin | Winter | 2024 | 371.52             | 431.55 | 506.34 | 645.08 | 73.59                 | 85.56 | 100.92 | 127.59 |
| AB | Northeast Plateau Air Basin | Winter | 2025 | 371.46             | 431.58 | 506.27 | 645.18 | 73.60                 | 85.62 | 100.94 | 127.74 |
| AB | Northeast Plateau Air Basin | Winter | 2026 | 371.46             | 431.69 | 506.16 | 645.40 | 73.62                 | 85.71 | 100.97 | 127.89 |
| AB | Northeast Plateau Air Basin | Winter | 2027 | 371.46             | 431.79 | 506.05 | 645.63 | 73.63                 | 85.79 | 100.98 | 128.04 |
| AB | Northeast Plateau Air Basin | Winter | 2028 | 371.45             | 431.88 | 505.95 | 645.86 | 73.64                 | 85.87 | 100.99 | 128.18 |
| AB | Northeast Plateau Air Basin | Winter | 2029 | 371.43             | 431.99 | 505.85 | 646.08 | 73.64                 | 85.94 | 100.99 | 128.31 |
| AB | Northeast Plateau Air Basin | Winter | 2030 | 371.40             | 432.08 | 505.74 | 646.30 | 73.65                 | 86.00 | 100.99 | 128.43 |
| AB | Northeast Plateau Air Basin | Winter | 2031 | 371.39             | 432.19 | 505.70 | 646.54 | 73.65                 | 86.06 | 100.99 | 128.55 |
| AB | Northeast Plateau Air Basin | Winter | 2032 | 371.39             | 432.28 | 505.67 | 646.80 | 73.66                 | 86.12 | 100.99 | 128.68 |
| AB | Northeast Plateau Air Basin | Winter | 2033 | 371.38             | 432.35 | 505.64 | 647.01 | 73.66                 | 86.18 | 101.00 | 128.78 |
| AB | Northeast Plateau Air Basin | Winter | 2034 | 371.37             | 432.42 | 505.61 | 647.20 | 73.67                 | 86.22 | 101.00 | 128.89 |
| AB | Northeast Plateau Air Basin | Winter | 2035 | 371.36             | 432.48 | 505.59 | 647.37 | 73.67                 | 86.26 | 101.00 | 128.98 |
| AB | Sacramento Valley Air Basin | Annual | 2010 | 339.47             | 391.58 | 465.54 | 585.89 | 73.13                 | 87.05 | 100.12 | 125.04 |
| AB | Sacramento Valley Air Basin | Annual | 2011 | 339.70             | 392.07 | 465.28 | 586.41 | 73.13                 | 86.45 | 100.12 | 125.22 |
| AB | Sacramento Valley Air Basin | Annual | 2012 | 339.92             | 392.53 | 465.05 | 586.98 | 73.14                 | 86.02 | 100.16 | 125.43 |
| AB | Sacramento Valley Air Basin | Annual | 2013 | 340.13             | 392.91 | 464.86 | 587.61 | 73.18                 | 85.67 | 100.21 | 125.66 |
| AB | Sacramento Valley Air Basin | Annual | 2014 | 340.32             | 393.25 | 464.72 | 588.24 | 73.20                 | 85.38 | 100.25 | 125.90 |
| AB | Sacramento Valley Air Basin | Annual | 2015 | 340.50             | 393.55 | 464.61 | 588.90 | 73.26                 | 85.16 | 100.28 | 126.15 |
| AB | Sacramento Valley Air Basin | Annual | 2016 | 341.42             | 394.73 | 465.46 | 590.86 | 73.34                 | 84.98 | 100.34 | 126.41 |
| AB | Sacramento Valley Air Basin | Annual | 2017 | 341.54             | 394.94 | 465.36 | 591.43 | 73.39                 | 84.78 | 100.38 | 126.66 |
| AB | Sacramento Valley Air Basin | Annual | 2018 | 341.62             | 395.12 | 465.27 | 591.91 | 73.42                 | 84.66 | 100.43 | 126.91 |
| AB | Sacramento Valley Air Basin | Annual | 2019 | 340.51             | 393.97 | 463.69 | 590.45 | 73.48                 | 84.72 | 100.49 | 127.12 |
| AB | Sacramento Valley Air Basin | Annual | 2020 | 340.58             | 394.18 | 463.62 | 590.84 | 73.58                 | 84.83 | 100.57 | 127.33 |
| AB | Sacramento Valley Air Basin | Annual | 2021 | 340.67             | 394.43 | 463.65 | 591.21 | 73.65                 | 84.97 | 100.65 | 127.48 |
| AB | Sacramento Valley Air Basin | Annual | 2022 | 340.69             | 394.59 | 463.59 | 591.44 | 73.71                 | 85.11 | 100.72 | 127.61 |
| AB | Sacramento Valley Air Basin | Annual | 2023 | 340.68             | 394.72 | 463.54 | 591.60 | 73.75                 | 85.22 | 100.77 | 127.77 |
| AB | Sacramento Valley Air Basin | Annual | 2024 | 340.67             | 394.84 | 463.48 | 591.71 | 73.77                 | 85.32 | 100.82 | 127.92 |
| AB | Sacramento Valley Air Basin | Annual | 2025 | 340.66             | 394.94 | 463.43 | 591.82 | 73.79                 | 85.41 | 100.86 | 128.06 |
| AB | Sacramento Valley Air Basin | Annual | 2026 | 340.83             | 395.25 | 463.58 | 592.22 | 73.81                 | 85.50 | 100.89 | 128.20 |
| AB | Sacramento Valley Air Basin | Annual | 2027 | 340.82             | 395.35 | 463.54 | 592.33 | 73.83                 | 85.58 | 100.91 | 128.33 |
| AB | Sacramento Valley Air Basin | Annual | 2028 | 340.82             | 395.45 | 463.50 | 592.44 | 73.84                 | 85.66 | 100.93 | 128.44 |
| AB | Sacramento Valley Air Basin | Annual | 2029 | 340.81             | 395.55 | 463.45 | 592.55 | 73.84                 | 85.73 | 100.94 | 128.55 |
| AB | Sacramento Valley Air Basin | Annual | 2030 | 340.79             | 395.65 | 463.41 | 592.66 | 73.85                 | 85.80 | 100.95 | 128.65 |
| AB | Sacramento Valley Air Basin | Annual | 2031 | 340.77             | 395.75 | 463.38 | 592.83 | 73.85                 | 85.86 | 100.96 | 128.75 |
| AB | Sacramento Valley Air Basin | Annual | 2032 | 340.75             | 395.84 | 463.35 | 592.99 | 73.86                 | 85.92 | 100.96 | 128.84 |
| AB | Sacramento Valley Air Basin | Annual | 2033 | 340.73             | 395.91 | 463.32 | 593.13 | 73.86                 | 85.97 | 100.97 | 128.92 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                    | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Sacramento Valley Air Basin | Annual | 2034 | 340.71              | 395.98 | 463.29 | 593.27 | 73.87                 | 86.02 | 100.97 | 129.00 |
| AB | Sacramento Valley Air Basin | Annual | 2035 | 340.69              | 396.02 | 463.26 | 593.38 | 73.87                 | 86.07 | 100.98 | 129.07 |
| AB | Sacramento Valley Air Basin | Summer | 2010 | 376.00              | 429.82 | 513.57 | 646.23 | 73.13                 | 87.05 | 100.12 | 125.04 |
| AB | Sacramento Valley Air Basin | Summer | 2011 | 376.48              | 431.05 | 513.58 | 646.73 | 73.13                 | 86.45 | 100.12 | 125.22 |
| AB | Sacramento Valley Air Basin | Summer | 2012 | 376.91              | 432.08 | 513.58 | 647.38 | 73.14                 | 86.02 | 100.16 | 125.43 |
| AB | Sacramento Valley Air Basin | Summer | 2013 | 377.28              | 432.92 | 513.60 | 648.19 | 73.18                 | 85.67 | 100.21 | 125.66 |
| AB | Sacramento Valley Air Basin | Summer | 2014 | 377.59              | 433.62 | 513.66 | 649.04 | 73.20                 | 85.38 | 100.25 | 125.90 |
| AB | Sacramento Valley Air Basin | Summer | 2015 | 377.87              | 434.22 | 513.73 | 649.95 | 73.26                 | 85.16 | 100.28 | 126.15 |
| AB | Sacramento Valley Air Basin | Summer | 2016 | 378.93              | 435.71 | 514.80 | 652.32 | 73.34                 | 84.98 | 100.34 | 126.41 |
| AB | Sacramento Valley Air Basin | Summer | 2017 | 379.08              | 436.13 | 514.80 | 653.13 | 73.39                 | 84.78 | 100.38 | 126.66 |
| AB | Sacramento Valley Air Basin | Summer | 2018 | 379.17              | 436.45 | 514.75 | 653.82 | 73.42                 | 84.66 | 100.43 | 126.91 |
| AB | Sacramento Valley Air Basin | Summer | 2019 | 377.91              | 435.23 | 513.00 | 652.30 | 73.48                 | 84.72 | 100.49 | 127.12 |
| AB | Sacramento Valley Air Basin | Summer | 2020 | 377.97              | 435.53 | 512.92 | 652.83 | 73.58                 | 84.83 | 100.57 | 127.33 |
| AB | Sacramento Valley Air Basin | Summer | 2021 | 378.06              | 435.87 | 512.93 | 653.31 | 73.65                 | 84.97 | 100.65 | 127.48 |
| AB | Sacramento Valley Air Basin | Summer | 2022 | 378.08              | 436.12 | 512.86 | 653.62 | 73.71                 | 85.11 | 100.72 | 127.61 |
| AB | Sacramento Valley Air Basin | Summer | 2023 | 378.08              | 436.32 | 512.79 | 653.85 | 73.75                 | 85.22 | 100.77 | 127.77 |
| AB | Sacramento Valley Air Basin | Summer | 2024 | 378.07              | 436.51 | 512.72 | 653.98 | 73.77                 | 85.32 | 100.82 | 127.92 |
| AB | Sacramento Valley Air Basin | Summer | 2025 | 378.07              | 436.68 | 512.67 | 654.11 | 73.79                 | 85.41 | 100.86 | 128.06 |
| AB | Sacramento Valley Air Basin | Summer | 2026 | 378.25              | 437.06 | 512.85 | 654.54 | 73.81                 | 85.50 | 100.89 | 128.20 |
| AB | Sacramento Valley Air Basin | Summer | 2027 | 378.25              | 437.21 | 512.82 | 654.66 | 73.83                 | 85.58 | 100.91 | 128.33 |
| AB | Sacramento Valley Air Basin | Summer | 2028 | 378.26              | 437.36 | 512.81 | 654.79 | 73.84                 | 85.66 | 100.93 | 128.44 |
| AB | Sacramento Valley Air Basin | Summer | 2029 | 378.26              | 437.53 | 512.79 | 654.92 | 73.84                 | 85.73 | 100.94 | 128.55 |
| AB | Sacramento Valley Air Basin | Summer | 2030 | 378.25              | 437.69 | 512.77 | 655.06 | 73.85                 | 85.80 | 100.95 | 128.65 |
| AB | Sacramento Valley Air Basin | Summer | 2031 | 378.24              | 437.85 | 512.75 | 655.24 | 73.85                 | 85.86 | 100.96 | 128.75 |
| AB | Sacramento Valley Air Basin | Summer | 2032 | 378.23              | 437.99 | 512.73 | 655.43 | 73.86                 | 85.92 | 100.96 | 128.84 |
| AB | Sacramento Valley Air Basin | Summer | 2033 | 378.22              | 438.09 | 512.71 | 655.61 | 73.86                 | 85.97 | 100.97 | 128.92 |
| AB | Sacramento Valley Air Basin | Summer | 2034 | 378.21              | 438.19 | 512.69 | 655.79 | 73.87                 | 86.02 | 100.97 | 129.00 |
| AB | Sacramento Valley Air Basin | Summer | 2035 | 378.19              | 438.26 | 512.67 | 655.95 | 73.87                 | 86.07 | 100.98 | 129.07 |
| AB | Sacramento Valley Air Basin | Winter | 2010 | 329.45              | 381.14 | 452.22 | 569.20 | 73.13                 | 87.05 | 100.12 | 125.04 |
| AB | Sacramento Valley Air Basin | Winter | 2011 | 329.60              | 381.43 | 451.86 | 569.72 | 73.13                 | 86.45 | 100.12 | 125.22 |
| AB | Sacramento Valley Air Basin | Winter | 2012 | 329.76              | 381.73 | 451.56 | 570.27 | 73.14                 | 86.02 | 100.16 | 125.43 |
| AB | Sacramento Valley Air Basin | Winter | 2013 | 329.93              | 381.98 | 451.31 | 570.86 | 73.18                 | 85.67 | 100.21 | 125.66 |
| AB | Sacramento Valley Air Basin | Winter | 2014 | 330.08              | 382.22 | 451.11 | 571.43 | 73.20                 | 85.38 | 100.25 | 125.90 |
| AB | Sacramento Valley Air Basin | Winter | 2015 | 330.24              | 382.45 | 450.95 | 572.00 | 73.26                 | 85.16 | 100.28 | 126.15 |
| AB | Sacramento Valley Air Basin | Winter | 2016 | 331.12              | 383.54 | 451.74 | 573.86 | 73.34                 | 84.98 | 100.34 | 126.41 |
| AB | Sacramento Valley Air Basin | Winter | 2017 | 331.23              | 383.69 | 451.61 | 574.36 | 73.39                 | 84.78 | 100.38 | 126.66 |
| AB | Sacramento Valley Air Basin | Winter | 2018 | 331.30              | 383.82 | 451.51 | 574.78 | 73.42                 | 84.66 | 100.43 | 126.91 |
| AB | Sacramento Valley Air Basin | Winter | 2019 | 330.23              | 382.69 | 449.98 | 573.34 | 73.48                 | 84.72 | 100.49 | 127.12 |
| AB | Sacramento Valley Air Basin | Winter | 2020 | 330.31              | 382.88 | 449.92 | 573.69 | 73.58                 | 84.83 | 100.57 | 127.33 |
| AB | Sacramento Valley Air Basin | Winter | 2021 | 330.40              | 383.10 | 449.95 | 574.02 | 73.65                 | 84.97 | 100.65 | 127.48 |
| AB | Sacramento Valley Air Basin | Winter | 2022 | 330.42              | 383.25 | 449.90 | 574.22 | 73.71                 | 85.11 | 100.72 | 127.61 |
| AB | Sacramento Valley Air Basin | Winter | 2023 | 330.41              | 383.35 | 449.84 | 574.36 | 73.75                 | 85.22 | 100.77 | 127.77 |
| AB | Sacramento Valley Air Basin | Winter | 2024 | 330.40              | 383.45 | 449.79 | 574.46 | 73.77                 | 85.32 | 100.82 | 127.92 |
| AB | Sacramento Valley Air Basin | Winter | 2025 | 330.38              | 383.54 | 449.74 | 574.57 | 73.79                 | 85.41 | 100.86 | 128.06 |
| AB | Sacramento Valley Air Basin | Winter | 2026 | 330.55              | 383.83 | 449.88 | 574.96 | 73.81                 | 85.50 | 100.89 | 128.20 |
| AB | Sacramento Valley Air Basin | Winter | 2027 | 330.54              | 383.91 | 449.84 | 575.06 | 73.83                 | 85.58 | 100.91 | 128.33 |
| AB | Sacramento Valley Air Basin | Winter | 2028 | 330.53              | 383.99 | 449.79 | 575.17 | 73.84                 | 85.66 | 100.93 | 128.44 |
| AB | Sacramento Valley Air Basin | Winter | 2029 | 330.52              | 384.08 | 449.74 | 575.27 | 73.84                 | 85.73 | 100.94 | 128.55 |
| AB | Sacramento Valley Air Basin | Winter | 2030 | 330.50              | 384.16 | 449.69 | 575.37 | 73.85                 | 85.80 | 100.95 | 128.65 |
| AB | Sacramento Valley Air Basin | Winter | 2031 | 330.48              | 384.24 | 449.65 | 575.53 | 73.85                 | 85.86 | 100.96 | 128.75 |
| AB | Sacramento Valley Air Basin | Winter | 2032 | 330.45              | 384.32 | 449.62 | 575.68 | 73.86                 | 85.92 | 100.96 | 128.84 |
| AB | Sacramento Valley Air Basin | Winter | 2033 | 330.43              | 384.39 | 449.58 | 575.82 | 73.86                 | 85.97 | 100.97 | 128.92 |
| AB | Sacramento Valley Air Basin | Winter | 2034 | 330.41              | 384.44 | 449.55 | 575.94 | 73.87                 | 86.02 | 100.97 | 129.00 |
| AB | Sacramento Valley Air Basin | Winter | 2035 | 330.39              | 384.48 | 449.51 | 576.04 | 73.87                 | 86.07 | 100.98 | 129.07 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Salton Sea Air Basin | Annual | 2010 | 341.46             | 391.26 | 466.98 | 588.92 | 72.93                 | 84.54 | 99.89  | 125.12 |
| AB | Salton Sea Air Basin | Annual | 2011 | 340.83             | 391.09 | 465.62 | 588.09 | 73.00                 | 84.47 | 99.94  | 125.40 |
| AB | Salton Sea Air Basin | Annual | 2012 | 341.10             | 391.81 | 465.53 | 588.82 | 73.09                 | 84.44 | 100.03 | 125.69 |
| AB | Salton Sea Air Basin | Annual | 2013 | 339.89             | 390.79 | 463.45 | 587.06 | 73.20                 | 84.46 | 100.12 | 126.01 |
| AB | Salton Sea Air Basin | Annual | 2014 | 340.06             | 391.30 | 463.35 | 587.74 | 73.28                 | 84.51 | 100.21 | 126.32 |
| AB | Salton Sea Air Basin | Annual | 2015 | 337.14             | 388.08 | 459.06 | 582.96 | 73.36                 | 84.58 | 100.30 | 126.63 |
| AB | Salton Sea Air Basin | Annual | 2016 | 337.23             | 388.43 | 458.97 | 583.49 | 73.43                 | 84.66 | 100.39 | 126.92 |
| AB | Salton Sea Air Basin | Annual | 2017 | 337.28             | 388.72 | 458.87 | 583.97 | 73.48                 | 84.73 | 100.46 | 127.20 |
| AB | Salton Sea Air Basin | Annual | 2018 | 337.30             | 388.94 | 458.77 | 584.35 | 73.51                 | 84.81 | 100.51 | 127.46 |
| AB | Salton Sea Air Basin | Annual | 2019 | 337.18             | 389.02 | 458.52 | 584.48 | 73.55                 | 84.95 | 100.58 | 127.69 |
| AB | Salton Sea Air Basin | Annual | 2020 | 337.18             | 389.22 | 458.46 | 584.79 | 73.61                 | 85.11 | 100.66 | 127.91 |
| AB | Salton Sea Air Basin | Annual | 2021 | 337.69             | 390.02 | 459.17 | 585.99 | 73.66                 | 85.25 | 100.73 | 128.08 |
| AB | Salton Sea Air Basin | Annual | 2022 | 337.68             | 390.23 | 459.20 | 586.30 | 73.68                 | 85.37 | 100.78 | 128.23 |
| AB | Salton Sea Air Basin | Annual | 2023 | 337.64             | 390.41 | 459.22 | 586.55 | 73.68                 | 85.48 | 100.83 | 128.38 |
| AB | Salton Sea Air Basin | Annual | 2024 | 341.70             | 395.19 | 464.82 | 593.82 | 73.69                 | 85.57 | 100.86 | 128.50 |
| AB | Salton Sea Air Basin | Annual | 2025 | 341.66             | 395.34 | 464.85 | 594.02 | 73.69                 | 85.66 | 100.90 | 128.62 |
| AB | Salton Sea Air Basin | Annual | 2026 | 341.65             | 395.52 | 464.87 | 594.24 | 73.69                 | 85.74 | 100.92 | 128.73 |
| AB | Salton Sea Air Basin | Annual | 2027 | 341.63             | 395.69 | 464.90 | 594.45 | 73.69                 | 85.81 | 100.94 | 128.82 |
| AB | Salton Sea Air Basin | Annual | 2028 | 341.62             | 395.85 | 464.93 | 594.65 | 73.69                 | 85.88 | 100.95 | 128.91 |
| AB | Salton Sea Air Basin | Annual | 2029 | 341.61             | 396.01 | 464.96 | 594.85 | 73.69                 | 85.94 | 100.96 | 128.98 |
| AB | Salton Sea Air Basin | Annual | 2030 | 341.59             | 396.17 | 464.99 | 595.05 | 73.69                 | 86.00 | 100.97 | 129.05 |
| AB | Salton Sea Air Basin | Annual | 2031 | 346.94             | 402.31 | 472.49 | 604.70 | 73.69                 | 86.05 | 100.98 | 129.12 |
| AB | Salton Sea Air Basin | Annual | 2032 | 346.94             | 402.50 | 472.58 | 605.00 | 73.69                 | 86.10 | 100.98 | 129.18 |
| AB | Salton Sea Air Basin | Annual | 2033 | 346.94             | 402.68 | 472.66 | 605.29 | 73.69                 | 86.15 | 100.99 | 129.23 |
| AB | Salton Sea Air Basin | Annual | 2034 | 346.96             | 402.84 | 472.74 | 605.57 | 73.69                 | 86.19 | 100.99 | 129.28 |
| AB | Salton Sea Air Basin | Annual | 2035 | 346.97             | 402.99 | 472.83 | 605.83 | 73.70                 | 86.22 | 100.99 | 129.33 |
| AB | Salton Sea Air Basin | Summer | 2010 | 347.94             | 398.06 | 475.64 | 600.02 | 72.93                 | 84.54 | 99.89  | 125.12 |
| AB | Salton Sea Air Basin | Summer | 2011 | 347.40             | 398.07 | 474.36 | 599.23 | 73.00                 | 84.47 | 99.94  | 125.40 |
| AB | Salton Sea Air Basin | Summer | 2012 | 347.71             | 398.93 | 474.30 | 599.96 | 73.09                 | 84.44 | 100.03 | 125.69 |
| AB | Salton Sea Air Basin | Summer | 2013 | 346.51             | 397.99 | 472.23 | 598.20 | 73.20                 | 84.46 | 100.12 | 126.01 |
| AB | Salton Sea Air Basin | Summer | 2014 | 346.72             | 398.61 | 472.18 | 598.94 | 73.28                 | 84.51 | 100.21 | 126.32 |
| AB | Salton Sea Air Basin | Summer | 2015 | 343.80             | 395.45 | 467.91 | 594.18 | 73.36                 | 84.58 | 100.30 | 126.63 |
| AB | Salton Sea Air Basin | Summer | 2016 | 343.92             | 395.87 | 467.86 | 594.79 | 73.43                 | 84.66 | 100.39 | 126.92 |
| AB | Salton Sea Air Basin | Summer | 2017 | 343.99             | 396.22 | 467.80 | 595.33 | 73.48                 | 84.73 | 100.46 | 127.20 |
| AB | Salton Sea Air Basin | Summer | 2018 | 344.01             | 396.49 | 467.72 | 595.75 | 73.51                 | 84.81 | 100.51 | 127.46 |
| AB | Salton Sea Air Basin | Summer | 2019 | 343.91             | 396.62 | 467.49 | 595.93 | 73.55                 | 84.95 | 100.58 | 127.69 |
| AB | Salton Sea Air Basin | Summer | 2020 | 343.92             | 396.85 | 467.43 | 596.26 | 73.61                 | 85.11 | 100.66 | 127.91 |
| AB | Salton Sea Air Basin | Summer | 2021 | 344.42             | 397.64 | 468.12 | 597.44 | 73.66                 | 85.25 | 100.73 | 128.08 |
| AB | Salton Sea Air Basin | Summer | 2022 | 344.40             | 397.86 | 468.13 | 597.74 | 73.68                 | 85.37 | 100.78 | 128.23 |
| AB | Salton Sea Air Basin | Summer | 2023 | 344.36             | 398.04 | 468.14 | 597.97 | 73.68                 | 85.48 | 100.83 | 128.38 |
| AB | Salton Sea Air Basin | Summer | 2024 | 348.46             | 402.88 | 473.79 | 605.31 | 73.69                 | 85.57 | 100.86 | 128.50 |
| AB | Salton Sea Air Basin | Summer | 2025 | 348.42             | 403.03 | 473.81 | 605.50 | 73.69                 | 85.66 | 100.90 | 128.62 |
| AB | Salton Sea Air Basin | Summer | 2026 | 348.41             | 403.21 | 473.82 | 605.69 | 73.69                 | 85.74 | 100.92 | 128.73 |
| AB | Salton Sea Air Basin | Summer | 2027 | 348.39             | 403.37 | 473.84 | 605.88 | 73.69                 | 85.81 | 100.94 | 128.82 |
| AB | Salton Sea Air Basin | Summer | 2028 | 348.38             | 403.54 | 473.86 | 606.07 | 73.69                 | 85.88 | 100.95 | 128.91 |
| AB | Salton Sea Air Basin | Summer | 2029 | 348.37             | 403.70 | 473.88 | 606.25 | 73.69                 | 85.94 | 100.96 | 128.98 |
| AB | Salton Sea Air Basin | Summer | 2030 | 348.36             | 403.86 | 473.90 | 606.44 | 73.69                 | 86.00 | 100.97 | 129.05 |
| AB | Salton Sea Air Basin | Summer | 2031 | 353.82             | 410.13 | 481.56 | 616.27 | 73.69                 | 86.05 | 100.98 | 129.12 |
| AB | Salton Sea Air Basin | Summer | 2032 | 353.82             | 410.32 | 481.63 | 616.55 | 73.69                 | 86.10 | 100.98 | 129.18 |
| AB | Salton Sea Air Basin | Summer | 2033 | 353.83             | 410.49 | 481.71 | 616.83 | 73.69                 | 86.15 | 100.99 | 129.23 |
| AB | Salton Sea Air Basin | Summer | 2034 | 353.84             | 410.65 | 481.79 | 617.09 | 73.69                 | 86.19 | 100.99 | 129.28 |
| AB | Salton Sea Air Basin | Summer | 2035 | 353.84             | 410.79 | 481.87 | 617.33 | 73.70                 | 86.22 | 100.99 | 129.33 |
| AB | Salton Sea Air Basin | Winter | 2010 | 322.01             | 371.13 | 441.23 | 556.43 | 72.93                 | 84.54 | 99.89  | 125.12 |
| AB | Salton Sea Air Basin | Winter | 2011 | 321.32             | 370.64 | 439.87 | 555.70 | 73.00                 | 84.47 | 99.94  | 125.40 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | Salton Sea Air Basin | Winter | 2012 | 321.51             | 371.06 | 439.70 | 556.40 | 73.09                 | 84.44 | 100.03 | 125.69 |
| AB | Salton Sea Air Basin | Winter | 2013 | 320.31             | 369.85 | 437.64 | 554.68 | 73.20                 | 84.46 | 100.12 | 126.01 |
| AB | Salton Sea Air Basin | Winter | 2014 | 320.43             | 370.15 | 437.46 | 555.24 | 73.28                 | 84.51 | 100.21 | 126.32 |
| AB | Salton Sea Air Basin | Winter | 2015 | 317.65             | 366.97 | 433.34 | 550.64 | 73.36                 | 84.58 | 100.30 | 126.63 |
| AB | Salton Sea Air Basin | Winter | 2016 | 317.72             | 367.19 | 433.19 | 551.06 | 73.43                 | 84.66 | 100.39 | 126.92 |
| AB | Salton Sea Air Basin | Winter | 2017 | 317.76             | 367.38 | 433.05 | 551.44 | 73.48                 | 84.73 | 100.46 | 127.20 |
| AB | Salton Sea Air Basin | Winter | 2018 | 317.77             | 367.53 | 432.94 | 551.76 | 73.51                 | 84.81 | 100.51 | 127.46 |
| AB | Salton Sea Air Basin | Winter | 2019 | 317.66             | 367.56 | 432.69 | 551.84 | 73.55                 | 84.95 | 100.58 | 127.69 |
| AB | Salton Sea Air Basin | Winter | 2020 | 317.66             | 367.71 | 432.63 | 552.09 | 73.61                 | 85.11 | 100.66 | 127.91 |
| AB | Salton Sea Air Basin | Winter | 2021 | 318.16             | 368.43 | 433.31 | 553.22 | 73.66                 | 85.25 | 100.73 | 128.08 |
| AB | Salton Sea Air Basin | Winter | 2022 | 318.16             | 368.61 | 433.35 | 553.51 | 73.68                 | 85.37 | 100.78 | 128.23 |
| AB | Salton Sea Air Basin | Winter | 2023 | 318.13             | 368.75 | 433.38 | 553.75 | 73.68                 | 85.48 | 100.83 | 128.38 |
| AB | Salton Sea Air Basin | Winter | 2024 | 321.95             | 373.25 | 438.66 | 560.61 | 73.69                 | 85.57 | 100.86 | 128.50 |
| AB | Salton Sea Air Basin | Winter | 2025 | 321.92             | 373.37 | 438.70 | 560.81 | 73.69                 | 85.66 | 100.90 | 128.62 |
| AB | Salton Sea Air Basin | Winter | 2026 | 321.91             | 373.53 | 438.74 | 561.04 | 73.69                 | 85.74 | 100.92 | 128.73 |
| AB | Salton Sea Air Basin | Winter | 2027 | 321.90             | 373.68 | 438.78 | 561.26 | 73.69                 | 85.81 | 100.94 | 128.82 |
| AB | Salton Sea Air Basin | Winter | 2028 | 321.88             | 373.82 | 438.82 | 561.46 | 73.69                 | 85.88 | 100.95 | 128.91 |
| AB | Salton Sea Air Basin | Winter | 2029 | 321.86             | 373.96 | 438.84 | 561.66 | 73.69                 | 85.94 | 100.96 | 128.98 |
| AB | Salton Sea Air Basin | Winter | 2030 | 321.84             | 374.09 | 438.87 | 561.85 | 73.69                 | 86.00 | 100.97 | 129.05 |
| AB | Salton Sea Air Basin | Winter | 2031 | 326.88             | 379.86 | 445.94 | 570.95 | 73.69                 | 86.05 | 100.98 | 129.12 |
| AB | Salton Sea Air Basin | Winter | 2032 | 326.88             | 380.03 | 446.02 | 571.24 | 73.69                 | 86.10 | 100.98 | 129.18 |
| AB | Salton Sea Air Basin | Winter | 2033 | 326.89             | 380.18 | 446.09 | 571.52 | 73.69                 | 86.15 | 100.99 | 129.23 |
| AB | Salton Sea Air Basin | Winter | 2034 | 326.90             | 380.33 | 446.17 | 571.77 | 73.69                 | 86.19 | 100.99 | 129.28 |
| AB | Salton Sea Air Basin | Winter | 2035 | 326.91             | 380.46 | 446.25 | 572.01 | 73.70                 | 86.22 | 100.99 | 129.33 |
| AB | San Diego Air Basin  | Annual | 2010 | 352.52             | 405.15 | 482.46 | 610.22 | 72.99                 | 83.92 | 99.34  | 125.27 |
| AB | San Diego Air Basin  | Annual | 2011 | 353.81             | 407.05 | 483.85 | 612.57 | 73.01                 | 83.88 | 99.44  | 125.44 |
| AB | San Diego Air Basin  | Annual | 2012 | 354.03             | 407.67 | 483.80 | 613.09 | 73.05                 | 83.89 | 99.57  | 125.64 |
| AB | San Diego Air Basin  | Annual | 2013 | 354.28             | 408.23 | 483.77 | 613.65 | 73.12                 | 83.94 | 99.70  | 125.85 |
| AB | San Diego Air Basin  | Annual | 2014 | 354.50             | 408.76 | 483.75 | 614.21 | 73.17                 | 83.99 | 99.82  | 126.06 |
| AB | San Diego Air Basin  | Annual | 2015 | 354.72             | 409.25 | 483.74 | 614.79 | 73.24                 | 84.07 | 99.93  | 126.29 |
| AB | San Diego Air Basin  | Annual | 2016 | 354.92             | 409.69 | 483.74 | 615.32 | 73.32                 | 84.16 | 100.05 | 126.52 |
| AB | San Diego Air Basin  | Annual | 2017 | 355.08             | 410.10 | 483.73 | 615.84 | 73.37                 | 84.25 | 100.15 | 126.74 |
| AB | San Diego Air Basin  | Annual | 2018 | 355.21             | 410.47 | 483.74 | 616.29 | 73.41                 | 84.35 | 100.25 | 126.96 |
| AB | San Diego Air Basin  | Annual | 2019 | 355.33             | 410.82 | 483.74 | 616.69 | 73.46                 | 84.52 | 100.35 | 127.15 |
| AB | San Diego Air Basin  | Annual | 2020 | 355.43             | 411.15 | 483.75 | 617.07 | 73.55                 | 84.69 | 100.45 | 127.34 |
| AB | San Diego Air Basin  | Annual | 2021 | 356.07             | 412.11 | 484.56 | 618.41 | 73.62                 | 84.87 | 100.55 | 127.52 |
| AB | San Diego Air Basin  | Annual | 2022 | 356.11             | 412.36 | 484.56 | 618.69 | 73.67                 | 85.02 | 100.63 | 127.67 |
| AB | San Diego Air Basin  | Annual | 2023 | 356.12             | 412.55 | 484.56 | 618.89 | 73.71                 | 85.15 | 100.70 | 127.83 |
| AB | San Diego Air Basin  | Annual | 2024 | 356.12             | 412.71 | 484.55 | 619.06 | 73.72                 | 85.27 | 100.76 | 127.98 |
| AB | San Diego Air Basin  | Annual | 2025 | 356.11             | 412.86 | 484.55 | 619.23 | 73.74                 | 85.38 | 100.81 | 128.12 |
| AB | San Diego Air Basin  | Annual | 2026 | 356.13             | 413.01 | 484.54 | 619.39 | 73.76                 | 85.48 | 100.85 | 128.26 |
| AB | San Diego Air Basin  | Annual | 2027 | 356.14             | 413.16 | 484.53 | 619.54 | 73.77                 | 85.57 | 100.88 | 128.38 |
| AB | San Diego Air Basin  | Annual | 2028 | 356.15             | 413.30 | 484.51 | 619.69 | 73.78                 | 85.66 | 100.90 | 128.48 |
| AB | San Diego Air Basin  | Annual | 2029 | 356.15             | 413.45 | 484.50 | 619.84 | 73.79                 | 85.74 | 100.92 | 128.58 |
| AB | San Diego Air Basin  | Annual | 2030 | 356.14             | 413.59 | 484.49 | 619.98 | 73.79                 | 85.81 | 100.93 | 128.68 |
| AB | San Diego Air Basin  | Annual | 2031 | 356.14             | 413.74 | 484.48 | 620.13 | 73.80                 | 85.89 | 100.94 | 128.77 |
| AB | San Diego Air Basin  | Annual | 2032 | 356.14             | 413.87 | 484.48 | 620.29 | 73.80                 | 85.96 | 100.95 | 128.86 |
| AB | San Diego Air Basin  | Annual | 2033 | 356.14             | 414.00 | 484.47 | 620.43 | 73.80                 | 86.02 | 100.96 | 128.93 |
| AB | San Diego Air Basin  | Annual | 2034 | 356.13             | 414.10 | 484.46 | 620.55 | 73.80                 | 86.08 | 100.97 | 129.01 |
| AB | San Diego Air Basin  | Annual | 2035 | 356.13             | 414.20 | 484.46 | 620.67 | 73.81                 | 86.13 | 100.97 | 129.08 |
| AB | San Diego Air Basin  | Summer | 2010 | 372.46             | 426.19 | 509.00 | 643.64 | 72.99                 | 83.92 | 99.34  | 125.27 |
| AB | San Diego Air Basin  | Summer | 2011 | 373.89             | 428.41 | 510.48 | 645.96 | 73.01                 | 83.88 | 99.44  | 125.44 |
| AB | San Diego Air Basin  | Summer | 2012 | 374.19             | 429.26 | 510.46 | 646.43 | 73.05                 | 83.89 | 99.57  | 125.64 |
| AB | San Diego Air Basin  | Summer | 2013 | 374.48             | 430.00 | 510.47 | 646.99 | 73.12                 | 83.94 | 99.70  | 125.85 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                         |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | San Diego Air Basin     | Summer | 2014 | 374.75             | 430.67 | 510.51 | 647.60 | 73.17                 | 83.99 | 99.82  | 126.06 |
| AB | San Diego Air Basin     | Summer | 2015 | 375.00             | 431.27 | 510.56 | 648.26 | 73.24                 | 84.07 | 99.93  | 126.29 |
| AB | San Diego Air Basin     | Summer | 2016 | 375.24             | 431.81 | 510.61 | 648.90 | 73.32                 | 84.16 | 100.05 | 126.52 |
| AB | San Diego Air Basin     | Summer | 2017 | 375.42             | 432.30 | 510.65 | 649.52 | 73.37                 | 84.25 | 100.15 | 126.74 |
| AB | San Diego Air Basin     | Summer | 2018 | 375.55             | 432.74 | 510.67 | 650.05 | 73.41                 | 84.35 | 100.25 | 126.96 |
| AB | San Diego Air Basin     | Summer | 2019 | 375.68             | 433.15 | 510.68 | 650.53 | 73.46                 | 84.52 | 100.35 | 127.15 |
| AB | San Diego Air Basin     | Summer | 2020 | 375.78             | 433.52 | 510.68 | 650.97 | 73.55                 | 84.69 | 100.45 | 127.34 |
| AB | San Diego Air Basin     | Summer | 2021 | 376.47             | 434.60 | 511.57 | 652.47 | 73.62                 | 84.87 | 100.55 | 127.52 |
| AB | San Diego Air Basin     | Summer | 2022 | 376.52             | 434.90 | 511.57 | 652.82 | 73.67                 | 85.02 | 100.63 | 127.67 |
| AB | San Diego Air Basin     | Summer | 2023 | 376.54             | 435.14 | 511.57 | 653.07 | 73.71                 | 85.15 | 100.70 | 127.83 |
| AB | San Diego Air Basin     | Summer | 2024 | 376.54             | 435.34 | 511.56 | 653.27 | 73.72                 | 85.27 | 100.76 | 127.98 |
| AB | San Diego Air Basin     | Summer | 2025 | 376.54             | 435.52 | 511.56 | 653.45 | 73.74                 | 85.38 | 100.81 | 128.12 |
| AB | San Diego Air Basin     | Summer | 2026 | 376.55             | 435.72 | 511.54 | 653.62 | 73.76                 | 85.48 | 100.85 | 128.26 |
| AB | San Diego Air Basin     | Summer | 2027 | 376.56             | 435.90 | 511.53 | 653.77 | 73.77                 | 85.57 | 100.88 | 128.38 |
| AB | San Diego Air Basin     | Summer | 2028 | 376.57             | 436.07 | 511.51 | 653.92 | 73.78                 | 85.66 | 100.90 | 128.48 |
| AB | San Diego Air Basin     | Summer | 2029 | 376.58             | 436.25 | 511.49 | 654.06 | 73.79                 | 85.74 | 100.92 | 128.58 |
| AB | San Diego Air Basin     | Summer | 2030 | 376.58             | 436.43 | 511.48 | 654.21 | 73.79                 | 85.81 | 100.93 | 128.68 |
| AB | San Diego Air Basin     | Summer | 2031 | 376.57             | 436.61 | 511.47 | 654.35 | 73.80                 | 85.89 | 100.94 | 128.77 |
| AB | San Diego Air Basin     | Summer | 2032 | 376.57             | 436.77 | 511.46 | 654.51 | 73.80                 | 85.96 | 100.95 | 128.86 |
| AB | San Diego Air Basin     | Summer | 2033 | 376.57             | 436.92 | 511.45 | 654.65 | 73.80                 | 86.02 | 100.96 | 128.93 |
| AB | San Diego Air Basin     | Summer | 2034 | 376.57             | 437.04 | 511.45 | 654.79 | 73.80                 | 86.08 | 100.97 | 129.01 |
| AB | San Diego Air Basin     | Summer | 2035 | 376.57             | 437.14 | 511.44 | 654.92 | 73.81                 | 86.13 | 100.97 | 129.08 |
| AB | San Diego Air Basin     | Winter | 2010 | 348.91             | 401.34 | 477.65 | 604.17 | 72.99                 | 83.92 | 99.34  | 125.27 |
| AB | San Diego Air Basin     | Winter | 2011 | 350.18             | 403.18 | 479.04 | 606.53 | 73.01                 | 83.88 | 99.44  | 125.44 |
| AB | San Diego Air Basin     | Winter | 2012 | 350.39             | 403.76 | 478.98 | 607.06 | 73.05                 | 83.89 | 99.57  | 125.64 |
| AB | San Diego Air Basin     | Winter | 2013 | 350.62             | 404.30 | 478.94 | 607.62 | 73.12                 | 83.94 | 99.70  | 125.85 |
| AB | San Diego Air Basin     | Winter | 2014 | 350.83             | 404.79 | 478.91 | 608.17 | 73.17                 | 83.99 | 99.82  | 126.06 |
| AB | San Diego Air Basin     | Winter | 2015 | 351.05             | 405.26 | 478.89 | 608.73 | 73.24                 | 84.07 | 99.93  | 126.29 |
| AB | San Diego Air Basin     | Winter | 2016 | 351.25             | 405.69 | 478.88 | 609.25 | 73.32                 | 84.16 | 100.05 | 126.52 |
| AB | San Diego Air Basin     | Winter | 2017 | 351.40             | 406.08 | 478.87 | 609.75 | 73.37                 | 84.25 | 100.15 | 126.74 |
| AB | San Diego Air Basin     | Winter | 2018 | 351.53             | 406.44 | 478.86 | 610.18 | 73.41                 | 84.35 | 100.25 | 126.96 |
| AB | San Diego Air Basin     | Winter | 2019 | 351.65             | 406.78 | 478.87 | 610.57 | 73.46                 | 84.52 | 100.35 | 127.15 |
| AB | San Diego Air Basin     | Winter | 2020 | 351.75             | 407.10 | 478.87 | 610.94 | 73.55                 | 84.69 | 100.45 | 127.34 |
| AB | San Diego Air Basin     | Winter | 2021 | 352.38             | 408.04 | 479.67 | 612.25 | 73.62                 | 84.87 | 100.55 | 127.52 |
| AB | San Diego Air Basin     | Winter | 2022 | 352.42             | 408.28 | 479.67 | 612.51 | 73.67                 | 85.02 | 100.63 | 127.67 |
| AB | San Diego Air Basin     | Winter | 2023 | 352.43             | 408.47 | 479.67 | 612.71 | 73.71                 | 85.15 | 100.70 | 127.83 |
| AB | San Diego Air Basin     | Winter | 2024 | 352.42             | 408.62 | 479.66 | 612.87 | 73.72                 | 85.27 | 100.76 | 127.98 |
| AB | San Diego Air Basin     | Winter | 2025 | 352.42             | 408.75 | 479.66 | 613.03 | 73.74                 | 85.38 | 100.81 | 128.12 |
| AB | San Diego Air Basin     | Winter | 2026 | 352.43             | 408.90 | 479.65 | 613.20 | 73.76                 | 85.48 | 100.85 | 128.26 |
| AB | San Diego Air Basin     | Winter | 2027 | 352.44             | 409.04 | 479.64 | 613.35 | 73.77                 | 85.57 | 100.88 | 128.38 |
| AB | San Diego Air Basin     | Winter | 2028 | 352.45             | 409.18 | 479.63 | 613.50 | 73.78                 | 85.66 | 100.90 | 128.48 |
| AB | San Diego Air Basin     | Winter | 2029 | 352.45             | 409.32 | 479.62 | 613.64 | 73.79                 | 85.74 | 100.92 | 128.58 |
| AB | San Diego Air Basin     | Winter | 2030 | 352.45             | 409.46 | 479.60 | 613.79 | 73.79                 | 85.81 | 100.93 | 128.68 |
| AB | San Diego Air Basin     | Winter | 2031 | 352.44             | 409.60 | 479.60 | 613.94 | 73.80                 | 85.89 | 100.94 | 128.77 |
| AB | San Diego Air Basin     | Winter | 2032 | 352.44             | 409.73 | 479.59 | 614.10 | 73.80                 | 85.96 | 100.95 | 128.86 |
| AB | San Diego Air Basin     | Winter | 2033 | 352.44             | 409.85 | 479.59 | 614.23 | 73.80                 | 86.02 | 100.96 | 128.93 |
| AB | San Diego Air Basin     | Winter | 2034 | 352.44             | 409.95 | 479.58 | 614.36 | 73.80                 | 86.08 | 100.97 | 129.01 |
| AB | San Diego Air Basin     | Winter | 2035 | 352.43             | 410.04 | 479.57 | 614.47 | 73.81                 | 86.13 | 100.97 | 129.08 |
| AB | San Francisco Air Basin | Annual | 2010 | 338.39             | 388.50 | 461.86 | 581.62 | 72.94                 | 84.37 | 99.40  | 124.69 |
| AB | San Francisco Air Basin | Annual | 2011 | 338.52             | 388.90 | 461.72 | 582.11 | 72.98                 | 84.25 | 99.50  | 124.89 |
| AB | San Francisco Air Basin | Annual | 2012 | 338.67             | 389.32 | 461.62 | 582.66 | 73.02                 | 84.19 | 99.62  | 125.11 |
| AB | San Francisco Air Basin | Annual | 2013 | 338.86             | 389.72 | 461.54 | 583.26 | 73.09                 | 84.17 | 99.74  | 125.34 |
| AB | San Francisco Air Basin | Annual | 2014 | 339.03             | 390.09 | 461.49 | 583.86 | 73.15                 | 84.17 | 99.85  | 125.59 |
| AB | San Francisco Air Basin | Annual | 2015 | 339.22             | 390.46 | 461.45 | 584.47 | 73.23                 | 84.19 | 99.96  | 125.85 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                         |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | San Francisco Air Basin | Annual | 2016 | 339.41             | 390.83 | 461.42 | 585.05 | 73.32                 | 84.24 | 100.07 | 126.10 |
| AB | San Francisco Air Basin | Annual | 2017 | 339.54             | 391.17 | 461.39 | 585.61 | 73.38                 | 84.29 | 100.17 | 126.36 |
| AB | San Francisco Air Basin | Annual | 2018 | 339.67             | 391.45 | 461.36 | 586.09 | 73.44                 | 84.35 | 100.26 | 126.61 |
| AB | San Francisco Air Basin | Annual | 2019 | 339.78             | 391.75 | 461.34 | 586.50 | 73.50                 | 84.48 | 100.35 | 126.84 |
| AB | San Francisco Air Basin | Annual | 2020 | 339.88             | 392.02 | 461.33 | 586.89 | 73.60                 | 84.63 | 100.45 | 127.06 |
| AB | San Francisco Air Basin | Annual | 2021 | 339.96             | 392.27 | 461.33 | 587.20 | 73.68                 | 84.79 | 100.54 | 127.24 |
| AB | San Francisco Air Basin | Annual | 2022 | 339.99             | 392.48 | 461.33 | 587.46 | 73.74                 | 84.93 | 100.62 | 127.39 |
| AB | San Francisco Air Basin | Annual | 2023 | 339.99             | 392.64 | 461.32 | 587.66 | 73.78                 | 85.06 | 100.69 | 127.56 |
| AB | San Francisco Air Basin | Annual | 2024 | 339.97             | 392.77 | 461.30 | 587.83 | 73.80                 | 85.17 | 100.75 | 127.71 |
| AB | San Francisco Air Basin | Annual | 2025 | 339.96             | 392.89 | 461.29 | 588.00 | 73.82                 | 85.27 | 100.80 | 127.87 |
| AB | San Francisco Air Basin | Annual | 2026 | 339.97             | 393.04 | 461.27 | 588.18 | 73.85                 | 85.38 | 100.84 | 128.01 |
| AB | San Francisco Air Basin | Annual | 2027 | 339.98             | 393.18 | 461.25 | 588.35 | 73.86                 | 85.47 | 100.87 | 128.15 |
| AB | San Francisco Air Basin | Annual | 2028 | 339.97             | 393.32 | 461.22 | 588.52 | 73.87                 | 85.55 | 100.89 | 128.26 |
| AB | San Francisco Air Basin | Annual | 2029 | 339.96             | 393.47 | 461.20 | 588.68 | 73.88                 | 85.63 | 100.91 | 128.38 |
| AB | San Francisco Air Basin | Annual | 2030 | 339.95             | 393.63 | 461.17 | 588.85 | 73.89                 | 85.71 | 100.92 | 128.49 |
| AB | San Francisco Air Basin | Annual | 2031 | 339.94             | 393.79 | 461.16 | 589.02 | 73.89                 | 85.79 | 100.93 | 128.59 |
| AB | San Francisco Air Basin | Annual | 2032 | 339.94             | 393.94 | 461.14 | 589.20 | 73.90                 | 85.86 | 100.94 | 128.69 |
| AB | San Francisco Air Basin | Annual | 2033 | 339.93             | 394.08 | 461.13 | 589.36 | 73.90                 | 85.92 | 100.95 | 128.79 |
| AB | San Francisco Air Basin | Annual | 2034 | 339.92             | 394.20 | 461.11 | 589.50 | 73.90                 | 85.98 | 100.95 | 128.87 |
| AB | San Francisco Air Basin | Annual | 2035 | 339.91             | 394.31 | 461.10 | 589.63 | 73.91                 | 86.04 | 100.96 | 128.96 |
| AB | San Francisco Air Basin | Summer | 2010 | 364.35             | 415.41 | 496.51 | 625.57 | 72.94                 | 84.37 | 99.40  | 124.69 |
| AB | San Francisco Air Basin | Summer | 2011 | 364.64             | 416.20 | 496.43 | 625.96 | 72.98                 | 84.25 | 99.50  | 124.89 |
| AB | San Francisco Air Basin | Summer | 2012 | 364.93             | 416.94 | 496.39 | 626.48 | 73.02                 | 84.19 | 99.62  | 125.11 |
| AB | San Francisco Air Basin | Summer | 2013 | 365.22             | 417.62 | 496.38 | 627.12 | 73.09                 | 84.17 | 99.74  | 125.34 |
| AB | San Francisco Air Basin | Summer | 2014 | 365.47             | 418.22 | 496.42 | 627.81 | 73.15                 | 84.17 | 99.85  | 125.59 |
| AB | San Francisco Air Basin | Summer | 2015 | 365.72             | 418.79 | 496.47 | 628.57 | 73.23                 | 84.19 | 99.96  | 125.85 |
| AB | San Francisco Air Basin | Summer | 2016 | 365.95             | 419.33 | 496.52 | 629.31 | 73.32                 | 84.24 | 100.07 | 126.10 |
| AB | San Francisco Air Basin | Summer | 2017 | 366.11             | 419.82 | 496.57 | 630.02 | 73.38                 | 84.29 | 100.17 | 126.36 |
| AB | San Francisco Air Basin | Summer | 2018 | 366.24             | 420.25 | 496.57 | 630.62 | 73.44                 | 84.35 | 100.26 | 126.61 |
| AB | San Francisco Air Basin | Summer | 2019 | 366.36             | 420.66 | 496.58 | 631.14 | 73.50                 | 84.48 | 100.35 | 126.84 |
| AB | San Francisco Air Basin | Summer | 2020 | 366.46             | 421.03 | 496.57 | 631.62 | 73.60                 | 84.63 | 100.45 | 127.06 |
| AB | San Francisco Air Basin | Summer | 2021 | 366.53             | 421.37 | 496.57 | 632.00 | 73.68                 | 84.79 | 100.54 | 127.24 |
| AB | San Francisco Air Basin | Summer | 2022 | 366.57             | 421.66 | 496.56 | 632.33 | 73.74                 | 84.93 | 100.62 | 127.39 |
| AB | San Francisco Air Basin | Summer | 2023 | 366.57             | 421.90 | 496.54 | 632.57 | 73.78                 | 85.06 | 100.69 | 127.56 |
| AB | San Francisco Air Basin | Summer | 2024 | 366.55             | 422.10 | 496.51 | 632.76 | 73.80                 | 85.17 | 100.75 | 127.71 |
| AB | San Francisco Air Basin | Summer | 2025 | 366.54             | 422.28 | 496.49 | 632.95 | 73.82                 | 85.27 | 100.80 | 127.87 |
| AB | San Francisco Air Basin | Summer | 2026 | 366.55             | 422.48 | 496.46 | 633.14 | 73.85                 | 85.38 | 100.84 | 128.01 |
| AB | San Francisco Air Basin | Summer | 2027 | 366.56             | 422.68 | 496.44 | 633.31 | 73.86                 | 85.47 | 100.87 | 128.15 |
| AB | San Francisco Air Basin | Summer | 2028 | 366.57             | 422.88 | 496.41 | 633.48 | 73.87                 | 85.55 | 100.89 | 128.26 |
| AB | San Francisco Air Basin | Summer | 2029 | 366.56             | 423.10 | 496.39 | 633.66 | 73.88                 | 85.63 | 100.91 | 128.38 |
| AB | San Francisco Air Basin | Summer | 2030 | 366.56             | 423.32 | 496.37 | 633.84 | 73.89                 | 85.71 | 100.92 | 128.49 |
| AB | San Francisco Air Basin | Summer | 2031 | 366.56             | 423.55 | 496.35 | 634.03 | 73.89                 | 85.79 | 100.93 | 128.59 |
| AB | San Francisco Air Basin | Summer | 2032 | 366.55             | 423.75 | 496.34 | 634.22 | 73.90                 | 85.86 | 100.94 | 128.69 |
| AB | San Francisco Air Basin | Summer | 2033 | 366.55             | 423.93 | 496.32 | 634.41 | 73.90                 | 85.92 | 100.95 | 128.79 |
| AB | San Francisco Air Basin | Summer | 2034 | 366.54             | 424.09 | 496.31 | 634.58 | 73.90                 | 85.98 | 100.95 | 128.87 |
| AB | San Francisco Air Basin | Summer | 2035 | 366.54             | 424.21 | 496.30 | 634.74 | 73.91                 | 86.04 | 100.96 | 128.96 |
| AB | San Francisco Air Basin | Winter | 2010 | 335.32             | 385.28 | 457.66 | 576.18 | 72.94                 | 84.37 | 99.40  | 124.69 |
| AB | San Francisco Air Basin | Winter | 2011 | 335.43             | 385.63 | 457.52 | 576.68 | 72.98                 | 84.25 | 99.50  | 124.89 |
| AB | San Francisco Air Basin | Winter | 2012 | 335.56             | 386.01 | 457.41 | 577.23 | 73.02                 | 84.19 | 99.62  | 125.11 |
| AB | San Francisco Air Basin | Winter | 2013 | 335.74             | 386.37 | 457.32 | 577.82 | 73.09                 | 84.17 | 99.74  | 125.34 |
| AB | San Francisco Air Basin | Winter | 2014 | 335.90             | 386.72 | 457.25 | 578.40 | 73.15                 | 84.17 | 99.85  | 125.59 |
| AB | San Francisco Air Basin | Winter | 2015 | 336.08             | 387.07 | 457.20 | 579.00 | 73.23                 | 84.19 | 99.96  | 125.85 |
| AB | San Francisco Air Basin | Winter | 2016 | 336.26             | 387.41 | 457.16 | 579.56 | 73.32                 | 84.24 | 100.07 | 126.10 |
| AB | San Francisco Air Basin | Winter | 2017 | 336.39             | 387.73 | 457.12 | 580.10 | 73.38                 | 84.29 | 100.17 | 126.36 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | San Francisco Air Basin      | Winter | 2018 | 336.52             | 388.00 | 457.08 | 580.55 | 73.44                 | 84.35 | 100.26 | 126.61 |
| AB | San Francisco Air Basin      | Winter | 2019 | 336.63             | 388.27 | 457.06 | 580.95 | 73.50                 | 84.48 | 100.35 | 126.84 |
| AB | San Francisco Air Basin      | Winter | 2020 | 336.73             | 388.53 | 457.05 | 581.32 | 73.60                 | 84.63 | 100.45 | 127.06 |
| AB | San Francisco Air Basin      | Winter | 2021 | 336.80             | 388.77 | 457.05 | 581.62 | 73.68                 | 84.79 | 100.54 | 127.24 |
| AB | San Francisco Air Basin      | Winter | 2022 | 336.84             | 388.97 | 457.05 | 581.88 | 73.74                 | 84.93 | 100.62 | 127.39 |
| AB | San Francisco Air Basin      | Winter | 2023 | 336.84             | 389.12 | 457.04 | 582.08 | 73.78                 | 85.06 | 100.69 | 127.56 |
| AB | San Francisco Air Basin      | Winter | 2024 | 336.82             | 389.24 | 457.02 | 582.24 | 73.80                 | 85.17 | 100.75 | 127.71 |
| AB | San Francisco Air Basin      | Winter | 2025 | 336.81             | 389.35 | 457.00 | 582.41 | 73.82                 | 85.27 | 100.80 | 127.87 |
| AB | San Francisco Air Basin      | Winter | 2026 | 336.82             | 389.49 | 456.98 | 582.60 | 73.85                 | 85.38 | 100.84 | 128.01 |
| AB | San Francisco Air Basin      | Winter | 2027 | 336.82             | 389.62 | 456.96 | 582.77 | 73.86                 | 85.47 | 100.87 | 128.15 |
| AB | San Francisco Air Basin      | Winter | 2028 | 336.82             | 389.76 | 456.94 | 582.93 | 73.87                 | 85.55 | 100.89 | 128.26 |
| AB | San Francisco Air Basin      | Winter | 2029 | 336.80             | 389.90 | 456.91 | 583.10 | 73.88                 | 85.63 | 100.91 | 128.38 |
| AB | San Francisco Air Basin      | Winter | 2030 | 336.79             | 390.05 | 456.89 | 583.27 | 73.89                 | 85.71 | 100.92 | 128.49 |
| AB | San Francisco Air Basin      | Winter | 2031 | 336.78             | 390.20 | 456.87 | 583.44 | 73.89                 | 85.79 | 100.93 | 128.59 |
| AB | San Francisco Air Basin      | Winter | 2032 | 336.77             | 390.35 | 456.86 | 583.61 | 73.90                 | 85.86 | 100.94 | 128.69 |
| AB | San Francisco Air Basin      | Winter | 2033 | 336.76             | 390.48 | 456.84 | 583.76 | 73.90                 | 85.92 | 100.95 | 128.79 |
| AB | San Francisco Air Basin      | Winter | 2034 | 336.76             | 390.60 | 456.82 | 583.90 | 73.90                 | 85.98 | 100.95 | 128.87 |
| AB | San Francisco Air Basin      | Winter | 2035 | 336.74             | 390.70 | 456.80 | 584.02 | 73.91                 | 86.04 | 100.96 | 128.96 |
| AB | San Joaquin Valley Air Basin | Annual | 2010 | 344.53             | 395.23 | 472.07 | 594.91 | 73.37                 | 85.32 | 100.36 | 124.58 |
| AB | San Joaquin Valley Air Basin | Annual | 2011 | 344.79             | 396.17 | 471.84 | 595.64 | 73.37                 | 85.05 | 100.34 | 124.82 |
| AB | San Joaquin Valley Air Basin | Annual | 2012 | 344.82             | 396.68 | 471.40 | 596.04 | 73.39                 | 84.87 | 100.35 | 125.07 |
| AB | San Joaquin Valley Air Basin | Annual | 2013 | 345.18             | 397.48 | 471.50 | 597.02 | 73.43                 | 84.73 | 100.37 | 125.34 |
| AB | San Joaquin Valley Air Basin | Annual | 2014 | 345.41             | 398.05 | 471.41 | 597.81 | 73.45                 | 84.65 | 100.38 | 125.62 |
| AB | San Joaquin Valley Air Basin | Annual | 2015 | 346.20             | 399.25 | 472.24 | 599.62 | 73.50                 | 84.60 | 100.40 | 125.92 |
| AB | San Joaquin Valley Air Basin | Annual | 2016 | 346.40             | 399.70 | 472.19 | 600.39 | 73.57                 | 84.57 | 100.44 | 126.22 |
| AB | San Joaquin Valley Air Basin | Annual | 2017 | 346.53             | 400.08 | 472.14 | 601.11 | 73.60                 | 84.54 | 100.44 | 126.51 |
| AB | San Joaquin Valley Air Basin | Annual | 2018 | 347.36             | 401.34 | 473.27 | 602.98 | 73.63                 | 84.56 | 100.47 | 126.79 |
| AB | San Joaquin Valley Air Basin | Annual | 2019 | 347.49             | 401.71 | 473.29 | 603.59 | 73.68                 | 84.67 | 100.51 | 127.05 |
| AB | San Joaquin Valley Air Basin | Annual | 2020 | 347.59             | 402.04 | 473.30 | 604.13 | 73.77                 | 84.83 | 100.58 | 127.28 |
| AB | San Joaquin Valley Air Basin | Annual | 2021 | 347.55             | 402.06 | 472.98 | 604.31 | 73.84                 | 84.99 | 100.66 | 127.48 |
| AB | San Joaquin Valley Air Basin | Annual | 2022 | 347.60             | 402.27 | 472.95 | 604.67 | 73.89                 | 85.13 | 100.73 | 127.64 |
| AB | San Joaquin Valley Air Basin | Annual | 2023 | 347.63             | 402.44 | 472.93 | 604.96 | 73.92                 | 85.25 | 100.78 | 127.82 |
| AB | San Joaquin Valley Air Basin | Annual | 2024 | 347.85             | 403.02 | 473.49 | 605.81 | 73.94                 | 85.37 | 100.83 | 127.98 |
| AB | San Joaquin Valley Air Basin | Annual | 2025 | 347.86             | 403.16 | 473.48 | 606.02 | 73.96                 | 85.47 | 100.86 | 128.14 |
| AB | San Joaquin Valley Air Basin | Annual | 2026 | 348.71             | 404.36 | 474.80 | 607.63 | 73.98                 | 85.57 | 100.89 | 128.28 |
| AB | San Joaquin Valley Air Basin | Annual | 2027 | 348.72             | 404.49 | 474.74 | 607.80 | 73.99                 | 85.65 | 100.92 | 128.41 |
| AB | San Joaquin Valley Air Basin | Annual | 2028 | 348.73             | 404.62 | 474.69 | 607.97 | 74.00                 | 85.74 | 100.93 | 128.53 |
| AB | San Joaquin Valley Air Basin | Annual | 2029 | 348.73             | 404.75 | 474.65 | 608.15 | 74.01                 | 85.81 | 100.94 | 128.63 |
| AB | San Joaquin Valley Air Basin | Annual | 2030 | 348.73             | 404.88 | 474.61 | 608.33 | 74.01                 | 85.88 | 100.95 | 128.74 |
| AB | San Joaquin Valley Air Basin | Annual | 2031 | 348.73             | 405.01 | 474.57 | 608.48 | 74.02                 | 85.95 | 100.96 | 128.83 |
| AB | San Joaquin Valley Air Basin | Annual | 2032 | 348.73             | 405.13 | 474.53 | 608.63 | 74.02                 | 86.02 | 100.96 | 128.92 |
| AB | San Joaquin Valley Air Basin | Annual | 2033 | 348.73             | 405.23 | 474.50 | 608.78 | 74.02                 | 86.07 | 100.97 | 129.00 |
| AB | San Joaquin Valley Air Basin | Annual | 2034 | 348.73             | 405.32 | 474.47 | 608.91 | 74.03                 | 86.12 | 100.97 | 129.08 |
| AB | San Joaquin Valley Air Basin | Annual | 2035 | 348.74             | 405.39 | 474.45 | 609.03 | 74.03                 | 86.17 | 100.98 | 129.15 |
| AB | San Joaquin Valley Air Basin | Summer | 2010 | 378.79             | 430.24 | 517.12 | 652.23 | 73.37                 | 85.32 | 100.36 | 124.58 |
| AB | San Joaquin Valley Air Basin | Summer | 2011 | 379.32             | 432.07 | 517.21 | 652.97 | 73.37                 | 85.05 | 100.34 | 124.82 |
| AB | San Joaquin Valley Air Basin | Summer | 2012 | 379.51             | 433.17 | 516.96 | 653.39 | 73.39                 | 84.87 | 100.35 | 125.07 |
| AB | San Joaquin Valley Air Basin | Summer | 2013 | 380.02             | 434.48 | 517.27 | 654.53 | 73.43                 | 84.73 | 100.37 | 125.34 |
| AB | San Joaquin Valley Air Basin | Summer | 2014 | 380.35             | 435.44 | 517.38 | 655.51 | 73.45                 | 84.65 | 100.38 | 125.62 |
| AB | San Joaquin Valley Air Basin | Summer | 2015 | 381.29             | 437.04 | 518.48 | 657.68 | 73.50                 | 84.60 | 100.40 | 125.92 |
| AB | San Joaquin Valley Air Basin | Summer | 2016 | 381.55             | 437.73 | 518.55 | 658.71 | 73.57                 | 84.57 | 100.44 | 126.22 |
| AB | San Joaquin Valley Air Basin | Summer | 2017 | 381.72             | 438.33 | 518.60 | 659.66 | 73.60                 | 84.54 | 100.44 | 126.51 |
| AB | San Joaquin Valley Air Basin | Summer | 2018 | 382.62             | 439.83 | 519.89 | 661.84 | 73.63                 | 84.56 | 100.47 | 126.79 |
| AB | San Joaquin Valley Air Basin | Summer | 2019 | 382.75             | 440.33 | 519.93 | 662.62 | 73.68                 | 84.67 | 100.51 | 127.05 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | San Joaquin Valley Air Basin  | Summer | 2020 | 382.86             | 440.77 | 519.95 | 663.30 | 73.77                 | 84.83 | 100.58 | 127.28 |
| AB | San Joaquin Valley Air Basin  | Summer | 2021 | 382.80             | 440.85 | 519.59 | 663.56 | 73.84                 | 84.99 | 100.66 | 127.48 |
| AB | San Joaquin Valley Air Basin  | Summer | 2022 | 382.85             | 441.14 | 519.54 | 664.00 | 73.89                 | 85.13 | 100.73 | 127.64 |
| AB | San Joaquin Valley Air Basin  | Summer | 2023 | 382.88             | 441.39 | 519.49 | 664.34 | 73.92                 | 85.25 | 100.78 | 127.82 |
| AB | San Joaquin Valley Air Basin  | Summer | 2024 | 383.14             | 442.10 | 520.11 | 665.29 | 73.94                 | 85.37 | 100.83 | 127.98 |
| AB | San Joaquin Valley Air Basin  | Summer | 2025 | 383.16             | 442.31 | 520.10 | 665.52 | 73.96                 | 85.47 | 100.86 | 128.14 |
| AB | San Joaquin Valley Air Basin  | Summer | 2026 | 384.09             | 443.68 | 521.54 | 667.23 | 73.98                 | 85.57 | 100.89 | 128.28 |
| AB | San Joaquin Valley Air Basin  | Summer | 2027 | 384.11             | 443.88 | 521.48 | 667.40 | 73.99                 | 85.65 | 100.92 | 128.41 |
| AB | San Joaquin Valley Air Basin  | Summer | 2028 | 384.12             | 444.07 | 521.44 | 667.58 | 74.00                 | 85.74 | 100.93 | 128.53 |
| AB | San Joaquin Valley Air Basin  | Summer | 2029 | 384.14             | 444.28 | 521.41 | 667.76 | 74.01                 | 85.81 | 100.94 | 128.63 |
| AB | San Joaquin Valley Air Basin  | Summer | 2030 | 384.15             | 444.48 | 521.38 | 667.96 | 74.01                 | 85.88 | 100.95 | 128.74 |
| AB | San Joaquin Valley Air Basin  | Summer | 2031 | 384.15             | 444.67 | 521.34 | 668.13 | 74.02                 | 85.95 | 100.96 | 128.83 |
| AB | San Joaquin Valley Air Basin  | Summer | 2032 | 384.15             | 444.83 | 521.31 | 668.31 | 74.02                 | 86.02 | 100.96 | 128.92 |
| AB | San Joaquin Valley Air Basin  | Summer | 2033 | 384.15             | 444.97 | 521.29 | 668.48 | 74.02                 | 86.07 | 100.97 | 129.00 |
| AB | San Joaquin Valley Air Basin  | Summer | 2034 | 384.16             | 445.10 | 521.27 | 668.66 | 74.03                 | 86.12 | 100.97 | 129.08 |
| AB | San Joaquin Valley Air Basin  | Summer | 2035 | 384.17             | 445.18 | 521.25 | 668.82 | 74.03                 | 86.17 | 100.98 | 129.15 |
| AB | San Joaquin Valley Air Basin  | Winter | 2010 | 331.71             | 382.09 | 455.17 | 573.36 | 73.37                 | 85.32 | 100.36 | 124.58 |
| AB | San Joaquin Valley Air Basin  | Winter | 2011 | 331.86             | 382.70 | 454.81 | 574.06 | 73.37                 | 85.05 | 100.34 | 124.82 |
| AB | San Joaquin Valley Air Basin  | Winter | 2012 | 331.84             | 382.98 | 454.30 | 574.45 | 73.39                 | 84.87 | 100.35 | 125.07 |
| AB | San Joaquin Valley Air Basin  | Winter | 2013 | 332.15             | 383.59 | 454.32 | 575.38 | 73.43                 | 84.73 | 100.37 | 125.34 |
| AB | San Joaquin Valley Air Basin  | Winter | 2014 | 332.34             | 384.02 | 454.16 | 576.11 | 73.45                 | 84.65 | 100.38 | 125.62 |
| AB | San Joaquin Valley Air Basin  | Winter | 2015 | 333.08             | 385.08 | 454.89 | 577.78 | 73.50                 | 84.60 | 100.40 | 125.92 |
| AB | San Joaquin Valley Air Basin  | Winter | 2016 | 333.25             | 385.43 | 454.79 | 578.46 | 73.57                 | 84.57 | 100.44 | 126.22 |
| AB | San Joaquin Valley Air Basin  | Winter | 2017 | 333.38             | 385.74 | 454.71 | 579.09 | 73.60                 | 84.54 | 100.44 | 126.51 |
| AB | San Joaquin Valley Air Basin  | Winter | 2018 | 334.17             | 386.90 | 455.78 | 580.83 | 73.63                 | 84.56 | 100.47 | 126.79 |
| AB | San Joaquin Valley Air Basin  | Winter | 2019 | 334.29             | 387.21 | 455.78 | 581.37 | 73.68                 | 84.67 | 100.51 | 127.05 |
| AB | San Joaquin Valley Air Basin  | Winter | 2020 | 334.40             | 387.49 | 455.79 | 581.86 | 73.77                 | 84.83 | 100.58 | 127.28 |
| AB | San Joaquin Valley Air Basin  | Winter | 2021 | 334.35             | 387.50 | 455.49 | 582.01 | 73.84                 | 84.99 | 100.66 | 127.48 |
| AB | San Joaquin Valley Air Basin  | Winter | 2022 | 334.40             | 387.67 | 455.46 | 582.34 | 73.89                 | 85.13 | 100.73 | 127.64 |
| AB | San Joaquin Valley Air Basin  | Winter | 2023 | 334.42             | 387.81 | 455.44 | 582.61 | 73.92                 | 85.25 | 100.78 | 127.82 |
| AB | San Joaquin Valley Air Basin  | Winter | 2024 | 334.63             | 388.34 | 455.98 | 583.42 | 73.94                 | 85.37 | 100.83 | 127.98 |
| AB | San Joaquin Valley Air Basin  | Winter | 2025 | 334.64             | 388.44 | 455.97 | 583.62 | 73.96                 | 85.47 | 100.86 | 128.14 |
| AB | San Joaquin Valley Air Basin  | Winter | 2026 | 335.45             | 389.58 | 457.23 | 585.17 | 73.98                 | 85.57 | 100.89 | 128.28 |
| AB | San Joaquin Valley Air Basin  | Winter | 2027 | 335.46             | 389.68 | 457.17 | 585.33 | 73.99                 | 85.65 | 100.92 | 128.41 |
| AB | San Joaquin Valley Air Basin  | Winter | 2028 | 335.46             | 389.78 | 457.12 | 585.50 | 74.00                 | 85.74 | 100.93 | 128.53 |
| AB | San Joaquin Valley Air Basin  | Winter | 2029 | 335.46             | 389.88 | 457.06 | 585.66 | 74.01                 | 85.81 | 100.94 | 128.63 |
| AB | San Joaquin Valley Air Basin  | Winter | 2030 | 335.45             | 389.98 | 457.02 | 585.83 | 74.01                 | 85.88 | 100.95 | 128.74 |
| AB | San Joaquin Valley Air Basin  | Winter | 2031 | 335.45             | 390.08 | 456.97 | 585.97 | 74.02                 | 85.95 | 100.96 | 128.83 |
| AB | San Joaquin Valley Air Basin  | Winter | 2032 | 335.44             | 390.18 | 456.93 | 586.11 | 74.02                 | 86.02 | 100.96 | 128.92 |
| AB | San Joaquin Valley Air Basin  | Winter | 2033 | 335.44             | 390.27 | 456.89 | 586.24 | 74.02                 | 86.07 | 100.97 | 129.00 |
| AB | San Joaquin Valley Air Basin  | Winter | 2034 | 335.44             | 390.34 | 456.86 | 586.35 | 74.03                 | 86.12 | 100.97 | 129.08 |
| AB | San Joaquin Valley Air Basin  | Winter | 2035 | 335.44             | 390.41 | 456.83 | 586.45 | 74.03                 | 86.17 | 100.98 | 129.15 |
| AB | South Central Coast Air Basin | Annual | 2010 | 324.53             | 377.77 | 444.25 | 560.00 | 73.41                 | 85.83 | 99.73  | 124.93 |
| AB | South Central Coast Air Basin | Annual | 2011 | 324.89             | 378.44 | 444.27 | 561.13 | 73.37                 | 85.48 | 99.79  | 125.12 |
| AB | South Central Coast Air Basin | Annual | 2012 | 324.92             | 378.63 | 443.93 | 561.68 | 73.33                 | 85.24 | 99.87  | 125.34 |
| AB | South Central Coast Air Basin | Annual | 2013 | 325.01             | 378.79 | 443.66 | 562.26 | 73.34                 | 85.04 | 99.96  | 125.57 |
| AB | South Central Coast Air Basin | Annual | 2014 | 325.07             | 378.92 | 443.44 | 562.79 | 73.32                 | 84.87 | 100.05 | 125.81 |
| AB | South Central Coast Air Basin | Annual | 2015 | 326.78             | 381.05 | 445.42 | 566.18 | 73.34                 | 84.73 | 100.13 | 126.06 |
| AB | South Central Coast Air Basin | Annual | 2016 | 326.90             | 381.17 | 445.27 | 566.68 | 73.38                 | 84.63 | 100.22 | 126.32 |
| AB | South Central Coast Air Basin | Annual | 2017 | 326.98             | 381.27 | 445.14 | 567.15 | 73.40                 | 84.54 | 100.30 | 126.57 |
| AB | South Central Coast Air Basin | Annual | 2018 | 327.04             | 381.38 | 445.03 | 567.56 | 73.42                 | 84.52 | 100.38 | 126.81 |
| AB | South Central Coast Air Basin | Annual | 2019 | 327.63             | 382.30 | 445.61 | 568.85 | 73.45                 | 84.60 | 100.46 | 127.04 |
| AB | South Central Coast Air Basin | Annual | 2020 | 327.67             | 382.43 | 445.52 | 569.15 | 73.55                 | 84.73 | 100.55 | 127.25 |
| AB | South Central Coast Air Basin | Annual | 2021 | 328.64             | 383.97 | 446.70 | 571.13 | 73.62                 | 84.87 | 100.64 | 127.42 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | South Central Coast Air Basin | Annual | 2022 | 328.67             | 384.16 | 446.72 | 571.43 | 73.67                 | 85.01 | 100.71 | 127.55 |
| AB | South Central Coast Air Basin | Annual | 2023 | 328.66             | 384.31 | 446.73 | 571.67 | 73.70                 | 85.12 | 100.77 | 127.71 |
| AB | South Central Coast Air Basin | Annual | 2024 | 329.35             | 385.50 | 447.67 | 573.19 | 73.72                 | 85.23 | 100.81 | 127.86 |
| AB | South Central Coast Air Basin | Annual | 2025 | 329.34             | 385.64 | 447.71 | 573.44 | 73.74                 | 85.32 | 100.85 | 128.01 |
| AB | South Central Coast Air Basin | Annual | 2026 | 328.64             | 385.23 | 446.70 | 572.50 | 73.76                 | 85.42 | 100.88 | 128.15 |
| AB | South Central Coast Air Basin | Annual | 2027 | 328.66             | 385.40 | 446.71 | 572.75 | 73.77                 | 85.50 | 100.91 | 128.27 |
| AB | South Central Coast Air Basin | Annual | 2028 | 328.66             | 385.57 | 446.73 | 573.00 | 73.78                 | 85.58 | 100.92 | 128.39 |
| AB | South Central Coast Air Basin | Annual | 2029 | 328.65             | 385.74 | 446.73 | 573.24 | 73.79                 | 85.65 | 100.93 | 128.50 |
| AB | South Central Coast Air Basin | Annual | 2030 | 328.64             | 385.91 | 446.73 | 573.47 | 73.79                 | 85.72 | 100.94 | 128.60 |
| AB | South Central Coast Air Basin | Annual | 2031 | 329.38             | 387.27 | 447.77 | 575.16 | 73.80                 | 85.79 | 100.95 | 128.70 |
| AB | South Central Coast Air Basin | Annual | 2032 | 329.33             | 387.45 | 447.79 | 575.40 | 73.80                 | 85.85 | 100.95 | 128.79 |
| AB | South Central Coast Air Basin | Annual | 2033 | 329.30             | 387.60 | 447.82 | 575.61 | 73.81                 | 85.91 | 100.96 | 128.88 |
| AB | South Central Coast Air Basin | Annual | 2034 | 329.26             | 387.75 | 447.85 | 575.81 | 73.81                 | 85.97 | 100.97 | 128.96 |
| AB | South Central Coast Air Basin | Annual | 2035 | 329.23             | 387.87 | 447.88 | 576.00 | 73.81                 | 86.02 | 100.97 | 129.03 |
| AB | South Central Coast Air Basin | Summer | 2010 | 336.60             | 390.99 | 459.84 | 580.17 | 73.41                 | 85.83 | 99.73  | 124.93 |
| AB | South Central Coast Air Basin | Summer | 2011 | 337.01             | 391.88 | 459.94 | 581.29 | 73.37                 | 85.48 | 99.79  | 125.12 |
| AB | South Central Coast Air Basin | Summer | 2012 | 337.08             | 392.23 | 459.65 | 581.83 | 73.33                 | 85.24 | 99.87  | 125.34 |
| AB | South Central Coast Air Basin | Summer | 2013 | 337.19             | 392.52 | 459.44 | 582.43 | 73.34                 | 85.04 | 99.96  | 125.57 |
| AB | South Central Coast Air Basin | Summer | 2014 | 337.26             | 392.75 | 459.26 | 582.99 | 73.32                 | 84.87 | 100.05 | 125.81 |
| AB | South Central Coast Air Basin | Summer | 2015 | 339.04             | 395.04 | 461.36 | 586.53 | 73.34                 | 84.73 | 100.13 | 126.06 |
| AB | South Central Coast Air Basin | Summer | 2016 | 339.17             | 395.24 | 461.23 | 587.08 | 73.38                 | 84.63 | 100.22 | 126.32 |
| AB | South Central Coast Air Basin | Summer | 2017 | 339.26             | 395.40 | 461.12 | 587.60 | 73.40                 | 84.54 | 100.30 | 126.57 |
| AB | South Central Coast Air Basin | Summer | 2018 | 339.31             | 395.56 | 461.01 | 588.05 | 73.42                 | 84.52 | 100.38 | 126.81 |
| AB | South Central Coast Air Basin | Summer | 2019 | 339.92             | 396.55 | 461.61 | 589.41 | 73.45                 | 84.60 | 100.46 | 127.04 |
| AB | South Central Coast Air Basin | Summer | 2020 | 339.95             | 396.69 | 461.51 | 589.72 | 73.55                 | 84.73 | 100.55 | 127.25 |
| AB | South Central Coast Air Basin | Summer | 2021 | 340.97             | 398.35 | 462.76 | 591.83 | 73.62                 | 84.87 | 100.64 | 127.42 |
| AB | South Central Coast Air Basin | Summer | 2022 | 340.99             | 398.58 | 462.80 | 592.18 | 73.67                 | 85.01 | 100.71 | 127.55 |
| AB | South Central Coast Air Basin | Summer | 2023 | 340.98             | 398.77 | 462.82 | 592.45 | 73.70                 | 85.12 | 100.77 | 127.71 |
| AB | South Central Coast Air Basin | Summer | 2024 | 341.72             | 400.07 | 463.83 | 594.09 | 73.72                 | 85.23 | 100.81 | 127.86 |
| AB | South Central Coast Air Basin | Summer | 2025 | 341.71             | 400.25 | 463.89 | 594.37 | 73.74                 | 85.32 | 100.85 | 128.01 |
| AB | South Central Coast Air Basin | Summer | 2026 | 341.01             | 399.87 | 462.89 | 593.44 | 73.76                 | 85.42 | 100.88 | 128.15 |
| AB | South Central Coast Air Basin | Summer | 2027 | 341.03             | 400.07 | 462.92 | 593.72 | 73.77                 | 85.50 | 100.91 | 128.27 |
| AB | South Central Coast Air Basin | Summer | 2028 | 341.04             | 400.28 | 462.96 | 594.00 | 73.78                 | 85.58 | 100.92 | 128.39 |
| AB | South Central Coast Air Basin | Summer | 2029 | 341.04             | 400.49 | 462.98 | 594.26 | 73.79                 | 85.65 | 100.93 | 128.50 |
| AB | South Central Coast Air Basin | Summer | 2030 | 341.03             | 400.70 | 463.00 | 594.53 | 73.79                 | 85.72 | 100.94 | 128.60 |
| AB | South Central Coast Air Basin | Summer | 2031 | 341.80             | 402.15 | 464.10 | 596.30 | 73.80                 | 85.79 | 100.95 | 128.70 |
| AB | South Central Coast Air Basin | Summer | 2032 | 341.75             | 402.36 | 464.14 | 596.56 | 73.80                 | 85.85 | 100.95 | 128.79 |
| AB | South Central Coast Air Basin | Summer | 2033 | 341.71             | 402.55 | 464.19 | 596.80 | 73.81                 | 85.91 | 100.96 | 128.88 |
| AB | South Central Coast Air Basin | Summer | 2034 | 341.67             | 402.72 | 464.23 | 597.03 | 73.81                 | 85.97 | 100.97 | 128.96 |
| AB | South Central Coast Air Basin | Summer | 2035 | 341.63             | 402.86 | 464.29 | 597.25 | 73.81                 | 86.02 | 100.97 | 129.03 |
| AB | South Central Coast Air Basin | Winter | 2010 | 322.51             | 375.46 | 441.66 | 556.61 | 73.41                 | 85.83 | 99.73  | 124.93 |
| AB | South Central Coast Air Basin | Winter | 2011 | 322.86             | 376.09 | 441.67 | 557.75 | 73.37                 | 85.48 | 99.79  | 125.12 |
| AB | South Central Coast Air Basin | Winter | 2012 | 322.89             | 376.25 | 441.32 | 558.31 | 73.33                 | 85.24 | 99.87  | 125.34 |
| AB | South Central Coast Air Basin | Winter | 2013 | 322.98             | 376.39 | 441.05 | 558.88 | 73.34                 | 85.04 | 99.96  | 125.57 |
| AB | South Central Coast Air Basin | Winter | 2014 | 323.04             | 376.50 | 440.82 | 559.41 | 73.32                 | 84.87 | 100.05 | 125.81 |
| AB | South Central Coast Air Basin | Winter | 2015 | 324.74             | 378.60 | 442.79 | 562.78 | 73.34                 | 84.73 | 100.13 | 126.06 |
| AB | South Central Coast Air Basin | Winter | 2016 | 324.86             | 378.71 | 442.63 | 563.27 | 73.38                 | 84.63 | 100.22 | 126.32 |
| AB | South Central Coast Air Basin | Winter | 2017 | 324.94             | 378.80 | 442.50 | 563.74 | 73.40                 | 84.54 | 100.30 | 126.57 |
| AB | South Central Coast Air Basin | Winter | 2018 | 325.00             | 378.91 | 442.39 | 564.14 | 73.42                 | 84.52 | 100.38 | 126.81 |
| AB | South Central Coast Air Basin | Winter | 2019 | 325.59             | 379.82 | 442.98 | 565.43 | 73.45                 | 84.60 | 100.46 | 127.04 |
| AB | South Central Coast Air Basin | Winter | 2020 | 325.64             | 379.94 | 442.89 | 565.73 | 73.55                 | 84.73 | 100.55 | 127.25 |
| AB | South Central Coast Air Basin | Winter | 2021 | 326.60             | 381.46 | 444.05 | 567.67 | 73.62                 | 84.87 | 100.64 | 127.42 |
| AB | South Central Coast Air Basin | Winter | 2022 | 326.62             | 381.64 | 444.06 | 567.96 | 73.67                 | 85.01 | 100.71 | 127.55 |
| AB | South Central Coast Air Basin | Winter | 2023 | 326.61             | 381.78 | 444.07 | 568.19 | 73.70                 | 85.12 | 100.77 | 127.71 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | South Central Coast Air Basin | Winter | 2024 | 327.29             | 382.96 | 444.99 | 569.69 | 73.72                 | 85.23 | 100.81 | 127.86 |
| AB | South Central Coast Air Basin | Winter | 2025 | 327.28             | 383.09 | 445.02 | 569.93 | 73.74                 | 85.32 | 100.85 | 128.01 |
| AB | South Central Coast Air Basin | Winter | 2026 | 326.58             | 382.67 | 444.01 | 568.98 | 73.76                 | 85.42 | 100.88 | 128.15 |
| AB | South Central Coast Air Basin | Winter | 2027 | 326.60             | 382.83 | 444.02 | 569.23 | 73.77                 | 85.50 | 100.91 | 128.27 |
| AB | South Central Coast Air Basin | Winter | 2028 | 326.60             | 382.99 | 444.03 | 569.47 | 73.78                 | 85.58 | 100.92 | 128.39 |
| AB | South Central Coast Air Basin | Winter | 2029 | 326.59             | 383.15 | 444.03 | 569.70 | 73.79                 | 85.65 | 100.93 | 128.50 |
| AB | South Central Coast Air Basin | Winter | 2030 | 326.57             | 383.32 | 444.02 | 569.92 | 73.79                 | 85.72 | 100.94 | 128.60 |
| AB | South Central Coast Air Basin | Winter | 2031 | 327.31             | 384.66 | 445.05 | 571.59 | 73.80                 | 85.79 | 100.95 | 128.70 |
| AB | South Central Coast Air Basin | Winter | 2032 | 327.27             | 384.82 | 445.06 | 571.82 | 73.80                 | 85.85 | 100.95 | 128.79 |
| AB | South Central Coast Air Basin | Winter | 2033 | 327.23             | 384.97 | 445.09 | 572.03 | 73.81                 | 85.91 | 100.96 | 128.88 |
| AB | South Central Coast Air Basin | Winter | 2034 | 327.19             | 385.12 | 445.11 | 572.22 | 73.81                 | 85.97 | 100.97 | 128.96 |
| AB | South Central Coast Air Basin | Winter | 2035 | 327.16             | 385.23 | 445.14 | 572.40 | 73.81                 | 86.02 | 100.97 | 129.03 |
| AB | South Coast Air Basin         | Annual | 2010 | 358.01             | 409.57 | 488.94 | 615.29 | 73.21                 | 84.03 | 99.45  | 125.25 |
| AB | South Coast Air Basin         | Annual | 2011 | 358.53             | 410.51 | 489.32 | 616.38 | 73.23                 | 83.98 | 99.55  | 125.45 |
| AB | South Coast Air Basin         | Annual | 2012 | 358.66             | 410.89 | 489.10 | 616.67 | 73.27                 | 83.98 | 99.67  | 125.65 |
| AB | South Coast Air Basin         | Annual | 2013 | 358.86             | 411.36 | 488.94 | 617.04 | 73.33                 | 83.99 | 99.79  | 125.87 |
| AB | South Coast Air Basin         | Annual | 2014 | 359.00             | 411.69 | 488.76 | 617.38 | 73.38                 | 84.02 | 99.90  | 126.09 |
| AB | South Coast Air Basin         | Annual | 2015 | 359.50             | 412.41 | 489.04 | 618.24 | 73.44                 | 84.07 | 100.01 | 126.32 |
| AB | South Coast Air Basin         | Annual | 2016 | 359.61             | 412.71 | 488.91 | 618.65 | 73.51                 | 84.14 | 100.12 | 126.56 |
| AB | South Coast Air Basin         | Annual | 2017 | 359.68             | 413.00 | 488.78 | 619.05 | 73.56                 | 84.22 | 100.22 | 126.80 |
| AB | South Coast Air Basin         | Annual | 2018 | 359.73             | 413.24 | 488.67 | 619.35 | 73.60                 | 84.30 | 100.30 | 127.02 |
| AB | South Coast Air Basin         | Annual | 2019 | 359.08             | 412.70 | 487.70 | 618.60 | 73.64                 | 84.46 | 100.39 | 127.22 |
| AB | South Coast Air Basin         | Annual | 2020 | 359.10             | 412.90 | 487.57 | 618.80 | 73.73                 | 84.62 | 100.49 | 127.42 |
| AB | South Coast Air Basin         | Annual | 2021 | 359.91             | 414.09 | 488.60 | 620.48 | 73.80                 | 84.79 | 100.58 | 127.58 |
| AB | South Coast Air Basin         | Annual | 2022 | 359.87             | 414.26 | 488.52 | 620.66 | 73.85                 | 84.93 | 100.66 | 127.72 |
| AB | South Coast Air Basin         | Annual | 2023 | 359.81             | 414.38 | 488.43 | 620.76 | 73.88                 | 85.06 | 100.72 | 127.88 |
| AB | South Coast Air Basin         | Annual | 2024 | 361.76             | 416.80 | 491.03 | 624.19 | 73.90                 | 85.17 | 100.77 | 128.02 |
| AB | South Coast Air Basin         | Annual | 2025 | 361.68             | 416.85 | 490.94 | 624.25 | 73.92                 | 85.28 | 100.82 | 128.15 |
| AB | South Coast Air Basin         | Annual | 2026 | 361.64             | 416.95 | 490.83 | 624.31 | 73.94                 | 85.38 | 100.85 | 128.29 |
| AB | South Coast Air Basin         | Annual | 2027 | 361.59             | 417.03 | 490.72 | 624.36 | 73.95                 | 85.47 | 100.88 | 128.40 |
| AB | South Coast Air Basin         | Annual | 2028 | 361.53             | 417.11 | 490.61 | 624.40 | 73.96                 | 85.56 | 100.90 | 128.50 |
| AB | South Coast Air Basin         | Annual | 2029 | 361.47             | 417.20 | 490.50 | 624.44 | 73.97                 | 85.64 | 100.92 | 128.60 |
| AB | South Coast Air Basin         | Annual | 2030 | 361.40             | 417.29 | 490.39 | 624.48 | 73.97                 | 85.72 | 100.93 | 128.70 |
| AB | South Coast Air Basin         | Annual | 2031 | 361.77             | 417.91 | 490.85 | 625.21 | 73.98                 | 85.79 | 100.94 | 128.79 |
| AB | South Coast Air Basin         | Annual | 2032 | 361.71             | 418.00 | 490.76 | 625.26 | 73.98                 | 85.87 | 100.95 | 128.87 |
| AB | South Coast Air Basin         | Annual | 2033 | 361.64             | 418.06 | 490.66 | 625.29 | 73.99                 | 85.93 | 100.96 | 128.95 |
| AB | South Coast Air Basin         | Annual | 2034 | 361.58             | 418.11 | 490.56 | 625.31 | 73.99                 | 85.99 | 100.96 | 129.02 |
| AB | South Coast Air Basin         | Annual | 2035 | 361.51             | 418.13 | 490.47 | 625.31 | 73.99                 | 86.05 | 100.97 | 129.09 |
| AB | South Coast Air Basin         | Summer | 2010 | 376.35             | 428.81 | 513.13 | 646.60 | 73.21                 | 84.03 | 99.45  | 125.25 |
| AB | South Coast Air Basin         | Summer | 2011 | 376.98             | 430.14 | 513.64 | 647.75 | 73.23                 | 83.98 | 99.55  | 125.45 |
| AB | South Coast Air Basin         | Summer | 2012 | 377.17             | 430.80 | 513.51 | 648.09 | 73.27                 | 83.98 | 99.67  | 125.65 |
| AB | South Coast Air Basin         | Summer | 2013 | 377.43             | 431.52 | 513.45 | 648.57 | 73.33                 | 83.99 | 99.79  | 125.87 |
| AB | South Coast Air Basin         | Summer | 2014 | 377.60             | 432.03 | 513.36 | 649.01 | 73.38                 | 84.02 | 99.90  | 126.09 |
| AB | South Coast Air Basin         | Summer | 2015 | 378.16             | 432.94 | 513.77 | 650.06 | 73.44                 | 84.07 | 100.01 | 126.32 |
| AB | South Coast Air Basin         | Summer | 2016 | 378.32             | 433.38 | 513.73 | 650.64 | 73.51                 | 84.14 | 100.12 | 126.56 |
| AB | South Coast Air Basin         | Summer | 2017 | 378.43             | 433.80 | 513.68 | 651.19 | 73.56                 | 84.22 | 100.22 | 126.80 |
| AB | South Coast Air Basin         | Summer | 2018 | 378.50             | 434.15 | 513.63 | 651.64 | 73.60                 | 84.30 | 100.30 | 127.02 |
| AB | South Coast Air Basin         | Summer | 2019 | 377.87             | 433.68 | 512.68 | 651.00 | 73.64                 | 84.46 | 100.39 | 127.22 |
| AB | South Coast Air Basin         | Summer | 2020 | 377.93             | 434.00 | 512.61 | 651.36 | 73.73                 | 84.62 | 100.49 | 127.42 |
| AB | South Coast Air Basin         | Summer | 2021 | 378.82             | 435.34 | 513.74 | 653.23 | 73.80                 | 84.79 | 100.58 | 127.58 |
| AB | South Coast Air Basin         | Summer | 2022 | 378.81             | 435.60 | 513.67 | 653.48 | 73.85                 | 84.93 | 100.66 | 127.72 |
| AB | South Coast Air Basin         | Summer | 2023 | 378.77             | 435.80 | 513.60 | 653.65 | 73.88                 | 85.06 | 100.72 | 127.88 |
| AB | South Coast Air Basin         | Summer | 2024 | 380.89             | 438.46 | 516.40 | 657.36 | 73.90                 | 85.17 | 100.77 | 128.02 |
| AB | South Coast Air Basin         | Summer | 2025 | 380.84             | 438.60 | 516.33 | 657.46 | 73.92                 | 85.28 | 100.82 | 128.15 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AB | South Coast Air Basin | Summer | 2026 | 380.82             | 438.77 | 516.25 | 657.54 | 73.94                 | 85.38 | 100.85 | 128.29 |
| AB | South Coast Air Basin | Summer | 2027 | 380.79             | 438.92 | 516.17 | 657.62 | 73.95                 | 85.47 | 100.88 | 128.40 |
| AB | South Coast Air Basin | Summer | 2028 | 380.76             | 439.07 | 516.09 | 657.69 | 73.96                 | 85.56 | 100.90 | 128.50 |
| AB | South Coast Air Basin | Summer | 2029 | 380.72             | 439.23 | 516.01 | 657.76 | 73.97                 | 85.64 | 100.92 | 128.60 |
| AB | South Coast Air Basin | Summer | 2030 | 380.68             | 439.39 | 515.93 | 657.84 | 73.97                 | 85.72 | 100.93 | 128.70 |
| AB | South Coast Air Basin | Summer | 2031 | 381.11             | 440.14 | 516.48 | 658.70 | 73.98                 | 85.79 | 100.94 | 128.79 |
| AB | South Coast Air Basin | Summer | 2032 | 381.07             | 440.30 | 516.43 | 658.81 | 73.98                 | 85.87 | 100.95 | 128.87 |
| AB | South Coast Air Basin | Summer | 2033 | 381.03             | 440.42 | 516.37 | 658.90 | 73.99                 | 85.93 | 100.96 | 128.95 |
| AB | South Coast Air Basin | Summer | 2034 | 380.99             | 440.52 | 516.30 | 658.98 | 73.99                 | 85.99 | 100.96 | 129.02 |
| AB | South Coast Air Basin | Summer | 2035 | 380.95             | 440.59 | 516.24 | 659.05 | 73.99                 | 86.05 | 100.97 | 129.09 |
| AB | South Coast Air Basin | Winter | 2010 | 352.27             | 403.73 | 481.40 | 605.84 | 73.21                 | 84.03 | 99.45  | 125.25 |
| AB | South Coast Air Basin | Winter | 2011 | 352.77             | 404.58 | 481.76 | 606.95 | 73.23                 | 83.98 | 99.55  | 125.45 |
| AB | South Coast Air Basin | Winter | 2012 | 352.88             | 404.90 | 481.53 | 607.26 | 73.27                 | 83.98 | 99.67  | 125.65 |
| AB | South Coast Air Basin | Winter | 2013 | 353.07             | 405.31 | 481.36 | 607.63 | 73.33                 | 83.99 | 99.79  | 125.87 |
| AB | South Coast Air Basin | Winter | 2014 | 353.20             | 405.60 | 481.16 | 607.96 | 73.38                 | 84.02 | 99.90  | 126.09 |
| AB | South Coast Air Basin | Winter | 2015 | 353.69             | 406.27 | 481.43 | 608.80 | 73.44                 | 84.07 | 100.01 | 126.32 |
| AB | South Coast Air Basin | Winter | 2016 | 353.79             | 406.55 | 481.28 | 609.19 | 73.51                 | 84.14 | 100.12 | 126.56 |
| AB | South Coast Air Basin | Winter | 2017 | 353.86             | 406.81 | 481.14 | 609.56 | 73.56                 | 84.22 | 100.22 | 126.80 |
| AB | South Coast Air Basin | Winter | 2018 | 353.91             | 407.02 | 481.03 | 609.84 | 73.60                 | 84.30 | 100.30 | 127.02 |
| AB | South Coast Air Basin | Winter | 2019 | 353.27             | 406.48 | 480.07 | 609.09 | 73.64                 | 84.46 | 100.39 | 127.22 |
| AB | South Coast Air Basin | Winter | 2020 | 353.29             | 406.67 | 479.94 | 609.28 | 73.73                 | 84.62 | 100.49 | 127.42 |
| AB | South Coast Air Basin | Winter | 2021 | 354.09             | 407.82 | 480.96 | 610.92 | 73.80                 | 84.79 | 100.58 | 127.58 |
| AB | South Coast Air Basin | Winter | 2022 | 354.06             | 407.97 | 480.88 | 611.08 | 73.85                 | 84.93 | 100.66 | 127.72 |
| AB | South Coast Air Basin | Winter | 2023 | 354.00             | 408.08 | 480.79 | 611.18 | 73.88                 | 85.06 | 100.72 | 127.88 |
| AB | South Coast Air Basin | Winter | 2024 | 355.90             | 410.43 | 483.35 | 614.53 | 73.90                 | 85.17 | 100.77 | 128.02 |
| AB | South Coast Air Basin | Winter | 2025 | 355.83             | 410.47 | 483.26 | 614.59 | 73.92                 | 85.28 | 100.82 | 128.15 |
| AB | South Coast Air Basin | Winter | 2026 | 355.79             | 410.55 | 483.16 | 614.66 | 73.94                 | 85.38 | 100.85 | 128.29 |
| AB | South Coast Air Basin | Winter | 2027 | 355.74             | 410.63 | 483.05 | 614.71 | 73.95                 | 85.47 | 100.88 | 128.40 |
| AB | South Coast Air Basin | Winter | 2028 | 355.68             | 410.70 | 482.94 | 614.76 | 73.96                 | 85.56 | 100.90 | 128.50 |
| AB | South Coast Air Basin | Winter | 2029 | 355.62             | 410.78 | 482.83 | 614.80 | 73.97                 | 85.64 | 100.92 | 128.60 |
| AB | South Coast Air Basin | Winter | 2030 | 355.55             | 410.85 | 482.72 | 614.84 | 73.97                 | 85.72 | 100.93 | 128.70 |
| AB | South Coast Air Basin | Winter | 2031 | 355.91             | 411.44 | 483.17 | 615.55 | 73.98                 | 85.79 | 100.94 | 128.79 |
| AB | South Coast Air Basin | Winter | 2032 | 355.85             | 411.52 | 483.08 | 615.60 | 73.98                 | 85.87 | 100.95 | 128.87 |
| AB | South Coast Air Basin | Winter | 2033 | 355.79             | 411.58 | 482.99 | 615.63 | 73.99                 | 85.93 | 100.96 | 128.95 |
| AB | South Coast Air Basin | Winter | 2034 | 355.73             | 411.62 | 482.89 | 615.65 | 73.99                 | 85.99 | 100.96 | 129.02 |
| AB | South Coast Air Basin | Winter | 2035 | 355.66             | 411.64 | 482.80 | 615.65 | 73.99                 | 86.05 | 100.97 | 129.09 |
| AD | Amador County APCD    | Annual | 2010 | 304.65             | 351.36 | 416.56 | 520.77 | 74.42                 | 88.71 | 101.28 | 124.30 |
| AD | Amador County APCD    | Annual | 2011 | 304.66             | 351.60 | 416.18 | 521.37 | 74.22                 | 87.90 | 101.12 | 124.48 |
| AD | Amador County APCD    | Annual | 2012 | 304.71             | 351.83 | 415.89 | 522.08 | 74.04                 | 87.30 | 101.03 | 124.70 |
| AD | Amador County APCD    | Annual | 2013 | 304.79             | 351.99 | 415.66 | 522.86 | 73.92                 | 86.76 | 100.95 | 124.94 |
| AD | Amador County APCD    | Annual | 2014 | 304.86             | 352.15 | 415.48 | 523.60 | 73.78                 | 86.37 | 100.90 | 125.21 |
| AD | Amador County APCD    | Annual | 2015 | 304.98             | 352.29 | 415.35 | 524.39 | 73.76                 | 85.97 | 100.78 | 125.49 |
| AD | Amador County APCD    | Annual | 2016 | 305.08             | 352.44 | 415.24 | 525.15 | 73.74                 | 85.71 | 100.76 | 125.78 |
| AD | Amador County APCD    | Annual | 2017 | 305.13             | 352.54 | 415.14 | 525.85 | 73.67                 | 85.39 | 100.65 | 126.08 |
| AD | Amador County APCD    | Annual | 2018 | 305.17             | 352.64 | 415.05 | 526.46 | 73.63                 | 85.21 | 100.62 | 126.36 |
| AD | Amador County APCD    | Annual | 2019 | 305.20             | 352.73 | 414.99 | 526.98 | 73.61                 | 85.07 | 100.64 | 126.62 |
| AD | Amador County APCD    | Annual | 2020 | 305.25             | 352.84 | 414.93 | 527.43 | 73.70                 | 85.10 | 100.70 | 126.87 |
| AD | Amador County APCD    | Annual | 2021 | 305.27             | 352.92 | 414.87 | 527.78 | 73.76                 | 85.17 | 100.76 | 127.07 |
| AD | Amador County APCD    | Annual | 2022 | 305.25             | 352.98 | 414.81 | 528.07 | 73.79                 | 85.24 | 100.80 | 127.21 |
| AD | Amador County APCD    | Annual | 2023 | 305.17             | 353.01 | 414.75 | 528.29 | 73.79                 | 85.29 | 100.83 | 127.40 |
| AD | Amador County APCD    | Annual | 2024 | 305.08             | 353.05 | 414.70 | 528.47 | 73.77                 | 85.35 | 100.86 | 127.58 |
| AD | Amador County APCD    | Annual | 2025 | 305.03             | 353.13 | 414.66 | 528.63 | 73.78                 | 85.43 | 100.90 | 127.75 |
| AD | Amador County APCD    | Annual | 2026 | 305.04             | 353.24 | 414.62 | 528.79 | 73.80                 | 85.53 | 100.92 | 127.91 |
| AD | Amador County APCD    | Annual | 2027 | 305.05             | 353.36 | 414.57 | 528.95 | 73.81                 | 85.62 | 100.94 | 128.05 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location           | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|--------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                    |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Amador County APCD | Annual | 2028 | 305.05             | 353.48 | 414.54 | 529.12 | 73.82                 | 85.70 | 100.96 | 128.19 |
| AD | Amador County APCD | Annual | 2029 | 305.04             | 353.60 | 414.51 | 529.29 | 73.83                 | 85.78 | 100.96 | 128.32 |
| AD | Amador County APCD | Annual | 2030 | 305.03             | 353.72 | 414.47 | 529.46 | 73.83                 | 85.85 | 100.96 | 128.44 |
| AD | Amador County APCD | Annual | 2031 | 305.02             | 353.84 | 414.44 | 529.67 | 73.83                 | 85.93 | 100.97 | 128.56 |
| AD | Amador County APCD | Annual | 2032 | 305.02             | 353.95 | 414.42 | 529.88 | 73.84                 | 85.99 | 100.97 | 128.68 |
| AD | Amador County APCD | Annual | 2033 | 305.01             | 354.05 | 414.40 | 530.07 | 73.84                 | 86.06 | 100.98 | 128.78 |
| AD | Amador County APCD | Annual | 2034 | 305.01             | 354.14 | 414.39 | 530.24 | 73.85                 | 86.11 | 100.98 | 128.88 |
| AD | Amador County APCD | Annual | 2035 | 305.01             | 354.21 | 414.37 | 530.39 | 73.85                 | 86.16 | 100.98 | 128.97 |
| AD | Amador County APCD | Summer | 2010 | 335.39             | 381.81 | 456.97 | 570.78 | 74.42                 | 88.71 | 101.28 | 124.30 |
| AD | Amador County APCD | Summer | 2011 | 335.69             | 383.05 | 456.90 | 571.49 | 74.22                 | 87.90 | 101.12 | 124.48 |
| AD | Amador County APCD | Summer | 2012 | 335.97             | 384.03 | 456.85 | 572.39 | 74.04                 | 87.30 | 101.03 | 124.70 |
| AD | Amador County APCD | Summer | 2013 | 336.23             | 384.81 | 456.85 | 573.45 | 73.92                 | 86.76 | 100.95 | 124.94 |
| AD | Amador County APCD | Summer | 2014 | 336.43             | 385.43 | 456.87 | 574.47 | 73.78                 | 86.37 | 100.90 | 125.21 |
| AD | Amador County APCD | Summer | 2015 | 336.65             | 385.97 | 456.94 | 575.58 | 73.76                 | 85.97 | 100.78 | 125.49 |
| AD | Amador County APCD | Summer | 2016 | 336.82             | 386.42 | 456.98 | 576.67 | 73.74                 | 85.71 | 100.76 | 125.78 |
| AD | Amador County APCD | Summer | 2017 | 336.90             | 386.79 | 457.00 | 577.65 | 73.67                 | 85.39 | 100.65 | 126.08 |
| AD | Amador County APCD | Summer | 2018 | 336.95             | 387.08 | 456.98 | 578.50 | 73.63                 | 85.21 | 100.62 | 126.36 |
| AD | Amador County APCD | Summer | 2019 | 336.99             | 387.35 | 456.95 | 579.23 | 73.61                 | 85.07 | 100.64 | 126.62 |
| AD | Amador County APCD | Summer | 2020 | 337.02             | 387.58 | 456.90 | 579.85 | 73.70                 | 85.10 | 100.70 | 126.87 |
| AD | Amador County APCD | Summer | 2021 | 337.03             | 387.78 | 456.85 | 580.34 | 73.76                 | 85.17 | 100.76 | 127.07 |
| AD | Amador County APCD | Summer | 2022 | 337.01             | 387.96 | 456.79 | 580.75 | 73.79                 | 85.24 | 100.80 | 127.21 |
| AD | Amador County APCD | Summer | 2023 | 336.93             | 388.10 | 456.74 | 581.05 | 73.79                 | 85.29 | 100.83 | 127.40 |
| AD | Amador County APCD | Summer | 2024 | 336.85             | 388.24 | 456.69 | 581.30 | 73.77                 | 85.35 | 100.86 | 127.58 |
| AD | Amador County APCD | Summer | 2025 | 336.80             | 388.38 | 456.65 | 581.51 | 73.78                 | 85.43 | 100.90 | 127.75 |
| AD | Amador County APCD | Summer | 2026 | 336.83             | 388.54 | 456.62 | 581.67 | 73.80                 | 85.53 | 100.92 | 127.91 |
| AD | Amador County APCD | Summer | 2027 | 336.85             | 388.70 | 456.59 | 581.84 | 73.81                 | 85.62 | 100.94 | 128.05 |
| AD | Amador County APCD | Summer | 2028 | 336.86             | 388.88 | 456.57 | 582.04 | 73.82                 | 85.70 | 100.96 | 128.19 |
| AD | Amador County APCD | Summer | 2029 | 336.87             | 389.06 | 456.55 | 582.24 | 73.83                 | 85.78 | 100.96 | 128.32 |
| AD | Amador County APCD | Summer | 2030 | 336.87             | 389.25 | 456.52 | 582.44 | 73.83                 | 85.85 | 100.96 | 128.44 |
| AD | Amador County APCD | Summer | 2031 | 336.87             | 389.46 | 456.50 | 582.71 | 73.83                 | 85.93 | 100.97 | 128.56 |
| AD | Amador County APCD | Summer | 2032 | 336.87             | 389.62 | 456.48 | 582.98 | 73.84                 | 85.99 | 100.97 | 128.68 |
| AD | Amador County APCD | Summer | 2033 | 336.86             | 389.77 | 456.47 | 583.23 | 73.84                 | 86.06 | 100.98 | 128.78 |
| AD | Amador County APCD | Summer | 2034 | 336.85             | 389.90 | 456.45 | 583.45 | 73.85                 | 86.11 | 100.98 | 128.88 |
| AD | Amador County APCD | Summer | 2035 | 336.85             | 389.98 | 456.44 | 583.66 | 73.85                 | 86.16 | 100.98 | 128.97 |
| AD | Amador County APCD | Winter | 2010 | 295.29             | 342.08 | 404.24 | 505.53 | 74.42                 | 88.71 | 101.28 | 124.30 |
| AD | Amador County APCD | Winter | 2011 | 295.21             | 342.02 | 403.78 | 506.10 | 74.22                 | 87.90 | 101.12 | 124.48 |
| AD | Amador County APCD | Winter | 2012 | 295.18             | 342.01 | 403.41 | 506.75 | 74.04                 | 87.30 | 101.03 | 124.70 |
| AD | Amador County APCD | Winter | 2013 | 295.22             | 341.99 | 403.11 | 507.45 | 73.92                 | 86.76 | 100.95 | 124.94 |
| AD | Amador County APCD | Winter | 2014 | 295.24             | 342.01 | 402.87 | 508.11 | 73.78                 | 86.37 | 100.90 | 125.21 |
| AD | Amador County APCD | Winter | 2015 | 295.33             | 342.02 | 402.67 | 508.79 | 73.76                 | 85.97 | 100.78 | 125.49 |
| AD | Amador County APCD | Winter | 2016 | 295.41             | 342.08 | 402.52 | 509.45 | 73.74                 | 85.71 | 100.76 | 125.78 |
| AD | Amador County APCD | Winter | 2017 | 295.45             | 342.10 | 402.38 | 510.06 | 73.67                 | 85.39 | 100.65 | 126.08 |
| AD | Amador County APCD | Winter | 2018 | 295.49             | 342.14 | 402.28 | 510.60 | 73.63                 | 85.21 | 100.62 | 126.36 |
| AD | Amador County APCD | Winter | 2019 | 295.52             | 342.18 | 402.21 | 511.06 | 73.61                 | 85.07 | 100.64 | 126.62 |
| AD | Amador County APCD | Winter | 2020 | 295.57             | 342.25 | 402.15 | 511.46 | 73.70                 | 85.10 | 100.70 | 126.87 |
| AD | Amador County APCD | Winter | 2021 | 295.59             | 342.29 | 402.08 | 511.77 | 73.76                 | 85.17 | 100.76 | 127.07 |
| AD | Amador County APCD | Winter | 2022 | 295.58             | 342.32 | 402.02 | 512.02 | 73.79                 | 85.24 | 100.80 | 127.21 |
| AD | Amador County APCD | Winter | 2023 | 295.49             | 342.32 | 401.95 | 512.21 | 73.79                 | 85.29 | 100.83 | 127.40 |
| AD | Amador County APCD | Winter | 2024 | 295.40             | 342.33 | 401.90 | 512.37 | 73.77                 | 85.35 | 100.86 | 127.58 |
| AD | Amador County APCD | Winter | 2025 | 295.35             | 342.39 | 401.87 | 512.52 | 73.78                 | 85.43 | 100.90 | 127.75 |
| AD | Amador County APCD | Winter | 2026 | 295.36             | 342.49 | 401.82 | 512.68 | 73.80                 | 85.53 | 100.92 | 127.91 |
| AD | Amador County APCD | Winter | 2027 | 295.36             | 342.59 | 401.77 | 512.84 | 73.81                 | 85.62 | 100.94 | 128.05 |
| AD | Amador County APCD | Winter | 2028 | 295.35             | 342.69 | 401.74 | 513.00 | 73.82                 | 85.70 | 100.96 | 128.19 |
| AD | Amador County APCD | Winter | 2029 | 295.34             | 342.79 | 401.70 | 513.16 | 73.83                 | 85.78 | 100.96 | 128.32 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Amador County APCD   | Winter | 2030 | 295.32             | 342.89 | 401.65 | 513.32 | 73.83                 | 85.85 | 100.96 | 128.44 |
| AD | Amador County APCD   | Winter | 2031 | 295.32             | 342.99 | 401.63 | 513.51 | 73.83                 | 85.93 | 100.97 | 128.56 |
| AD | Amador County APCD   | Winter | 2032 | 295.32             | 343.09 | 401.61 | 513.70 | 73.84                 | 85.99 | 100.97 | 128.68 |
| AD | Amador County APCD   | Winter | 2033 | 295.31             | 343.17 | 401.59 | 513.88 | 73.84                 | 86.06 | 100.98 | 128.78 |
| AD | Amador County APCD   | Winter | 2034 | 295.31             | 343.24 | 401.57 | 514.03 | 73.85                 | 86.11 | 100.98 | 128.88 |
| AD | Amador County APCD   | Winter | 2035 | 295.30             | 343.31 | 401.56 | 514.17 | 73.85                 | 86.16 | 100.98 | 128.97 |
| AD | Antelope Valley APCD | Annual | 2010 | 345.89             | 395.46 | 472.51 | 595.78 | 73.36                 | 84.38 | 99.72  | 125.11 |
| AD | Antelope Valley APCD | Annual | 2011 | 348.87             | 399.45 | 476.26 | 601.40 | 73.38                 | 84.28 | 99.78  | 125.35 |
| AD | Antelope Valley APCD | Annual | 2012 | 349.04             | 400.17 | 476.18 | 602.17 | 73.40                 | 84.27 | 99.87  | 125.60 |
| AD | Antelope Valley APCD | Annual | 2013 | 350.49             | 402.29 | 477.89 | 605.21 | 73.42                 | 84.25 | 99.97  | 125.87 |
| AD | Antelope Valley APCD | Annual | 2014 | 350.66             | 402.85 | 477.86 | 605.99 | 73.46                 | 84.24 | 100.05 | 126.14 |
| AD | Antelope Valley APCD | Annual | 2015 | 355.63             | 408.92 | 484.44 | 615.13 | 73.50                 | 84.26 | 100.16 | 126.42 |
| AD | Antelope Valley APCD | Annual | 2016 | 355.79             | 409.41 | 484.43 | 615.82 | 73.56                 | 84.33 | 100.25 | 126.69 |
| AD | Antelope Valley APCD | Annual | 2017 | 355.91             | 409.84 | 484.42 | 616.46 | 73.60                 | 84.36 | 100.32 | 126.95 |
| AD | Antelope Valley APCD | Annual | 2018 | 356.00             | 410.20 | 484.40 | 617.00 | 73.63                 | 84.42 | 100.38 | 127.20 |
| AD | Antelope Valley APCD | Annual | 2019 | 357.84             | 412.61 | 486.79 | 620.54 | 73.67                 | 84.58 | 100.46 | 127.42 |
| AD | Antelope Valley APCD | Annual | 2020 | 357.92             | 412.97 | 486.78 | 620.97 | 73.75                 | 84.76 | 100.55 | 127.62 |
| AD | Antelope Valley APCD | Annual | 2021 | 360.97             | 416.79 | 490.85 | 626.51 | 73.82                 | 84.94 | 100.64 | 127.79 |
| AD | Antelope Valley APCD | Annual | 2022 | 361.00             | 417.09 | 490.84 | 626.80 | 73.87                 | 85.10 | 100.71 | 127.92 |
| AD | Antelope Valley APCD | Annual | 2023 | 361.00             | 417.34 | 490.82 | 627.02 | 73.90                 | 85.24 | 100.77 | 128.08 |
| AD | Antelope Valley APCD | Annual | 2024 | 361.28             | 417.87 | 491.15 | 627.65 | 73.91                 | 85.37 | 100.81 | 128.23 |
| AD | Antelope Valley APCD | Annual | 2025 | 361.29             | 418.06 | 491.14 | 627.84 | 73.93                 | 85.48 | 100.86 | 128.37 |
| AD | Antelope Valley APCD | Annual | 2026 | 361.30             | 418.26 | 491.12 | 628.01 | 73.95                 | 85.58 | 100.89 | 128.50 |
| AD | Antelope Valley APCD | Annual | 2027 | 361.31             | 418.44 | 491.10 | 628.17 | 73.97                 | 85.67 | 100.91 | 128.62 |
| AD | Antelope Valley APCD | Annual | 2028 | 361.32             | 418.63 | 491.09 | 628.32 | 73.97                 | 85.76 | 100.93 | 128.72 |
| AD | Antelope Valley APCD | Annual | 2029 | 361.32             | 418.81 | 491.07 | 628.47 | 73.98                 | 85.84 | 100.94 | 128.81 |
| AD | Antelope Valley APCD | Annual | 2030 | 361.31             | 418.99 | 491.06 | 628.62 | 73.98                 | 85.91 | 100.95 | 128.90 |
| AD | Antelope Valley APCD | Annual | 2031 | 366.94             | 425.72 | 498.73 | 638.58 | 73.99                 | 85.98 | 100.96 | 128.98 |
| AD | Antelope Valley APCD | Annual | 2032 | 366.93             | 425.88 | 498.72 | 638.71 | 73.99                 | 86.05 | 100.97 | 129.05 |
| AD | Antelope Valley APCD | Annual | 2033 | 366.93             | 426.03 | 498.71 | 638.83 | 74.00                 | 86.10 | 100.98 | 129.12 |
| AD | Antelope Valley APCD | Annual | 2034 | 366.92             | 426.15 | 498.70 | 638.94 | 74.00                 | 86.15 | 100.98 | 129.18 |
| AD | Antelope Valley APCD | Annual | 2035 | 366.92             | 426.26 | 498.69 | 639.04 | 74.00                 | 86.20 | 100.99 | 129.24 |
| AD | Antelope Valley APCD | Summer | 2010 | 381.87             | 431.89 | 519.76 | 655.58 | 73.36                 | 84.38 | 99.72  | 125.11 |
| AD | Antelope Valley APCD | Summer | 2011 | 385.34             | 436.89 | 524.09 | 661.69 | 73.38                 | 84.28 | 99.78  | 125.35 |
| AD | Antelope Valley APCD | Summer | 2012 | 385.66             | 438.19 | 524.18 | 662.56 | 73.40                 | 84.27 | 99.87  | 125.60 |
| AD | Antelope Valley APCD | Summer | 2013 | 387.37             | 440.97 | 526.26 | 666.03 | 73.42                 | 84.25 | 99.97  | 125.87 |
| AD | Antelope Valley APCD | Summer | 2014 | 387.63             | 441.94 | 526.42 | 667.04 | 73.46                 | 84.24 | 100.05 | 126.14 |
| AD | Antelope Valley APCD | Summer | 2015 | 393.20             | 448.92 | 533.87 | 677.32 | 73.50                 | 84.26 | 100.16 | 126.42 |
| AD | Antelope Valley APCD | Summer | 2016 | 393.41             | 449.67 | 534.00 | 678.24 | 73.56                 | 84.33 | 100.25 | 126.69 |
| AD | Antelope Valley APCD | Summer | 2017 | 393.56             | 450.33 | 534.08 | 679.07 | 73.60                 | 84.36 | 100.32 | 126.95 |
| AD | Antelope Valley APCD | Summer | 2018 | 393.65             | 450.86 | 534.11 | 679.75 | 73.63                 | 84.42 | 100.38 | 127.20 |
| AD | Antelope Valley APCD | Summer | 2019 | 395.68             | 453.61 | 536.75 | 683.71 | 73.67                 | 84.58 | 100.46 | 127.42 |
| AD | Antelope Valley APCD | Summer | 2020 | 395.75             | 454.07 | 536.73 | 684.25 | 73.75                 | 84.76 | 100.55 | 127.62 |
| AD | Antelope Valley APCD | Summer | 2021 | 399.16             | 458.42 | 541.24 | 690.46 | 73.82                 | 84.94 | 100.64 | 127.79 |
| AD | Antelope Valley APCD | Summer | 2022 | 399.20             | 458.86 | 541.22 | 690.83 | 73.87                 | 85.10 | 100.71 | 127.92 |
| AD | Antelope Valley APCD | Summer | 2023 | 399.21             | 459.24 | 541.20 | 691.10 | 73.90                 | 85.24 | 100.77 | 128.08 |
| AD | Antelope Valley APCD | Summer | 2024 | 399.46             | 459.85 | 541.48 | 691.72 | 73.91                 | 85.37 | 100.81 | 128.23 |
| AD | Antelope Valley APCD | Summer | 2025 | 399.48             | 460.16 | 541.47 | 691.93 | 73.93                 | 85.48 | 100.86 | 128.37 |
| AD | Antelope Valley APCD | Summer | 2026 | 399.50             | 460.45 | 541.44 | 692.11 | 73.95                 | 85.58 | 100.89 | 128.50 |
| AD | Antelope Valley APCD | Summer | 2027 | 399.52             | 460.73 | 541.42 | 692.27 | 73.97                 | 85.67 | 100.91 | 128.62 |
| AD | Antelope Valley APCD | Summer | 2028 | 399.53             | 461.00 | 541.41 | 692.44 | 73.97                 | 85.76 | 100.93 | 128.72 |
| AD | Antelope Valley APCD | Summer | 2029 | 399.53             | 461.26 | 541.39 | 692.59 | 73.98                 | 85.84 | 100.94 | 128.81 |
| AD | Antelope Valley APCD | Summer | 2030 | 399.53             | 461.50 | 541.38 | 692.75 | 73.98                 | 85.91 | 100.95 | 128.90 |
| AD | Antelope Valley APCD | Summer | 2031 | 405.74             | 468.99 | 549.84 | 703.69 | 73.99                 | 85.98 | 100.96 | 128.98 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Antelope Valley APCD | Summer | 2032 | 405.72             | 469.23 | 549.82 | 703.80 | 73.99                 | 86.05 | 100.97 | 129.05 |
| AD | Antelope Valley APCD | Summer | 2033 | 405.71             | 469.41 | 549.81 | 703.92 | 74.00                 | 86.10 | 100.98 | 129.12 |
| AD | Antelope Valley APCD | Summer | 2034 | 405.70             | 469.58 | 549.80 | 704.05 | 74.00                 | 86.15 | 100.98 | 129.18 |
| AD | Antelope Valley APCD | Summer | 2035 | 405.69             | 469.70 | 549.79 | 704.16 | 74.00                 | 86.20 | 100.99 | 129.24 |
| AD | Antelope Valley APCD | Winter | 2010 | 335.14             | 384.58 | 458.40 | 577.92 | 73.36                 | 84.38 | 99.72  | 125.11 |
| AD | Antelope Valley APCD | Winter | 2011 | 337.98             | 388.27 | 461.98 | 583.39 | 73.38                 | 84.28 | 99.78  | 125.35 |
| AD | Antelope Valley APCD | Winter | 2012 | 338.10             | 388.82 | 461.84 | 584.13 | 73.40                 | 84.27 | 99.87  | 125.60 |
| AD | Antelope Valley APCD | Winter | 2013 | 339.47             | 390.73 | 463.43 | 587.03 | 73.42                 | 84.25 | 99.97  | 125.87 |
| AD | Antelope Valley APCD | Winter | 2014 | 339.61             | 391.17 | 463.35 | 587.75 | 73.46                 | 84.24 | 100.05 | 126.14 |
| AD | Antelope Valley APCD | Winter | 2015 | 344.39             | 396.95 | 469.65 | 596.52 | 73.50                 | 84.26 | 100.16 | 126.42 |
| AD | Antelope Valley APCD | Winter | 2016 | 344.53             | 397.37 | 469.60 | 597.15 | 73.56                 | 84.33 | 100.25 | 126.69 |
| AD | Antelope Valley APCD | Winter | 2017 | 344.65             | 397.72 | 469.56 | 597.73 | 73.60                 | 84.36 | 100.32 | 126.95 |
| AD | Antelope Valley APCD | Winter | 2018 | 344.74             | 398.03 | 469.53 | 598.23 | 73.63                 | 84.42 | 100.38 | 127.20 |
| AD | Antelope Valley APCD | Winter | 2019 | 346.52             | 400.35 | 471.84 | 601.64 | 73.67                 | 84.58 | 100.46 | 127.42 |
| AD | Antelope Valley APCD | Winter | 2020 | 346.60             | 400.67 | 471.84 | 602.04 | 73.75                 | 84.76 | 100.55 | 127.62 |
| AD | Antelope Valley APCD | Winter | 2021 | 349.54             | 404.32 | 475.76 | 607.37 | 73.82                 | 84.94 | 100.64 | 127.79 |
| AD | Antelope Valley APCD | Winter | 2022 | 349.57             | 404.59 | 475.75 | 607.63 | 73.87                 | 85.10 | 100.71 | 127.92 |
| AD | Antelope Valley APCD | Winter | 2023 | 349.56             | 404.80 | 475.74 | 607.83 | 73.90                 | 85.24 | 100.77 | 128.08 |
| AD | Antelope Valley APCD | Winter | 2024 | 349.86             | 405.31 | 476.10 | 608.49 | 73.91                 | 85.37 | 100.81 | 128.23 |
| AD | Antelope Valley APCD | Winter | 2025 | 349.87             | 405.47 | 476.09 | 608.67 | 73.93                 | 85.48 | 100.86 | 128.37 |
| AD | Antelope Valley APCD | Winter | 2026 | 349.88             | 405.64 | 476.07 | 608.84 | 73.95                 | 85.58 | 100.89 | 128.50 |
| AD | Antelope Valley APCD | Winter | 2027 | 349.89             | 405.80 | 476.06 | 609.00 | 73.97                 | 85.67 | 100.91 | 128.62 |
| AD | Antelope Valley APCD | Winter | 2028 | 349.89             | 405.96 | 476.04 | 609.15 | 73.97                 | 85.76 | 100.93 | 128.72 |
| AD | Antelope Valley APCD | Winter | 2029 | 349.89             | 406.12 | 476.02 | 609.30 | 73.98                 | 85.84 | 100.94 | 128.81 |
| AD | Antelope Valley APCD | Winter | 2030 | 349.88             | 406.27 | 476.01 | 609.44 | 73.98                 | 85.91 | 100.95 | 128.90 |
| AD | Antelope Valley APCD | Winter | 2031 | 355.33             | 412.77 | 483.44 | 619.10 | 73.99                 | 85.98 | 100.96 | 128.98 |
| AD | Antelope Valley APCD | Winter | 2032 | 355.33             | 412.92 | 483.43 | 619.24 | 73.99                 | 86.05 | 100.97 | 129.05 |
| AD | Antelope Valley APCD | Winter | 2033 | 355.33             | 413.05 | 483.42 | 619.36 | 74.00                 | 86.10 | 100.98 | 129.12 |
| AD | Antelope Valley APCD | Winter | 2034 | 355.32             | 413.16 | 483.41 | 619.46 | 74.00                 | 86.15 | 100.98 | 129.18 |
| AD | Antelope Valley APCD | Winter | 2035 | 355.32             | 413.26 | 483.40 | 619.56 | 74.00                 | 86.20 | 100.99 | 129.24 |
| AD | Bay Area AQMD        | Annual | 2010 | 338.39             | 388.50 | 461.86 | 581.62 | 72.94                 | 84.37 | 99.40  | 124.69 |
| AD | Bay Area AQMD        | Annual | 2011 | 338.52             | 388.90 | 461.72 | 582.11 | 72.98                 | 84.25 | 99.50  | 124.89 |
| AD | Bay Area AQMD        | Annual | 2012 | 338.67             | 389.32 | 461.62 | 582.66 | 73.02                 | 84.19 | 99.62  | 125.11 |
| AD | Bay Area AQMD        | Annual | 2013 | 338.86             | 389.72 | 461.54 | 583.26 | 73.09                 | 84.17 | 99.74  | 125.34 |
| AD | Bay Area AQMD        | Annual | 2014 | 339.03             | 390.09 | 461.49 | 583.86 | 73.15                 | 84.17 | 99.85  | 125.59 |
| AD | Bay Area AQMD        | Annual | 2015 | 339.22             | 390.46 | 461.45 | 584.47 | 73.23                 | 84.19 | 99.96  | 125.85 |
| AD | Bay Area AQMD        | Annual | 2016 | 339.41             | 390.83 | 461.42 | 585.05 | 73.32                 | 84.24 | 100.07 | 126.10 |
| AD | Bay Area AQMD        | Annual | 2017 | 339.54             | 391.17 | 461.39 | 585.61 | 73.38                 | 84.29 | 100.17 | 126.36 |
| AD | Bay Area AQMD        | Annual | 2018 | 339.67             | 391.45 | 461.36 | 586.09 | 73.44                 | 84.35 | 100.26 | 126.61 |
| AD | Bay Area AQMD        | Annual | 2019 | 339.78             | 391.75 | 461.34 | 586.50 | 73.50                 | 84.48 | 100.35 | 126.84 |
| AD | Bay Area AQMD        | Annual | 2020 | 339.88             | 392.02 | 461.33 | 586.89 | 73.60                 | 84.63 | 100.45 | 127.06 |
| AD | Bay Area AQMD        | Annual | 2021 | 339.96             | 392.27 | 461.33 | 587.20 | 73.68                 | 84.79 | 100.54 | 127.24 |
| AD | Bay Area AQMD        | Annual | 2022 | 339.99             | 392.48 | 461.33 | 587.46 | 73.74                 | 84.93 | 100.62 | 127.39 |
| AD | Bay Area AQMD        | Annual | 2023 | 339.99             | 392.64 | 461.32 | 587.66 | 73.78                 | 85.06 | 100.69 | 127.56 |
| AD | Bay Area AQMD        | Annual | 2024 | 339.97             | 392.77 | 461.30 | 587.83 | 73.80                 | 85.17 | 100.75 | 127.71 |
| AD | Bay Area AQMD        | Annual | 2025 | 339.96             | 392.89 | 461.29 | 588.00 | 73.82                 | 85.27 | 100.80 | 127.87 |
| AD | Bay Area AQMD        | Annual | 2026 | 339.97             | 393.04 | 461.27 | 588.18 | 73.85                 | 85.38 | 100.84 | 128.01 |
| AD | Bay Area AQMD        | Annual | 2027 | 339.98             | 393.18 | 461.25 | 588.35 | 73.86                 | 85.47 | 100.87 | 128.15 |
| AD | Bay Area AQMD        | Annual | 2028 | 339.97             | 393.32 | 461.22 | 588.52 | 73.87                 | 85.55 | 100.89 | 128.26 |
| AD | Bay Area AQMD        | Annual | 2029 | 339.96             | 393.47 | 461.20 | 588.68 | 73.88                 | 85.63 | 100.91 | 128.38 |
| AD | Bay Area AQMD        | Annual | 2030 | 339.95             | 393.63 | 461.17 | 588.85 | 73.89                 | 85.71 | 100.92 | 128.49 |
| AD | Bay Area AQMD        | Annual | 2031 | 339.94             | 393.79 | 461.16 | 589.02 | 73.89                 | 85.79 | 100.93 | 128.59 |
| AD | Bay Area AQMD        | Annual | 2032 | 339.94             | 393.94 | 461.14 | 589.20 | 73.90                 | 85.86 | 100.94 | 128.69 |
| AD | Bay Area AQMD        | Annual | 2033 | 339.93             | 394.08 | 461.13 | 589.36 | 73.90                 | 85.92 | 100.95 | 128.79 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Bay Area AQMD | Annual | 2034 | 339.92             | 394.20 | 461.11 | 589.50 | 73.90                 | 85.98 | 100.95 | 128.87 |
| AD | Bay Area AQMD | Annual | 2035 | 339.91             | 394.31 | 461.10 | 589.63 | 73.91                 | 86.04 | 100.96 | 128.96 |
| AD | Bay Area AQMD | Summer | 2010 | 364.35             | 415.41 | 496.51 | 625.57 | 72.94                 | 84.37 | 99.40  | 124.69 |
| AD | Bay Area AQMD | Summer | 2011 | 364.64             | 416.20 | 496.43 | 625.96 | 72.98                 | 84.25 | 99.50  | 124.89 |
| AD | Bay Area AQMD | Summer | 2012 | 364.93             | 416.94 | 496.39 | 626.48 | 73.02                 | 84.19 | 99.62  | 125.11 |
| AD | Bay Area AQMD | Summer | 2013 | 365.22             | 417.62 | 496.38 | 627.12 | 73.09                 | 84.17 | 99.74  | 125.34 |
| AD | Bay Area AQMD | Summer | 2014 | 365.47             | 418.22 | 496.42 | 627.81 | 73.15                 | 84.17 | 99.85  | 125.59 |
| AD | Bay Area AQMD | Summer | 2015 | 365.72             | 418.79 | 496.47 | 628.57 | 73.23                 | 84.19 | 99.96  | 125.85 |
| AD | Bay Area AQMD | Summer | 2016 | 365.95             | 419.33 | 496.52 | 629.31 | 73.32                 | 84.24 | 100.07 | 126.10 |
| AD | Bay Area AQMD | Summer | 2017 | 366.11             | 419.82 | 496.57 | 630.02 | 73.38                 | 84.29 | 100.17 | 126.36 |
| AD | Bay Area AQMD | Summer | 2018 | 366.24             | 420.25 | 496.57 | 630.62 | 73.44                 | 84.35 | 100.26 | 126.61 |
| AD | Bay Area AQMD | Summer | 2019 | 366.36             | 420.66 | 496.58 | 631.14 | 73.50                 | 84.48 | 100.35 | 126.84 |
| AD | Bay Area AQMD | Summer | 2020 | 366.46             | 421.03 | 496.57 | 631.62 | 73.60                 | 84.63 | 100.45 | 127.06 |
| AD | Bay Area AQMD | Summer | 2021 | 366.53             | 421.37 | 496.57 | 632.00 | 73.68                 | 84.79 | 100.54 | 127.24 |
| AD | Bay Area AQMD | Summer | 2022 | 366.57             | 421.66 | 496.56 | 632.33 | 73.74                 | 84.93 | 100.62 | 127.39 |
| AD | Bay Area AQMD | Summer | 2023 | 366.57             | 421.90 | 496.54 | 632.57 | 73.78                 | 85.06 | 100.69 | 127.56 |
| AD | Bay Area AQMD | Summer | 2024 | 366.55             | 422.10 | 496.51 | 632.76 | 73.80                 | 85.17 | 100.75 | 127.71 |
| AD | Bay Area AQMD | Summer | 2025 | 366.54             | 422.28 | 496.49 | 632.95 | 73.82                 | 85.27 | 100.80 | 127.87 |
| AD | Bay Area AQMD | Summer | 2026 | 366.55             | 422.48 | 496.46 | 633.14 | 73.85                 | 85.38 | 100.84 | 128.01 |
| AD | Bay Area AQMD | Summer | 2027 | 366.56             | 422.68 | 496.44 | 633.31 | 73.86                 | 85.47 | 100.87 | 128.15 |
| AD | Bay Area AQMD | Summer | 2028 | 366.57             | 422.88 | 496.41 | 633.48 | 73.87                 | 85.55 | 100.89 | 128.26 |
| AD | Bay Area AQMD | Summer | 2029 | 366.56             | 423.10 | 496.39 | 633.66 | 73.88                 | 85.63 | 100.91 | 128.38 |
| AD | Bay Area AQMD | Summer | 2030 | 366.56             | 423.32 | 496.37 | 633.84 | 73.89                 | 85.71 | 100.92 | 128.49 |
| AD | Bay Area AQMD | Summer | 2031 | 366.56             | 423.55 | 496.35 | 634.03 | 73.89                 | 85.79 | 100.93 | 128.59 |
| AD | Bay Area AQMD | Summer | 2032 | 366.55             | 423.75 | 496.34 | 634.22 | 73.90                 | 85.86 | 100.94 | 128.69 |
| AD | Bay Area AQMD | Summer | 2033 | 366.55             | 423.93 | 496.32 | 634.41 | 73.90                 | 85.92 | 100.95 | 128.79 |
| AD | Bay Area AQMD | Summer | 2034 | 366.54             | 424.09 | 496.31 | 634.58 | 73.90                 | 85.98 | 100.95 | 128.87 |
| AD | Bay Area AQMD | Summer | 2035 | 366.54             | 424.21 | 496.30 | 634.74 | 73.91                 | 86.04 | 100.96 | 128.96 |
| AD | Bay Area AQMD | Winter | 2010 | 335.32             | 385.28 | 457.66 | 576.18 | 72.94                 | 84.37 | 99.40  | 124.69 |
| AD | Bay Area AQMD | Winter | 2011 | 335.43             | 385.63 | 457.52 | 576.68 | 72.98                 | 84.25 | 99.50  | 124.89 |
| AD | Bay Area AQMD | Winter | 2012 | 335.56             | 386.01 | 457.41 | 577.23 | 73.02                 | 84.19 | 99.62  | 125.11 |
| AD | Bay Area AQMD | Winter | 2013 | 335.74             | 386.37 | 457.32 | 577.82 | 73.09                 | 84.17 | 99.74  | 125.34 |
| AD | Bay Area AQMD | Winter | 2014 | 335.90             | 386.72 | 457.25 | 578.40 | 73.15                 | 84.17 | 99.85  | 125.59 |
| AD | Bay Area AQMD | Winter | 2015 | 336.08             | 387.07 | 457.20 | 579.00 | 73.23                 | 84.19 | 99.96  | 125.85 |
| AD | Bay Area AQMD | Winter | 2016 | 336.26             | 387.41 | 457.16 | 579.56 | 73.32                 | 84.24 | 100.07 | 126.10 |
| AD | Bay Area AQMD | Winter | 2017 | 336.39             | 387.73 | 457.12 | 580.10 | 73.38                 | 84.29 | 100.17 | 126.36 |
| AD | Bay Area AQMD | Winter | 2018 | 336.52             | 388.00 | 457.08 | 580.55 | 73.44                 | 84.35 | 100.26 | 126.61 |
| AD | Bay Area AQMD | Winter | 2019 | 336.63             | 388.27 | 457.06 | 580.95 | 73.50                 | 84.48 | 100.35 | 126.84 |
| AD | Bay Area AQMD | Winter | 2020 | 336.73             | 388.53 | 457.05 | 581.32 | 73.60                 | 84.63 | 100.45 | 127.06 |
| AD | Bay Area AQMD | Winter | 2021 | 336.80             | 388.77 | 457.05 | 581.62 | 73.68                 | 84.79 | 100.54 | 127.24 |
| AD | Bay Area AQMD | Winter | 2022 | 336.84             | 388.97 | 457.05 | 581.88 | 73.74                 | 84.93 | 100.62 | 127.39 |
| AD | Bay Area AQMD | Winter | 2023 | 336.84             | 389.12 | 457.04 | 582.08 | 73.78                 | 85.06 | 100.69 | 127.56 |
| AD | Bay Area AQMD | Winter | 2024 | 336.82             | 389.24 | 457.02 | 582.24 | 73.80                 | 85.17 | 100.75 | 127.71 |
| AD | Bay Area AQMD | Winter | 2025 | 336.81             | 389.35 | 457.00 | 582.41 | 73.82                 | 85.27 | 100.80 | 127.87 |
| AD | Bay Area AQMD | Winter | 2026 | 336.82             | 389.49 | 456.98 | 582.60 | 73.85                 | 85.38 | 100.84 | 128.01 |
| AD | Bay Area AQMD | Winter | 2027 | 336.82             | 389.62 | 456.96 | 582.77 | 73.86                 | 85.47 | 100.87 | 128.15 |
| AD | Bay Area AQMD | Winter | 2028 | 336.82             | 389.76 | 456.94 | 582.93 | 73.87                 | 85.55 | 100.89 | 128.26 |
| AD | Bay Area AQMD | Winter | 2029 | 336.80             | 389.90 | 456.91 | 583.10 | 73.88                 | 85.63 | 100.91 | 128.38 |
| AD | Bay Area AQMD | Winter | 2030 | 336.79             | 390.05 | 456.89 | 583.27 | 73.89                 | 85.71 | 100.92 | 128.49 |
| AD | Bay Area AQMD | Winter | 2031 | 336.78             | 390.20 | 456.87 | 583.44 | 73.89                 | 85.79 | 100.93 | 128.59 |
| AD | Bay Area AQMD | Winter | 2032 | 336.77             | 390.35 | 456.86 | 583.61 | 73.90                 | 85.86 | 100.94 | 128.69 |
| AD | Bay Area AQMD | Winter | 2033 | 336.76             | 390.48 | 456.84 | 583.76 | 73.90                 | 85.92 | 100.95 | 128.79 |
| AD | Bay Area AQMD | Winter | 2034 | 336.76             | 390.60 | 456.82 | 583.90 | 73.90                 | 85.98 | 100.95 | 128.87 |
| AD | Bay Area AQMD | Winter | 2035 | 336.74             | 390.70 | 456.80 | 584.02 | 73.91                 | 86.04 | 100.96 | 128.96 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location          | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Butte County APCD | Annual | 2010 | 339.87             | 396.33 | 466.79 | 582.59 | 73.74                 | 93.40 | 101.05 | 125.37 |
| AD | Butte County APCD | Annual | 2011 | 340.16             | 396.11 | 466.41 | 583.82 | 73.64                 | 91.64 | 100.92 | 125.50 |
| AD | Butte County APCD | Annual | 2012 | 340.27             | 395.85 | 465.90 | 584.74 | 73.58                 | 90.38 | 100.87 | 125.67 |
| AD | Butte County APCD | Annual | 2013 | 340.39             | 395.57 | 465.50 | 585.71 | 73.53                 | 89.20 | 100.81 | 125.88 |
| AD | Butte County APCD | Annual | 2014 | 340.47             | 395.32 | 465.20 | 586.62 | 73.46                 | 88.16 | 100.77 | 126.08 |
| AD | Butte County APCD | Annual | 2015 | 340.60             | 395.14 | 464.96 | 587.52 | 73.45                 | 87.30 | 100.75 | 126.32 |
| AD | Butte County APCD | Annual | 2016 | 342.35             | 396.92 | 466.99 | 591.13 | 73.49                 | 86.64 | 100.74 | 126.57 |
| AD | Butte County APCD | Annual | 2017 | 342.42             | 396.78 | 466.81 | 591.87 | 73.48                 | 85.98 | 100.71 | 126.82 |
| AD | Butte County APCD | Annual | 2018 | 342.44             | 396.68 | 466.66 | 592.50 | 73.44                 | 85.49 | 100.70 | 127.05 |
| AD | Butte County APCD | Annual | 2019 | 342.48             | 396.71 | 466.54 | 593.04 | 73.45                 | 85.31 | 100.70 | 127.27 |
| AD | Butte County APCD | Annual | 2020 | 342.53             | 396.78 | 466.44 | 593.51 | 73.54                 | 85.30 | 100.76 | 127.47 |
| AD | Butte County APCD | Annual | 2021 | 343.10             | 397.55 | 467.11 | 594.81 | 73.60                 | 85.41 | 100.82 | 127.57 |
| AD | Butte County APCD | Annual | 2022 | 343.10             | 397.67 | 467.03 | 595.07 | 73.64                 | 85.50 | 100.87 | 127.65 |
| AD | Butte County APCD | Annual | 2023 | 343.08             | 397.75 | 466.95 | 595.27 | 73.67                 | 85.58 | 100.90 | 127.82 |
| AD | Butte County APCD | Annual | 2024 | 343.02             | 397.84 | 466.88 | 595.42 | 73.68                 | 85.66 | 100.93 | 127.97 |
| AD | Butte County APCD | Annual | 2025 | 343.01             | 397.92 | 466.82 | 595.60 | 73.70                 | 85.73 | 100.96 | 128.12 |
| AD | Butte County APCD | Annual | 2026 | 343.02             | 398.03 | 466.75 | 595.77 | 73.72                 | 85.80 | 100.97 | 128.26 |
| AD | Butte County APCD | Annual | 2027 | 343.02             | 398.12 | 466.69 | 595.94 | 73.73                 | 85.86 | 100.98 | 128.39 |
| AD | Butte County APCD | Annual | 2028 | 343.02             | 398.22 | 466.63 | 596.11 | 73.74                 | 85.92 | 100.99 | 128.51 |
| AD | Butte County APCD | Annual | 2029 | 343.02             | 398.31 | 466.55 | 596.28 | 73.74                 | 85.97 | 100.99 | 128.62 |
| AD | Butte County APCD | Annual | 2030 | 343.01             | 398.40 | 466.48 | 596.45 | 73.75                 | 86.02 | 100.98 | 128.72 |
| AD | Butte County APCD | Annual | 2031 | 343.01             | 398.49 | 466.45 | 596.62 | 73.75                 | 86.07 | 100.98 | 128.82 |
| AD | Butte County APCD | Annual | 2032 | 343.01             | 398.57 | 466.42 | 596.79 | 73.76                 | 86.12 | 100.99 | 128.91 |
| AD | Butte County APCD | Annual | 2033 | 343.00             | 398.64 | 466.40 | 596.95 | 73.76                 | 86.15 | 100.99 | 128.99 |
| AD | Butte County APCD | Annual | 2034 | 343.00             | 398.69 | 466.38 | 597.09 | 73.76                 | 86.19 | 100.99 | 129.06 |
| AD | Butte County APCD | Annual | 2035 | 342.99             | 398.74 | 466.36 | 597.22 | 73.77                 | 86.22 | 100.99 | 129.13 |
| AD | Butte County APCD | Summer | 2010 | 378.25             | 435.25 | 516.75 | 645.70 | 73.74                 | 93.40 | 101.05 | 125.37 |
| AD | Butte County APCD | Summer | 2011 | 379.01             | 436.21 | 517.19 | 647.27 | 73.64                 | 91.64 | 100.92 | 125.50 |
| AD | Butte County APCD | Summer | 2012 | 379.48             | 436.79 | 517.26 | 648.57 | 73.58                 | 90.38 | 100.87 | 125.67 |
| AD | Butte County APCD | Summer | 2013 | 379.86             | 437.26 | 517.34 | 649.98 | 73.53                 | 89.20 | 100.81 | 125.88 |
| AD | Butte County APCD | Summer | 2014 | 380.14             | 437.60 | 517.39 | 651.33 | 73.46                 | 88.16 | 100.77 | 126.08 |
| AD | Butte County APCD | Summer | 2015 | 380.40             | 437.90 | 517.40 | 652.65 | 73.45                 | 87.30 | 100.75 | 126.32 |
| AD | Butte County APCD | Summer | 2016 | 382.44             | 440.27 | 519.84 | 656.95 | 73.49                 | 86.64 | 100.74 | 126.57 |
| AD | Butte County APCD | Summer | 2017 | 382.54             | 440.50 | 519.76 | 658.01 | 73.48                 | 85.98 | 100.71 | 126.82 |
| AD | Butte County APCD | Summer | 2018 | 382.56             | 440.67 | 519.63 | 658.88 | 73.44                 | 85.49 | 100.70 | 127.05 |
| AD | Butte County APCD | Summer | 2019 | 382.59             | 440.87 | 519.51 | 659.62 | 73.45                 | 85.31 | 100.70 | 127.27 |
| AD | Butte County APCD | Summer | 2020 | 382.63             | 441.06 | 519.39 | 660.26 | 73.54                 | 85.30 | 100.76 | 127.47 |
| AD | Butte County APCD | Summer | 2021 | 383.24             | 442.01 | 520.14 | 661.82 | 73.60                 | 85.41 | 100.82 | 127.57 |
| AD | Butte County APCD | Summer | 2022 | 383.23             | 442.21 | 520.05 | 662.21 | 73.64                 | 85.50 | 100.87 | 127.65 |
| AD | Butte County APCD | Summer | 2023 | 383.21             | 442.39 | 519.98 | 662.50 | 73.67                 | 85.58 | 100.90 | 127.82 |
| AD | Butte County APCD | Summer | 2024 | 383.15             | 442.57 | 519.92 | 662.70 | 73.68                 | 85.66 | 100.93 | 127.97 |
| AD | Butte County APCD | Summer | 2025 | 383.13             | 442.73 | 519.88 | 662.89 | 73.70                 | 85.73 | 100.96 | 128.12 |
| AD | Butte County APCD | Summer | 2026 | 383.15             | 442.89 | 519.81 | 663.05 | 73.72                 | 85.80 | 100.97 | 128.26 |
| AD | Butte County APCD | Summer | 2027 | 383.17             | 443.04 | 519.76 | 663.21 | 73.73                 | 85.86 | 100.98 | 128.39 |
| AD | Butte County APCD | Summer | 2028 | 383.19             | 443.19 | 519.72 | 663.40 | 73.74                 | 85.92 | 100.99 | 128.51 |
| AD | Butte County APCD | Summer | 2029 | 383.21             | 443.35 | 519.67 | 663.59 | 73.74                 | 85.97 | 100.99 | 128.62 |
| AD | Butte County APCD | Summer | 2030 | 383.22             | 443.50 | 519.63 | 663.79 | 73.75                 | 86.02 | 100.98 | 128.72 |
| AD | Butte County APCD | Summer | 2031 | 383.22             | 443.64 | 519.62 | 663.97 | 73.75                 | 86.07 | 100.98 | 128.82 |
| AD | Butte County APCD | Summer | 2032 | 383.22             | 443.74 | 519.61 | 664.16 | 73.76                 | 86.12 | 100.99 | 128.91 |
| AD | Butte County APCD | Summer | 2033 | 383.22             | 443.83 | 519.60 | 664.35 | 73.76                 | 86.15 | 100.99 | 128.99 |
| AD | Butte County APCD | Summer | 2034 | 383.22             | 443.91 | 519.59 | 664.54 | 73.76                 | 86.19 | 100.99 | 129.06 |
| AD | Butte County APCD | Summer | 2035 | 383.21             | 443.96 | 519.58 | 664.71 | 73.77                 | 86.22 | 100.99 | 129.13 |
| AD | Butte County APCD | Winter | 2010 | 328.68             | 384.98 | 452.21 | 564.18 | 73.74                 | 93.40 | 101.05 | 125.37 |
| AD | Butte County APCD | Winter | 2011 | 328.82             | 384.41 | 451.61 | 565.32 | 73.64                 | 91.64 | 100.92 | 125.50 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Butte County APCD     | Winter | 2012 | 328.84             | 383.90 | 450.92 | 566.13 | 73.58                 | 90.38 | 100.87 | 125.67 |
| AD | Butte County APCD     | Winter | 2013 | 328.87             | 383.41 | 450.39 | 566.96 | 73.53                 | 89.20 | 100.81 | 125.88 |
| AD | Butte County APCD     | Winter | 2014 | 328.90             | 382.99 | 449.98 | 567.75 | 73.46                 | 88.16 | 100.77 | 126.08 |
| AD | Butte County APCD     | Winter | 2015 | 328.99             | 382.67 | 449.66 | 568.52 | 73.45                 | 87.30 | 100.75 | 126.32 |
| AD | Butte County APCD     | Winter | 2016 | 330.67             | 384.27 | 451.57 | 571.94 | 73.49                 | 86.64 | 100.74 | 126.57 |
| AD | Butte County APCD     | Winter | 2017 | 330.72             | 384.03 | 451.37 | 572.58 | 73.48                 | 85.98 | 100.71 | 126.82 |
| AD | Butte County APCD     | Winter | 2018 | 330.74             | 383.86 | 451.21 | 573.14 | 73.44                 | 85.49 | 100.70 | 127.05 |
| AD | Butte County APCD     | Winter | 2019 | 330.78             | 383.84 | 451.09 | 573.62 | 73.45                 | 85.31 | 100.70 | 127.27 |
| AD | Butte County APCD     | Winter | 2020 | 330.84             | 383.86 | 450.99 | 574.04 | 73.54                 | 85.30 | 100.76 | 127.47 |
| AD | Butte County APCD     | Winter | 2021 | 331.40             | 384.59 | 451.65 | 575.26 | 73.60                 | 85.41 | 100.82 | 127.57 |
| AD | Butte County APCD     | Winter | 2022 | 331.39             | 384.68 | 451.56 | 575.49 | 73.64                 | 85.50 | 100.87 | 127.65 |
| AD | Butte County APCD     | Winter | 2023 | 331.38             | 384.73 | 451.48 | 575.67 | 73.67                 | 85.58 | 100.90 | 127.82 |
| AD | Butte County APCD     | Winter | 2024 | 331.32             | 384.80 | 451.41 | 575.80 | 73.68                 | 85.66 | 100.93 | 127.97 |
| AD | Butte County APCD     | Winter | 2025 | 331.30             | 384.86 | 451.35 | 575.97 | 73.70                 | 85.73 | 100.96 | 128.12 |
| AD | Butte County APCD     | Winter | 2026 | 331.31             | 384.94 | 451.28 | 576.14 | 73.72                 | 85.80 | 100.97 | 128.26 |
| AD | Butte County APCD     | Winter | 2027 | 331.31             | 385.02 | 451.21 | 576.32 | 73.73                 | 85.86 | 100.98 | 128.39 |
| AD | Butte County APCD     | Winter | 2028 | 331.31             | 385.10 | 451.14 | 576.48 | 73.74                 | 85.92 | 100.99 | 128.51 |
| AD | Butte County APCD     | Winter | 2029 | 331.30             | 385.18 | 451.06 | 576.65 | 73.74                 | 85.97 | 100.99 | 128.62 |
| AD | Butte County APCD     | Winter | 2030 | 331.28             | 385.25 | 450.98 | 576.81 | 73.75                 | 86.02 | 100.98 | 128.72 |
| AD | Butte County APCD     | Winter | 2031 | 331.28             | 385.33 | 450.94 | 576.98 | 73.75                 | 86.07 | 100.98 | 128.82 |
| AD | Butte County APCD     | Winter | 2032 | 331.28             | 385.40 | 450.91 | 577.14 | 73.76                 | 86.12 | 100.99 | 128.91 |
| AD | Butte County APCD     | Winter | 2033 | 331.27             | 385.45 | 450.88 | 577.29 | 73.76                 | 86.15 | 100.99 | 128.99 |
| AD | Butte County APCD     | Winter | 2034 | 331.27             | 385.51 | 450.86 | 577.42 | 73.76                 | 86.19 | 100.99 | 129.06 |
| AD | Butte County APCD     | Winter | 2035 | 331.26             | 385.55 | 450.84 | 577.54 | 73.77                 | 86.22 | 100.99 | 129.13 |
| AD | Calaveras County APCD | Annual | 2010 | 339.15             | 393.21 | 464.59 | 580.79 | 74.52                 | 89.63 | 101.49 | 124.52 |
| AD | Calaveras County APCD | Annual | 2011 | 339.17             | 393.31 | 464.13 | 581.44 | 74.31                 | 88.76 | 101.30 | 124.68 |
| AD | Calaveras County APCD | Annual | 2012 | 339.22             | 393.39 | 463.78 | 582.21 | 74.10                 | 88.01 | 101.21 | 124.87 |
| AD | Calaveras County APCD | Annual | 2013 | 339.30             | 393.43 | 463.49 | 583.06 | 73.93                 | 87.36 | 101.13 | 125.10 |
| AD | Calaveras County APCD | Annual | 2014 | 339.36             | 393.46 | 463.27 | 583.88 | 73.74                 | 86.82 | 101.00 | 125.34 |
| AD | Calaveras County APCD | Annual | 2015 | 339.48             | 393.52 | 463.10 | 584.75 | 73.70                 | 86.38 | 100.93 | 125.59 |
| AD | Calaveras County APCD | Annual | 2016 | 339.59             | 393.59 | 462.96 | 585.57 | 73.69                 | 86.07 | 100.88 | 125.88 |
| AD | Calaveras County APCD | Annual | 2017 | 339.64             | 393.63 | 462.83 | 586.35 | 73.61                 | 85.70 | 100.81 | 126.15 |
| AD | Calaveras County APCD | Annual | 2018 | 339.66             | 393.65 | 462.73 | 587.01 | 73.51                 | 85.38 | 100.75 | 126.42 |
| AD | Calaveras County APCD | Annual | 2019 | 339.69             | 393.73 | 462.65 | 587.57 | 73.48                 | 85.28 | 100.71 | 126.69 |
| AD | Calaveras County APCD | Annual | 2020 | 339.72             | 393.81 | 462.58 | 588.07 | 73.55                 | 85.28 | 100.76 | 126.92 |
| AD | Calaveras County APCD | Annual | 2021 | 339.70             | 393.86 | 462.51 | 588.43 | 73.59                 | 85.33 | 100.81 | 127.08 |
| AD | Calaveras County APCD | Annual | 2022 | 339.67             | 393.90 | 462.43 | 588.75 | 73.61                 | 85.38 | 100.85 | 127.26 |
| AD | Calaveras County APCD | Annual | 2023 | 339.61             | 393.93 | 462.36 | 588.97 | 73.61                 | 85.43 | 100.87 | 127.44 |
| AD | Calaveras County APCD | Annual | 2024 | 339.52             | 393.92 | 462.29 | 589.14 | 73.58                 | 85.45 | 100.89 | 127.61 |
| AD | Calaveras County APCD | Annual | 2025 | 339.50             | 393.98 | 462.24 | 589.30 | 73.59                 | 85.52 | 100.92 | 127.77 |
| AD | Calaveras County APCD | Annual | 2026 | 339.51             | 394.11 | 462.19 | 589.48 | 73.61                 | 85.62 | 100.94 | 127.93 |
| AD | Calaveras County APCD | Annual | 2027 | 339.51             | 394.23 | 462.13 | 589.67 | 73.62                 | 85.70 | 100.96 | 128.08 |
| AD | Calaveras County APCD | Annual | 2028 | 339.51             | 394.36 | 462.10 | 589.86 | 73.63                 | 85.78 | 100.97 | 128.21 |
| AD | Calaveras County APCD | Annual | 2029 | 339.50             | 394.48 | 462.05 | 590.05 | 73.64                 | 85.86 | 100.97 | 128.34 |
| AD | Calaveras County APCD | Annual | 2030 | 339.49             | 394.60 | 462.00 | 590.25 | 73.64                 | 85.93 | 100.97 | 128.46 |
| AD | Calaveras County APCD | Annual | 2031 | 339.49             | 394.71 | 461.98 | 590.48 | 73.65                 | 86.00 | 100.98 | 128.58 |
| AD | Calaveras County APCD | Annual | 2032 | 339.49             | 394.82 | 461.96 | 590.71 | 73.65                 | 86.06 | 100.98 | 128.70 |
| AD | Calaveras County APCD | Annual | 2033 | 339.49             | 394.90 | 461.94 | 590.91 | 73.65                 | 86.12 | 100.98 | 128.81 |
| AD | Calaveras County APCD | Annual | 2034 | 339.48             | 394.98 | 461.92 | 591.10 | 73.66                 | 86.17 | 100.99 | 128.90 |
| AD | Calaveras County APCD | Annual | 2035 | 339.48             | 395.05 | 461.91 | 591.26 | 73.66                 | 86.21 | 100.99 | 128.99 |
| AD | Calaveras County APCD | Summer | 2010 | 371.79             | 425.53 | 507.37 | 633.67 | 74.52                 | 89.63 | 101.49 | 124.52 |
| AD | Calaveras County APCD | Summer | 2011 | 372.10             | 426.67 | 507.24 | 634.43 | 74.31                 | 88.76 | 101.30 | 124.68 |
| AD | Calaveras County APCD | Summer | 2012 | 372.38             | 427.56 | 507.15 | 635.42 | 74.10                 | 88.01 | 101.21 | 124.87 |
| AD | Calaveras County APCD | Summer | 2013 | 372.63             | 428.25 | 507.10 | 636.56 | 73.93                 | 87.36 | 101.13 | 125.10 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                       |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Calaveras County APCD | Summer | 2014 | 372.82              | 428.79 | 507.12 | 637.70 | 73.74                 | 86.82 | 101.00 | 125.34 |
| AD | Calaveras County APCD | Summer | 2015 | 373.03              | 429.26 | 507.15 | 638.94 | 73.70                 | 86.38 | 100.93 | 125.59 |
| AD | Calaveras County APCD | Summer | 2016 | 373.20              | 429.64 | 507.18 | 640.12 | 73.69                 | 86.07 | 100.88 | 125.88 |
| AD | Calaveras County APCD | Summer | 2017 | 373.29              | 429.96 | 507.18 | 641.21 | 73.61                 | 85.70 | 100.81 | 126.15 |
| AD | Calaveras County APCD | Summer | 2018 | 373.31              | 430.20 | 507.15 | 642.13 | 73.51                 | 85.38 | 100.75 | 126.42 |
| AD | Calaveras County APCD | Summer | 2019 | 373.34              | 430.44 | 507.12 | 642.91 | 73.48                 | 85.28 | 100.71 | 126.69 |
| AD | Calaveras County APCD | Summer | 2020 | 373.36              | 430.67 | 507.07 | 643.60 | 73.55                 | 85.28 | 100.76 | 126.92 |
| AD | Calaveras County APCD | Summer | 2021 | 373.33              | 430.84 | 507.00 | 644.13 | 73.59                 | 85.33 | 100.81 | 127.08 |
| AD | Calaveras County APCD | Summer | 2022 | 373.30              | 431.01 | 506.94 | 644.57 | 73.61                 | 85.38 | 100.85 | 127.26 |
| AD | Calaveras County APCD | Summer | 2023 | 373.24              | 431.15 | 506.88 | 644.89 | 73.61                 | 85.43 | 100.87 | 127.44 |
| AD | Calaveras County APCD | Summer | 2024 | 373.18              | 431.27 | 506.81 | 645.12 | 73.58                 | 85.45 | 100.89 | 127.61 |
| AD | Calaveras County APCD | Summer | 2025 | 373.16              | 431.40 | 506.76 | 645.32 | 73.59                 | 85.52 | 100.92 | 127.77 |
| AD | Calaveras County APCD | Summer | 2026 | 373.18              | 431.61 | 506.71 | 645.52 | 73.61                 | 85.62 | 100.94 | 127.93 |
| AD | Calaveras County APCD | Summer | 2027 | 373.19              | 431.81 | 506.66 | 645.72 | 73.62                 | 85.70 | 100.96 | 128.08 |
| AD | Calaveras County APCD | Summer | 2028 | 373.20              | 432.01 | 506.63 | 645.94 | 73.63                 | 85.78 | 100.97 | 128.21 |
| AD | Calaveras County APCD | Summer | 2029 | 373.21              | 432.20 | 506.60 | 646.17 | 73.64                 | 85.86 | 100.97 | 128.34 |
| AD | Calaveras County APCD | Summer | 2030 | 373.22              | 432.39 | 506.57 | 646.41 | 73.64                 | 85.93 | 100.97 | 128.46 |
| AD | Calaveras County APCD | Summer | 2031 | 373.22              | 432.56 | 506.56 | 646.71 | 73.65                 | 86.00 | 100.98 | 128.58 |
| AD | Calaveras County APCD | Summer | 2032 | 373.21              | 432.71 | 506.56 | 646.99 | 73.65                 | 86.06 | 100.98 | 128.70 |
| AD | Calaveras County APCD | Summer | 2033 | 373.21              | 432.83 | 506.55 | 647.26 | 73.65                 | 86.12 | 100.98 | 128.81 |
| AD | Calaveras County APCD | Summer | 2034 | 373.20              | 432.93 | 506.54 | 647.51 | 73.66                 | 86.17 | 100.99 | 128.90 |
| AD | Calaveras County APCD | Summer | 2035 | 373.19              | 433.00 | 506.53 | 647.73 | 73.66                 | 86.21 | 100.99 | 128.99 |
| AD | Calaveras County APCD | Winter | 2010 | 329.78              | 383.93 | 452.30 | 565.59 | 74.52                 | 89.63 | 101.49 | 124.52 |
| AD | Calaveras County APCD | Winter | 2011 | 329.72              | 383.73 | 451.75 | 566.21 | 74.31                 | 88.76 | 101.30 | 124.68 |
| AD | Calaveras County APCD | Winter | 2012 | 329.69              | 383.57 | 451.31 | 566.92 | 74.10                 | 88.01 | 101.21 | 124.87 |
| AD | Calaveras County APCD | Winter | 2013 | 329.72              | 383.42 | 450.96 | 567.68 | 73.93                 | 87.36 | 101.13 | 125.10 |
| AD | Calaveras County APCD | Winter | 2014 | 329.75              | 383.31 | 450.67 | 568.42 | 73.74                 | 86.82 | 101.00 | 125.34 |
| AD | Calaveras County APCD | Winter | 2015 | 329.84              | 383.25 | 450.44 | 569.19 | 73.70                 | 86.38 | 100.93 | 125.59 |
| AD | Calaveras County APCD | Winter | 2016 | 329.93              | 383.24 | 450.25 | 569.90 | 73.69                 | 86.07 | 100.88 | 125.88 |
| AD | Calaveras County APCD | Winter | 2017 | 329.98              | 383.20 | 450.09 | 570.59 | 73.61                 | 85.70 | 100.81 | 126.15 |
| AD | Calaveras County APCD | Winter | 2018 | 329.99              | 383.15 | 449.97 | 571.17 | 73.51                 | 85.38 | 100.75 | 126.42 |
| AD | Calaveras County APCD | Winter | 2019 | 330.02              | 383.18 | 449.87 | 571.67 | 73.48                 | 85.28 | 100.71 | 126.69 |
| AD | Calaveras County APCD | Winter | 2020 | 330.05              | 383.22 | 449.80 | 572.12 | 73.55                 | 85.28 | 100.76 | 126.92 |
| AD | Calaveras County APCD | Winter | 2021 | 330.04              | 383.24 | 449.72 | 572.43 | 73.59                 | 85.33 | 100.81 | 127.08 |
| AD | Calaveras County APCD | Winter | 2022 | 330.01              | 383.24 | 449.64 | 572.72 | 73.61                 | 85.38 | 100.85 | 127.26 |
| AD | Calaveras County APCD | Winter | 2023 | 329.94              | 383.24 | 449.56 | 572.90 | 73.61                 | 85.43 | 100.87 | 127.44 |
| AD | Calaveras County APCD | Winter | 2024 | 329.85              | 383.19 | 449.49 | 573.05 | 73.58                 | 85.45 | 100.89 | 127.61 |
| AD | Calaveras County APCD | Winter | 2025 | 329.83              | 383.23 | 449.45 | 573.20 | 73.59                 | 85.52 | 100.92 | 127.77 |
| AD | Calaveras County APCD | Winter | 2026 | 329.84              | 383.34 | 449.40 | 573.38 | 73.61                 | 85.62 | 100.94 | 127.93 |
| AD | Calaveras County APCD | Winter | 2027 | 329.84              | 383.44 | 449.34 | 573.56 | 73.62                 | 85.70 | 100.96 | 128.08 |
| AD | Calaveras County APCD | Winter | 2028 | 329.83              | 383.54 | 449.30 | 573.75 | 73.63                 | 85.78 | 100.97 | 128.21 |
| AD | Calaveras County APCD | Winter | 2029 | 329.82              | 383.64 | 449.25 | 573.93 | 73.64                 | 85.86 | 100.97 | 128.34 |
| AD | Calaveras County APCD | Winter | 2030 | 329.81              | 383.74 | 449.19 | 574.11 | 73.64                 | 85.93 | 100.97 | 128.46 |
| AD | Calaveras County APCD | Winter | 2031 | 329.80              | 383.84 | 449.17 | 574.32 | 73.65                 | 86.00 | 100.98 | 128.58 |
| AD | Calaveras County APCD | Winter | 2032 | 329.80              | 383.93 | 449.14 | 574.54 | 73.65                 | 86.06 | 100.98 | 128.70 |
| AD | Calaveras County APCD | Winter | 2033 | 329.80              | 384.01 | 449.12 | 574.73 | 73.65                 | 86.12 | 100.98 | 128.81 |
| AD | Calaveras County APCD | Winter | 2034 | 329.80              | 384.08 | 449.11 | 574.89 | 73.66                 | 86.17 | 100.99 | 128.90 |
| AD | Calaveras County APCD | Winter | 2035 | 329.79              | 384.14 | 449.09 | 575.04 | 73.66                 | 86.21 | 100.99 | 128.99 |
| AD | Colusa County APCD    | Annual | 2010 | 336.15              | 393.71 | 462.59 | 577.05 | 73.02                 | 94.44 | 100.85 | 124.61 |
| AD | Colusa County APCD    | Annual | 2011 | 336.30              | 393.20 | 461.94 | 577.64 | 73.01                 | 92.76 | 100.79 | 124.78 |
| AD | Colusa County APCD    | Annual | 2012 | 336.46              | 392.86 | 461.43 | 578.32 | 73.01                 | 91.49 | 100.76 | 124.99 |
| AD | Colusa County APCD    | Annual | 2013 | 336.61              | 392.53 | 461.04 | 579.07 | 73.01                 | 90.33 | 100.78 | 125.24 |
| AD | Colusa County APCD    | Annual | 2014 | 336.76              | 392.14 | 460.74 | 579.85 | 73.01                 | 89.10 | 100.78 | 125.48 |
| AD | Colusa County APCD    | Annual | 2015 | 336.94              | 391.90 | 460.48 | 580.66 | 73.07                 | 88.20 | 100.70 | 125.75 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location           | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|--------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                    |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Colusa County APCD | Annual | 2016 | 337.08             | 391.55 | 460.28 | 581.44 | 73.11                 | 87.13 | 100.69 | 126.03 |
| AD | Colusa County APCD | Annual | 2017 | 337.18             | 391.40 | 460.11 | 582.19 | 73.11                 | 86.50 | 100.69 | 126.31 |
| AD | Colusa County APCD | Annual | 2018 | 337.27             | 391.20 | 459.97 | 582.84 | 73.14                 | 85.83 | 100.67 | 126.58 |
| AD | Colusa County APCD | Annual | 2019 | 337.32             | 391.11 | 459.85 | 583.42 | 73.14                 | 85.43 | 100.69 | 126.82 |
| AD | Colusa County APCD | Annual | 2020 | 337.37             | 391.06 | 459.75 | 583.92 | 73.23                 | 85.29 | 100.77 | 127.05 |
| AD | Colusa County APCD | Annual | 2021 | 337.43             | 391.13 | 459.66 | 584.31 | 73.30                 | 85.37 | 100.83 | 127.21 |
| AD | Colusa County APCD | Annual | 2022 | 337.40             | 391.19 | 459.57 | 584.63 | 73.33                 | 85.43 | 100.88 | 127.34 |
| AD | Colusa County APCD | Annual | 2023 | 337.39             | 391.29 | 459.49 | 584.89 | 73.36                 | 85.52 | 100.91 | 127.52 |
| AD | Colusa County APCD | Annual | 2024 | 337.37             | 391.34 | 459.41 | 585.10 | 73.37                 | 85.59 | 100.94 | 127.69 |
| AD | Colusa County APCD | Annual | 2025 | 337.36             | 391.40 | 459.36 | 585.31 | 73.39                 | 85.65 | 100.97 | 127.86 |
| AD | Colusa County APCD | Annual | 2026 | 337.37             | 391.51 | 459.27 | 585.53 | 73.41                 | 85.73 | 100.99 | 128.02 |
| AD | Colusa County APCD | Annual | 2027 | 337.38             | 391.61 | 459.21 | 585.75 | 73.42                 | 85.79 | 101.00 | 128.16 |
| AD | Colusa County APCD | Annual | 2028 | 337.39             | 391.73 | 459.15 | 585.97 | 73.43                 | 85.86 | 101.01 | 128.30 |
| AD | Colusa County APCD | Annual | 2029 | 337.40             | 391.84 | 459.07 | 586.18 | 73.44                 | 85.92 | 101.01 | 128.42 |
| AD | Colusa County APCD | Annual | 2030 | 337.38             | 391.95 | 458.99 | 586.40 | 73.44                 | 85.97 | 101.00 | 128.54 |
| AD | Colusa County APCD | Annual | 2031 | 337.38             | 392.05 | 458.95 | 586.61 | 73.45                 | 86.03 | 101.00 | 128.66 |
| AD | Colusa County APCD | Annual | 2032 | 337.38             | 392.15 | 458.92 | 586.83 | 73.45                 | 86.08 | 101.00 | 128.77 |
| AD | Colusa County APCD | Annual | 2033 | 337.38             | 392.24 | 458.89 | 587.03 | 73.46                 | 86.13 | 101.01 | 128.87 |
| AD | Colusa County APCD | Annual | 2034 | 337.37             | 392.31 | 458.85 | 587.21 | 73.46                 | 86.17 | 101.01 | 128.96 |
| AD | Colusa County APCD | Annual | 2035 | 337.36             | 392.37 | 458.83 | 587.37 | 73.47                 | 86.21 | 101.01 | 129.05 |
| AD | Colusa County APCD | Summer | 2010 | 369.11             | 427.03 | 505.43 | 632.25 | 73.02                 | 94.44 | 100.85 | 124.61 |
| AD | Colusa County APCD | Summer | 2011 | 369.53             | 427.36 | 505.34 | 632.77 | 73.01                 | 92.76 | 100.79 | 124.78 |
| AD | Colusa County APCD | Summer | 2012 | 369.90             | 427.67 | 505.27 | 633.46 | 73.01                 | 91.49 | 100.76 | 124.99 |
| AD | Colusa County APCD | Summer | 2013 | 370.21             | 427.88 | 505.20 | 634.32 | 73.01                 | 90.33 | 100.78 | 125.24 |
| AD | Colusa County APCD | Summer | 2014 | 370.47             | 427.99 | 505.17 | 635.26 | 73.01                 | 89.10 | 100.78 | 125.48 |
| AD | Colusa County APCD | Summer | 2015 | 370.74             | 428.12 | 505.15 | 636.30 | 73.07                 | 88.20 | 100.70 | 125.75 |
| AD | Colusa County APCD | Summer | 2016 | 370.94             | 428.19 | 505.10 | 637.33 | 73.11                 | 87.13 | 100.69 | 126.03 |
| AD | Colusa County APCD | Summer | 2017 | 371.07             | 428.29 | 505.00 | 638.32 | 73.11                 | 86.50 | 100.69 | 126.31 |
| AD | Colusa County APCD | Summer | 2018 | 371.17             | 428.34 | 504.89 | 639.18 | 73.14                 | 85.83 | 100.67 | 126.58 |
| AD | Colusa County APCD | Summer | 2019 | 371.22             | 428.46 | 504.77 | 639.93 | 73.14                 | 85.43 | 100.69 | 126.82 |
| AD | Colusa County APCD | Summer | 2020 | 371.26             | 428.58 | 504.65 | 640.57 | 73.23                 | 85.29 | 100.77 | 127.05 |
| AD | Colusa County APCD | Summer | 2021 | 371.31             | 428.73 | 504.55 | 641.07 | 73.30                 | 85.37 | 100.83 | 127.21 |
| AD | Colusa County APCD | Summer | 2022 | 371.28             | 428.87 | 504.46 | 641.49 | 73.33                 | 85.43 | 100.88 | 127.34 |
| AD | Colusa County APCD | Summer | 2023 | 371.27             | 429.02 | 504.39 | 641.81 | 73.36                 | 85.52 | 100.91 | 127.52 |
| AD | Colusa County APCD | Summer | 2024 | 371.27             | 429.15 | 504.32 | 642.06 | 73.37                 | 85.59 | 100.94 | 127.69 |
| AD | Colusa County APCD | Summer | 2025 | 371.27             | 429.27 | 504.27 | 642.28 | 73.39                 | 85.65 | 100.97 | 127.86 |
| AD | Colusa County APCD | Summer | 2026 | 371.29             | 429.45 | 504.21 | 642.53 | 73.41                 | 85.73 | 100.99 | 128.02 |
| AD | Colusa County APCD | Summer | 2027 | 371.32             | 429.59 | 504.17 | 642.78 | 73.42                 | 85.79 | 101.00 | 128.16 |
| AD | Colusa County APCD | Summer | 2028 | 371.34             | 429.79 | 504.14 | 643.02 | 73.43                 | 85.86 | 101.01 | 128.30 |
| AD | Colusa County APCD | Summer | 2029 | 371.35             | 429.96 | 504.09 | 643.27 | 73.44                 | 85.92 | 101.01 | 128.42 |
| AD | Colusa County APCD | Summer | 2030 | 371.36             | 430.13 | 504.04 | 643.51 | 73.44                 | 85.97 | 101.00 | 128.54 |
| AD | Colusa County APCD | Summer | 2031 | 371.36             | 430.29 | 504.05 | 643.74 | 73.45                 | 86.03 | 101.00 | 128.66 |
| AD | Colusa County APCD | Summer | 2032 | 371.36             | 430.43 | 504.04 | 643.98 | 73.45                 | 86.08 | 101.00 | 128.77 |
| AD | Colusa County APCD | Summer | 2033 | 371.36             | 430.55 | 504.04 | 644.21 | 73.46                 | 86.13 | 101.01 | 128.87 |
| AD | Colusa County APCD | Summer | 2034 | 371.36             | 430.64 | 504.02 | 644.42 | 73.46                 | 86.17 | 101.01 | 128.96 |
| AD | Colusa County APCD | Summer | 2035 | 371.35             | 430.71 | 504.00 | 644.62 | 73.47                 | 86.21 | 101.01 | 129.05 |
| AD | Colusa County APCD | Winter | 2010 | 325.06             | 382.50 | 448.17 | 558.47 | 73.02                 | 94.44 | 100.85 | 124.61 |
| AD | Colusa County APCD | Winter | 2011 | 325.11             | 381.70 | 447.33 | 559.09 | 73.01                 | 92.76 | 100.79 | 124.78 |
| AD | Colusa County APCD | Winter | 2012 | 325.20             | 381.15 | 446.68 | 559.76 | 73.01                 | 91.49 | 100.76 | 124.99 |
| AD | Colusa County APCD | Winter | 2013 | 325.30             | 380.64 | 446.18 | 560.48 | 73.01                 | 90.33 | 100.78 | 125.24 |
| AD | Colusa County APCD | Winter | 2014 | 325.41             | 380.08 | 445.78 | 561.20 | 73.01                 | 89.10 | 100.78 | 125.48 |
| AD | Colusa County APCD | Winter | 2015 | 325.57             | 379.70 | 445.45 | 561.93 | 73.07                 | 88.20 | 100.70 | 125.75 |
| AD | Colusa County APCD | Winter | 2016 | 325.69             | 379.22 | 445.20 | 562.63 | 73.11                 | 87.13 | 100.69 | 126.03 |
| AD | Colusa County APCD | Winter | 2017 | 325.77             | 378.98 | 445.00 | 563.29 | 73.11                 | 86.50 | 100.69 | 126.31 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Colusa County APCD    | Winter | 2018 | 325.86             | 378.69 | 444.85 | 563.88 | 73.14                 | 85.83 | 100.67 | 126.58 |
| AD | Colusa County APCD    | Winter | 2019 | 325.91             | 378.54 | 444.73 | 564.40 | 73.14                 | 85.43 | 100.69 | 126.82 |
| AD | Colusa County APCD    | Winter | 2020 | 325.96             | 378.43 | 444.64 | 564.86 | 73.23                 | 85.29 | 100.77 | 127.05 |
| AD | Colusa County APCD    | Winter | 2021 | 326.03             | 378.48 | 444.56 | 565.20 | 73.30                 | 85.37 | 100.83 | 127.21 |
| AD | Colusa County APCD    | Winter | 2022 | 326.00             | 378.50 | 444.46 | 565.49 | 73.33                 | 85.43 | 100.88 | 127.34 |
| AD | Colusa County APCD    | Winter | 2023 | 325.99             | 378.59 | 444.38 | 565.73 | 73.36                 | 85.52 | 100.91 | 127.52 |
| AD | Colusa County APCD    | Winter | 2024 | 325.96             | 378.62 | 444.30 | 565.93 | 73.37                 | 85.59 | 100.94 | 127.69 |
| AD | Colusa County APCD    | Winter | 2025 | 325.94             | 378.65 | 444.24 | 566.14 | 73.39                 | 85.65 | 100.97 | 127.86 |
| AD | Colusa County APCD    | Winter | 2026 | 325.95             | 378.74 | 444.15 | 566.35 | 73.41                 | 85.73 | 100.99 | 128.02 |
| AD | Colusa County APCD    | Winter | 2027 | 325.96             | 378.83 | 444.08 | 566.56 | 73.42                 | 85.79 | 101.00 | 128.16 |
| AD | Colusa County APCD    | Winter | 2028 | 325.96             | 378.92 | 444.01 | 566.77 | 73.43                 | 85.86 | 101.01 | 128.30 |
| AD | Colusa County APCD    | Winter | 2029 | 325.97             | 379.01 | 443.92 | 566.97 | 73.44                 | 85.92 | 101.01 | 128.42 |
| AD | Colusa County APCD    | Winter | 2030 | 325.95             | 379.10 | 443.83 | 567.18 | 73.44                 | 85.97 | 101.00 | 128.54 |
| AD | Colusa County APCD    | Winter | 2031 | 325.95             | 379.18 | 443.78 | 567.38 | 73.45                 | 86.03 | 101.00 | 128.66 |
| AD | Colusa County APCD    | Winter | 2032 | 325.95             | 379.27 | 443.73 | 567.59 | 73.45                 | 86.08 | 101.00 | 128.77 |
| AD | Colusa County APCD    | Winter | 2033 | 325.94             | 379.34 | 443.70 | 567.78 | 73.46                 | 86.13 | 101.01 | 128.87 |
| AD | Colusa County APCD    | Winter | 2034 | 325.93             | 379.41 | 443.65 | 567.95 | 73.46                 | 86.17 | 101.01 | 128.96 |
| AD | Colusa County APCD    | Winter | 2035 | 325.92             | 379.46 | 443.62 | 568.10 | 73.47                 | 86.21 | 101.01 | 129.05 |
| AD | El Dorado County APCD | Annual | 2010 | 344.06             | 399.91 | 474.51 | 595.67 | 73.80                 | 87.93 | 100.07 | 125.05 |
| AD | El Dorado County APCD | Annual | 2011 | 344.37             | 400.11 | 474.18 | 596.23 | 73.69                 | 87.21 | 100.08 | 125.19 |
| AD | El Dorado County APCD | Annual | 2012 | 344.66             | 400.37 | 473.92 | 596.88 | 73.60                 | 86.69 | 100.14 | 125.37 |
| AD | El Dorado County APCD | Annual | 2013 | 344.92             | 400.60 | 473.73 | 597.60 | 73.52                 | 86.25 | 100.18 | 125.58 |
| AD | El Dorado County APCD | Annual | 2014 | 345.14             | 400.81 | 473.57 | 598.32 | 73.42                 | 85.86 | 100.22 | 125.79 |
| AD | El Dorado County APCD | Annual | 2015 | 345.36             | 401.02 | 473.47 | 599.08 | 73.39                 | 85.52 | 100.26 | 126.03 |
| AD | El Dorado County APCD | Annual | 2016 | 345.56             | 401.22 | 473.39 | 599.80 | 73.42                 | 85.23 | 100.32 | 126.28 |
| AD | El Dorado County APCD | Annual | 2017 | 345.72             | 401.40 | 473.32 | 600.49 | 73.43                 | 84.98 | 100.35 | 126.52 |
| AD | El Dorado County APCD | Annual | 2018 | 345.84             | 401.56 | 473.26 | 601.09 | 73.41                 | 84.79 | 100.39 | 126.76 |
| AD | El Dorado County APCD | Annual | 2019 | 342.63             | 398.23 | 469.09 | 596.26 | 73.42                 | 84.81 | 100.46 | 126.97 |
| AD | El Dorado County APCD | Annual | 2020 | 342.72             | 398.46 | 469.09 | 596.75 | 73.51                 | 84.90 | 100.55 | 127.17 |
| AD | El Dorado County APCD | Annual | 2021 | 342.78             | 398.68 | 469.12 | 597.13 | 73.59                 | 85.03 | 100.63 | 127.30 |
| AD | El Dorado County APCD | Annual | 2022 | 342.81             | 398.88 | 469.15 | 597.45 | 73.64                 | 85.16 | 100.70 | 127.41 |
| AD | El Dorado County APCD | Annual | 2023 | 342.82             | 399.03 | 469.17 | 597.71 | 73.67                 | 85.26 | 100.75 | 127.57 |
| AD | El Dorado County APCD | Annual | 2024 | 342.83             | 399.18 | 469.16 | 597.94 | 73.69                 | 85.36 | 100.80 | 127.71 |
| AD | El Dorado County APCD | Annual | 2025 | 342.83             | 399.32 | 469.18 | 598.18 | 73.71                 | 85.45 | 100.84 | 127.86 |
| AD | El Dorado County APCD | Annual | 2026 | 342.86             | 399.50 | 469.17 | 598.40 | 73.73                 | 85.55 | 100.88 | 128.01 |
| AD | El Dorado County APCD | Annual | 2027 | 342.87             | 399.67 | 469.18 | 598.61 | 73.74                 | 85.63 | 100.90 | 128.14 |
| AD | El Dorado County APCD | Annual | 2028 | 342.89             | 399.84 | 469.18 | 598.84 | 73.76                 | 85.71 | 100.92 | 128.26 |
| AD | El Dorado County APCD | Annual | 2029 | 342.90             | 400.02 | 469.17 | 599.06 | 73.76                 | 85.79 | 100.93 | 128.37 |
| AD | El Dorado County APCD | Annual | 2030 | 342.92             | 400.19 | 469.17 | 599.30 | 73.77                 | 85.86 | 100.94 | 128.48 |
| AD | El Dorado County APCD | Annual | 2031 | 342.94             | 400.37 | 469.18 | 599.52 | 73.77                 | 85.94 | 100.95 | 128.59 |
| AD | El Dorado County APCD | Annual | 2032 | 342.96             | 400.53 | 469.19 | 599.74 | 73.78                 | 86.00 | 100.95 | 128.70 |
| AD | El Dorado County APCD | Annual | 2033 | 342.97             | 400.67 | 469.20 | 599.95 | 73.78                 | 86.06 | 100.96 | 128.79 |
| AD | El Dorado County APCD | Annual | 2034 | 342.98             | 400.81 | 469.22 | 600.14 | 73.78                 | 86.12 | 100.97 | 128.88 |
| AD | El Dorado County APCD | Annual | 2035 | 342.99             | 400.92 | 469.23 | 600.31 | 73.79                 | 86.17 | 100.97 | 128.97 |
| AD | El Dorado County APCD | Summer | 2010 | 374.54             | 427.96 | 510.75 | 641.98 | 73.80                 | 87.93 | 100.07 | 125.05 |
| AD | El Dorado County APCD | Summer | 2011 | 374.93             | 428.86 | 510.63 | 642.58 | 73.69                 | 87.21 | 100.08 | 125.19 |
| AD | El Dorado County APCD | Summer | 2012 | 375.31             | 429.65 | 510.55 | 643.32 | 73.60                 | 86.69 | 100.14 | 125.37 |
| AD | El Dorado County APCD | Summer | 2013 | 375.65             | 430.31 | 510.52 | 644.16 | 73.52                 | 86.25 | 100.18 | 125.58 |
| AD | El Dorado County APCD | Summer | 2014 | 375.94             | 430.86 | 510.54 | 645.06 | 73.42                 | 85.86 | 100.22 | 125.79 |
| AD | El Dorado County APCD | Summer | 2015 | 376.22             | 431.35 | 510.57 | 646.01 | 73.39                 | 85.52 | 100.26 | 126.03 |
| AD | El Dorado County APCD | Summer | 2016 | 376.46             | 431.78 | 510.61 | 646.90 | 73.42                 | 85.23 | 100.32 | 126.28 |
| AD | El Dorado County APCD | Summer | 2017 | 376.65             | 432.17 | 510.63 | 647.77 | 73.43                 | 84.98 | 100.35 | 126.52 |
| AD | El Dorado County APCD | Summer | 2018 | 376.77             | 432.48 | 510.62 | 648.50 | 73.41                 | 84.79 | 100.39 | 126.76 |
| AD | El Dorado County APCD | Summer | 2019 | 373.21             | 428.93 | 506.01 | 643.20 | 73.42                 | 84.81 | 100.46 | 126.97 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                       |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | El Dorado County APCD | Summer | 2020 | 373.27              | 429.23 | 505.95 | 643.70 | 73.51                 | 84.90 | 100.55 | 127.17 |
| AD | El Dorado County APCD | Summer | 2021 | 373.33              | 429.49 | 505.85 | 644.00 | 73.59                 | 85.03 | 100.63 | 127.30 |
| AD | El Dorado County APCD | Summer | 2022 | 373.37              | 429.73 | 505.76 | 644.26 | 73.64                 | 85.16 | 100.70 | 127.41 |
| AD | El Dorado County APCD | Summer | 2023 | 373.40              | 429.92 | 505.67 | 644.45 | 73.67                 | 85.26 | 100.75 | 127.57 |
| AD | El Dorado County APCD | Summer | 2024 | 373.39              | 430.06 | 505.63 | 644.57 | 73.69                 | 85.36 | 100.80 | 127.71 |
| AD | El Dorado County APCD | Summer | 2025 | 373.41              | 430.22 | 505.59 | 644.69 | 73.71                 | 85.45 | 100.84 | 127.86 |
| AD | El Dorado County APCD | Summer | 2026 | 373.41              | 430.40 | 505.56 | 644.85 | 73.73                 | 85.55 | 100.88 | 128.01 |
| AD | El Dorado County APCD | Summer | 2027 | 373.41              | 430.57 | 505.53 | 645.01 | 73.74                 | 85.63 | 100.90 | 128.14 |
| AD | El Dorado County APCD | Summer | 2028 | 373.41              | 430.76 | 505.51 | 645.18 | 73.76                 | 85.71 | 100.92 | 128.26 |
| AD | El Dorado County APCD | Summer | 2029 | 373.41              | 430.95 | 505.48 | 645.36 | 73.76                 | 85.79 | 100.93 | 128.37 |
| AD | El Dorado County APCD | Summer | 2030 | 373.42              | 431.14 | 505.45 | 645.55 | 73.77                 | 85.86 | 100.94 | 128.48 |
| AD | El Dorado County APCD | Summer | 2031 | 373.41              | 431.34 | 505.42 | 645.79 | 73.77                 | 85.94 | 100.95 | 128.59 |
| AD | El Dorado County APCD | Summer | 2032 | 373.40              | 431.50 | 505.39 | 646.04 | 73.78                 | 86.00 | 100.95 | 128.70 |
| AD | El Dorado County APCD | Summer | 2033 | 373.40              | 431.64 | 505.36 | 646.26 | 73.78                 | 86.06 | 100.96 | 128.79 |
| AD | El Dorado County APCD | Summer | 2034 | 373.40              | 431.76 | 505.33 | 646.48 | 73.78                 | 86.12 | 100.97 | 128.88 |
| AD | El Dorado County APCD | Summer | 2035 | 373.39              | 431.86 | 505.30 | 646.67 | 73.79                 | 86.17 | 100.97 | 128.97 |
| AD | El Dorado County APCD | Winter | 2010 | 336.47              | 392.87 | 465.40 | 584.06 | 73.80                 | 87.93 | 100.07 | 125.05 |
| AD | El Dorado County APCD | Winter | 2011 | 336.76              | 392.90 | 465.02 | 584.60 | 73.69                 | 87.21 | 100.08 | 125.19 |
| AD | El Dorado County APCD | Winter | 2012 | 337.03              | 393.02 | 464.72 | 585.24 | 73.60                 | 86.69 | 100.14 | 125.37 |
| AD | El Dorado County APCD | Winter | 2013 | 337.27              | 393.15 | 464.49 | 585.93 | 73.52                 | 86.25 | 100.18 | 125.58 |
| AD | El Dorado County APCD | Winter | 2014 | 337.47              | 393.27 | 464.28 | 586.60 | 73.42                 | 85.86 | 100.22 | 125.79 |
| AD | El Dorado County APCD | Winter | 2015 | 337.68              | 393.40 | 464.14 | 587.31 | 73.39                 | 85.52 | 100.26 | 126.03 |
| AD | El Dorado County APCD | Winter | 2016 | 337.87              | 393.55 | 464.04 | 587.99 | 73.42                 | 85.23 | 100.32 | 126.28 |
| AD | El Dorado County APCD | Winter | 2017 | 338.02              | 393.68 | 463.94 | 588.63 | 73.43                 | 84.98 | 100.35 | 126.52 |
| AD | El Dorado County APCD | Winter | 2018 | 338.13              | 393.80 | 463.87 | 589.19 | 73.41                 | 84.79 | 100.39 | 126.76 |
| AD | El Dorado County APCD | Winter | 2019 | 335.01              | 390.52 | 459.80 | 584.48 | 73.42                 | 84.81 | 100.46 | 126.97 |
| AD | El Dorado County APCD | Winter | 2020 | 335.11              | 390.72 | 459.82 | 584.96 | 73.51                 | 84.90 | 100.55 | 127.17 |
| AD | El Dorado County APCD | Winter | 2021 | 335.16              | 390.94 | 459.88 | 585.35 | 73.59                 | 85.03 | 100.63 | 127.30 |
| AD | El Dorado County APCD | Winter | 2022 | 335.19              | 391.13 | 459.93 | 585.69 | 73.64                 | 85.16 | 100.70 | 127.41 |
| AD | El Dorado County APCD | Winter | 2023 | 335.21              | 391.27 | 459.97 | 585.96 | 73.67                 | 85.26 | 100.75 | 127.57 |
| AD | El Dorado County APCD | Winter | 2024 | 335.21              | 391.42 | 459.98 | 586.21 | 73.69                 | 85.36 | 100.80 | 127.71 |
| AD | El Dorado County APCD | Winter | 2025 | 335.22              | 391.55 | 460.00 | 586.49 | 73.71                 | 85.45 | 100.84 | 127.86 |
| AD | El Dorado County APCD | Winter | 2026 | 335.25              | 391.72 | 460.01 | 586.71 | 73.73                 | 85.55 | 100.88 | 128.01 |
| AD | El Dorado County APCD | Winter | 2027 | 335.27              | 391.89 | 460.02 | 586.94 | 73.74                 | 85.63 | 100.90 | 128.14 |
| AD | El Dorado County APCD | Winter | 2028 | 335.28              | 392.06 | 460.03 | 587.17 | 73.76                 | 85.71 | 100.92 | 128.26 |
| AD | El Dorado County APCD | Winter | 2029 | 335.30              | 392.23 | 460.02 | 587.41 | 73.76                 | 85.79 | 100.93 | 128.37 |
| AD | El Dorado County APCD | Winter | 2030 | 335.32              | 392.40 | 460.03 | 587.66 | 73.77                 | 85.86 | 100.94 | 128.48 |
| AD | El Dorado County APCD | Winter | 2031 | 335.34              | 392.57 | 460.04 | 587.87 | 73.77                 | 85.94 | 100.95 | 128.59 |
| AD | El Dorado County APCD | Winter | 2032 | 335.37              | 392.73 | 460.07 | 588.09 | 73.78                 | 86.00 | 100.95 | 128.70 |
| AD | El Dorado County APCD | Winter | 2033 | 335.39              | 392.87 | 460.09 | 588.29 | 73.78                 | 86.06 | 100.96 | 128.79 |
| AD | El Dorado County APCD | Winter | 2034 | 335.40              | 393.01 | 460.11 | 588.48 | 73.78                 | 86.12 | 100.97 | 128.88 |
| AD | El Dorado County APCD | Winter | 2035 | 335.42              | 393.13 | 460.13 | 588.64 | 73.79                 | 86.17 | 100.97 | 128.97 |
| AD | Feather River AQMD    | Annual | 2010 | 325.72              | 381.57 | 447.59 | 558.28 | 73.45                 | 93.72 | 100.52 | 124.69 |
| AD | Feather River AQMD    | Annual | 2011 | 325.89              | 381.23 | 447.09 | 559.03 | 73.45                 | 92.05 | 100.47 | 124.90 |
| AD | Feather River AQMD    | Annual | 2012 | 326.09              | 381.01 | 446.71 | 559.86 | 73.48                 | 90.72 | 100.48 | 125.14 |
| AD | Feather River AQMD    | Annual | 2013 | 326.28              | 380.77 | 446.42 | 560.75 | 73.50                 | 89.47 | 100.49 | 125.41 |
| AD | Feather River AQMD    | Annual | 2014 | 326.43              | 380.65 | 446.20 | 561.58 | 73.50                 | 88.61 | 100.49 | 125.69 |
| AD | Feather River AQMD    | Annual | 2015 | 326.61              | 380.45 | 446.03 | 562.43 | 73.55                 | 87.57 | 100.52 | 125.97 |
| AD | Feather River AQMD    | Annual | 2016 | 326.77              | 380.34 | 445.89 | 563.22 | 73.60                 | 86.86 | 100.54 | 126.26 |
| AD | Feather River AQMD    | Annual | 2017 | 326.89              | 380.23 | 445.76 | 563.96 | 73.64                 | 86.15 | 100.56 | 126.55 |
| AD | Feather River AQMD    | Annual | 2018 | 326.97              | 380.11 | 445.66 | 564.59 | 73.65                 | 85.54 | 100.60 | 126.82 |
| AD | Feather River AQMD    | Annual | 2019 | 325.22              | 377.77 | 443.02 | 562.17 | 73.67                 | 85.33 | 100.64 | 127.05 |
| AD | Feather River AQMD    | Annual | 2020 | 325.28              | 377.78 | 442.94 | 562.61 | 73.76                 | 85.29 | 100.71 | 127.27 |
| AD | Feather River AQMD    | Annual | 2021 | 325.33              | 377.89 | 442.88 | 562.95 | 73.83                 | 85.40 | 100.78 | 127.43 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location           | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|--------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                    |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Feather River AQMD | Annual | 2022 | 325.35             | 377.98 | 442.82 | 563.23 | 73.87                 | 85.48 | 100.83 | 127.56 |
| AD | Feather River AQMD | Annual | 2023 | 325.35             | 378.04 | 442.76 | 563.45 | 73.90                 | 85.56 | 100.87 | 127.73 |
| AD | Feather River AQMD | Annual | 2024 | 325.30             | 378.13 | 442.73 | 563.63 | 73.92                 | 85.63 | 100.91 | 127.89 |
| AD | Feather River AQMD | Annual | 2025 | 325.29             | 378.23 | 442.70 | 563.82 | 73.94                 | 85.70 | 100.93 | 128.04 |
| AD | Feather River AQMD | Annual | 2026 | 325.30             | 378.30 | 442.64 | 563.98 | 73.96                 | 85.77 | 100.95 | 128.18 |
| AD | Feather River AQMD | Annual | 2027 | 325.32             | 378.37 | 442.59 | 564.14 | 73.97                 | 85.82 | 100.97 | 128.30 |
| AD | Feather River AQMD | Annual | 2028 | 325.33             | 378.44 | 442.55 | 564.31 | 73.98                 | 85.87 | 100.98 | 128.42 |
| AD | Feather River AQMD | Annual | 2029 | 325.33             | 378.52 | 442.50 | 564.48 | 73.99                 | 85.92 | 100.98 | 128.53 |
| AD | Feather River AQMD | Annual | 2030 | 325.33             | 378.59 | 442.45 | 564.66 | 73.99                 | 85.97 | 100.97 | 128.64 |
| AD | Feather River AQMD | Annual | 2031 | 325.34             | 378.67 | 442.43 | 564.81 | 73.99                 | 86.01 | 100.98 | 128.74 |
| AD | Feather River AQMD | Annual | 2032 | 325.35             | 378.75 | 442.40 | 564.96 | 74.00                 | 86.06 | 100.98 | 128.83 |
| AD | Feather River AQMD | Annual | 2033 | 325.36             | 378.81 | 442.38 | 565.10 | 74.00                 | 86.09 | 100.99 | 128.92 |
| AD | Feather River AQMD | Annual | 2034 | 325.36             | 378.88 | 442.36 | 565.23 | 74.01                 | 86.13 | 100.99 | 129.00 |
| AD | Feather River AQMD | Annual | 2035 | 325.37             | 378.92 | 442.34 | 565.35 | 74.01                 | 86.16 | 100.99 | 129.08 |
| AD | Feather River AQMD | Summer | 2010 | 361.70             | 419.04 | 494.41 | 617.34 | 73.45                 | 93.72 | 100.52 | 124.69 |
| AD | Feather River AQMD | Summer | 2011 | 362.18             | 419.54 | 494.52 | 618.21 | 73.45                 | 92.05 | 100.47 | 124.90 |
| AD | Feather River AQMD | Summer | 2012 | 362.62             | 419.99 | 494.59 | 619.26 | 73.48                 | 90.72 | 100.48 | 125.14 |
| AD | Feather River AQMD | Summer | 2013 | 363.00             | 420.31 | 494.65 | 620.44 | 73.50                 | 89.47 | 100.49 | 125.41 |
| AD | Feather River AQMD | Summer | 2014 | 363.29             | 420.57 | 494.71 | 621.58 | 73.50                 | 88.61 | 100.49 | 125.69 |
| AD | Feather River AQMD | Summer | 2015 | 363.57             | 420.79 | 494.73 | 622.75 | 73.55                 | 87.57 | 100.52 | 125.97 |
| AD | Feather River AQMD | Summer | 2016 | 363.79             | 420.94 | 494.73 | 623.88 | 73.60                 | 86.86 | 100.54 | 126.26 |
| AD | Feather River AQMD | Summer | 2017 | 363.94             | 421.09 | 494.67 | 624.89 | 73.64                 | 86.15 | 100.56 | 126.55 |
| AD | Feather River AQMD | Summer | 2018 | 364.03             | 421.16 | 494.57 | 625.74 | 73.65                 | 85.54 | 100.60 | 126.82 |
| AD | Feather River AQMD | Summer | 2019 | 362.06             | 418.63 | 491.62 | 623.14 | 73.67                 | 85.33 | 100.64 | 127.05 |
| AD | Feather River AQMD | Summer | 2020 | 362.10             | 418.69 | 491.50 | 623.69 | 73.76                 | 85.29 | 100.71 | 127.27 |
| AD | Feather River AQMD | Summer | 2021 | 362.12             | 418.84 | 491.40 | 624.12 | 73.83                 | 85.40 | 100.78 | 127.43 |
| AD | Feather River AQMD | Summer | 2022 | 362.12             | 418.98 | 491.31 | 624.47 | 73.87                 | 85.48 | 100.83 | 127.56 |
| AD | Feather River AQMD | Summer | 2023 | 362.11             | 419.10 | 491.25 | 624.74 | 73.90                 | 85.56 | 100.87 | 127.73 |
| AD | Feather River AQMD | Summer | 2024 | 362.07             | 419.25 | 491.20 | 624.93 | 73.92                 | 85.63 | 100.91 | 127.89 |
| AD | Feather River AQMD | Summer | 2025 | 362.06             | 419.39 | 491.18 | 625.12 | 73.94                 | 85.70 | 100.93 | 128.04 |
| AD | Feather River AQMD | Summer | 2026 | 362.09             | 419.49 | 491.11 | 625.25 | 73.96                 | 85.77 | 100.95 | 128.18 |
| AD | Feather River AQMD | Summer | 2027 | 362.12             | 419.57 | 491.08 | 625.41 | 73.97                 | 85.82 | 100.97 | 128.30 |
| AD | Feather River AQMD | Summer | 2028 | 362.15             | 419.68 | 491.05 | 625.58 | 73.98                 | 85.87 | 100.98 | 128.42 |
| AD | Feather River AQMD | Summer | 2029 | 362.17             | 419.79 | 491.02 | 625.77 | 73.99                 | 85.92 | 100.98 | 128.53 |
| AD | Feather River AQMD | Summer | 2030 | 362.19             | 419.91 | 491.00 | 625.97 | 73.99                 | 85.97 | 100.97 | 128.64 |
| AD | Feather River AQMD | Summer | 2031 | 362.20             | 420.01 | 491.01 | 626.14 | 73.99                 | 86.01 | 100.98 | 128.74 |
| AD | Feather River AQMD | Summer | 2032 | 362.21             | 420.10 | 491.01 | 626.33 | 74.00                 | 86.06 | 100.98 | 128.83 |
| AD | Feather River AQMD | Summer | 2033 | 362.22             | 420.19 | 491.01 | 626.51 | 74.00                 | 86.09 | 100.99 | 128.92 |
| AD | Feather River AQMD | Summer | 2034 | 362.22             | 420.27 | 491.00 | 626.69 | 74.01                 | 86.13 | 100.99 | 129.00 |
| AD | Feather River AQMD | Summer | 2035 | 362.23             | 420.33 | 490.99 | 626.85 | 74.01                 | 86.16 | 100.99 | 129.08 |
| AD | Feather River AQMD | Winter | 2010 | 315.77             | 371.26 | 434.66 | 541.87 | 73.45                 | 93.72 | 100.52 | 124.69 |
| AD | Feather River AQMD | Winter | 2011 | 315.85             | 370.69 | 433.99 | 542.58 | 73.45                 | 92.05 | 100.47 | 124.90 |
| AD | Feather River AQMD | Winter | 2012 | 315.98             | 370.29 | 433.49 | 543.36 | 73.48                 | 90.72 | 100.48 | 125.14 |
| AD | Feather River AQMD | Winter | 2013 | 316.12             | 369.90 | 433.11 | 544.17 | 73.50                 | 89.47 | 100.49 | 125.41 |
| AD | Feather River AQMD | Winter | 2014 | 316.24             | 369.68 | 432.81 | 544.92 | 73.50                 | 88.61 | 100.49 | 125.69 |
| AD | Feather River AQMD | Winter | 2015 | 316.38             | 369.37 | 432.59 | 545.67 | 73.55                 | 87.57 | 100.52 | 125.97 |
| AD | Feather River AQMD | Winter | 2016 | 316.52             | 369.19 | 432.41 | 546.38 | 73.60                 | 86.86 | 100.54 | 126.26 |
| AD | Feather River AQMD | Winter | 2017 | 316.64             | 369.01 | 432.27 | 547.04 | 73.64                 | 86.15 | 100.56 | 126.55 |
| AD | Feather River AQMD | Winter | 2018 | 316.72             | 368.83 | 432.16 | 547.62 | 73.65                 | 85.54 | 100.60 | 126.82 |
| AD | Feather River AQMD | Winter | 2019 | 315.03             | 366.54 | 429.60 | 545.24 | 73.67                 | 85.33 | 100.64 | 127.05 |
| AD | Feather River AQMD | Winter | 2020 | 315.10             | 366.54 | 429.54 | 545.66 | 73.76                 | 85.29 | 100.71 | 127.27 |
| AD | Feather River AQMD | Winter | 2021 | 315.16             | 366.64 | 429.48 | 545.97 | 73.83                 | 85.40 | 100.78 | 127.43 |
| AD | Feather River AQMD | Winter | 2022 | 315.18             | 366.71 | 429.43 | 546.23 | 73.87                 | 85.48 | 100.83 | 127.56 |
| AD | Feather River AQMD | Winter | 2023 | 315.18             | 366.76 | 429.38 | 546.44 | 73.90                 | 85.56 | 100.87 | 127.73 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location           | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |        |        |        |
|----|--------------------|--------|------|---------------------|--------|--------|--------|-----------------------|--------|--------|--------|
|    |                    |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1   | LDT2   | MDV    |
| AD | Feather River AQMD | Winter | 2024 | 315.13              | 366.83 | 429.35 | 546.62 | 73.92                 | 85.63  | 100.91 | 127.89 |
| AD | Feather River AQMD | Winter | 2025 | 315.11              | 366.92 | 429.32 | 546.81 | 73.94                 | 85.70  | 100.93 | 128.04 |
| AD | Feather River AQMD | Winter | 2026 | 315.13              | 366.98 | 429.26 | 546.98 | 73.96                 | 85.77  | 100.95 | 128.18 |
| AD | Feather River AQMD | Winter | 2027 | 315.14              | 367.04 | 429.21 | 547.14 | 73.97                 | 85.82  | 100.97 | 128.30 |
| AD | Feather River AQMD | Winter | 2028 | 315.14              | 367.11 | 429.17 | 547.32 | 73.98                 | 85.87  | 100.98 | 128.42 |
| AD | Feather River AQMD | Winter | 2029 | 315.14              | 367.17 | 429.11 | 547.49 | 73.99                 | 85.92  | 100.98 | 128.53 |
| AD | Feather River AQMD | Winter | 2030 | 315.14              | 367.24 | 429.06 | 547.66 | 73.99                 | 85.97  | 100.97 | 128.64 |
| AD | Feather River AQMD | Winter | 2031 | 315.15              | 367.31 | 429.02 | 547.79 | 73.99                 | 86.01  | 100.98 | 128.74 |
| AD | Feather River AQMD | Winter | 2032 | 315.16              | 367.38 | 428.99 | 547.93 | 74.00                 | 86.06  | 100.98 | 128.83 |
| AD | Feather River AQMD | Winter | 2033 | 315.16              | 367.45 | 428.96 | 548.06 | 74.00                 | 86.09  | 100.99 | 128.92 |
| AD | Feather River AQMD | Winter | 2034 | 315.17              | 367.50 | 428.94 | 548.17 | 74.01                 | 86.13  | 100.99 | 129.00 |
| AD | Feather River AQMD | Winter | 2035 | 315.18              | 367.55 | 428.92 | 548.27 | 74.01                 | 86.16  | 100.99 | 129.08 |
| AD | Glenn County APCD  | Annual | 2010 | 347.61              | 407.24 | 479.18 | 597.47 | 73.80                 | 101.05 | 102.36 | 125.05 |
| AD | Glenn County APCD  | Annual | 2011 | 347.94              | 406.83 | 478.46 | 597.84 | 73.70                 | 98.07  | 102.06 | 125.06 |
| AD | Glenn County APCD  | Annual | 2012 | 348.25              | 406.57 | 477.93 | 598.43 | 73.59                 | 95.83  | 101.82 | 125.13 |
| AD | Glenn County APCD  | Annual | 2013 | 348.56              | 406.34 | 477.52 | 599.20 | 73.54                 | 93.69  | 101.62 | 125.27 |
| AD | Glenn County APCD  | Annual | 2014 | 348.81              | 406.16 | 477.20 | 600.00 | 73.43                 | 91.83  | 101.37 | 125.43 |
| AD | Glenn County APCD  | Annual | 2015 | 349.05              | 406.03 | 476.95 | 600.89 | 73.38                 | 90.19  | 101.22 | 125.64 |
| AD | Glenn County APCD  | Annual | 2016 | 349.27              | 405.92 | 476.74 | 601.81 | 73.41                 | 88.68  | 101.09 | 125.88 |
| AD | Glenn County APCD  | Annual | 2017 | 349.44              | 405.85 | 476.57 | 602.68 | 73.41                 | 87.43  | 101.01 | 126.13 |
| AD | Glenn County APCD  | Annual | 2018 | 349.58              | 405.77 | 476.41 | 603.43 | 73.43                 | 86.26  | 100.91 | 126.38 |
| AD | Glenn County APCD  | Annual | 2019 | 349.68              | 405.76 | 476.29 | 604.10 | 73.46                 | 85.63  | 100.80 | 126.62 |
| AD | Glenn County APCD  | Annual | 2020 | 349.77              | 405.79 | 476.19 | 604.70 | 73.56                 | 85.43  | 100.85 | 126.85 |
| AD | Glenn County APCD  | Annual | 2021 | 349.82              | 405.88 | 476.10 | 605.14 | 73.62                 | 85.50  | 100.90 | 126.97 |
| AD | Glenn County APCD  | Annual | 2022 | 349.86              | 405.97 | 476.01 | 605.47 | 73.68                 | 85.55  | 100.94 | 127.04 |
| AD | Glenn County APCD  | Annual | 2023 | 349.88              | 406.04 | 475.94 | 605.72 | 73.71                 | 85.61  | 100.98 | 127.23 |
| AD | Glenn County APCD  | Annual | 2024 | 349.89              | 406.11 | 475.87 | 605.91 | 73.71                 | 85.66  | 101.00 | 127.41 |
| AD | Glenn County APCD  | Annual | 2025 | 349.89              | 406.19 | 475.82 | 606.12 | 73.72                 | 85.74  | 101.02 | 127.59 |
| AD | Glenn County APCD  | Annual | 2026 | 349.91              | 406.27 | 475.76 | 606.32 | 73.75                 | 85.81  | 101.03 | 127.77 |
| AD | Glenn County APCD  | Annual | 2027 | 349.93              | 406.34 | 475.71 | 606.53 | 73.76                 | 85.87  | 101.03 | 127.93 |
| AD | Glenn County APCD  | Annual | 2028 | 349.94              | 406.42 | 475.66 | 606.74 | 73.77                 | 85.93  | 101.03 | 128.07 |
| AD | Glenn County APCD  | Annual | 2029 | 349.94              | 406.49 | 475.61 | 606.94 | 73.78                 | 85.99  | 101.02 | 128.21 |
| AD | Glenn County APCD  | Annual | 2030 | 349.94              | 406.57 | 475.56 | 607.16 | 73.78                 | 86.04  | 101.01 | 128.34 |
| AD | Glenn County APCD  | Annual | 2031 | 349.94              | 406.64 | 475.55 | 607.42 | 73.79                 | 86.10  | 101.01 | 128.47 |
| AD | Glenn County APCD  | Annual | 2032 | 349.94              | 406.69 | 475.53 | 607.68 | 73.79                 | 86.15  | 101.01 | 128.60 |
| AD | Glenn County APCD  | Annual | 2033 | 349.94              | 406.75 | 475.52 | 607.92 | 73.80                 | 86.19  | 101.01 | 128.71 |
| AD | Glenn County APCD  | Annual | 2034 | 349.94              | 406.79 | 475.50 | 608.14 | 73.80                 | 86.23  | 101.01 | 128.82 |
| AD | Glenn County APCD  | Annual | 2035 | 349.93              | 406.82 | 475.49 | 608.33 | 73.81                 | 86.26  | 101.01 | 128.92 |
| AD | Glenn County APCD  | Summer | 2010 | 384.83              | 445.81 | 527.20 | 657.56 | 73.80                 | 101.05 | 102.36 | 125.05 |
| AD | Glenn County APCD  | Summer | 2011 | 385.51              | 446.50 | 527.25 | 657.84 | 73.70                 | 98.07  | 102.06 | 125.06 |
| AD | Glenn County APCD  | Summer | 2012 | 386.08              | 446.98 | 527.28 | 658.52 | 73.59                 | 95.83  | 101.82 | 125.13 |
| AD | Glenn County APCD  | Summer | 2013 | 386.56              | 447.34 | 527.28 | 659.58 | 73.54                 | 93.69  | 101.62 | 125.27 |
| AD | Glenn County APCD  | Summer | 2014 | 386.94              | 447.60 | 527.29 | 660.69 | 73.43                 | 91.83  | 101.37 | 125.43 |
| AD | Glenn County APCD  | Summer | 2015 | 387.27              | 447.83 | 527.25 | 661.99 | 73.38                 | 90.19  | 101.22 | 125.64 |
| AD | Glenn County APCD  | Summer | 2016 | 387.55              | 448.01 | 527.19 | 663.37 | 73.41                 | 88.68  | 101.09 | 125.88 |
| AD | Glenn County APCD  | Summer | 2017 | 387.74              | 448.13 | 527.06 | 664.65 | 73.41                 | 87.43  | 101.01 | 126.13 |
| AD | Glenn County APCD  | Summer | 2018 | 387.86              | 448.22 | 526.91 | 665.76 | 73.43                 | 86.26  | 100.91 | 126.38 |
| AD | Glenn County APCD  | Summer | 2019 | 387.96              | 448.30 | 526.79 | 666.74 | 73.46                 | 85.63  | 100.80 | 126.62 |
| AD | Glenn County APCD  | Summer | 2020 | 388.02              | 448.37 | 526.65 | 667.59 | 73.56                 | 85.43  | 100.85 | 126.85 |
| AD | Glenn County APCD  | Summer | 2021 | 388.06              | 448.51 | 526.53 | 668.25 | 73.62                 | 85.50  | 100.90 | 126.97 |
| AD | Glenn County APCD  | Summer | 2022 | 388.09              | 448.64 | 526.43 | 668.76 | 73.68                 | 85.55  | 100.94 | 127.04 |
| AD | Glenn County APCD  | Summer | 2023 | 388.10              | 448.75 | 526.35 | 669.12 | 73.71                 | 85.61  | 100.98 | 127.23 |
| AD | Glenn County APCD  | Summer | 2024 | 388.12              | 448.88 | 526.29 | 669.37 | 73.71                 | 85.66  | 101.00 | 127.41 |
| AD | Glenn County APCD  | Summer | 2025 | 388.13              | 449.00 | 526.24 | 669.61 | 73.72                 | 85.74  | 101.02 | 127.59 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location          | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |        |        |        |
|----|-------------------|--------|------|--------------------|--------|--------|--------|-----------------------|--------|--------|--------|
|    |                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1   | LDT2   | MDV    |
| AD | Glenn County APCD | Summer | 2026 | 388.17             | 449.13 | 526.19 | 669.78 | 73.75                 | 85.81  | 101.03 | 127.77 |
| AD | Glenn County APCD | Summer | 2027 | 388.21             | 449.21 | 526.15 | 669.97 | 73.76                 | 85.87  | 101.03 | 127.93 |
| AD | Glenn County APCD | Summer | 2028 | 388.24             | 449.33 | 526.12 | 670.17 | 73.77                 | 85.93  | 101.03 | 128.07 |
| AD | Glenn County APCD | Summer | 2029 | 388.26             | 449.45 | 526.10 | 670.39 | 73.78                 | 85.99  | 101.02 | 128.21 |
| AD | Glenn County APCD | Summer | 2030 | 388.28             | 449.57 | 526.08 | 670.64 | 73.78                 | 86.04  | 101.01 | 128.34 |
| AD | Glenn County APCD | Summer | 2031 | 388.27             | 449.67 | 526.12 | 670.94 | 73.79                 | 86.10  | 101.01 | 128.47 |
| AD | Glenn County APCD | Summer | 2032 | 388.27             | 449.74 | 526.13 | 671.26 | 73.79                 | 86.15  | 101.01 | 128.60 |
| AD | Glenn County APCD | Summer | 2033 | 388.26             | 449.81 | 526.14 | 671.55 | 73.80                 | 86.19  | 101.01 | 128.71 |
| AD | Glenn County APCD | Summer | 2034 | 388.25             | 449.85 | 526.14 | 671.85 | 73.80                 | 86.23  | 101.01 | 128.82 |
| AD | Glenn County APCD | Summer | 2035 | 388.24             | 449.87 | 526.13 | 672.11 | 73.81                 | 86.26  | 101.01 | 128.92 |
| AD | Glenn County APCD | Winter | 2010 | 335.44             | 394.64 | 463.49 | 577.83 | 73.80                 | 101.05 | 102.36 | 125.05 |
| AD | Glenn County APCD | Winter | 2011 | 335.66             | 393.87 | 462.51 | 578.23 | 73.70                 | 98.07  | 102.06 | 125.06 |
| AD | Glenn County APCD | Winter | 2012 | 335.89             | 393.37 | 461.80 | 578.79 | 73.59                 | 95.83  | 101.82 | 125.13 |
| AD | Glenn County APCD | Winter | 2013 | 336.14             | 392.94 | 461.25 | 579.47 | 73.54                 | 93.69  | 101.62 | 125.27 |
| AD | Glenn County APCD | Winter | 2014 | 336.35             | 392.62 | 460.83 | 580.17 | 73.43                 | 91.83  | 101.37 | 125.43 |
| AD | Glenn County APCD | Winter | 2015 | 336.56             | 392.37 | 460.51 | 580.92 | 73.38                 | 90.19  | 101.22 | 125.64 |
| AD | Glenn County APCD | Winter | 2016 | 336.76             | 392.17 | 460.25 | 581.69 | 73.41                 | 88.68  | 101.09 | 125.88 |
| AD | Glenn County APCD | Winter | 2017 | 336.93             | 392.03 | 460.06 | 582.43 | 73.41                 | 87.43  | 101.01 | 126.13 |
| AD | Glenn County APCD | Winter | 2018 | 337.06             | 391.89 | 459.91 | 583.06 | 73.43                 | 86.26  | 100.91 | 126.38 |
| AD | Glenn County APCD | Winter | 2019 | 337.18             | 391.86 | 459.79 | 583.63 | 73.46                 | 85.63  | 100.80 | 126.62 |
| AD | Glenn County APCD | Winter | 2020 | 337.27             | 391.87 | 459.70 | 584.15 | 73.56                 | 85.43  | 100.85 | 126.85 |
| AD | Glenn County APCD | Winter | 2021 | 337.33             | 391.95 | 459.61 | 584.51 | 73.62                 | 85.50  | 100.90 | 126.97 |
| AD | Glenn County APCD | Winter | 2022 | 337.37             | 392.02 | 459.54 | 584.78 | 73.68                 | 85.55  | 100.94 | 127.04 |
| AD | Glenn County APCD | Winter | 2023 | 337.39             | 392.08 | 459.47 | 585.00 | 73.71                 | 85.61  | 100.98 | 127.23 |
| AD | Glenn County APCD | Winter | 2024 | 337.39             | 392.13 | 459.40 | 585.17 | 73.71                 | 85.66  | 101.00 | 127.41 |
| AD | Glenn County APCD | Winter | 2025 | 337.39             | 392.20 | 459.34 | 585.37 | 73.72                 | 85.74  | 101.02 | 127.59 |
| AD | Glenn County APCD | Winter | 2026 | 337.41             | 392.27 | 459.27 | 585.58 | 73.75                 | 85.81  | 101.03 | 127.77 |
| AD | Glenn County APCD | Winter | 2027 | 337.42             | 392.32 | 459.22 | 585.80 | 73.76                 | 85.87  | 101.03 | 127.93 |
| AD | Glenn County APCD | Winter | 2028 | 337.42             | 392.39 | 459.16 | 586.00 | 73.77                 | 85.93  | 101.03 | 128.07 |
| AD | Glenn County APCD | Winter | 2029 | 337.42             | 392.46 | 459.10 | 586.21 | 73.78                 | 85.99  | 101.02 | 128.21 |
| AD | Glenn County APCD | Winter | 2030 | 337.42             | 392.52 | 459.05 | 586.42 | 73.78                 | 86.04  | 101.01 | 128.34 |
| AD | Glenn County APCD | Winter | 2031 | 337.42             | 392.58 | 459.02 | 586.66 | 73.79                 | 86.10  | 101.01 | 128.47 |
| AD | Glenn County APCD | Winter | 2032 | 337.42             | 392.63 | 459.00 | 586.91 | 73.79                 | 86.15  | 101.01 | 128.60 |
| AD | Glenn County APCD | Winter | 2033 | 337.41             | 392.67 | 458.97 | 587.13 | 73.80                 | 86.19  | 101.01 | 128.71 |
| AD | Glenn County APCD | Winter | 2034 | 337.41             | 392.71 | 458.95 | 587.32 | 73.80                 | 86.23  | 101.01 | 128.82 |
| AD | Glenn County APCD | Winter | 2035 | 337.41             | 392.75 | 458.94 | 587.49 | 73.81                 | 86.26  | 101.01 | 128.92 |
| AD | Great Basin UAPCD | Annual | 2010 | 351.71             | 410.12 | 479.62 | 598.88 | 74.54                 | 91.99  | 101.41 | 124.88 |
| AD | Great Basin UAPCD | Annual | 2011 | 351.58             | 409.65 | 479.10 | 599.56 | 74.30                 | 90.81  | 101.24 | 125.01 |
| AD | Great Basin UAPCD | Annual | 2012 | 351.55             | 409.23 | 478.69 | 600.33 | 74.12                 | 89.78  | 101.13 | 125.19 |
| AD | Great Basin UAPCD | Annual | 2013 | 351.50             | 408.84 | 478.36 | 601.12 | 73.86                 | 88.90  | 101.03 | 125.40 |
| AD | Great Basin UAPCD | Annual | 2014 | 351.45             | 408.49 | 478.12 | 601.90 | 73.59                 | 88.09  | 100.88 | 125.62 |
| AD | Great Basin UAPCD | Annual | 2015 | 351.50             | 408.21 | 477.92 | 602.74 | 73.49                 | 87.37  | 100.88 | 125.86 |
| AD | Great Basin UAPCD | Annual | 2016 | 351.62             | 407.99 | 477.76 | 603.56 | 73.49                 | 86.82  | 100.85 | 126.11 |
| AD | Great Basin UAPCD | Annual | 2017 | 351.64             | 407.78 | 477.63 | 604.31 | 73.40                 | 86.29  | 100.83 | 126.37 |
| AD | Great Basin UAPCD | Annual | 2018 | 351.66             | 407.60 | 477.52 | 604.96 | 73.33                 | 85.85  | 100.80 | 126.61 |
| AD | Great Basin UAPCD | Annual | 2019 | 351.69             | 407.52 | 477.42 | 605.53 | 73.29                 | 85.59  | 100.75 | 126.84 |
| AD | Great Basin UAPCD | Annual | 2020 | 351.72             | 407.45 | 477.34 | 606.03 | 73.36                 | 85.50  | 100.79 | 127.06 |
| AD | Great Basin UAPCD | Annual | 2021 | 351.66             | 407.35 | 477.26 | 606.36 | 73.36                 | 85.50  | 100.84 | 127.21 |
| AD | Great Basin UAPCD | Annual | 2022 | 351.57             | 407.28 | 477.17 | 606.67 | 73.35                 | 85.52  | 100.88 | 127.36 |
| AD | Great Basin UAPCD | Annual | 2023 | 351.48             | 407.18 | 477.10 | 606.89 | 73.33                 | 85.53  | 100.90 | 127.53 |
| AD | Great Basin UAPCD | Annual | 2024 | 351.41             | 407.09 | 477.03 | 607.04 | 73.32                 | 85.55  | 100.92 | 127.69 |
| AD | Great Basin UAPCD | Annual | 2025 | 351.37             | 407.16 | 477.00 | 607.21 | 73.31                 | 85.62  | 100.95 | 127.84 |
| AD | Great Basin UAPCD | Annual | 2026 | 351.39             | 407.29 | 476.94 | 607.42 | 73.33                 | 85.71  | 100.97 | 127.99 |
| AD | Great Basin UAPCD | Annual | 2027 | 351.40             | 407.43 | 476.89 | 607.63 | 73.34                 | 85.79  | 100.99 | 128.14 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location          | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Great Basin UAPCD | Annual | 2028 | 351.40             | 407.56 | 476.84 | 607.84 | 73.35                 | 85.87 | 101.00 | 128.27 |
| AD | Great Basin UAPCD | Annual | 2029 | 351.39             | 407.69 | 476.77 | 608.06 | 73.36                 | 85.94 | 101.00 | 128.39 |
| AD | Great Basin UAPCD | Annual | 2030 | 351.38             | 407.82 | 476.71 | 608.27 | 73.36                 | 86.00 | 101.00 | 128.51 |
| AD | Great Basin UAPCD | Annual | 2031 | 351.38             | 407.96 | 476.68 | 608.50 | 73.36                 | 86.07 | 101.01 | 128.63 |
| AD | Great Basin UAPCD | Annual | 2032 | 351.38             | 408.09 | 476.65 | 608.73 | 73.37                 | 86.13 | 101.01 | 128.74 |
| AD | Great Basin UAPCD | Annual | 2033 | 351.38             | 408.21 | 476.62 | 608.94 | 73.37                 | 86.18 | 101.01 | 128.84 |
| AD | Great Basin UAPCD | Annual | 2034 | 351.37             | 408.32 | 476.60 | 609.12 | 73.38                 | 86.23 | 101.02 | 128.94 |
| AD | Great Basin UAPCD | Annual | 2035 | 351.37             | 408.41 | 476.58 | 609.28 | 73.38                 | 86.28 | 101.02 | 129.02 |
| AD | Great Basin UAPCD | Summer | 2010 | 368.80             | 426.31 | 499.33 | 622.32 | 74.54                 | 91.99 | 101.41 | 124.88 |
| AD | Great Basin UAPCD | Summer | 2011 | 368.81             | 426.47 | 498.98 | 623.07 | 74.30                 | 90.81 | 101.24 | 125.01 |
| AD | Great Basin UAPCD | Summer | 2012 | 368.86             | 426.56 | 498.74 | 623.95 | 74.12                 | 89.78 | 101.13 | 125.19 |
| AD | Great Basin UAPCD | Summer | 2013 | 368.89             | 426.59 | 498.57 | 624.87 | 73.86                 | 88.90 | 101.03 | 125.40 |
| AD | Great Basin UAPCD | Summer | 2014 | 368.92             | 426.59 | 498.50 | 625.78 | 73.59                 | 88.09 | 100.88 | 125.62 |
| AD | Great Basin UAPCD | Summer | 2015 | 369.01             | 426.63 | 498.39 | 626.79 | 73.49                 | 87.37 | 100.88 | 125.86 |
| AD | Great Basin UAPCD | Summer | 2016 | 369.15             | 426.65 | 498.34 | 627.79 | 73.49                 | 86.82 | 100.85 | 126.11 |
| AD | Great Basin UAPCD | Summer | 2017 | 369.19             | 426.65 | 498.29 | 628.71 | 73.40                 | 86.29 | 100.83 | 126.37 |
| AD | Great Basin UAPCD | Summer | 2018 | 369.21             | 426.63 | 498.22 | 629.47 | 73.33                 | 85.85 | 100.80 | 126.61 |
| AD | Great Basin UAPCD | Summer | 2019 | 369.25             | 426.71 | 498.16 | 630.15 | 73.29                 | 85.59 | 100.75 | 126.84 |
| AD | Great Basin UAPCD | Summer | 2020 | 369.30             | 426.76 | 498.11 | 630.75 | 73.36                 | 85.50 | 100.79 | 127.06 |
| AD | Great Basin UAPCD | Summer | 2021 | 369.22             | 426.73 | 498.07 | 631.17 | 73.36                 | 85.50 | 100.84 | 127.21 |
| AD | Great Basin UAPCD | Summer | 2022 | 369.14             | 426.72 | 498.03 | 631.56 | 73.35                 | 85.52 | 100.88 | 127.36 |
| AD | Great Basin UAPCD | Summer | 2023 | 369.04             | 426.67 | 498.01 | 631.85 | 73.33                 | 85.53 | 100.90 | 127.53 |
| AD | Great Basin UAPCD | Summer | 2024 | 368.98             | 426.64 | 498.01 | 632.03 | 73.32                 | 85.55 | 100.92 | 127.69 |
| AD | Great Basin UAPCD | Summer | 2025 | 368.96             | 426.73 | 498.02 | 632.24 | 73.31                 | 85.62 | 100.95 | 127.84 |
| AD | Great Basin UAPCD | Summer | 2026 | 368.99             | 426.89 | 497.97 | 632.46 | 73.33                 | 85.71 | 100.97 | 127.99 |
| AD | Great Basin UAPCD | Summer | 2027 | 369.03             | 427.08 | 497.94 | 632.69 | 73.34                 | 85.79 | 100.99 | 128.14 |
| AD | Great Basin UAPCD | Summer | 2028 | 369.05             | 427.25 | 497.90 | 632.94 | 73.35                 | 85.87 | 101.00 | 128.27 |
| AD | Great Basin UAPCD | Summer | 2029 | 369.06             | 427.42 | 497.85 | 633.19 | 73.36                 | 85.94 | 101.00 | 128.39 |
| AD | Great Basin UAPCD | Summer | 2030 | 369.07             | 427.57 | 497.80 | 633.43 | 73.36                 | 86.00 | 101.00 | 128.51 |
| AD | Great Basin UAPCD | Summer | 2031 | 369.06             | 427.77 | 497.77 | 633.69 | 73.36                 | 86.07 | 101.01 | 128.63 |
| AD | Great Basin UAPCD | Summer | 2032 | 369.06             | 427.93 | 497.74 | 633.93 | 73.37                 | 86.13 | 101.01 | 128.74 |
| AD | Great Basin UAPCD | Summer | 2033 | 369.06             | 428.08 | 497.72 | 634.18 | 73.37                 | 86.18 | 101.01 | 128.84 |
| AD | Great Basin UAPCD | Summer | 2034 | 369.05             | 428.21 | 497.70 | 634.38 | 73.38                 | 86.23 | 101.02 | 128.94 |
| AD | Great Basin UAPCD | Summer | 2035 | 369.04             | 428.32 | 497.68 | 634.56 | 73.38                 | 86.28 | 101.02 | 129.02 |
| AD | Great Basin UAPCD | Winter | 2010 | 367.72             | 425.30 | 498.12 | 620.89 | 74.54                 | 91.99 | 101.41 | 124.88 |
| AD | Great Basin UAPCD | Winter | 2011 | 367.73             | 425.41 | 497.76 | 621.64 | 74.30                 | 90.81 | 101.24 | 125.01 |
| AD | Great Basin UAPCD | Winter | 2012 | 367.77             | 425.48 | 497.51 | 622.51 | 74.12                 | 89.78 | 101.13 | 125.19 |
| AD | Great Basin UAPCD | Winter | 2013 | 367.80             | 425.47 | 497.33 | 623.43 | 73.86                 | 88.90 | 101.03 | 125.40 |
| AD | Great Basin UAPCD | Winter | 2014 | 367.82             | 425.45 | 497.25 | 624.33 | 73.59                 | 88.09 | 100.88 | 125.62 |
| AD | Great Basin UAPCD | Winter | 2015 | 367.92             | 425.48 | 497.13 | 625.32 | 73.49                 | 87.37 | 100.88 | 125.86 |
| AD | Great Basin UAPCD | Winter | 2016 | 368.05             | 425.48 | 497.08 | 626.32 | 73.49                 | 86.82 | 100.85 | 126.11 |
| AD | Great Basin UAPCD | Winter | 2017 | 368.09             | 425.46 | 497.03 | 627.23 | 73.40                 | 86.29 | 100.83 | 126.37 |
| AD | Great Basin UAPCD | Winter | 2018 | 368.11             | 425.44 | 496.95 | 627.98 | 73.33                 | 85.85 | 100.80 | 126.61 |
| AD | Great Basin UAPCD | Winter | 2019 | 368.14             | 425.50 | 496.89 | 628.66 | 73.29                 | 85.59 | 100.75 | 126.84 |
| AD | Great Basin UAPCD | Winter | 2020 | 368.19             | 425.55 | 496.84 | 629.25 | 73.36                 | 85.50 | 100.79 | 127.06 |
| AD | Great Basin UAPCD | Winter | 2021 | 368.12             | 425.51 | 496.80 | 629.66 | 73.36                 | 85.50 | 100.84 | 127.21 |
| AD | Great Basin UAPCD | Winter | 2022 | 368.04             | 425.50 | 496.75 | 630.05 | 73.35                 | 85.52 | 100.88 | 127.36 |
| AD | Great Basin UAPCD | Winter | 2023 | 367.94             | 425.45 | 496.73 | 630.33 | 73.33                 | 85.53 | 100.90 | 127.53 |
| AD | Great Basin UAPCD | Winter | 2024 | 367.88             | 425.41 | 496.72 | 630.51 | 73.32                 | 85.55 | 100.92 | 127.69 |
| AD | Great Basin UAPCD | Winter | 2025 | 367.85             | 425.50 | 496.73 | 630.71 | 73.31                 | 85.62 | 100.95 | 127.84 |
| AD | Great Basin UAPCD | Winter | 2026 | 367.89             | 425.66 | 496.68 | 630.94 | 73.33                 | 85.71 | 100.97 | 127.99 |
| AD | Great Basin UAPCD | Winter | 2027 | 367.93             | 425.85 | 496.65 | 631.16 | 73.34                 | 85.79 | 100.99 | 128.14 |
| AD | Great Basin UAPCD | Winter | 2028 | 367.95             | 426.02 | 496.61 | 631.41 | 73.35                 | 85.87 | 101.00 | 128.27 |
| AD | Great Basin UAPCD | Winter | 2029 | 367.95             | 426.19 | 496.56 | 631.66 | 73.36                 | 85.94 | 101.00 | 128.39 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Great Basin UAPCD    | Winter | 2030 | 367.96              | 426.33 | 496.51 | 631.90 | 73.36                 | 86.00 | 101.00 | 128.51 |
| AD | Great Basin UAPCD    | Winter | 2031 | 367.95              | 426.53 | 496.47 | 632.15 | 73.36                 | 86.07 | 101.01 | 128.63 |
| AD | Great Basin UAPCD    | Winter | 2032 | 367.95              | 426.69 | 496.45 | 632.40 | 73.37                 | 86.13 | 101.01 | 128.74 |
| AD | Great Basin UAPCD    | Winter | 2033 | 367.95              | 426.84 | 496.42 | 632.64 | 73.37                 | 86.18 | 101.01 | 128.84 |
| AD | Great Basin UAPCD    | Winter | 2034 | 367.94              | 426.96 | 496.41 | 632.84 | 73.38                 | 86.23 | 101.02 | 128.94 |
| AD | Great Basin UAPCD    | Winter | 2035 | 367.94              | 427.07 | 496.38 | 633.02 | 73.38                 | 86.28 | 101.02 | 129.02 |
| AD | Imperial County APCD | Annual | 2010 | 333.06              | 382.51 | 456.21 | 575.78 | 72.99                 | 86.06 | 100.65 | 125.48 |
| AD | Imperial County APCD | Annual | 2011 | 332.74              | 382.65 | 455.12 | 575.21 | 73.04                 | 85.73 | 100.60 | 125.71 |
| AD | Imperial County APCD | Annual | 2012 | 333.03              | 383.36 | 454.93 | 575.79 | 73.14                 | 85.50 | 100.60 | 125.97 |
| AD | Imperial County APCD | Annual | 2013 | 331.75              | 382.30 | 452.68 | 573.90 | 73.23                 | 85.37 | 100.58 | 126.29 |
| AD | Imperial County APCD | Annual | 2014 | 331.98              | 382.91 | 452.61 | 574.66 | 73.31                 | 85.29 | 100.59 | 126.61 |
| AD | Imperial County APCD | Annual | 2015 | 327.26              | 377.77 | 445.90 | 566.93 | 73.39                 | 85.24 | 100.62 | 126.91 |
| AD | Imperial County APCD | Annual | 2016 | 327.36              | 378.16 | 445.86 | 567.56 | 73.41                 | 85.18 | 100.65 | 127.20 |
| AD | Imperial County APCD | Annual | 2017 | 327.39              | 378.50 | 445.81 | 568.11 | 73.41                 | 85.15 | 100.65 | 127.47 |
| AD | Imperial County APCD | Annual | 2018 | 327.40              | 378.76 | 445.76 | 568.55 | 73.39                 | 85.16 | 100.65 | 127.71 |
| AD | Imperial County APCD | Annual | 2019 | 327.23              | 378.80 | 445.47 | 568.62 | 73.39                 | 85.24 | 100.69 | 127.93 |
| AD | Imperial County APCD | Annual | 2020 | 327.21              | 379.01 | 445.41 | 568.92 | 73.41                 | 85.34 | 100.76 | 128.13 |
| AD | Imperial County APCD | Annual | 2021 | 327.15              | 379.11 | 445.34 | 569.08 | 73.42                 | 85.44 | 100.80 | 128.28 |
| AD | Imperial County APCD | Annual | 2022 | 327.03              | 379.19 | 445.26 | 569.20 | 73.39                 | 85.52 | 100.84 | 128.40 |
| AD | Imperial County APCD | Annual | 2023 | 326.91              | 379.26 | 445.18 | 569.30 | 73.35                 | 85.60 | 100.87 | 128.53 |
| AD | Imperial County APCD | Annual | 2024 | 329.56              | 382.51 | 448.87 | 574.16 | 73.32                 | 85.66 | 100.89 | 128.63 |
| AD | Imperial County APCD | Annual | 2025 | 329.46              | 382.58 | 448.83 | 574.22 | 73.28                 | 85.73 | 100.92 | 128.73 |
| AD | Imperial County APCD | Annual | 2026 | 329.42              | 382.67 | 448.77 | 574.27 | 73.26                 | 85.80 | 100.94 | 128.82 |
| AD | Imperial County APCD | Annual | 2027 | 329.39              | 382.76 | 448.73 | 574.32 | 73.24                 | 85.86 | 100.95 | 128.90 |
| AD | Imperial County APCD | Annual | 2028 | 329.37              | 382.86 | 448.71 | 574.39 | 73.23                 | 85.92 | 100.96 | 128.97 |
| AD | Imperial County APCD | Annual | 2029 | 329.36              | 382.96 | 448.68 | 574.47 | 73.21                 | 85.97 | 100.96 | 129.04 |
| AD | Imperial County APCD | Annual | 2030 | 329.34              | 383.07 | 448.66 | 574.55 | 73.20                 | 86.02 | 100.97 | 129.10 |
| AD | Imperial County APCD | Annual | 2031 | 329.66              | 383.57 | 449.13 | 575.24 | 73.19                 | 86.07 | 100.97 | 129.15 |
| AD | Imperial County APCD | Annual | 2032 | 329.64              | 383.67 | 449.12 | 575.31 | 73.18                 | 86.11 | 100.97 | 129.21 |
| AD | Imperial County APCD | Annual | 2033 | 329.63              | 383.75 | 449.11 | 575.38 | 73.18                 | 86.15 | 100.98 | 129.26 |
| AD | Imperial County APCD | Annual | 2034 | 329.63              | 383.82 | 449.11 | 575.45 | 73.18                 | 86.19 | 100.98 | 129.30 |
| AD | Imperial County APCD | Annual | 2035 | 329.62              | 383.88 | 449.10 | 575.52 | 73.18                 | 86.22 | 100.98 | 129.34 |
| AD | Imperial County APCD | Summer | 2010 | 341.49              | 391.06 | 467.38 | 590.08 | 72.99                 | 86.06 | 100.65 | 125.48 |
| AD | Imperial County APCD | Summer | 2011 | 341.29              | 391.47 | 466.40 | 589.55 | 73.04                 | 85.73 | 100.60 | 125.71 |
| AD | Imperial County APCD | Summer | 2012 | 341.64              | 392.37 | 466.28 | 590.14 | 73.14                 | 85.50 | 100.60 | 125.97 |
| AD | Imperial County APCD | Summer | 2013 | 340.37              | 391.46 | 464.05 | 588.24 | 73.23                 | 85.37 | 100.58 | 126.29 |
| AD | Imperial County APCD | Summer | 2014 | 340.64              | 392.20 | 464.05 | 589.07 | 73.31                 | 85.29 | 100.59 | 126.61 |
| AD | Imperial County APCD | Summer | 2015 | 335.82              | 387.05 | 457.23 | 581.20 | 73.39                 | 85.24 | 100.62 | 126.91 |
| AD | Imperial County APCD | Summer | 2016 | 335.93              | 387.53 | 457.23 | 581.90 | 73.41                 | 85.18 | 100.65 | 127.20 |
| AD | Imperial County APCD | Summer | 2017 | 335.98              | 387.93 | 457.21 | 582.52 | 73.41                 | 85.15 | 100.65 | 127.47 |
| AD | Imperial County APCD | Summer | 2018 | 335.99              | 388.23 | 457.17 | 583.00 | 73.39                 | 85.16 | 100.65 | 127.71 |
| AD | Imperial County APCD | Summer | 2019 | 335.83              | 388.32 | 456.89 | 583.10 | 73.39                 | 85.24 | 100.69 | 127.93 |
| AD | Imperial County APCD | Summer | 2020 | 335.80              | 388.55 | 456.83 | 583.42 | 73.41                 | 85.34 | 100.76 | 128.13 |
| AD | Imperial County APCD | Summer | 2021 | 335.69              | 388.62 | 456.70 | 583.51 | 73.42                 | 85.44 | 100.80 | 128.28 |
| AD | Imperial County APCD | Summer | 2022 | 335.56              | 388.70 | 456.60 | 583.62 | 73.39                 | 85.52 | 100.84 | 128.40 |
| AD | Imperial County APCD | Summer | 2023 | 335.42              | 388.78 | 456.51 | 583.70 | 73.35                 | 85.60 | 100.87 | 128.53 |
| AD | Imperial County APCD | Summer | 2024 | 338.10              | 392.07 | 460.23 | 588.61 | 73.32                 | 85.66 | 100.89 | 128.63 |
| AD | Imperial County APCD | Summer | 2025 | 338.00              | 392.15 | 460.18 | 588.66 | 73.28                 | 85.73 | 100.92 | 128.73 |
| AD | Imperial County APCD | Summer | 2026 | 337.95              | 392.24 | 460.11 | 588.69 | 73.26                 | 85.80 | 100.94 | 128.82 |
| AD | Imperial County APCD | Summer | 2027 | 337.92              | 392.33 | 460.07 | 588.73 | 73.24                 | 85.86 | 100.95 | 128.90 |
| AD | Imperial County APCD | Summer | 2028 | 337.91              | 392.44 | 460.04 | 588.80 | 73.23                 | 85.92 | 100.96 | 128.97 |
| AD | Imperial County APCD | Summer | 2029 | 337.90              | 392.56 | 460.02 | 588.88 | 73.21                 | 85.97 | 100.96 | 129.04 |
| AD | Imperial County APCD | Summer | 2030 | 337.89              | 392.68 | 460.00 | 588.96 | 73.20                 | 86.02 | 100.97 | 129.10 |
| AD | Imperial County APCD | Summer | 2031 | 338.20              | 393.18 | 460.46 | 589.62 | 73.19                 | 86.07 | 100.97 | 129.15 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Imperial County APCD | Summer | 2032 | 338.17             | 393.28 | 460.45 | 589.69 | 73.18                 | 86.11 | 100.97 | 129.21 |
| AD | Imperial County APCD | Summer | 2033 | 338.16             | 393.37 | 460.44 | 589.76 | 73.18                 | 86.15 | 100.98 | 129.26 |
| AD | Imperial County APCD | Summer | 2034 | 338.16             | 393.45 | 460.44 | 589.84 | 73.18                 | 86.19 | 100.98 | 129.30 |
| AD | Imperial County APCD | Summer | 2035 | 338.15             | 393.51 | 460.44 | 589.91 | 73.18                 | 86.22 | 100.98 | 129.34 |
| AD | Imperial County APCD | Winter | 2010 | 314.45             | 363.62 | 431.53 | 544.19 | 72.99                 | 86.06 | 100.65 | 125.48 |
| AD | Imperial County APCD | Winter | 2011 | 313.97             | 363.27 | 430.33 | 543.72 | 73.04                 | 85.73 | 100.60 | 125.71 |
| AD | Imperial County APCD | Winter | 2012 | 314.13             | 363.55 | 430.01 | 544.27 | 73.14                 | 85.50 | 100.60 | 125.97 |
| AD | Imperial County APCD | Winter | 2013 | 312.79             | 362.16 | 427.68 | 542.37 | 73.23                 | 85.37 | 100.58 | 126.29 |
| AD | Imperial County APCD | Winter | 2014 | 312.93             | 362.45 | 427.46 | 542.97 | 73.31                 | 85.29 | 100.59 | 126.61 |
| AD | Imperial County APCD | Winter | 2015 | 308.44             | 357.38 | 421.00 | 535.54 | 73.39                 | 85.24 | 100.62 | 126.91 |
| AD | Imperial County APCD | Winter | 2016 | 308.50             | 357.58 | 420.87 | 536.02 | 73.41                 | 85.18 | 100.65 | 127.20 |
| AD | Imperial County APCD | Winter | 2017 | 308.52             | 357.77 | 420.75 | 536.45 | 73.41                 | 85.15 | 100.65 | 127.47 |
| AD | Imperial County APCD | Winter | 2018 | 308.53             | 357.93 | 420.67 | 536.81 | 73.39                 | 85.16 | 100.65 | 127.71 |
| AD | Imperial County APCD | Winter | 2019 | 308.38             | 357.91 | 420.39 | 536.83 | 73.39                 | 85.24 | 100.69 | 127.93 |
| AD | Imperial County APCD | Winter | 2020 | 308.36             | 358.06 | 420.34 | 537.09 | 73.41                 | 85.34 | 100.76 | 128.13 |
| AD | Imperial County APCD | Winter | 2021 | 308.33             | 358.16 | 420.31 | 537.29 | 73.42                 | 85.44 | 100.80 | 128.28 |
| AD | Imperial County APCD | Winter | 2022 | 308.24             | 358.22 | 420.27 | 537.43 | 73.39                 | 85.52 | 100.84 | 128.40 |
| AD | Imperial County APCD | Winter | 2023 | 308.13             | 358.28 | 420.22 | 537.54 | 73.35                 | 85.60 | 100.87 | 128.53 |
| AD | Imperial County APCD | Winter | 2024 | 310.65             | 361.33 | 423.72 | 542.17 | 73.32                 | 85.66 | 100.89 | 128.63 |
| AD | Imperial County APCD | Winter | 2025 | 310.55             | 361.39 | 423.70 | 542.25 | 73.28                 | 85.73 | 100.92 | 128.73 |
| AD | Imperial County APCD | Winter | 2026 | 310.52             | 361.47 | 423.66 | 542.33 | 73.26                 | 85.80 | 100.94 | 128.82 |
| AD | Imperial County APCD | Winter | 2027 | 310.48             | 361.55 | 423.63 | 542.41 | 73.24                 | 85.86 | 100.95 | 128.90 |
| AD | Imperial County APCD | Winter | 2028 | 310.46             | 361.64 | 423.61 | 542.49 | 73.23                 | 85.92 | 100.96 | 128.97 |
| AD | Imperial County APCD | Winter | 2029 | 310.44             | 361.71 | 423.57 | 542.57 | 73.21                 | 85.97 | 100.96 | 129.04 |
| AD | Imperial County APCD | Winter | 2030 | 310.42             | 361.79 | 423.54 | 542.64 | 73.20                 | 86.02 | 100.97 | 129.10 |
| AD | Imperial County APCD | Winter | 2031 | 310.73             | 362.26 | 423.98 | 543.31 | 73.19                 | 86.07 | 100.97 | 129.15 |
| AD | Imperial County APCD | Winter | 2032 | 310.71             | 362.33 | 423.97 | 543.39 | 73.18                 | 86.11 | 100.97 | 129.21 |
| AD | Imperial County APCD | Winter | 2033 | 310.71             | 362.40 | 423.97 | 543.46 | 73.18                 | 86.15 | 100.98 | 129.26 |
| AD | Imperial County APCD | Winter | 2034 | 310.70             | 362.46 | 423.96 | 543.52 | 73.18                 | 86.19 | 100.98 | 129.30 |
| AD | Imperial County APCD | Winter | 2035 | 310.70             | 362.51 | 423.95 | 543.58 | 73.18                 | 86.22 | 100.98 | 129.34 |
| AD | Kern County APCD     | Annual | 2010 | 336.08             | 392.10 | 460.74 | 577.53 | 74.06                 | 93.66 | 100.99 | 125.79 |
| AD | Kern County APCD     | Annual | 2011 | 336.60             | 392.15 | 460.74 | 578.88 | 73.94                 | 91.90 | 100.87 | 125.91 |
| AD | Kern County APCD     | Annual | 2012 | 336.72             | 391.78 | 460.32 | 579.53 | 73.83                 | 90.38 | 100.77 | 126.04 |
| AD | Kern County APCD     | Annual | 2013 | 336.85             | 391.46 | 460.00 | 580.23 | 73.76                 | 89.06 | 100.75 | 126.20 |
| AD | Kern County APCD     | Annual | 2014 | 336.97             | 391.23 | 459.75 | 580.93 | 73.68                 | 88.03 | 100.72 | 126.38 |
| AD | Kern County APCD     | Annual | 2015 | 337.07             | 391.05 | 459.55 | 581.63 | 73.61                 | 87.19 | 100.70 | 126.58 |
| AD | Kern County APCD     | Annual | 2016 | 337.08             | 390.85 | 459.24 | 582.18 | 73.59                 | 86.61 | 100.72 | 126.80 |
| AD | Kern County APCD     | Annual | 2017 | 337.18             | 390.73 | 459.10 | 582.87 | 73.57                 | 85.95 | 100.70 | 127.03 |
| AD | Kern County APCD     | Annual | 2018 | 337.24             | 390.67 | 458.98 | 583.45 | 73.54                 | 85.51 | 100.67 | 127.24 |
| AD | Kern County APCD     | Annual | 2019 | 337.31             | 390.73 | 458.89 | 583.95 | 73.55                 | 85.38 | 100.69 | 127.44 |
| AD | Kern County APCD     | Annual | 2020 | 337.37             | 390.79 | 458.81 | 584.40 | 73.62                 | 85.36 | 100.74 | 127.63 |
| AD | Kern County APCD     | Annual | 2021 | 338.50             | 392.19 | 460.25 | 586.62 | 73.68                 | 85.47 | 100.80 | 127.74 |
| AD | Kern County APCD     | Annual | 2022 | 338.52             | 392.29 | 460.18 | 586.87 | 73.72                 | 85.56 | 100.85 | 127.82 |
| AD | Kern County APCD     | Annual | 2023 | 338.51             | 392.38 | 460.12 | 587.07 | 73.75                 | 85.64 | 100.89 | 127.98 |
| AD | Kern County APCD     | Annual | 2024 | 338.48             | 392.46 | 460.06 | 587.20 | 73.76                 | 85.71 | 100.92 | 128.12 |
| AD | Kern County APCD     | Annual | 2025 | 338.48             | 392.53 | 460.01 | 587.35 | 73.78                 | 85.78 | 100.95 | 128.26 |
| AD | Kern County APCD     | Annual | 2026 | 338.50             | 392.63 | 459.97 | 587.56 | 73.79                 | 85.84 | 100.97 | 128.40 |
| AD | Kern County APCD     | Annual | 2027 | 338.52             | 392.72 | 459.92 | 587.75 | 73.81                 | 85.90 | 100.98 | 128.53 |
| AD | Kern County APCD     | Annual | 2028 | 338.53             | 392.80 | 459.88 | 587.93 | 73.82                 | 85.95 | 100.99 | 128.65 |
| AD | Kern County APCD     | Annual | 2029 | 338.53             | 392.88 | 459.83 | 588.10 | 73.82                 | 86.00 | 100.99 | 128.75 |
| AD | Kern County APCD     | Annual | 2030 | 338.52             | 392.95 | 459.78 | 588.27 | 73.82                 | 86.04 | 100.98 | 128.85 |
| AD | Kern County APCD     | Annual | 2031 | 338.52             | 393.02 | 459.75 | 588.42 | 73.83                 | 86.08 | 100.99 | 128.94 |
| AD | Kern County APCD     | Annual | 2032 | 338.52             | 393.08 | 459.73 | 588.57 | 73.83                 | 86.12 | 100.99 | 129.02 |
| AD | Kern County APCD     | Annual | 2033 | 338.52             | 393.13 | 459.71 | 588.70 | 73.84                 | 86.16 | 100.99 | 129.09 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location         | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Kern County APCD | Annual | 2034 | 338.52             | 393.17 | 459.69 | 588.81 | 73.84                 | 86.19 | 101.00 | 129.16 |
| AD | Kern County APCD | Annual | 2035 | 338.52             | 393.20 | 459.67 | 588.91 | 73.84                 | 86.21 | 101.00 | 129.22 |
| AD | Kern County APCD | Summer | 2010 | 370.45             | 428.06 | 505.41 | 634.10 | 74.06                 | 93.66 | 100.99 | 125.79 |
| AD | Kern County APCD | Summer | 2011 | 371.25             | 428.88 | 505.98 | 635.59 | 73.94                 | 91.90 | 100.87 | 125.91 |
| AD | Kern County APCD | Summer | 2012 | 371.53             | 429.08 | 505.93 | 636.35 | 73.83                 | 90.38 | 100.77 | 126.04 |
| AD | Kern County APCD | Summer | 2013 | 371.80             | 429.22 | 505.88 | 637.24 | 73.76                 | 89.06 | 100.75 | 126.20 |
| AD | Kern County APCD | Summer | 2014 | 372.02             | 429.32 | 505.86 | 638.18 | 73.68                 | 88.03 | 100.72 | 126.38 |
| AD | Kern County APCD | Summer | 2015 | 372.21             | 429.42 | 505.83 | 639.13 | 73.61                 | 87.19 | 100.70 | 126.58 |
| AD | Kern County APCD | Summer | 2016 | 372.30             | 429.42 | 505.66 | 640.02 | 73.59                 | 86.61 | 100.72 | 126.80 |
| AD | Kern County APCD | Summer | 2017 | 372.46             | 429.55 | 505.63 | 641.01 | 73.57                 | 85.95 | 100.70 | 127.03 |
| AD | Kern County APCD | Summer | 2018 | 372.55             | 429.66 | 505.57 | 641.83 | 73.54                 | 85.51 | 100.67 | 127.24 |
| AD | Kern County APCD | Summer | 2019 | 372.63             | 429.83 | 505.50 | 642.53 | 73.55                 | 85.38 | 100.69 | 127.44 |
| AD | Kern County APCD | Summer | 2020 | 372.70             | 430.00 | 505.43 | 643.14 | 73.62                 | 85.36 | 100.74 | 127.63 |
| AD | Kern County APCD | Summer | 2021 | 373.95             | 431.58 | 507.02 | 645.71 | 73.68                 | 85.47 | 100.80 | 127.74 |
| AD | Kern County APCD | Summer | 2022 | 373.96             | 431.73 | 506.96 | 646.06 | 73.72                 | 85.56 | 100.85 | 127.82 |
| AD | Kern County APCD | Summer | 2023 | 373.95             | 431.88 | 506.89 | 646.33 | 73.75                 | 85.64 | 100.89 | 127.98 |
| AD | Kern County APCD | Summer | 2024 | 373.93             | 431.99 | 506.83 | 646.50 | 73.76                 | 85.71 | 100.92 | 128.12 |
| AD | Kern County APCD | Summer | 2025 | 373.93             | 432.11 | 506.78 | 646.66 | 73.78                 | 85.78 | 100.95 | 128.26 |
| AD | Kern County APCD | Summer | 2026 | 373.97             | 432.28 | 506.79 | 646.94 | 73.79                 | 85.84 | 100.97 | 128.40 |
| AD | Kern County APCD | Summer | 2027 | 374.00             | 432.43 | 506.79 | 647.19 | 73.81                 | 85.90 | 100.98 | 128.53 |
| AD | Kern County APCD | Summer | 2028 | 374.02             | 432.56 | 506.79 | 647.41 | 73.82                 | 85.95 | 100.99 | 128.65 |
| AD | Kern County APCD | Summer | 2029 | 374.04             | 432.69 | 506.77 | 647.62 | 73.82                 | 86.00 | 100.99 | 128.75 |
| AD | Kern County APCD | Summer | 2030 | 374.04             | 432.80 | 506.75 | 647.82 | 73.82                 | 86.04 | 100.98 | 128.85 |
| AD | Kern County APCD | Summer | 2031 | 374.04             | 432.90 | 506.73 | 647.98 | 73.83                 | 86.08 | 100.99 | 128.94 |
| AD | Kern County APCD | Summer | 2032 | 374.04             | 432.98 | 506.71 | 648.14 | 73.83                 | 86.12 | 100.99 | 129.02 |
| AD | Kern County APCD | Summer | 2033 | 374.04             | 433.05 | 506.68 | 648.28 | 73.84                 | 86.16 | 100.99 | 129.09 |
| AD | Kern County APCD | Summer | 2034 | 374.04             | 433.09 | 506.66 | 648.41 | 73.84                 | 86.19 | 101.00 | 129.16 |
| AD | Kern County APCD | Summer | 2035 | 374.03             | 433.12 | 506.63 | 648.53 | 73.84                 | 86.21 | 101.00 | 129.22 |
| AD | Kern County APCD | Winter | 2010 | 325.30             | 380.82 | 446.72 | 559.78 | 74.06                 | 93.66 | 100.99 | 125.79 |
| AD | Kern County APCD | Winter | 2011 | 325.73             | 380.63 | 446.54 | 561.09 | 73.94                 | 91.90 | 100.87 | 125.91 |
| AD | Kern County APCD | Winter | 2012 | 325.80             | 380.08 | 446.01 | 561.70 | 73.83                 | 90.38 | 100.77 | 126.04 |
| AD | Kern County APCD | Winter | 2013 | 325.89             | 379.61 | 445.61 | 562.35 | 73.76                 | 89.06 | 100.75 | 126.20 |
| AD | Kern County APCD | Winter | 2014 | 325.97             | 379.28 | 445.29 | 562.97 | 73.68                 | 88.03 | 100.72 | 126.38 |
| AD | Kern County APCD | Winter | 2015 | 326.05             | 379.02 | 445.03 | 563.59 | 73.61                 | 87.19 | 100.70 | 126.58 |
| AD | Kern County APCD | Winter | 2016 | 326.03             | 378.75 | 444.68 | 564.04 | 73.59                 | 86.61 | 100.72 | 126.80 |
| AD | Kern County APCD | Winter | 2017 | 326.12             | 378.55 | 444.51 | 564.64 | 73.57                 | 85.95 | 100.70 | 127.03 |
| AD | Kern County APCD | Winter | 2018 | 326.17             | 378.44 | 444.37 | 565.14 | 73.54                 | 85.51 | 100.67 | 127.24 |
| AD | Kern County APCD | Winter | 2019 | 326.23             | 378.47 | 444.27 | 565.58 | 73.55                 | 85.38 | 100.69 | 127.44 |
| AD | Kern County APCD | Winter | 2020 | 326.29             | 378.49 | 444.19 | 565.97 | 73.62                 | 85.36 | 100.74 | 127.63 |
| AD | Kern County APCD | Winter | 2021 | 327.38             | 379.84 | 445.58 | 568.09 | 73.68                 | 85.47 | 100.80 | 127.74 |
| AD | Kern County APCD | Winter | 2022 | 327.40             | 379.92 | 445.51 | 568.30 | 73.72                 | 85.56 | 100.85 | 127.82 |
| AD | Kern County APCD | Winter | 2023 | 327.39             | 379.99 | 445.45 | 568.48 | 73.75                 | 85.64 | 100.89 | 127.98 |
| AD | Kern County APCD | Winter | 2024 | 327.36             | 380.05 | 445.39 | 568.60 | 73.76                 | 85.71 | 100.92 | 128.12 |
| AD | Kern County APCD | Winter | 2025 | 327.36             | 380.12 | 445.34 | 568.75 | 73.78                 | 85.78 | 100.95 | 128.26 |
| AD | Kern County APCD | Winter | 2026 | 327.38             | 380.19 | 445.29 | 568.94 | 73.79                 | 85.84 | 100.97 | 128.40 |
| AD | Kern County APCD | Winter | 2027 | 327.39             | 380.27 | 445.22 | 569.11 | 73.81                 | 85.90 | 100.98 | 128.53 |
| AD | Kern County APCD | Winter | 2028 | 327.39             | 380.33 | 445.17 | 569.28 | 73.82                 | 85.95 | 100.99 | 128.65 |
| AD | Kern County APCD | Winter | 2029 | 327.39             | 380.39 | 445.11 | 569.43 | 73.82                 | 86.00 | 100.99 | 128.75 |
| AD | Kern County APCD | Winter | 2030 | 327.38             | 380.45 | 445.05 | 569.59 | 73.82                 | 86.04 | 100.98 | 128.85 |
| AD | Kern County APCD | Winter | 2031 | 327.38             | 380.51 | 445.02 | 569.73 | 73.83                 | 86.08 | 100.99 | 128.94 |
| AD | Kern County APCD | Winter | 2032 | 327.38             | 380.56 | 445.00 | 569.88 | 73.83                 | 86.12 | 100.99 | 129.02 |
| AD | Kern County APCD | Winter | 2033 | 327.38             | 380.61 | 444.98 | 570.01 | 73.84                 | 86.16 | 100.99 | 129.09 |
| AD | Kern County APCD | Winter | 2034 | 327.38             | 380.65 | 444.96 | 570.12 | 73.84                 | 86.19 | 101.00 | 129.16 |
| AD | Kern County APCD | Winter | 2035 | 327.38             | 380.68 | 444.94 | 570.22 | 73.84                 | 86.21 | 101.00 | 129.22 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location         | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Lake County APCD | Annual | 2010 | 342.07             | 393.50 | 467.77 | 584.22 | 74.77                 | 89.34 | 101.91 | 124.46 |
| AD | Lake County APCD | Annual | 2011 | 342.02             | 394.05 | 467.30 | 584.79 | 74.52                 | 88.47 | 101.71 | 124.54 |
| AD | Lake County APCD | Annual | 2012 | 342.06             | 394.51 | 466.93 | 585.54 | 74.36                 | 87.81 | 101.56 | 124.69 |
| AD | Lake County APCD | Annual | 2013 | 342.12             | 394.89 | 466.63 | 586.41 | 74.20                 | 87.25 | 101.40 | 124.90 |
| AD | Lake County APCD | Annual | 2014 | 342.14             | 395.21 | 466.41 | 587.25 | 73.98                 | 86.77 | 101.22 | 125.12 |
| AD | Lake County APCD | Annual | 2015 | 342.23             | 395.51 | 466.24 | 588.17 | 73.90                 | 86.33 | 101.09 | 125.37 |
| AD | Lake County APCD | Annual | 2016 | 342.33             | 395.78 | 466.10 | 589.06 | 73.88                 | 85.99 | 101.00 | 125.66 |
| AD | Lake County APCD | Annual | 2017 | 342.36             | 396.00 | 465.97 | 589.89 | 73.79                 | 85.60 | 100.88 | 125.95 |
| AD | Lake County APCD | Annual | 2018 | 342.39             | 396.17 | 465.87 | 590.62 | 73.73                 | 85.27 | 100.83 | 126.22 |
| AD | Lake County APCD | Annual | 2019 | 342.41             | 396.35 | 465.79 | 591.26 | 73.69                 | 85.13 | 100.79 | 126.48 |
| AD | Lake County APCD | Annual | 2020 | 342.44             | 396.52 | 465.72 | 591.82 | 73.77                 | 85.14 | 100.79 | 126.73 |
| AD | Lake County APCD | Annual | 2021 | 342.39             | 396.64 | 465.65 | 592.21 | 73.79                 | 85.21 | 100.84 | 126.90 |
| AD | Lake County APCD | Annual | 2022 | 342.31             | 396.75 | 465.57 | 592.55 | 73.78                 | 85.27 | 100.85 | 127.07 |
| AD | Lake County APCD | Annual | 2023 | 342.19             | 396.83 | 465.51 | 592.77 | 73.76                 | 85.32 | 100.87 | 127.26 |
| AD | Lake County APCD | Annual | 2024 | 342.07             | 396.89 | 465.44 | 592.97 | 73.71                 | 85.36 | 100.88 | 127.45 |
| AD | Lake County APCD | Annual | 2025 | 342.01             | 396.99 | 465.40 | 593.14 | 73.71                 | 85.45 | 100.91 | 127.61 |
| AD | Lake County APCD | Annual | 2026 | 342.02             | 397.10 | 465.36 | 593.32 | 73.73                 | 85.55 | 100.93 | 127.78 |
| AD | Lake County APCD | Annual | 2027 | 342.03             | 397.21 | 465.31 | 593.53 | 73.74                 | 85.64 | 100.94 | 127.94 |
| AD | Lake County APCD | Annual | 2028 | 342.03             | 397.32 | 465.27 | 593.73 | 73.75                 | 85.72 | 100.95 | 128.09 |
| AD | Lake County APCD | Annual | 2029 | 342.02             | 397.43 | 465.24 | 593.93 | 73.75                 | 85.80 | 100.96 | 128.22 |
| AD | Lake County APCD | Annual | 2030 | 342.00             | 397.54 | 465.21 | 594.14 | 73.75                 | 85.88 | 100.95 | 128.35 |
| AD | Lake County APCD | Annual | 2031 | 342.00             | 397.66 | 465.19 | 594.38 | 73.76                 | 85.96 | 100.95 | 128.48 |
| AD | Lake County APCD | Annual | 2032 | 341.99             | 397.76 | 465.18 | 594.62 | 73.76                 | 86.03 | 100.96 | 128.61 |
| AD | Lake County APCD | Annual | 2033 | 341.99             | 397.84 | 465.18 | 594.84 | 73.77                 | 86.09 | 100.96 | 128.72 |
| AD | Lake County APCD | Annual | 2034 | 341.98             | 397.92 | 465.17 | 595.03 | 73.77                 | 86.15 | 100.97 | 128.82 |
| AD | Lake County APCD | Annual | 2035 | 341.97             | 397.97 | 465.16 | 595.21 | 73.78                 | 86.20 | 100.97 | 128.92 |
| AD | Lake County APCD | Summer | 2010 | 365.54             | 417.38 | 498.77 | 621.97 | 74.77                 | 89.34 | 101.91 | 124.46 |
| AD | Lake County APCD | Summer | 2011 | 365.78             | 418.72 | 498.60 | 622.61 | 74.52                 | 88.47 | 101.71 | 124.54 |
| AD | Lake County APCD | Summer | 2012 | 366.03             | 419.77 | 498.49 | 623.54 | 74.36                 | 87.81 | 101.56 | 124.69 |
| AD | Lake County APCD | Summer | 2013 | 366.25             | 420.60 | 498.41 | 624.68 | 74.20                 | 87.25 | 101.40 | 124.90 |
| AD | Lake County APCD | Summer | 2014 | 366.39             | 421.26 | 498.37 | 625.78 | 73.98                 | 86.77 | 101.22 | 125.12 |
| AD | Lake County APCD | Summer | 2015 | 366.55             | 421.85 | 498.36 | 627.02 | 73.90                 | 86.33 | 101.09 | 125.37 |
| AD | Lake County APCD | Summer | 2016 | 366.69             | 422.33 | 498.33 | 628.23 | 73.88                 | 85.99 | 101.00 | 125.66 |
| AD | Lake County APCD | Summer | 2017 | 366.75             | 422.72 | 498.28 | 629.33 | 73.79                 | 85.60 | 100.88 | 125.95 |
| AD | Lake County APCD | Summer | 2018 | 366.77             | 423.03 | 498.21 | 630.31 | 73.73                 | 85.27 | 100.83 | 126.22 |
| AD | Lake County APCD | Summer | 2019 | 366.79             | 423.31 | 498.14 | 631.16 | 73.69                 | 85.13 | 100.79 | 126.48 |
| AD | Lake County APCD | Summer | 2020 | 366.81             | 423.55 | 498.08 | 631.89 | 73.77                 | 85.14 | 100.79 | 126.73 |
| AD | Lake County APCD | Summer | 2021 | 366.76             | 423.74 | 498.00 | 632.43 | 73.79                 | 85.21 | 100.84 | 126.90 |
| AD | Lake County APCD | Summer | 2022 | 366.67             | 423.91 | 497.93 | 632.88 | 73.78                 | 85.27 | 100.85 | 127.07 |
| AD | Lake County APCD | Summer | 2023 | 366.57             | 424.04 | 497.87 | 633.19 | 73.76                 | 85.32 | 100.87 | 127.26 |
| AD | Lake County APCD | Summer | 2024 | 366.46             | 424.16 | 497.81 | 633.47 | 73.71                 | 85.36 | 100.88 | 127.45 |
| AD | Lake County APCD | Summer | 2025 | 366.41             | 424.28 | 497.76 | 633.69 | 73.71                 | 85.45 | 100.91 | 127.61 |
| AD | Lake County APCD | Summer | 2026 | 366.43             | 424.42 | 497.70 | 633.89 | 73.73                 | 85.55 | 100.93 | 127.78 |
| AD | Lake County APCD | Summer | 2027 | 366.46             | 424.56 | 497.65 | 634.10 | 73.74                 | 85.64 | 100.94 | 127.94 |
| AD | Lake County APCD | Summer | 2028 | 366.47             | 424.70 | 497.62 | 634.32 | 73.75                 | 85.72 | 100.95 | 128.09 |
| AD | Lake County APCD | Summer | 2029 | 366.48             | 424.86 | 497.59 | 634.55 | 73.75                 | 85.80 | 100.96 | 128.22 |
| AD | Lake County APCD | Summer | 2030 | 366.48             | 425.00 | 497.56 | 634.80 | 73.75                 | 85.88 | 100.95 | 128.35 |
| AD | Lake County APCD | Summer | 2031 | 366.48             | 425.18 | 497.58 | 635.06 | 73.76                 | 85.96 | 100.95 | 128.48 |
| AD | Lake County APCD | Summer | 2032 | 366.47             | 425.33 | 497.59 | 635.34 | 73.76                 | 86.03 | 100.96 | 128.61 |
| AD | Lake County APCD | Summer | 2033 | 366.46             | 425.44 | 497.60 | 635.60 | 73.77                 | 86.09 | 100.96 | 128.72 |
| AD | Lake County APCD | Summer | 2034 | 366.45             | 425.54 | 497.60 | 635.84 | 73.77                 | 86.15 | 100.97 | 128.82 |
| AD | Lake County APCD | Summer | 2035 | 366.44             | 425.60 | 497.60 | 636.06 | 73.78                 | 86.20 | 100.97 | 128.92 |
| AD | Lake County APCD | Winter | 2010 | 355.28             | 406.94 | 485.21 | 605.47 | 74.77                 | 89.34 | 101.91 | 124.46 |
| AD | Lake County APCD | Winter | 2011 | 355.39             | 407.93 | 484.91 | 606.07 | 74.52                 | 88.47 | 101.71 | 124.54 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location           | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|--------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                    |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Lake County APCD   | Winter | 2012 | 355.55             | 408.73 | 484.69 | 606.93 | 74.36                 | 87.81 | 101.56 | 124.69 |
| AD | Lake County APCD   | Winter | 2013 | 355.70             | 409.36 | 484.52 | 607.95 | 74.20                 | 87.25 | 101.40 | 124.90 |
| AD | Lake County APCD   | Winter | 2014 | 355.79             | 409.87 | 484.39 | 608.93 | 73.98                 | 86.77 | 101.22 | 125.12 |
| AD | Lake County APCD   | Winter | 2015 | 355.91             | 410.33 | 484.31 | 610.03 | 73.90                 | 86.33 | 101.09 | 125.37 |
| AD | Lake County APCD   | Winter | 2016 | 356.04             | 410.72 | 484.24 | 611.10 | 73.88                 | 85.99 | 101.00 | 125.66 |
| AD | Lake County APCD   | Winter | 2017 | 356.08             | 411.04 | 484.15 | 612.08 | 73.79                 | 85.60 | 100.88 | 125.95 |
| AD | Lake County APCD   | Winter | 2018 | 356.11             | 411.29 | 484.07 | 612.96 | 73.73                 | 85.27 | 100.83 | 126.22 |
| AD | Lake County APCD   | Winter | 2019 | 356.13             | 411.52 | 484.00 | 613.71 | 73.69                 | 85.13 | 100.79 | 126.48 |
| AD | Lake County APCD   | Winter | 2020 | 356.15             | 411.73 | 483.93 | 614.36 | 73.77                 | 85.14 | 100.79 | 126.73 |
| AD | Lake County APCD   | Winter | 2021 | 356.11             | 411.89 | 483.85 | 614.84 | 73.79                 | 85.21 | 100.84 | 126.90 |
| AD | Lake County APCD   | Winter | 2022 | 356.02             | 412.03 | 483.78 | 615.25 | 73.78                 | 85.27 | 100.85 | 127.07 |
| AD | Lake County APCD   | Winter | 2023 | 355.91             | 412.15 | 483.72 | 615.52 | 73.76                 | 85.32 | 100.87 | 127.26 |
| AD | Lake County APCD   | Winter | 2024 | 355.79             | 412.24 | 483.66 | 615.76 | 73.71                 | 85.36 | 100.88 | 127.45 |
| AD | Lake County APCD   | Winter | 2025 | 355.74             | 412.35 | 483.61 | 615.96 | 73.71                 | 85.45 | 100.91 | 127.61 |
| AD | Lake County APCD   | Winter | 2026 | 355.76             | 412.47 | 483.56 | 616.15 | 73.73                 | 85.55 | 100.93 | 127.78 |
| AD | Lake County APCD   | Winter | 2027 | 355.78             | 412.60 | 483.51 | 616.36 | 73.74                 | 85.64 | 100.94 | 127.94 |
| AD | Lake County APCD   | Winter | 2028 | 355.78             | 412.73 | 483.47 | 616.58 | 73.75                 | 85.72 | 100.95 | 128.09 |
| AD | Lake County APCD   | Winter | 2029 | 355.78             | 412.87 | 483.44 | 616.79 | 73.75                 | 85.80 | 100.96 | 128.22 |
| AD | Lake County APCD   | Winter | 2030 | 355.78             | 412.99 | 483.41 | 617.02 | 73.75                 | 85.88 | 100.95 | 128.35 |
| AD | Lake County APCD   | Winter | 2031 | 355.77             | 413.15 | 483.42 | 617.27 | 73.76                 | 85.96 | 100.95 | 128.48 |
| AD | Lake County APCD   | Winter | 2032 | 355.77             | 413.27 | 483.42 | 617.53 | 73.76                 | 86.03 | 100.96 | 128.61 |
| AD | Lake County APCD   | Winter | 2033 | 355.76             | 413.37 | 483.42 | 617.77 | 73.77                 | 86.09 | 100.96 | 128.72 |
| AD | Lake County APCD   | Winter | 2034 | 355.75             | 413.46 | 483.42 | 618.00 | 73.77                 | 86.15 | 100.97 | 128.82 |
| AD | Lake County APCD   | Winter | 2035 | 355.74             | 413.52 | 483.42 | 618.20 | 73.78                 | 86.20 | 100.97 | 128.92 |
| AD | Lassen County APCD | Annual | 2010 | 366.63             | 428.55 | 501.21 | 626.78 | 75.03                 | 93.49 | 101.72 | 124.85 |
| AD | Lassen County APCD | Annual | 2011 | 366.52             | 427.89 | 500.66 | 627.52 | 74.78                 | 92.04 | 101.44 | 124.99 |
| AD | Lassen County APCD | Annual | 2012 | 366.51             | 427.37 | 500.23 | 628.37 | 74.62                 | 90.87 | 101.30 | 125.17 |
| AD | Lassen County APCD | Annual | 2013 | 366.45             | 426.93 | 499.88 | 629.27 | 74.35                 | 89.90 | 101.18 | 125.38 |
| AD | Lassen County APCD | Annual | 2014 | 366.47             | 426.50 | 499.61 | 630.13 | 74.18                 | 88.91 | 101.02 | 125.60 |
| AD | Lassen County APCD | Annual | 2015 | 366.54             | 426.15 | 499.39 | 631.03 | 74.11                 | 88.06 | 100.90 | 125.84 |
| AD | Lassen County APCD | Annual | 2016 | 366.63             | 425.82 | 499.23 | 631.85 | 74.09                 | 87.24 | 100.87 | 126.11 |
| AD | Lassen County APCD | Annual | 2017 | 366.62             | 425.58 | 499.09 | 632.62 | 73.95                 | 86.60 | 100.80 | 126.37 |
| AD | Lassen County APCD | Annual | 2018 | 366.60             | 425.38 | 498.97 | 633.29 | 73.84                 | 86.10 | 100.79 | 126.62 |
| AD | Lassen County APCD | Annual | 2019 | 366.62             | 425.22 | 498.88 | 633.88 | 73.81                 | 85.71 | 100.76 | 126.84 |
| AD | Lassen County APCD | Annual | 2020 | 366.64             | 425.15 | 498.80 | 634.35 | 73.88                 | 85.60 | 100.80 | 127.07 |
| AD | Lassen County APCD | Annual | 2021 | 366.58             | 425.05 | 498.73 | 634.71 | 73.90                 | 85.58 | 100.85 | 127.25 |
| AD | Lassen County APCD | Annual | 2022 | 366.46             | 424.97 | 498.64 | 635.00 | 73.88                 | 85.58 | 100.88 | 127.38 |
| AD | Lassen County APCD | Annual | 2023 | 366.37             | 424.91 | 498.56 | 635.19 | 73.88                 | 85.59 | 100.91 | 127.55 |
| AD | Lassen County APCD | Annual | 2024 | 366.23             | 424.85 | 498.49 | 635.34 | 73.85                 | 85.60 | 100.93 | 127.70 |
| AD | Lassen County APCD | Annual | 2025 | 366.17             | 424.91 | 498.44 | 635.47 | 73.85                 | 85.67 | 100.96 | 127.84 |
| AD | Lassen County APCD | Annual | 2026 | 366.19             | 425.03 | 498.40 | 635.65 | 73.87                 | 85.75 | 100.99 | 127.99 |
| AD | Lassen County APCD | Annual | 2027 | 366.19             | 425.15 | 498.34 | 635.84 | 73.88                 | 85.83 | 101.00 | 128.13 |
| AD | Lassen County APCD | Annual | 2028 | 366.19             | 425.28 | 498.29 | 636.04 | 73.89                 | 85.91 | 101.01 | 128.26 |
| AD | Lassen County APCD | Annual | 2029 | 366.17             | 425.41 | 498.23 | 636.23 | 73.89                 | 85.98 | 101.01 | 128.38 |
| AD | Lassen County APCD | Annual | 2030 | 366.16             | 425.52 | 498.17 | 636.41 | 73.89                 | 86.04 | 101.01 | 128.49 |
| AD | Lassen County APCD | Annual | 2031 | 366.15             | 425.65 | 498.14 | 636.65 | 73.90                 | 86.10 | 101.01 | 128.61 |
| AD | Lassen County APCD | Annual | 2032 | 366.15             | 425.76 | 498.12 | 636.90 | 73.90                 | 86.16 | 101.01 | 128.73 |
| AD | Lassen County APCD | Annual | 2033 | 366.15             | 425.86 | 498.09 | 637.12 | 73.91                 | 86.22 | 101.02 | 128.83 |
| AD | Lassen County APCD | Annual | 2034 | 366.14             | 425.94 | 498.07 | 637.31 | 73.91                 | 86.26 | 101.02 | 128.92 |
| AD | Lassen County APCD | Annual | 2035 | 366.13             | 426.00 | 498.05 | 637.48 | 73.92                 | 86.30 | 101.02 | 129.01 |
| AD | Lassen County APCD | Summer | 2010 | 385.95             | 446.82 | 526.65 | 657.83 | 75.03                 | 93.49 | 101.72 | 124.85 |
| AD | Lassen County APCD | Summer | 2011 | 386.07             | 446.99 | 526.29 | 658.69 | 74.78                 | 92.04 | 101.44 | 124.99 |
| AD | Lassen County APCD | Summer | 2012 | 386.23             | 447.10 | 526.01 | 659.72 | 74.62                 | 90.87 | 101.30 | 125.17 |
| AD | Lassen County APCD | Summer | 2013 | 386.31             | 447.13 | 525.80 | 660.84 | 74.35                 | 89.90 | 101.18 | 125.38 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Lassen County APCD   | Summer | 2014 | 386.41             | 447.10 | 525.66 | 661.92 | 74.18                 | 88.91 | 101.02 | 125.60 |
| AD | Lassen County APCD   | Summer | 2015 | 386.54             | 447.07 | 525.57 | 663.05 | 74.11                 | 88.06 | 100.90 | 125.84 |
| AD | Lassen County APCD   | Summer | 2016 | 386.67             | 447.02 | 525.50 | 664.09 | 74.09                 | 87.24 | 100.87 | 126.11 |
| AD | Lassen County APCD   | Summer | 2017 | 386.67             | 446.98 | 525.44 | 665.06 | 73.95                 | 86.60 | 100.80 | 126.37 |
| AD | Lassen County APCD   | Summer | 2018 | 386.66             | 446.94 | 525.37 | 665.90 | 73.84                 | 86.10 | 100.79 | 126.62 |
| AD | Lassen County APCD   | Summer | 2019 | 386.67             | 446.92 | 525.31 | 666.64 | 73.81                 | 85.71 | 100.76 | 126.84 |
| AD | Lassen County APCD   | Summer | 2020 | 386.68             | 446.95 | 525.25 | 667.23 | 73.88                 | 85.60 | 100.80 | 127.07 |
| AD | Lassen County APCD   | Summer | 2021 | 386.62             | 446.96 | 525.18 | 667.70 | 73.90                 | 85.58 | 100.85 | 127.25 |
| AD | Lassen County APCD   | Summer | 2022 | 386.49             | 446.97 | 525.10 | 668.07 | 73.88                 | 85.58 | 100.88 | 127.38 |
| AD | Lassen County APCD   | Summer | 2023 | 386.41             | 446.99 | 525.03 | 668.33 | 73.88                 | 85.59 | 100.91 | 127.55 |
| AD | Lassen County APCD   | Summer | 2024 | 386.28             | 447.01 | 524.97 | 668.54 | 73.85                 | 85.60 | 100.93 | 127.70 |
| AD | Lassen County APCD   | Summer | 2025 | 386.22             | 447.11 | 524.92 | 668.73 | 73.85                 | 85.67 | 100.96 | 127.84 |
| AD | Lassen County APCD   | Summer | 2026 | 386.24             | 447.28 | 524.88 | 668.93 | 73.87                 | 85.75 | 100.99 | 127.99 |
| AD | Lassen County APCD   | Summer | 2027 | 386.26             | 447.44 | 524.83 | 669.14 | 73.88                 | 85.83 | 101.00 | 128.13 |
| AD | Lassen County APCD   | Summer | 2028 | 386.27             | 447.61 | 524.79 | 669.37 | 73.89                 | 85.91 | 101.01 | 128.26 |
| AD | Lassen County APCD   | Summer | 2029 | 386.27             | 447.79 | 524.74 | 669.59 | 73.89                 | 85.98 | 101.01 | 128.38 |
| AD | Lassen County APCD   | Summer | 2030 | 386.26             | 447.96 | 524.69 | 669.81 | 73.89                 | 86.04 | 101.01 | 128.49 |
| AD | Lassen County APCD   | Summer | 2031 | 386.26             | 448.12 | 524.66 | 670.10 | 73.90                 | 86.10 | 101.01 | 128.61 |
| AD | Lassen County APCD   | Summer | 2032 | 386.26             | 448.27 | 524.64 | 670.38 | 73.90                 | 86.16 | 101.01 | 128.73 |
| AD | Lassen County APCD   | Summer | 2033 | 386.25             | 448.40 | 524.62 | 670.64 | 73.91                 | 86.22 | 101.02 | 128.83 |
| AD | Lassen County APCD   | Summer | 2034 | 386.25             | 448.50 | 524.60 | 670.87 | 73.91                 | 86.26 | 101.02 | 128.92 |
| AD | Lassen County APCD   | Summer | 2035 | 386.24             | 448.57 | 524.58 | 671.07 | 73.92                 | 86.30 | 101.02 | 129.01 |
| AD | Lassen County APCD   | Winter | 2010 | 359.88             | 422.17 | 492.33 | 615.94 | 75.03                 | 93.49 | 101.72 | 124.85 |
| AD | Lassen County APCD   | Winter | 2011 | 359.69             | 421.22 | 491.71 | 616.64 | 74.78                 | 92.04 | 101.44 | 124.99 |
| AD | Lassen County APCD   | Winter | 2012 | 359.63             | 420.48 | 491.23 | 617.43 | 74.62                 | 90.87 | 101.30 | 125.17 |
| AD | Lassen County APCD   | Winter | 2013 | 359.52             | 419.89 | 490.84 | 618.25 | 74.35                 | 89.90 | 101.18 | 125.38 |
| AD | Lassen County APCD   | Winter | 2014 | 359.51             | 419.32 | 490.52 | 619.04 | 74.18                 | 88.91 | 101.02 | 125.60 |
| AD | Lassen County APCD   | Winter | 2015 | 359.57             | 418.85 | 490.26 | 619.85 | 74.11                 | 88.06 | 100.90 | 125.84 |
| AD | Lassen County APCD   | Winter | 2016 | 359.64             | 418.43 | 490.06 | 620.60 | 74.09                 | 87.24 | 100.87 | 126.11 |
| AD | Lassen County APCD   | Winter | 2017 | 359.62             | 418.11 | 489.89 | 621.30 | 73.95                 | 86.60 | 100.80 | 126.37 |
| AD | Lassen County APCD   | Winter | 2018 | 359.60             | 417.85 | 489.77 | 621.91 | 73.84                 | 86.10 | 100.79 | 126.62 |
| AD | Lassen County APCD   | Winter | 2019 | 359.62             | 417.65 | 489.66 | 622.44 | 73.81                 | 85.71 | 100.76 | 126.84 |
| AD | Lassen County APCD   | Winter | 2020 | 359.65             | 417.54 | 489.58 | 622.88 | 73.88                 | 85.60 | 100.80 | 127.07 |
| AD | Lassen County APCD   | Winter | 2021 | 359.59             | 417.41 | 489.50 | 623.21 | 73.90                 | 85.58 | 100.85 | 127.25 |
| AD | Lassen County APCD   | Winter | 2022 | 359.47             | 417.29 | 489.40 | 623.46 | 73.88                 | 85.58 | 100.88 | 127.38 |
| AD | Lassen County APCD   | Winter | 2023 | 359.38             | 417.21 | 489.33 | 623.63 | 73.88                 | 85.59 | 100.91 | 127.55 |
| AD | Lassen County APCD   | Winter | 2024 | 359.24             | 417.11 | 489.25 | 623.75 | 73.85                 | 85.60 | 100.93 | 127.70 |
| AD | Lassen County APCD   | Winter | 2025 | 359.18             | 417.16 | 489.20 | 623.86 | 73.85                 | 85.67 | 100.96 | 127.84 |
| AD | Lassen County APCD   | Winter | 2026 | 359.19             | 417.27 | 489.16 | 624.04 | 73.87                 | 85.75 | 100.99 | 127.99 |
| AD | Lassen County APCD   | Winter | 2027 | 359.18             | 417.38 | 489.10 | 624.22 | 73.88                 | 85.83 | 101.00 | 128.13 |
| AD | Lassen County APCD   | Winter | 2028 | 359.18             | 417.49 | 489.05 | 624.41 | 73.89                 | 85.91 | 101.01 | 128.26 |
| AD | Lassen County APCD   | Winter | 2029 | 359.16             | 417.59 | 488.98 | 624.59 | 73.89                 | 85.98 | 101.01 | 128.38 |
| AD | Lassen County APCD   | Winter | 2030 | 359.14             | 417.70 | 488.92 | 624.75 | 73.89                 | 86.04 | 101.01 | 128.49 |
| AD | Lassen County APCD   | Winter | 2031 | 359.14             | 417.80 | 488.89 | 624.98 | 73.90                 | 86.10 | 101.01 | 128.61 |
| AD | Lassen County APCD   | Winter | 2032 | 359.14             | 417.90 | 488.86 | 625.22 | 73.90                 | 86.16 | 101.01 | 128.73 |
| AD | Lassen County APCD   | Winter | 2033 | 359.13             | 417.99 | 488.84 | 625.43 | 73.91                 | 86.22 | 101.02 | 128.83 |
| AD | Lassen County APCD   | Winter | 2034 | 359.13             | 418.06 | 488.82 | 625.61 | 73.91                 | 86.26 | 101.02 | 128.92 |
| AD | Lassen County APCD   | Winter | 2035 | 359.12             | 418.13 | 488.80 | 625.76 | 73.92                 | 86.30 | 101.02 | 129.01 |
| AD | Mariposa County APCD | Annual | 2010 | 354.50             | 410.51 | 485.83 | 607.63 | 74.37                 | 89.51 | 102.09 | 125.68 |
| AD | Mariposa County APCD | Annual | 2011 | 354.40             | 410.55 | 485.11 | 608.19 | 74.22                 | 88.77 | 101.86 | 125.71 |
| AD | Mariposa County APCD | Annual | 2012 | 354.31             | 410.56 | 484.54 | 608.86 | 74.03                 | 88.15 | 101.71 | 125.79 |
| AD | Mariposa County APCD | Annual | 2013 | 354.36             | 410.52 | 484.09 | 609.60 | 73.97                 | 87.50 | 101.57 | 125.92 |
| AD | Mariposa County APCD | Annual | 2014 | 354.33             | 410.46 | 483.72 | 610.33 | 73.82                 | 86.87 | 101.30 | 126.07 |
| AD | Mariposa County APCD | Annual | 2015 | 354.43             | 410.47 | 483.42 | 611.09 | 73.83                 | 86.45 | 101.16 | 126.26 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Mariposa County APCD | Annual | 2016 | 354.48              | 410.49 | 483.19 | 611.81 | 73.80                 | 86.11 | 101.08 | 126.48 |
| AD | Mariposa County APCD | Annual | 2017 | 354.51              | 410.47 | 483.00 | 612.49 | 73.77                 | 85.68 | 101.00 | 126.70 |
| AD | Mariposa County APCD | Annual | 2018 | 354.51              | 410.48 | 482.83 | 613.06 | 73.71                 | 85.43 | 100.90 | 126.90 |
| AD | Mariposa County APCD | Annual | 2019 | 354.47              | 410.55 | 482.70 | 613.53 | 73.61                 | 85.35 | 100.87 | 127.11 |
| AD | Mariposa County APCD | Annual | 2020 | 354.41              | 410.60 | 482.59 | 613.96 | 73.65                 | 85.32 | 100.89 | 127.30 |
| AD | Mariposa County APCD | Annual | 2021 | 354.35              | 410.60 | 482.48 | 614.20 | 73.67                 | 85.35 | 100.93 | 127.34 |
| AD | Mariposa County APCD | Annual | 2022 | 354.26              | 410.63 | 482.35 | 614.40 | 73.67                 | 85.40 | 100.94 | 127.39 |
| AD | Mariposa County APCD | Annual | 2023 | 354.08              | 410.62 | 482.24 | 614.56 | 73.64                 | 85.42 | 100.94 | 127.56 |
| AD | Mariposa County APCD | Annual | 2024 | 353.92              | 410.60 | 482.16 | 614.67 | 73.60                 | 85.46 | 100.96 | 127.71 |
| AD | Mariposa County APCD | Annual | 2025 | 353.86              | 410.66 | 482.10 | 614.79 | 73.60                 | 85.52 | 100.99 | 127.87 |
| AD | Mariposa County APCD | Annual | 2026 | 353.86              | 410.81 | 482.03 | 614.95 | 73.62                 | 85.62 | 101.00 | 128.02 |
| AD | Mariposa County APCD | Annual | 2027 | 353.86              | 410.93 | 481.97 | 615.12 | 73.63                 | 85.71 | 101.01 | 128.16 |
| AD | Mariposa County APCD | Annual | 2028 | 353.85              | 411.06 | 481.91 | 615.29 | 73.64                 | 85.79 | 101.02 | 128.29 |
| AD | Mariposa County APCD | Annual | 2029 | 353.83              | 411.19 | 481.84 | 615.47 | 73.64                 | 85.87 | 101.02 | 128.41 |
| AD | Mariposa County APCD | Annual | 2030 | 353.81              | 411.31 | 481.77 | 615.62 | 73.64                 | 85.94 | 101.01 | 128.52 |
| AD | Mariposa County APCD | Annual | 2031 | 353.81              | 411.44 | 481.74 | 615.85 | 73.65                 | 86.01 | 101.01 | 128.65 |
| AD | Mariposa County APCD | Annual | 2032 | 353.80              | 411.54 | 481.71 | 616.07 | 73.65                 | 86.08 | 101.02 | 128.76 |
| AD | Mariposa County APCD | Annual | 2033 | 353.80              | 411.63 | 481.68 | 616.27 | 73.66                 | 86.13 | 101.02 | 128.86 |
| AD | Mariposa County APCD | Annual | 2034 | 353.79              | 411.70 | 481.65 | 616.45 | 73.66                 | 86.19 | 101.02 | 128.96 |
| AD | Mariposa County APCD | Annual | 2035 | 353.78              | 411.77 | 481.63 | 616.61 | 73.67                 | 86.23 | 101.02 | 129.05 |
| AD | Mariposa County APCD | Summer | 2010 | 383.75              | 439.08 | 524.10 | 654.73 | 74.37                 | 89.51 | 102.09 | 125.68 |
| AD | Mariposa County APCD | Summer | 2011 | 383.98              | 440.10 | 523.79 | 655.48 | 74.22                 | 88.77 | 101.86 | 125.71 |
| AD | Mariposa County APCD | Summer | 2012 | 384.14              | 440.90 | 523.54 | 656.41 | 74.03                 | 88.15 | 101.71 | 125.79 |
| AD | Mariposa County APCD | Summer | 2013 | 384.37              | 441.53 | 523.38 | 657.50 | 73.97                 | 87.50 | 101.57 | 125.92 |
| AD | Mariposa County APCD | Summer | 2014 | 384.48              | 442.00 | 523.29 | 658.57 | 73.82                 | 86.87 | 101.30 | 126.07 |
| AD | Mariposa County APCD | Summer | 2015 | 384.66              | 442.44 | 523.21 | 659.71 | 73.83                 | 86.45 | 101.16 | 126.26 |
| AD | Mariposa County APCD | Summer | 2016 | 384.77              | 442.80 | 523.13 | 660.80 | 73.80                 | 86.11 | 101.08 | 126.48 |
| AD | Mariposa County APCD | Summer | 2017 | 384.83              | 443.08 | 523.05 | 661.80 | 73.77                 | 85.68 | 101.00 | 126.70 |
| AD | Mariposa County APCD | Summer | 2018 | 384.83              | 443.32 | 522.95 | 662.65 | 73.71                 | 85.43 | 100.90 | 126.90 |
| AD | Mariposa County APCD | Summer | 2019 | 384.80              | 443.56 | 522.85 | 663.34 | 73.61                 | 85.35 | 100.87 | 127.11 |
| AD | Mariposa County APCD | Summer | 2020 | 384.74              | 443.78 | 522.76 | 663.97 | 73.65                 | 85.32 | 100.89 | 127.30 |
| AD | Mariposa County APCD | Summer | 2021 | 384.68              | 443.93 | 522.65 | 664.40 | 73.67                 | 85.35 | 100.93 | 127.34 |
| AD | Mariposa County APCD | Summer | 2022 | 384.58              | 444.09 | 522.56 | 664.75 | 73.67                 | 85.40 | 100.94 | 127.39 |
| AD | Mariposa County APCD | Summer | 2023 | 384.42              | 444.21 | 522.47 | 665.02 | 73.64                 | 85.42 | 100.94 | 127.56 |
| AD | Mariposa County APCD | Summer | 2024 | 384.29              | 444.31 | 522.40 | 665.20 | 73.60                 | 85.46 | 100.96 | 127.71 |
| AD | Mariposa County APCD | Summer | 2025 | 384.24              | 444.44 | 522.34 | 665.37 | 73.60                 | 85.52 | 100.99 | 127.87 |
| AD | Mariposa County APCD | Summer | 2026 | 384.25              | 444.68 | 522.29 | 665.56 | 73.62                 | 85.62 | 101.00 | 128.02 |
| AD | Mariposa County APCD | Summer | 2027 | 384.26              | 444.88 | 522.24 | 665.76 | 73.63                 | 85.71 | 101.01 | 128.16 |
| AD | Mariposa County APCD | Summer | 2028 | 384.26              | 445.08 | 522.20 | 665.98 | 73.64                 | 85.79 | 101.02 | 128.29 |
| AD | Mariposa County APCD | Summer | 2029 | 384.26              | 445.29 | 522.15 | 666.20 | 73.64                 | 85.87 | 101.02 | 128.41 |
| AD | Mariposa County APCD | Summer | 2030 | 384.25              | 445.48 | 522.11 | 666.42 | 73.64                 | 85.94 | 101.01 | 128.52 |
| AD | Mariposa County APCD | Summer | 2031 | 384.25              | 445.67 | 522.08 | 666.71 | 73.65                 | 86.01 | 101.01 | 128.65 |
| AD | Mariposa County APCD | Summer | 2032 | 384.25              | 445.81 | 522.06 | 667.00 | 73.65                 | 86.08 | 101.02 | 128.76 |
| AD | Mariposa County APCD | Summer | 2033 | 384.25              | 445.93 | 522.04 | 667.26 | 73.66                 | 86.13 | 101.02 | 128.86 |
| AD | Mariposa County APCD | Summer | 2034 | 384.24              | 446.03 | 522.02 | 667.49 | 73.66                 | 86.19 | 101.02 | 128.96 |
| AD | Mariposa County APCD | Summer | 2035 | 384.23              | 446.10 | 521.99 | 667.70 | 73.67                 | 86.23 | 101.02 | 129.05 |
| AD | Mariposa County APCD | Winter | 2010 | 347.30              | 403.48 | 476.41 | 596.03 | 74.37                 | 89.51 | 102.09 | 125.68 |
| AD | Mariposa County APCD | Winter | 2011 | 347.12              | 403.27 | 475.59 | 596.55 | 74.22                 | 88.77 | 101.86 | 125.71 |
| AD | Mariposa County APCD | Winter | 2012 | 346.97              | 403.10 | 474.94 | 597.15 | 74.03                 | 88.15 | 101.71 | 125.79 |
| AD | Mariposa County APCD | Winter | 2013 | 346.97              | 402.89 | 474.42 | 597.81 | 73.97                 | 87.50 | 101.57 | 125.92 |
| AD | Mariposa County APCD | Winter | 2014 | 346.91              | 402.69 | 473.97 | 598.45 | 73.82                 | 86.87 | 101.30 | 126.07 |
| AD | Mariposa County APCD | Winter | 2015 | 346.99              | 402.60 | 473.63 | 599.12 | 73.83                 | 86.45 | 101.16 | 126.26 |
| AD | Mariposa County APCD | Winter | 2016 | 347.02              | 402.54 | 473.35 | 599.75 | 73.80                 | 86.11 | 101.08 | 126.48 |
| AD | Mariposa County APCD | Winter | 2017 | 347.05              | 402.44 | 473.14 | 600.35 | 73.77                 | 85.68 | 101.00 | 126.70 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Mariposa County APCD  | Winter | 2018 | 347.05             | 402.40 | 472.95 | 600.86 | 73.71                 | 85.43 | 100.90 | 126.90 |
| AD | Mariposa County APCD  | Winter | 2019 | 347.00             | 402.43 | 472.82 | 601.27 | 73.61                 | 85.35 | 100.87 | 127.11 |
| AD | Mariposa County APCD  | Winter | 2020 | 346.95             | 402.43 | 472.71 | 601.65 | 73.65                 | 85.32 | 100.89 | 127.30 |
| AD | Mariposa County APCD  | Winter | 2021 | 346.89             | 402.39 | 472.58 | 601.84 | 73.67                 | 85.35 | 100.93 | 127.34 |
| AD | Mariposa County APCD  | Winter | 2022 | 346.79             | 402.39 | 472.45 | 602.00 | 73.67                 | 85.40 | 100.94 | 127.39 |
| AD | Mariposa County APCD  | Winter | 2023 | 346.62             | 402.35 | 472.34 | 602.13 | 73.64                 | 85.42 | 100.94 | 127.56 |
| AD | Mariposa County APCD  | Winter | 2024 | 346.44             | 402.31 | 472.26 | 602.23 | 73.60                 | 85.46 | 100.96 | 127.71 |
| AD | Mariposa County APCD  | Winter | 2025 | 346.39             | 402.35 | 472.20 | 602.34 | 73.60                 | 85.52 | 100.99 | 127.87 |
| AD | Mariposa County APCD  | Winter | 2026 | 346.39             | 402.47 | 472.12 | 602.49 | 73.62                 | 85.62 | 101.00 | 128.02 |
| AD | Mariposa County APCD  | Winter | 2027 | 346.37             | 402.58 | 472.05 | 602.65 | 73.63                 | 85.71 | 101.01 | 128.16 |
| AD | Mariposa County APCD  | Winter | 2028 | 346.37             | 402.69 | 472.00 | 602.81 | 73.64                 | 85.79 | 101.02 | 128.29 |
| AD | Mariposa County APCD  | Winter | 2029 | 346.35             | 402.80 | 471.92 | 602.98 | 73.64                 | 85.87 | 101.02 | 128.41 |
| AD | Mariposa County APCD  | Winter | 2030 | 346.32             | 402.90 | 471.85 | 603.12 | 73.64                 | 85.94 | 101.01 | 128.52 |
| AD | Mariposa County APCD  | Winter | 2031 | 346.31             | 403.01 | 471.81 | 603.33 | 73.65                 | 86.01 | 101.01 | 128.65 |
| AD | Mariposa County APCD  | Winter | 2032 | 346.31             | 403.10 | 471.78 | 603.54 | 73.65                 | 86.08 | 101.02 | 128.76 |
| AD | Mariposa County APCD  | Winter | 2033 | 346.30             | 403.18 | 471.75 | 603.72 | 73.66                 | 86.13 | 101.02 | 128.86 |
| AD | Mariposa County APCD  | Winter | 2034 | 346.29             | 403.25 | 471.72 | 603.89 | 73.66                 | 86.19 | 101.02 | 128.96 |
| AD | Mariposa County APCD  | Winter | 2035 | 346.28             | 403.31 | 471.70 | 604.03 | 73.67                 | 86.23 | 101.02 | 129.05 |
| AD | Mendocino County APCD | Annual | 2010 | 328.61             | 379.07 | 451.10 | 562.37 | 72.79                 | 86.74 | 100.94 | 123.79 |
| AD | Mendocino County APCD | Annual | 2011 | 328.64             | 379.33 | 450.55 | 563.04 | 72.74                 | 86.20 | 100.83 | 123.99 |
| AD | Mendocino County APCD | Annual | 2012 | 328.71             | 379.62 | 450.13 | 563.82 | 72.71                 | 85.88 | 100.79 | 124.25 |
| AD | Mendocino County APCD | Annual | 2013 | 328.81             | 379.86 | 449.78 | 564.69 | 72.69                 | 85.57 | 100.77 | 124.53 |
| AD | Mendocino County APCD | Annual | 2014 | 328.91             | 380.10 | 449.50 | 565.53 | 72.66                 | 85.38 | 100.70 | 124.83 |
| AD | Mendocino County APCD | Annual | 2015 | 329.05             | 380.33 | 449.28 | 566.42 | 72.71                 | 85.22 | 100.68 | 125.15 |
| AD | Mendocino County APCD | Annual | 2016 | 329.20             | 380.54 | 449.10 | 567.26 | 72.78                 | 85.05 | 100.67 | 125.47 |
| AD | Mendocino County APCD | Annual | 2017 | 329.29             | 380.71 | 448.96 | 568.05 | 72.79                 | 84.90 | 100.65 | 125.80 |
| AD | Mendocino County APCD | Annual | 2018 | 329.36             | 380.86 | 448.84 | 568.75 | 72.80                 | 84.79 | 100.64 | 126.10 |
| AD | Mendocino County APCD | Annual | 2019 | 329.41             | 381.04 | 448.75 | 569.35 | 72.81                 | 84.81 | 100.66 | 126.39 |
| AD | Mendocino County APCD | Annual | 2020 | 329.46             | 381.20 | 448.68 | 569.87 | 72.90                 | 84.89 | 100.71 | 126.66 |
| AD | Mendocino County APCD | Annual | 2021 | 329.47             | 381.32 | 448.60 | 570.28 | 72.95                 | 85.00 | 100.77 | 126.88 |
| AD | Mendocino County APCD | Annual | 2022 | 329.44             | 381.41 | 448.52 | 570.63 | 72.98                 | 85.10 | 100.81 | 127.08 |
| AD | Mendocino County APCD | Annual | 2023 | 329.37             | 381.48 | 448.45 | 570.90 | 72.99                 | 85.18 | 100.85 | 127.29 |
| AD | Mendocino County APCD | Annual | 2024 | 329.30             | 381.52 | 448.37 | 571.09 | 72.98                 | 85.26 | 100.87 | 127.48 |
| AD | Mendocino County APCD | Annual | 2025 | 329.26             | 381.61 | 448.33 | 571.27 | 72.99                 | 85.36 | 100.90 | 127.65 |
| AD | Mendocino County APCD | Annual | 2026 | 329.27             | 381.77 | 448.27 | 571.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| AD | Mendocino County APCD | Annual | 2027 | 329.27             | 381.91 | 448.22 | 571.68 | 73.03                 | 85.57 | 100.94 | 127.97 |
| AD | Mendocino County APCD | Annual | 2028 | 329.27             | 382.05 | 448.17 | 571.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| AD | Mendocino County APCD | Annual | 2029 | 329.25             | 382.19 | 448.10 | 572.09 | 73.04                 | 85.75 | 100.95 | 128.24 |
| AD | Mendocino County APCD | Annual | 2030 | 329.24             | 382.33 | 448.03 | 572.30 | 73.04                 | 85.83 | 100.95 | 128.37 |
| AD | Mendocino County APCD | Annual | 2031 | 329.23             | 382.47 | 448.00 | 572.53 | 73.05                 | 85.91 | 100.96 | 128.50 |
| AD | Mendocino County APCD | Annual | 2032 | 329.23             | 382.60 | 447.97 | 572.77 | 73.06                 | 85.98 | 100.96 | 128.62 |
| AD | Mendocino County APCD | Annual | 2033 | 329.22             | 382.71 | 447.95 | 572.98 | 73.06                 | 86.05 | 100.96 | 128.73 |
| AD | Mendocino County APCD | Annual | 2034 | 329.22             | 382.81 | 447.93 | 573.17 | 73.07                 | 86.11 | 100.97 | 128.83 |
| AD | Mendocino County APCD | Annual | 2035 | 329.21             | 382.89 | 447.91 | 573.33 | 73.07                 | 86.16 | 100.97 | 128.93 |
| AD | Mendocino County APCD | Summer | 2010 | 335.50             | 385.93 | 460.22 | 573.75 | 72.79                 | 86.74 | 100.94 | 123.79 |
| AD | Mendocino County APCD | Summer | 2011 | 335.60             | 386.40 | 459.76 | 574.44 | 72.74                 | 86.20 | 100.83 | 123.99 |
| AD | Mendocino County APCD | Summer | 2012 | 335.73             | 386.85 | 459.39 | 575.26 | 72.71                 | 85.88 | 100.79 | 124.25 |
| AD | Mendocino County APCD | Summer | 2013 | 335.88             | 387.22 | 459.11 | 576.18 | 72.69                 | 85.57 | 100.77 | 124.53 |
| AD | Mendocino County APCD | Summer | 2014 | 336.01             | 387.57 | 458.87 | 577.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| AD | Mendocino County APCD | Summer | 2015 | 336.17             | 387.90 | 458.70 | 578.04 | 72.71                 | 85.22 | 100.68 | 125.15 |
| AD | Mendocino County APCD | Summer | 2016 | 336.34             | 388.18 | 458.56 | 578.96 | 72.78                 | 85.05 | 100.67 | 125.47 |
| AD | Mendocino County APCD | Summer | 2017 | 336.43             | 388.42 | 458.43 | 579.82 | 72.79                 | 84.90 | 100.65 | 125.80 |
| AD | Mendocino County APCD | Summer | 2018 | 336.49             | 388.62 | 458.33 | 580.57 | 72.80                 | 84.79 | 100.64 | 126.10 |
| AD | Mendocino County APCD | Summer | 2019 | 336.54             | 388.83 | 458.25 | 581.22 | 72.81                 | 84.81 | 100.66 | 126.39 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |        |        |        |
|----|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|--------|--------|--------|
|    |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1   | LDT2   | MDV    |
| AD | Mendocino County APCD | Summer | 2020 | 336.59             | 389.03 | 458.18 | 581.78 | 72.90                 | 84.89  | 100.71 | 126.66 |
| AD | Mendocino County APCD | Summer | 2021 | 336.60             | 389.18 | 458.11 | 582.21 | 72.95                 | 85.00  | 100.77 | 126.88 |
| AD | Mendocino County APCD | Summer | 2022 | 336.57             | 389.31 | 458.03 | 582.59 | 72.98                 | 85.10  | 100.81 | 127.08 |
| AD | Mendocino County APCD | Summer | 2023 | 336.50             | 389.40 | 457.96 | 582.88 | 72.99                 | 85.18  | 100.85 | 127.29 |
| AD | Mendocino County APCD | Summer | 2024 | 336.43             | 389.46 | 457.89 | 583.08 | 72.98                 | 85.26  | 100.87 | 127.48 |
| AD | Mendocino County APCD | Summer | 2025 | 336.39             | 389.57 | 457.85 | 583.26 | 72.99                 | 85.36  | 100.90 | 127.65 |
| AD | Mendocino County APCD | Summer | 2026 | 336.40             | 389.75 | 457.79 | 583.47 | 73.01                 | 85.47  | 100.93 | 127.81 |
| AD | Mendocino County APCD | Summer | 2027 | 336.41             | 389.91 | 457.74 | 583.68 | 73.03                 | 85.57  | 100.94 | 127.97 |
| AD | Mendocino County APCD | Summer | 2028 | 336.41             | 390.07 | 457.70 | 583.89 | 73.03                 | 85.66  | 100.96 | 128.11 |
| AD | Mendocino County APCD | Summer | 2029 | 336.40             | 390.24 | 457.63 | 584.11 | 73.04                 | 85.75  | 100.95 | 128.24 |
| AD | Mendocino County APCD | Summer | 2030 | 336.39             | 390.39 | 457.57 | 584.32 | 73.04                 | 85.83  | 100.95 | 128.37 |
| AD | Mendocino County APCD | Summer | 2031 | 336.39             | 390.55 | 457.53 | 584.57 | 73.05                 | 85.91  | 100.96 | 128.50 |
| AD | Mendocino County APCD | Summer | 2032 | 336.38             | 390.69 | 457.51 | 584.82 | 73.06                 | 85.98  | 100.96 | 128.62 |
| AD | Mendocino County APCD | Summer | 2033 | 336.38             | 390.81 | 457.48 | 585.05 | 73.06                 | 86.05  | 100.96 | 128.73 |
| AD | Mendocino County APCD | Summer | 2034 | 336.37             | 390.92 | 457.46 | 585.25 | 73.07                 | 86.11  | 100.97 | 128.83 |
| AD | Mendocino County APCD | Summer | 2035 | 336.36             | 391.01 | 457.44 | 585.42 | 73.07                 | 86.16  | 100.97 | 128.93 |
| AD | Mendocino County APCD | Winter | 2010 | 325.36             | 375.84 | 446.80 | 556.99 | 72.79                 | 86.74  | 100.94 | 123.79 |
| AD | Mendocino County APCD | Winter | 2011 | 325.35             | 375.99 | 446.21 | 557.66 | 72.74                 | 86.20  | 100.83 | 123.99 |
| AD | Mendocino County APCD | Winter | 2012 | 325.39             | 376.21 | 445.75 | 558.43 | 72.71                 | 85.88  | 100.79 | 124.25 |
| AD | Mendocino County APCD | Winter | 2013 | 325.47             | 376.38 | 445.38 | 559.27 | 72.69                 | 85.57  | 100.77 | 124.53 |
| AD | Mendocino County APCD | Winter | 2014 | 325.56             | 376.57 | 445.08 | 560.08 | 72.66                 | 85.38  | 100.70 | 124.83 |
| AD | Mendocino County APCD | Winter | 2015 | 325.69             | 376.77 | 444.84 | 560.93 | 72.71                 | 85.22  | 100.68 | 125.15 |
| AD | Mendocino County APCD | Winter | 2016 | 325.84             | 376.93 | 444.64 | 561.74 | 72.78                 | 85.05  | 100.67 | 125.47 |
| AD | Mendocino County APCD | Winter | 2017 | 325.92             | 377.08 | 444.49 | 562.50 | 72.79                 | 84.90  | 100.65 | 125.80 |
| AD | Mendocino County APCD | Winter | 2018 | 325.99             | 377.20 | 444.36 | 563.17 | 72.80                 | 84.79  | 100.64 | 126.10 |
| AD | Mendocino County APCD | Winter | 2019 | 326.04             | 377.36 | 444.27 | 563.75 | 72.81                 | 84.81  | 100.66 | 126.39 |
| AD | Mendocino County APCD | Winter | 2020 | 326.10             | 377.51 | 444.20 | 564.26 | 72.90                 | 84.89  | 100.71 | 126.66 |
| AD | Mendocino County APCD | Winter | 2021 | 326.10             | 377.61 | 444.12 | 564.65 | 72.95                 | 85.00  | 100.77 | 126.88 |
| AD | Mendocino County APCD | Winter | 2022 | 326.08             | 377.69 | 444.04 | 564.99 | 72.98                 | 85.10  | 100.81 | 127.08 |
| AD | Mendocino County APCD | Winter | 2023 | 326.01             | 377.75 | 443.96 | 565.25 | 72.99                 | 85.18  | 100.85 | 127.29 |
| AD | Mendocino County APCD | Winter | 2024 | 325.93             | 377.77 | 443.88 | 565.44 | 72.98                 | 85.26  | 100.87 | 127.48 |
| AD | Mendocino County APCD | Winter | 2025 | 325.89             | 377.86 | 443.83 | 565.61 | 72.99                 | 85.36  | 100.90 | 127.65 |
| AD | Mendocino County APCD | Winter | 2026 | 325.90             | 378.00 | 443.78 | 565.81 | 73.01                 | 85.47  | 100.93 | 127.81 |
| AD | Mendocino County APCD | Winter | 2027 | 325.90             | 378.13 | 443.72 | 566.01 | 73.03                 | 85.57  | 100.94 | 127.97 |
| AD | Mendocino County APCD | Winter | 2028 | 325.90             | 378.27 | 443.68 | 566.22 | 73.03                 | 85.66  | 100.96 | 128.11 |
| AD | Mendocino County APCD | Winter | 2029 | 325.88             | 378.40 | 443.60 | 566.42 | 73.04                 | 85.75  | 100.95 | 128.24 |
| AD | Mendocino County APCD | Winter | 2030 | 325.86             | 378.53 | 443.54 | 566.62 | 73.04                 | 85.83  | 100.95 | 128.37 |
| AD | Mendocino County APCD | Winter | 2031 | 325.86             | 378.66 | 443.50 | 566.86 | 73.05                 | 85.91  | 100.96 | 128.50 |
| AD | Mendocino County APCD | Winter | 2032 | 325.85             | 378.78 | 443.47 | 567.09 | 73.06                 | 85.98  | 100.96 | 128.62 |
| AD | Mendocino County APCD | Winter | 2033 | 325.85             | 378.89 | 443.45 | 567.29 | 73.06                 | 86.05  | 100.96 | 128.73 |
| AD | Mendocino County APCD | Winter | 2034 | 325.84             | 378.99 | 443.43 | 567.47 | 73.07                 | 86.11  | 100.97 | 128.83 |
| AD | Mendocino County APCD | Winter | 2035 | 325.83             | 379.07 | 443.41 | 567.63 | 73.07                 | 86.16  | 100.97 | 128.93 |
| AD | Modoc County APCD     | Annual | 2010 | 408.79             | 488.59 | 560.53 | 697.57 | 74.87                 | 100.48 | 102.62 | 125.01 |
| AD | Modoc County APCD     | Annual | 2011 | 408.63             | 485.64 | 559.72 | 698.46 | 74.72                 | 97.48  | 102.30 | 125.08 |
| AD | Modoc County APCD     | Annual | 2012 | 408.43             | 483.59 | 559.09 | 699.50 | 74.39                 | 95.30  | 102.13 | 125.22 |
| AD | Modoc County APCD     | Annual | 2013 | 408.39             | 482.13 | 558.57 | 700.69 | 74.23                 | 93.74  | 101.93 | 125.38 |
| AD | Modoc County APCD     | Annual | 2014 | 408.30             | 480.62 | 558.13 | 701.74 | 73.97                 | 91.96  | 101.58 | 125.59 |
| AD | Modoc County APCD     | Annual | 2015 | 408.25             | 479.23 | 557.81 | 702.85 | 73.76                 | 90.19  | 101.45 | 125.82 |
| AD | Modoc County APCD     | Annual | 2016 | 408.36             | 478.26 | 557.54 | 703.92 | 73.79                 | 88.96  | 101.31 | 126.08 |
| AD | Modoc County APCD     | Annual | 2017 | 408.32             | 477.36 | 557.31 | 704.96 | 73.64                 | 87.77  | 101.05 | 126.34 |
| AD | Modoc County APCD     | Annual | 2018 | 408.22             | 476.76 | 557.13 | 705.82 | 73.43                 | 87.03  | 100.91 | 126.59 |
| AD | Modoc County APCD     | Annual | 2019 | 408.20             | 476.34 | 556.98 | 706.60 | 73.35                 | 86.56  | 100.78 | 126.79 |
| AD | Modoc County APCD     | Annual | 2020 | 408.15             | 475.96 | 556.87 | 707.25 | 73.39                 | 86.27  | 100.81 | 127.00 |
| AD | Modoc County APCD     | Annual | 2021 | 408.10             | 475.54 | 556.77 | 707.69 | 73.42                 | 86.13  | 100.87 | 127.13 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location          | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |        |        |        |
|----|-------------------|--------|------|--------------------|--------|--------|--------|-----------------------|--------|--------|--------|
|    |                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1   | LDT2   | MDV    |
| AD | Modoc County APCD | Annual | 2022 | 408.00             | 475.17 | 556.62 | 708.03 | 73.42                 | 86.00  | 100.88 | 127.20 |
| AD | Modoc County APCD | Annual | 2023 | 407.93             | 474.79 | 556.52 | 708.27 | 73.44                 | 85.87  | 100.91 | 127.38 |
| AD | Modoc County APCD | Annual | 2024 | 407.79             | 474.58 | 556.39 | 708.49 | 73.41                 | 85.82  | 100.92 | 127.55 |
| AD | Modoc County APCD | Annual | 2025 | 407.72             | 474.59 | 556.34 | 708.71 | 73.41                 | 85.87  | 100.96 | 127.72 |
| AD | Modoc County APCD | Annual | 2026 | 407.73             | 474.69 | 556.26 | 709.00 | 73.43                 | 85.94  | 100.98 | 127.90 |
| AD | Modoc County APCD | Annual | 2027 | 407.73             | 474.80 | 556.20 | 709.30 | 73.44                 | 86.00  | 100.99 | 128.07 |
| AD | Modoc County APCD | Annual | 2028 | 407.71             | 474.90 | 556.15 | 709.60 | 73.44                 | 86.06  | 101.01 | 128.22 |
| AD | Modoc County APCD | Annual | 2029 | 407.70             | 475.01 | 556.08 | 709.88 | 73.45                 | 86.12  | 101.01 | 128.36 |
| AD | Modoc County APCD | Annual | 2030 | 407.68             | 475.10 | 556.00 | 710.15 | 73.45                 | 86.17  | 101.01 | 128.50 |
| AD | Modoc County APCD | Annual | 2031 | 407.69             | 475.22 | 555.95 | 710.46 | 73.45                 | 86.22  | 101.01 | 128.63 |
| AD | Modoc County APCD | Annual | 2032 | 407.68             | 475.32 | 555.91 | 710.77 | 73.46                 | 86.27  | 101.01 | 128.76 |
| AD | Modoc County APCD | Annual | 2033 | 407.68             | 475.40 | 555.88 | 711.04 | 73.47                 | 86.31  | 101.01 | 128.87 |
| AD | Modoc County APCD | Annual | 2034 | 407.67             | 475.47 | 555.85 | 711.29 | 73.47                 | 86.35  | 101.01 | 128.97 |
| AD | Modoc County APCD | Annual | 2035 | 407.66             | 475.53 | 555.81 | 711.49 | 73.48                 | 86.38  | 101.02 | 129.07 |
| AD | Modoc County APCD | Summer | 2010 | 425.39             | 503.36 | 582.23 | 724.10 | 74.87                 | 100.48 | 102.62 | 125.01 |
| AD | Modoc County APCD | Summer | 2011 | 425.44             | 501.48 | 581.68 | 725.15 | 74.72                 | 97.48  | 102.30 | 125.08 |
| AD | Modoc County APCD | Summer | 2012 | 425.41             | 500.15 | 581.24 | 726.37 | 74.39                 | 95.30  | 102.13 | 125.22 |
| AD | Modoc County APCD | Summer | 2013 | 425.50             | 499.17 | 580.90 | 727.80 | 74.23                 | 93.74  | 101.93 | 125.38 |
| AD | Modoc County APCD | Summer | 2014 | 425.50             | 498.13 | 580.66 | 729.05 | 73.97                 | 91.96  | 101.58 | 125.59 |
| AD | Modoc County APCD | Summer | 2015 | 425.50             | 497.14 | 580.45 | 730.41 | 73.76                 | 90.19  | 101.45 | 125.82 |
| AD | Modoc County APCD | Summer | 2016 | 425.64             | 496.45 | 580.30 | 731.70 | 73.79                 | 88.96  | 101.31 | 126.08 |
| AD | Modoc County APCD | Summer | 2017 | 425.62             | 495.80 | 580.16 | 732.94 | 73.64                 | 87.77  | 101.05 | 126.34 |
| AD | Modoc County APCD | Summer | 2018 | 425.52             | 495.35 | 580.02 | 733.96 | 73.43                 | 87.03  | 100.91 | 126.59 |
| AD | Modoc County APCD | Summer | 2019 | 425.50             | 495.06 | 579.91 | 734.91 | 73.35                 | 86.56  | 100.78 | 126.79 |
| AD | Modoc County APCD | Summer | 2020 | 425.44             | 494.80 | 579.80 | 735.68 | 73.39                 | 86.27  | 100.81 | 127.00 |
| AD | Modoc County APCD | Summer | 2021 | 425.39             | 494.51 | 579.70 | 736.23 | 73.42                 | 86.13  | 100.87 | 127.13 |
| AD | Modoc County APCD | Summer | 2022 | 425.28             | 494.26 | 579.57 | 736.66 | 73.42                 | 86.00  | 100.88 | 127.20 |
| AD | Modoc County APCD | Summer | 2023 | 425.21             | 493.99 | 579.47 | 736.98 | 73.44                 | 85.87  | 100.91 | 127.38 |
| AD | Modoc County APCD | Summer | 2024 | 425.08             | 493.85 | 579.37 | 737.26 | 73.41                 | 85.82  | 100.92 | 127.55 |
| AD | Modoc County APCD | Summer | 2025 | 425.02             | 493.90 | 579.31 | 737.53 | 73.41                 | 85.87  | 100.96 | 127.72 |
| AD | Modoc County APCD | Summer | 2026 | 425.03             | 494.03 | 579.22 | 737.87 | 73.43                 | 85.94  | 100.98 | 127.90 |
| AD | Modoc County APCD | Summer | 2027 | 425.04             | 494.17 | 579.16 | 738.21 | 73.44                 | 86.00  | 100.99 | 128.07 |
| AD | Modoc County APCD | Summer | 2028 | 425.05             | 494.30 | 579.11 | 738.56 | 73.44                 | 86.06  | 101.01 | 128.22 |
| AD | Modoc County APCD | Summer | 2029 | 425.05             | 494.46 | 579.05 | 738.88 | 73.45                 | 86.12  | 101.01 | 128.36 |
| AD | Modoc County APCD | Summer | 2030 | 425.04             | 494.57 | 578.98 | 739.20 | 73.45                 | 86.17  | 101.01 | 128.50 |
| AD | Modoc County APCD | Summer | 2031 | 425.05             | 494.75 | 578.95 | 739.54 | 73.45                 | 86.22  | 101.01 | 128.63 |
| AD | Modoc County APCD | Summer | 2032 | 425.05             | 494.88 | 578.93 | 739.88 | 73.46                 | 86.27  | 101.01 | 128.76 |
| AD | Modoc County APCD | Summer | 2033 | 425.05             | 494.99 | 578.91 | 740.18 | 73.47                 | 86.31  | 101.01 | 128.87 |
| AD | Modoc County APCD | Summer | 2034 | 425.04             | 495.08 | 578.89 | 740.44 | 73.47                 | 86.35  | 101.01 | 128.97 |
| AD | Modoc County APCD | Summer | 2035 | 425.03             | 495.14 | 578.86 | 740.68 | 73.48                 | 86.38  | 101.02 | 129.07 |
| AD | Modoc County APCD | Winter | 2010 | 403.43             | 483.82 | 553.52 | 689.00 | 74.87                 | 100.48 | 102.62 | 125.01 |
| AD | Modoc County APCD | Winter | 2011 | 403.20             | 480.53 | 552.63 | 689.84 | 74.72                 | 97.48  | 102.30 | 125.08 |
| AD | Modoc County APCD | Winter | 2012 | 402.94             | 478.25 | 551.93 | 690.82 | 74.39                 | 95.30  | 102.13 | 125.22 |
| AD | Modoc County APCD | Winter | 2013 | 402.86             | 476.62 | 551.35 | 691.93 | 74.23                 | 93.74  | 101.93 | 125.38 |
| AD | Modoc County APCD | Winter | 2014 | 402.75             | 474.97 | 550.86 | 692.91 | 73.97                 | 91.96  | 101.58 | 125.59 |
| AD | Modoc County APCD | Winter | 2015 | 402.67             | 473.44 | 550.49 | 693.96 | 73.76                 | 90.19  | 101.45 | 125.82 |
| AD | Modoc County APCD | Winter | 2016 | 402.78             | 472.38 | 550.19 | 694.95 | 73.79                 | 88.96  | 101.31 | 126.08 |
| AD | Modoc County APCD | Winter | 2017 | 402.74             | 471.40 | 549.93 | 695.92 | 73.64                 | 87.77  | 101.05 | 126.34 |
| AD | Modoc County APCD | Winter | 2018 | 402.64             | 470.75 | 549.73 | 696.72 | 73.43                 | 87.03  | 100.91 | 126.59 |
| AD | Modoc County APCD | Winter | 2019 | 402.61             | 470.29 | 549.57 | 697.46 | 73.35                 | 86.56  | 100.78 | 126.79 |
| AD | Modoc County APCD | Winter | 2020 | 402.56             | 469.87 | 549.46 | 698.07 | 73.39                 | 86.27  | 100.81 | 127.00 |
| AD | Modoc County APCD | Winter | 2021 | 402.52             | 469.41 | 549.36 | 698.48 | 73.42                 | 86.13  | 100.87 | 127.13 |
| AD | Modoc County APCD | Winter | 2022 | 402.41             | 469.01 | 549.21 | 698.78 | 73.42                 | 86.00  | 100.88 | 127.20 |
| AD | Modoc County APCD | Winter | 2023 | 402.35             | 468.59 | 549.10 | 699.00 | 73.44                 | 85.87  | 100.91 | 127.38 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location           | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|--------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                    |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Modoc County APCD  | Winter | 2024 | 402.21             | 468.35 | 548.97 | 699.20 | 73.41                 | 85.82 | 100.92 | 127.55 |
| AD | Modoc County APCD  | Winter | 2025 | 402.14             | 468.36 | 548.91 | 699.40 | 73.41                 | 85.87 | 100.96 | 127.72 |
| AD | Modoc County APCD  | Winter | 2026 | 402.14             | 468.45 | 548.84 | 699.67 | 73.43                 | 85.94 | 100.98 | 127.90 |
| AD | Modoc County APCD  | Winter | 2027 | 402.13             | 468.54 | 548.78 | 699.96 | 73.44                 | 86.00 | 100.99 | 128.07 |
| AD | Modoc County APCD  | Winter | 2028 | 402.11             | 468.63 | 548.73 | 700.25 | 73.44                 | 86.06 | 101.01 | 128.22 |
| AD | Modoc County APCD  | Winter | 2029 | 402.10             | 468.72 | 548.66 | 700.50 | 73.45                 | 86.12 | 101.01 | 128.36 |
| AD | Modoc County APCD  | Winter | 2030 | 402.08             | 468.81 | 548.57 | 700.77 | 73.45                 | 86.17 | 101.01 | 128.50 |
| AD | Modoc County APCD  | Winter | 2031 | 402.08             | 468.91 | 548.52 | 701.07 | 73.45                 | 86.22 | 101.01 | 128.63 |
| AD | Modoc County APCD  | Winter | 2032 | 402.08             | 469.00 | 548.47 | 701.37 | 73.46                 | 86.27 | 101.01 | 128.76 |
| AD | Modoc County APCD  | Winter | 2033 | 402.07             | 469.08 | 548.44 | 701.63 | 73.47                 | 86.31 | 101.01 | 128.87 |
| AD | Modoc County APCD  | Winter | 2034 | 402.06             | 469.14 | 548.40 | 701.87 | 73.47                 | 86.35 | 101.01 | 128.97 |
| AD | Modoc County APCD  | Winter | 2035 | 402.05             | 469.20 | 548.37 | 702.06 | 73.48                 | 86.38 | 101.02 | 129.07 |
| AD | Mojave Desert AQMD | Annual | 2010 | 343.05             | 394.06 | 468.76 | 591.38 | 73.41                 | 85.48 | 100.04 | 125.17 |
| AD | Mojave Desert AQMD | Annual | 2011 | 342.29             | 393.63 | 467.24 | 590.34 | 73.41                 | 85.20 | 100.07 | 125.44 |
| AD | Mojave Desert AQMD | Annual | 2012 | 342.53             | 394.30 | 467.14 | 591.14 | 73.44                 | 85.03 | 100.14 | 125.71 |
| AD | Mojave Desert AQMD | Annual | 2013 | 341.38             | 393.17 | 465.19 | 589.42 | 73.47                 | 84.92 | 100.21 | 125.99 |
| AD | Mojave Desert AQMD | Annual | 2014 | 341.59             | 393.65 | 465.17 | 590.21 | 73.49                 | 84.81 | 100.26 | 126.27 |
| AD | Mojave Desert AQMD | Annual | 2015 | 338.75             | 390.36 | 460.98 | 585.50 | 73.53                 | 84.76 | 100.32 | 126.55 |
| AD | Mojave Desert AQMD | Annual | 2016 | 338.93             | 390.74 | 460.98 | 586.19 | 73.58                 | 84.74 | 100.39 | 126.82 |
| AD | Mojave Desert AQMD | Annual | 2017 | 339.08             | 391.08 | 460.98 | 586.83 | 73.61                 | 84.71 | 100.44 | 127.08 |
| AD | Mojave Desert AQMD | Annual | 2018 | 339.19             | 391.37 | 460.98 | 587.37 | 73.63                 | 84.72 | 100.49 | 127.32 |
| AD | Mojave Desert AQMD | Annual | 2019 | 338.63             | 390.87 | 460.03 | 586.67 | 73.67                 | 84.83 | 100.55 | 127.55 |
| AD | Mojave Desert AQMD | Annual | 2020 | 338.73             | 391.16 | 460.03 | 587.11 | 73.75                 | 84.98 | 100.63 | 127.76 |
| AD | Mojave Desert AQMD | Annual | 2021 | 338.49             | 390.98 | 459.55 | 586.82 | 73.81                 | 85.14 | 100.70 | 127.93 |
| AD | Mojave Desert AQMD | Annual | 2022 | 338.53             | 391.22 | 459.56 | 587.12 | 73.85                 | 85.27 | 100.76 | 128.07 |
| AD | Mojave Desert AQMD | Annual | 2023 | 338.54             | 391.42 | 459.56 | 587.36 | 73.88                 | 85.39 | 100.81 | 128.23 |
| AD | Mojave Desert AQMD | Annual | 2024 | 340.10             | 393.08 | 461.41 | 589.95 | 73.90                 | 85.50 | 100.85 | 128.37 |
| AD | Mojave Desert AQMD | Annual | 2025 | 340.11             | 393.24 | 461.42 | 590.15 | 73.91                 | 85.59 | 100.89 | 128.50 |
| AD | Mojave Desert AQMD | Annual | 2026 | 340.14             | 393.40 | 461.41 | 590.33 | 73.93                 | 85.68 | 100.92 | 128.62 |
| AD | Mojave Desert AQMD | Annual | 2027 | 340.16             | 393.55 | 461.40 | 590.50 | 73.94                 | 85.76 | 100.94 | 128.72 |
| AD | Mojave Desert AQMD | Annual | 2028 | 340.18             | 393.70 | 461.40 | 590.67 | 73.95                 | 85.84 | 100.95 | 128.82 |
| AD | Mojave Desert AQMD | Annual | 2029 | 340.20             | 393.85 | 461.40 | 590.84 | 73.96                 | 85.91 | 100.96 | 128.90 |
| AD | Mojave Desert AQMD | Annual | 2030 | 340.22             | 393.99 | 461.40 | 591.00 | 73.96                 | 85.97 | 100.97 | 128.98 |
| AD | Mojave Desert AQMD | Annual | 2031 | 342.78             | 396.53 | 464.37 | 595.11 | 73.96                 | 86.03 | 100.98 | 129.06 |
| AD | Mojave Desert AQMD | Annual | 2032 | 342.80             | 396.66 | 464.38 | 595.29 | 73.97                 | 86.09 | 100.98 | 129.13 |
| AD | Mojave Desert AQMD | Annual | 2033 | 342.81             | 396.77 | 464.39 | 595.46 | 73.97                 | 86.13 | 100.99 | 129.19 |
| AD | Mojave Desert AQMD | Annual | 2034 | 342.83             | 396.88 | 464.41 | 595.62 | 73.97                 | 86.18 | 100.99 | 129.24 |
| AD | Mojave Desert AQMD | Annual | 2035 | 342.85             | 396.97 | 464.43 | 595.76 | 73.98                 | 86.22 | 101.00 | 129.29 |
| AD | Mojave Desert AQMD | Summer | 2010 | 368.41             | 420.54 | 502.82 | 633.92 | 73.41                 | 85.48 | 100.04 | 125.17 |
| AD | Mojave Desert AQMD | Summer | 2011 | 367.55             | 420.78 | 501.45 | 632.76 | 73.41                 | 85.20 | 100.07 | 125.44 |
| AD | Mojave Desert AQMD | Summer | 2012 | 367.74             | 422.01 | 501.49 | 633.58 | 73.44                 | 85.03 | 100.14 | 125.71 |
| AD | Mojave Desert AQMD | Summer | 2013 | 366.36             | 420.99 | 499.44 | 631.63 | 73.47                 | 84.92 | 100.21 | 125.99 |
| AD | Mojave Desert AQMD | Summer | 2014 | 366.44             | 421.63 | 499.44 | 632.39 | 73.49                 | 84.81 | 100.26 | 126.27 |
| AD | Mojave Desert AQMD | Summer | 2015 | 363.25             | 418.10 | 494.94 | 627.28 | 73.53                 | 84.76 | 100.32 | 126.55 |
| AD | Mojave Desert AQMD | Summer | 2016 | 363.37             | 418.49 | 494.93 | 627.96 | 73.58                 | 84.74 | 100.39 | 126.82 |
| AD | Mojave Desert AQMD | Summer | 2017 | 363.42             | 418.82 | 494.89 | 628.59 | 73.61                 | 84.71 | 100.44 | 127.08 |
| AD | Mojave Desert AQMD | Summer | 2018 | 363.43             | 419.07 | 494.81 | 629.09 | 73.63                 | 84.72 | 100.49 | 127.32 |
| AD | Mojave Desert AQMD | Summer | 2019 | 362.72             | 418.47 | 493.69 | 628.25 | 73.67                 | 84.83 | 100.55 | 127.55 |
| AD | Mojave Desert AQMD | Summer | 2020 | 362.73             | 418.73 | 493.60 | 628.67 | 73.75                 | 84.98 | 100.63 | 127.76 |
| AD | Mojave Desert AQMD | Summer | 2021 | 362.41             | 418.50 | 492.93 | 628.23 | 73.81                 | 85.14 | 100.70 | 127.93 |
| AD | Mojave Desert AQMD | Summer | 2022 | 362.41             | 418.75 | 492.84 | 628.48 | 73.85                 | 85.27 | 100.76 | 128.07 |
| AD | Mojave Desert AQMD | Summer | 2023 | 362.38             | 418.95 | 492.74 | 628.63 | 73.88                 | 85.39 | 100.81 | 128.23 |
| AD | Mojave Desert AQMD | Summer | 2024 | 363.89             | 420.61 | 494.47 | 631.12 | 73.90                 | 85.50 | 100.85 | 128.37 |
| AD | Mojave Desert AQMD | Summer | 2025 | 363.86             | 420.78 | 494.42 | 631.25 | 73.91                 | 85.59 | 100.89 | 128.50 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                  | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                           |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Mojave Desert AQMD        | Summer | 2026 | 363.86             | 420.97 | 494.37 | 631.36 | 73.93                 | 85.68 | 100.92 | 128.62 |
| AD | Mojave Desert AQMD        | Summer | 2027 | 363.84             | 421.14 | 494.32 | 631.45 | 73.94                 | 85.76 | 100.94 | 128.72 |
| AD | Mojave Desert AQMD        | Summer | 2028 | 363.82             | 421.29 | 494.28 | 631.55 | 73.95                 | 85.84 | 100.95 | 128.82 |
| AD | Mojave Desert AQMD        | Summer | 2029 | 363.80             | 421.45 | 494.24 | 631.64 | 73.96                 | 85.91 | 100.96 | 128.90 |
| AD | Mojave Desert AQMD        | Summer | 2030 | 363.78             | 421.60 | 494.20 | 631.73 | 73.96                 | 85.97 | 100.97 | 128.98 |
| AD | Mojave Desert AQMD        | Summer | 2031 | 366.32             | 424.18 | 497.16 | 635.80 | 73.96                 | 86.03 | 100.98 | 129.06 |
| AD | Mojave Desert AQMD        | Summer | 2032 | 366.30             | 424.34 | 497.16 | 635.94 | 73.97                 | 86.09 | 100.98 | 129.13 |
| AD | Mojave Desert AQMD        | Summer | 2033 | 366.29             | 424.48 | 497.16 | 636.07 | 73.97                 | 86.13 | 100.99 | 129.19 |
| AD | Mojave Desert AQMD        | Summer | 2034 | 366.28             | 424.59 | 497.16 | 636.19 | 73.97                 | 86.18 | 100.99 | 129.24 |
| AD | Mojave Desert AQMD        | Summer | 2035 | 366.27             | 424.67 | 497.16 | 636.30 | 73.98                 | 86.22 | 101.00 | 129.29 |
| AD | Mojave Desert AQMD        | Winter | 2010 | 329.23             | 380.23 | 450.90 | 569.02 | 73.41                 | 85.48 | 100.04 | 125.17 |
| AD | Mojave Desert AQMD        | Winter | 2011 | 328.43             | 379.61 | 449.39 | 568.04 | 73.41                 | 85.20 | 100.07 | 125.44 |
| AD | Mojave Desert AQMD        | Winter | 2012 | 328.62             | 380.12 | 449.23 | 568.81 | 73.44                 | 85.03 | 100.14 | 125.71 |
| AD | Mojave Desert AQMD        | Winter | 2013 | 327.45             | 378.91 | 447.29 | 567.12 | 73.47                 | 84.92 | 100.21 | 125.99 |
| AD | Mojave Desert AQMD        | Winter | 2014 | 327.61             | 379.28 | 447.21 | 567.85 | 73.49                 | 84.81 | 100.26 | 126.27 |
| AD | Mojave Desert AQMD        | Winter | 2015 | 324.84             | 376.02 | 443.12 | 563.25 | 73.53                 | 84.76 | 100.32 | 126.55 |
| AD | Mojave Desert AQMD        | Winter | 2016 | 324.99             | 376.34 | 443.08 | 563.87 | 73.58                 | 84.74 | 100.39 | 126.82 |
| AD | Mojave Desert AQMD        | Winter | 2017 | 325.11             | 376.62 | 443.04 | 564.46 | 73.61                 | 84.71 | 100.44 | 127.08 |
| AD | Mojave Desert AQMD        | Winter | 2018 | 325.20             | 376.87 | 443.02 | 564.96 | 73.63                 | 84.72 | 100.49 | 127.32 |
| AD | Mojave Desert AQMD        | Winter | 2019 | 324.64             | 376.36 | 442.08 | 564.24 | 73.67                 | 84.83 | 100.55 | 127.55 |
| AD | Mojave Desert AQMD        | Winter | 2020 | 324.71             | 376.61 | 442.06 | 564.63 | 73.75                 | 84.98 | 100.63 | 127.76 |
| AD | Mojave Desert AQMD        | Winter | 2021 | 324.46             | 376.36 | 441.55 | 564.27 | 73.81                 | 85.14 | 100.70 | 127.93 |
| AD | Mojave Desert AQMD        | Winter | 2022 | 324.48             | 376.54 | 441.52 | 564.49 | 73.85                 | 85.27 | 100.76 | 128.07 |
| AD | Mojave Desert AQMD        | Winter | 2023 | 324.48             | 376.68 | 441.50 | 564.66 | 73.88                 | 85.39 | 100.81 | 128.23 |
| AD | Mojave Desert AQMD        | Winter | 2024 | 325.93             | 378.21 | 443.20 | 567.06 | 73.90                 | 85.50 | 100.85 | 128.37 |
| AD | Mojave Desert AQMD        | Winter | 2025 | 325.94             | 378.32 | 443.20 | 567.22 | 73.91                 | 85.59 | 100.89 | 128.50 |
| AD | Mojave Desert AQMD        | Winter | 2026 | 325.96             | 378.44 | 443.18 | 567.37 | 73.93                 | 85.68 | 100.92 | 128.62 |
| AD | Mojave Desert AQMD        | Winter | 2027 | 325.97             | 378.56 | 443.16 | 567.51 | 73.94                 | 85.76 | 100.94 | 128.72 |
| AD | Mojave Desert AQMD        | Winter | 2028 | 325.99             | 378.68 | 443.15 | 567.64 | 73.95                 | 85.84 | 100.95 | 128.82 |
| AD | Mojave Desert AQMD        | Winter | 2029 | 325.99             | 378.79 | 443.13 | 567.78 | 73.96                 | 85.91 | 100.96 | 128.90 |
| AD | Mojave Desert AQMD        | Winter | 2030 | 326.00             | 378.91 | 443.12 | 567.91 | 73.96                 | 85.97 | 100.97 | 128.98 |
| AD | Mojave Desert AQMD        | Winter | 2031 | 328.38             | 381.24 | 445.87 | 571.70 | 73.96                 | 86.03 | 100.98 | 129.06 |
| AD | Mojave Desert AQMD        | Winter | 2032 | 328.39             | 381.34 | 445.87 | 571.84 | 73.97                 | 86.09 | 100.98 | 129.13 |
| AD | Mojave Desert AQMD        | Winter | 2033 | 328.40             | 381.43 | 445.87 | 571.96 | 73.97                 | 86.13 | 100.99 | 129.19 |
| AD | Mojave Desert AQMD        | Winter | 2034 | 328.42             | 381.50 | 445.87 | 572.08 | 73.97                 | 86.18 | 100.99 | 129.24 |
| AD | Mojave Desert AQMD        | Winter | 2035 | 328.43             | 381.57 | 445.87 | 572.18 | 73.98                 | 86.22 | 101.00 | 129.29 |
| AD | Monterey Bay Unified APCD | Annual | 2010 | 352.08             | 409.85 | 484.60 | 606.53 | 72.96                 | 88.37 | 99.87  | 123.92 |
| AD | Monterey Bay Unified APCD | Annual | 2011 | 352.06             | 409.40 | 483.84 | 606.61 | 72.93                 | 87.57 | 99.90  | 124.13 |
| AD | Monterey Bay Unified APCD | Annual | 2012 | 352.19             | 409.24 | 483.32 | 607.40 | 72.89                 | 86.90 | 99.95  | 124.37 |
| AD | Monterey Bay Unified APCD | Annual | 2013 | 352.37             | 409.19 | 482.92 | 608.27 | 72.92                 | 86.40 | 100.03 | 124.65 |
| AD | Monterey Bay Unified APCD | Annual | 2014 | 352.53             | 409.12 | 482.60 | 609.12 | 72.92                 | 85.94 | 100.10 | 124.93 |
| AD | Monterey Bay Unified APCD | Annual | 2015 | 352.73             | 409.11 | 482.36 | 609.99 | 72.98                 | 85.55 | 100.18 | 125.24 |
| AD | Monterey Bay Unified APCD | Annual | 2016 | 352.92             | 409.09 | 482.18 | 610.81 | 73.05                 | 85.20 | 100.28 | 125.55 |
| AD | Monterey Bay Unified APCD | Annual | 2017 | 353.06             | 409.10 | 482.04 | 611.59 | 73.09                 | 84.93 | 100.35 | 125.86 |
| AD | Monterey Bay Unified APCD | Annual | 2018 | 353.17             | 409.13 | 481.94 | 612.28 | 73.12                 | 84.71 | 100.43 | 126.15 |
| AD | Monterey Bay Unified APCD | Annual | 2019 | 353.27             | 409.25 | 481.87 | 612.89 | 73.16                 | 84.66 | 100.51 | 126.43 |
| AD | Monterey Bay Unified APCD | Annual | 2020 | 353.37             | 409.39 | 481.83 | 613.44 | 73.25                 | 84.73 | 100.59 | 126.69 |
| AD | Monterey Bay Unified APCD | Annual | 2021 | 354.32             | 410.59 | 483.10 | 615.32 | 73.33                 | 84.87 | 100.68 | 126.92 |
| AD | Monterey Bay Unified APCD | Annual | 2022 | 354.37             | 410.77 | 483.07 | 615.74 | 73.38                 | 84.99 | 100.74 | 127.10 |
| AD | Monterey Bay Unified APCD | Annual | 2023 | 354.37             | 410.92 | 483.04 | 616.07 | 73.42                 | 85.10 | 100.80 | 127.31 |
| AD | Monterey Bay Unified APCD | Annual | 2024 | 354.34             | 411.03 | 483.02 | 616.34 | 73.43                 | 85.19 | 100.84 | 127.49 |
| AD | Monterey Bay Unified APCD | Annual | 2025 | 354.34             | 411.14 | 483.01 | 616.61 | 73.45                 | 85.28 | 100.88 | 127.66 |
| AD | Monterey Bay Unified APCD | Annual | 2026 | 353.30             | 409.99 | 481.54 | 614.89 | 73.47                 | 85.37 | 100.91 | 127.83 |
| AD | Monterey Bay Unified APCD | Annual | 2027 | 353.33             | 410.12 | 481.49 | 615.18 | 73.49                 | 85.45 | 100.93 | 127.98 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                  | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                           |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Monterey Bay Unified APCD | Annual | 2028 | 353.35             | 410.27 | 481.44 | 615.46 | 73.50                 | 85.52 | 100.94 | 128.12 |
| AD | Monterey Bay Unified APCD | Annual | 2029 | 353.36             | 410.41 | 481.37 | 615.73 | 73.51                 | 85.58 | 100.94 | 128.25 |
| AD | Monterey Bay Unified APCD | Annual | 2030 | 353.37             | 410.56 | 481.31 | 616.01 | 73.51                 | 85.65 | 100.94 | 128.38 |
| AD | Monterey Bay Unified APCD | Annual | 2031 | 353.39             | 410.72 | 481.27 | 616.28 | 73.52                 | 85.71 | 100.95 | 128.50 |
| AD | Monterey Bay Unified APCD | Annual | 2032 | 353.41             | 410.88 | 481.25 | 616.56 | 73.52                 | 85.77 | 100.96 | 128.62 |
| AD | Monterey Bay Unified APCD | Annual | 2033 | 353.43             | 411.02 | 481.23 | 616.82 | 73.53                 | 85.83 | 100.96 | 128.73 |
| AD | Monterey Bay Unified APCD | Annual | 2034 | 353.45             | 411.15 | 481.21 | 617.05 | 73.53                 | 85.88 | 100.96 | 128.83 |
| AD | Monterey Bay Unified APCD | Annual | 2035 | 353.47             | 411.25 | 481.20 | 617.25 | 73.54                 | 85.93 | 100.97 | 128.92 |
| AD | Monterey Bay Unified APCD | Summer | 2010 | 372.98             | 431.76 | 511.84 | 642.11 | 72.96                 | 88.37 | 99.87  | 123.92 |
| AD | Monterey Bay Unified APCD | Summer | 2011 | 373.14             | 431.60 | 511.31 | 642.11 | 72.93                 | 87.57 | 99.90  | 124.13 |
| AD | Monterey Bay Unified APCD | Summer | 2012 | 373.41             | 431.71 | 511.01 | 642.95 | 72.89                 | 86.90 | 99.95  | 124.37 |
| AD | Monterey Bay Unified APCD | Summer | 2013 | 373.71             | 431.90 | 510.79 | 643.91 | 72.92                 | 86.40 | 100.03 | 124.65 |
| AD | Monterey Bay Unified APCD | Summer | 2014 | 373.96             | 432.06 | 510.63 | 644.90 | 72.92                 | 85.94 | 100.10 | 124.93 |
| AD | Monterey Bay Unified APCD | Summer | 2015 | 374.21             | 432.22 | 510.51 | 645.93 | 72.98                 | 85.55 | 100.18 | 125.24 |
| AD | Monterey Bay Unified APCD | Summer | 2016 | 374.44             | 432.38 | 510.41 | 646.92 | 73.05                 | 85.20 | 100.28 | 125.55 |
| AD | Monterey Bay Unified APCD | Summer | 2017 | 374.60             | 432.55 | 510.33 | 647.86 | 73.09                 | 84.93 | 100.35 | 125.86 |
| AD | Monterey Bay Unified APCD | Summer | 2018 | 374.71             | 432.72 | 510.25 | 648.67 | 73.12                 | 84.71 | 100.43 | 126.15 |
| AD | Monterey Bay Unified APCD | Summer | 2019 | 374.81             | 432.96 | 510.19 | 649.38 | 73.16                 | 84.66 | 100.51 | 126.43 |
| AD | Monterey Bay Unified APCD | Summer | 2020 | 374.91             | 433.20 | 510.15 | 650.02 | 73.25                 | 84.73 | 100.59 | 126.69 |
| AD | Monterey Bay Unified APCD | Summer | 2021 | 375.91             | 434.52 | 511.49 | 652.05 | 73.33                 | 84.87 | 100.68 | 126.92 |
| AD | Monterey Bay Unified APCD | Summer | 2022 | 375.97             | 434.78 | 511.48 | 652.54 | 73.38                 | 84.99 | 100.74 | 127.10 |
| AD | Monterey Bay Unified APCD | Summer | 2023 | 375.98             | 434.99 | 511.46 | 652.91 | 73.42                 | 85.10 | 100.80 | 127.31 |
| AD | Monterey Bay Unified APCD | Summer | 2024 | 375.97             | 435.16 | 511.45 | 653.21 | 73.43                 | 85.19 | 100.84 | 127.49 |
| AD | Monterey Bay Unified APCD | Summer | 2025 | 375.98             | 435.32 | 511.45 | 653.50 | 73.45                 | 85.28 | 100.88 | 127.66 |
| AD | Monterey Bay Unified APCD | Summer | 2026 | 374.88             | 434.13 | 509.90 | 651.66 | 73.47                 | 85.37 | 100.91 | 127.83 |
| AD | Monterey Bay Unified APCD | Summer | 2027 | 374.91             | 434.30 | 509.87 | 651.96 | 73.49                 | 85.45 | 100.93 | 127.98 |
| AD | Monterey Bay Unified APCD | Summer | 2028 | 374.94             | 434.48 | 509.85 | 652.26 | 73.50                 | 85.52 | 100.94 | 128.12 |
| AD | Monterey Bay Unified APCD | Summer | 2029 | 374.97             | 434.67 | 509.80 | 652.55 | 73.51                 | 85.58 | 100.94 | 128.25 |
| AD | Monterey Bay Unified APCD | Summer | 2030 | 374.99             | 434.87 | 509.76 | 652.86 | 73.51                 | 85.65 | 100.94 | 128.38 |
| AD | Monterey Bay Unified APCD | Summer | 2031 | 375.02             | 435.07 | 509.74 | 653.15 | 73.52                 | 85.71 | 100.95 | 128.50 |
| AD | Monterey Bay Unified APCD | Summer | 2032 | 375.05             | 435.26 | 509.73 | 653.46 | 73.52                 | 85.77 | 100.96 | 128.62 |
| AD | Monterey Bay Unified APCD | Summer | 2033 | 375.08             | 435.43 | 509.73 | 653.75 | 73.53                 | 85.83 | 100.96 | 128.73 |
| AD | Monterey Bay Unified APCD | Summer | 2034 | 375.11             | 435.58 | 509.72 | 654.02 | 73.53                 | 85.88 | 100.96 | 128.83 |
| AD | Monterey Bay Unified APCD | Summer | 2035 | 375.13             | 435.71 | 509.72 | 654.27 | 73.54                 | 85.93 | 100.97 | 128.92 |
| AD | Monterey Bay Unified APCD | Winter | 2010 | 350.54             | 408.22 | 482.61 | 603.75 | 72.96                 | 88.37 | 99.87  | 123.92 |
| AD | Monterey Bay Unified APCD | Winter | 2011 | 350.51             | 407.75 | 481.84 | 603.84 | 72.93                 | 87.57 | 99.90  | 124.13 |
| AD | Monterey Bay Unified APCD | Winter | 2012 | 350.63             | 407.55 | 481.30 | 604.63 | 72.89                 | 86.90 | 99.95  | 124.37 |
| AD | Monterey Bay Unified APCD | Winter | 2013 | 350.80             | 407.48 | 480.89 | 605.48 | 72.92                 | 86.40 | 100.03 | 124.65 |
| AD | Monterey Bay Unified APCD | Winter | 2014 | 350.96             | 407.39 | 480.56 | 606.32 | 72.92                 | 85.94 | 100.10 | 124.93 |
| AD | Monterey Bay Unified APCD | Winter | 2015 | 351.15             | 407.36 | 480.31 | 607.18 | 72.98                 | 85.55 | 100.18 | 125.24 |
| AD | Monterey Bay Unified APCD | Winter | 2016 | 351.33             | 407.32 | 480.12 | 607.99 | 73.05                 | 85.20 | 100.28 | 125.55 |
| AD | Monterey Bay Unified APCD | Winter | 2017 | 351.48             | 407.33 | 479.98 | 608.75 | 73.09                 | 84.93 | 100.35 | 125.86 |
| AD | Monterey Bay Unified APCD | Winter | 2018 | 351.58             | 407.34 | 479.88 | 609.43 | 73.12                 | 84.71 | 100.43 | 126.15 |
| AD | Monterey Bay Unified APCD | Winter | 2019 | 351.68             | 407.44 | 479.81 | 610.03 | 73.16                 | 84.66 | 100.51 | 126.43 |
| AD | Monterey Bay Unified APCD | Winter | 2020 | 351.78             | 407.58 | 479.76 | 610.57 | 73.25                 | 84.73 | 100.59 | 126.69 |
| AD | Monterey Bay Unified APCD | Winter | 2021 | 352.73             | 408.76 | 481.03 | 612.44 | 73.33                 | 84.87 | 100.68 | 126.92 |
| AD | Monterey Bay Unified APCD | Winter | 2022 | 352.78             | 408.94 | 481.00 | 612.85 | 73.38                 | 84.99 | 100.74 | 127.10 |
| AD | Monterey Bay Unified APCD | Winter | 2023 | 352.78             | 409.08 | 480.97 | 613.18 | 73.42                 | 85.10 | 100.80 | 127.31 |
| AD | Monterey Bay Unified APCD | Winter | 2024 | 352.74             | 409.19 | 480.94 | 613.44 | 73.43                 | 85.19 | 100.84 | 127.49 |
| AD | Monterey Bay Unified APCD | Winter | 2025 | 352.74             | 409.30 | 480.93 | 613.72 | 73.45                 | 85.28 | 100.88 | 127.66 |
| AD | Monterey Bay Unified APCD | Winter | 2026 | 351.70             | 408.15 | 479.46 | 612.01 | 73.47                 | 85.37 | 100.91 | 127.83 |
| AD | Monterey Bay Unified APCD | Winter | 2027 | 351.73             | 408.27 | 479.41 | 612.29 | 73.49                 | 85.45 | 100.93 | 127.98 |
| AD | Monterey Bay Unified APCD | Winter | 2028 | 351.74             | 408.41 | 479.36 | 612.56 | 73.50                 | 85.52 | 100.94 | 128.12 |
| AD | Monterey Bay Unified APCD | Winter | 2029 | 351.75             | 408.56 | 479.28 | 612.84 | 73.51                 | 85.58 | 100.94 | 128.25 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                  | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                           |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Monterey Bay Unified APCD | Winter | 2030 | 351.76              | 408.70 | 479.22 | 613.11 | 73.51                 | 85.65 | 100.94 | 128.38 |
| AD | Monterey Bay Unified APCD | Winter | 2031 | 351.78              | 408.85 | 479.18 | 613.38 | 73.52                 | 85.71 | 100.95 | 128.50 |
| AD | Monterey Bay Unified APCD | Winter | 2032 | 351.80              | 409.00 | 479.15 | 613.65 | 73.52                 | 85.77 | 100.96 | 128.62 |
| AD | Monterey Bay Unified APCD | Winter | 2033 | 351.82              | 409.14 | 479.13 | 613.90 | 73.53                 | 85.83 | 100.96 | 128.73 |
| AD | Monterey Bay Unified APCD | Winter | 2034 | 351.84              | 409.26 | 479.11 | 614.13 | 73.53                 | 85.88 | 100.96 | 128.83 |
| AD | Monterey Bay Unified APCD | Winter | 2035 | 351.85              | 409.37 | 479.10 | 614.33 | 73.54                 | 85.93 | 100.97 | 128.92 |
| AD | North Coast Unified APCD  | Annual | 2010 | 338.11              | 392.75 | 467.85 | 585.18 | 73.17                 | 86.39 | 100.59 | 124.05 |
| AD | North Coast Unified APCD  | Annual | 2011 | 338.10              | 393.14 | 467.19 | 585.81 | 73.12                 | 85.93 | 100.52 | 124.23 |
| AD | North Coast Unified APCD  | Annual | 2012 | 338.14              | 393.49 | 466.64 | 586.54 | 73.06                 | 85.62 | 100.52 | 124.47 |
| AD | North Coast Unified APCD  | Annual | 2013 | 338.24              | 393.78 | 466.22 | 587.38 | 73.05                 | 85.35 | 100.53 | 124.74 |
| AD | North Coast Unified APCD  | Annual | 2014 | 338.28              | 394.01 | 465.87 | 588.19 | 73.01                 | 85.13 | 100.52 | 125.01 |
| AD | North Coast Unified APCD  | Annual | 2015 | 338.37              | 394.26 | 465.57 | 589.00 | 72.98                 | 84.96 | 100.52 | 125.31 |
| AD | North Coast Unified APCD  | Annual | 2016 | 338.50              | 394.52 | 465.35 | 589.80 | 73.04                 | 84.88 | 100.56 | 125.63 |
| AD | North Coast Unified APCD  | Annual | 2017 | 338.57              | 394.73 | 465.13 | 590.53 | 73.04                 | 84.75 | 100.59 | 125.94 |
| AD | North Coast Unified APCD  | Annual | 2018 | 338.64              | 394.93 | 464.97 | 591.16 | 73.06                 | 84.68 | 100.60 | 126.24 |
| AD | North Coast Unified APCD  | Annual | 2019 | 338.69              | 395.13 | 464.85 | 591.71 | 73.08                 | 84.72 | 100.65 | 126.52 |
| AD | North Coast Unified APCD  | Annual | 2020 | 338.73              | 395.31 | 464.72 | 592.18 | 73.17                 | 84.80 | 100.71 | 126.78 |
| AD | North Coast Unified APCD  | Annual | 2021 | 338.75              | 395.45 | 464.60 | 592.55 | 73.23                 | 84.92 | 100.77 | 126.99 |
| AD | North Coast Unified APCD  | Annual | 2022 | 338.73              | 395.55 | 464.48 | 592.85 | 73.27                 | 85.02 | 100.82 | 127.17 |
| AD | North Coast Unified APCD  | Annual | 2023 | 338.66              | 395.62 | 464.39 | 593.07 | 73.28                 | 85.12 | 100.86 | 127.37 |
| AD | North Coast Unified APCD  | Annual | 2024 | 338.54              | 395.69 | 464.32 | 593.28 | 73.28                 | 85.20 | 100.89 | 127.56 |
| AD | North Coast Unified APCD  | Annual | 2025 | 338.47              | 395.79 | 464.26 | 593.47 | 73.29                 | 85.30 | 100.92 | 127.72 |
| AD | North Coast Unified APCD  | Annual | 2026 | 338.49              | 395.93 | 464.14 | 593.62 | 73.31                 | 85.41 | 100.94 | 127.88 |
| AD | North Coast Unified APCD  | Annual | 2027 | 338.50              | 396.07 | 464.04 | 593.77 | 73.32                 | 85.51 | 100.96 | 128.03 |
| AD | North Coast Unified APCD  | Annual | 2028 | 338.50              | 396.22 | 463.93 | 593.95 | 73.33                 | 85.61 | 100.97 | 128.17 |
| AD | North Coast Unified APCD  | Annual | 2029 | 338.50              | 396.36 | 463.83 | 594.12 | 73.33                 | 85.70 | 100.97 | 128.30 |
| AD | North Coast Unified APCD  | Annual | 2030 | 338.48              | 396.49 | 463.70 | 594.29 | 73.34                 | 85.78 | 100.96 | 128.43 |
| AD | North Coast Unified APCD  | Annual | 2031 | 338.48              | 396.63 | 463.68 | 594.46 | 73.34                 | 85.86 | 100.97 | 128.55 |
| AD | North Coast Unified APCD  | Annual | 2032 | 338.47              | 396.74 | 463.65 | 594.63 | 73.35                 | 85.94 | 100.97 | 128.67 |
| AD | North Coast Unified APCD  | Annual | 2033 | 338.46              | 396.83 | 463.63 | 594.77 | 73.35                 | 86.01 | 100.97 | 128.77 |
| AD | North Coast Unified APCD  | Annual | 2034 | 338.45              | 396.90 | 463.60 | 594.89 | 73.36                 | 86.07 | 100.98 | 128.87 |
| AD | North Coast Unified APCD  | Annual | 2035 | 338.44              | 396.95 | 463.58 | 594.99 | 73.36                 | 86.12 | 100.98 | 128.96 |
| AD | North Coast Unified APCD  | Summer | 2010 | 339.07              | 393.94 | 469.47 | 587.35 | 73.17                 | 86.39 | 100.59 | 124.05 |
| AD | North Coast Unified APCD  | Summer | 2011 | 339.07              | 394.39 | 468.84 | 587.99 | 73.12                 | 85.93 | 100.52 | 124.23 |
| AD | North Coast Unified APCD  | Summer | 2012 | 339.11              | 394.78 | 468.30 | 588.72 | 73.06                 | 85.62 | 100.52 | 124.47 |
| AD | North Coast Unified APCD  | Summer | 2013 | 339.22              | 395.11 | 467.90 | 589.58 | 73.05                 | 85.35 | 100.53 | 124.74 |
| AD | North Coast Unified APCD  | Summer | 2014 | 339.27              | 395.37 | 467.56 | 590.40 | 73.01                 | 85.13 | 100.52 | 125.01 |
| AD | North Coast Unified APCD  | Summer | 2015 | 339.36              | 395.64 | 467.27 | 591.23 | 72.98                 | 84.96 | 100.52 | 125.31 |
| AD | North Coast Unified APCD  | Summer | 2016 | 339.49              | 395.92 | 467.05 | 592.05 | 73.04                 | 84.88 | 100.56 | 125.63 |
| AD | North Coast Unified APCD  | Summer | 2017 | 339.56              | 396.15 | 466.84 | 592.80 | 73.04                 | 84.75 | 100.59 | 125.94 |
| AD | North Coast Unified APCD  | Summer | 2018 | 339.62              | 396.36 | 466.67 | 593.44 | 73.06                 | 84.68 | 100.60 | 126.24 |
| AD | North Coast Unified APCD  | Summer | 2019 | 339.68              | 396.58 | 466.56 | 594.00 | 73.08                 | 84.72 | 100.65 | 126.52 |
| AD | North Coast Unified APCD  | Summer | 2020 | 339.72              | 396.76 | 466.42 | 594.47 | 73.17                 | 84.80 | 100.71 | 126.78 |
| AD | North Coast Unified APCD  | Summer | 2021 | 339.73              | 396.92 | 466.29 | 594.85 | 73.23                 | 84.92 | 100.77 | 126.99 |
| AD | North Coast Unified APCD  | Summer | 2022 | 339.71              | 397.02 | 466.18 | 595.16 | 73.27                 | 85.02 | 100.82 | 127.17 |
| AD | North Coast Unified APCD  | Summer | 2023 | 339.64              | 397.10 | 466.08 | 595.38 | 73.28                 | 85.12 | 100.86 | 127.37 |
| AD | North Coast Unified APCD  | Summer | 2024 | 339.52              | 397.18 | 466.01 | 595.60 | 73.28                 | 85.20 | 100.89 | 127.56 |
| AD | North Coast Unified APCD  | Summer | 2025 | 339.44              | 397.28 | 465.96 | 595.80 | 73.29                 | 85.30 | 100.92 | 127.72 |
| AD | North Coast Unified APCD  | Summer | 2026 | 339.46              | 397.42 | 465.83 | 595.95 | 73.31                 | 85.41 | 100.94 | 127.88 |
| AD | North Coast Unified APCD  | Summer | 2027 | 339.47              | 397.56 | 465.72 | 596.10 | 73.32                 | 85.51 | 100.96 | 128.03 |
| AD | North Coast Unified APCD  | Summer | 2028 | 339.48              | 397.72 | 465.61 | 596.27 | 73.33                 | 85.61 | 100.97 | 128.17 |
| AD | North Coast Unified APCD  | Summer | 2029 | 339.48              | 397.86 | 465.51 | 596.44 | 73.33                 | 85.70 | 100.97 | 128.30 |
| AD | North Coast Unified APCD  | Summer | 2030 | 339.46              | 397.99 | 465.38 | 596.62 | 73.34                 | 85.78 | 100.96 | 128.43 |
| AD | North Coast Unified APCD  | Summer | 2031 | 339.46              | 398.14 | 465.36 | 596.78 | 73.34                 | 85.86 | 100.97 | 128.55 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                 | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|--------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                          |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | North Coast Unified APCD | Summer | 2032 | 339.46             | 398.25 | 465.34 | 596.94 | 73.35                 | 85.94 | 100.97 | 128.67 |
| AD | North Coast Unified APCD | Summer | 2033 | 339.45             | 398.34 | 465.31 | 597.08 | 73.35                 | 86.01 | 100.97 | 128.77 |
| AD | North Coast Unified APCD | Summer | 2034 | 339.43             | 398.40 | 465.29 | 597.20 | 73.36                 | 86.07 | 100.98 | 128.87 |
| AD | North Coast Unified APCD | Summer | 2035 | 339.42             | 398.44 | 465.27 | 597.30 | 73.36                 | 86.12 | 100.98 | 128.96 |
| AD | North Coast Unified APCD | Winter | 2010 | 336.39             | 390.83 | 465.37 | 582.01 | 73.17                 | 86.39 | 100.59 | 124.05 |
| AD | North Coast Unified APCD | Winter | 2011 | 336.36             | 391.14 | 464.68 | 582.63 | 73.12                 | 85.93 | 100.52 | 124.23 |
| AD | North Coast Unified APCD | Winter | 2012 | 336.38             | 391.43 | 464.11 | 583.35 | 73.06                 | 85.62 | 100.52 | 124.47 |
| AD | North Coast Unified APCD | Winter | 2013 | 336.47             | 391.68 | 463.67 | 584.16 | 73.05                 | 85.35 | 100.53 | 124.74 |
| AD | North Coast Unified APCD | Winter | 2014 | 336.51             | 391.88 | 463.31 | 584.95 | 73.01                 | 85.13 | 100.52 | 125.01 |
| AD | North Coast Unified APCD | Winter | 2015 | 336.59             | 392.10 | 463.00 | 585.74 | 72.98                 | 84.96 | 100.52 | 125.31 |
| AD | North Coast Unified APCD | Winter | 2016 | 336.72             | 392.33 | 462.77 | 586.52 | 73.04                 | 84.88 | 100.56 | 125.63 |
| AD | North Coast Unified APCD | Winter | 2017 | 336.79             | 392.52 | 462.55 | 587.24 | 73.04                 | 84.75 | 100.59 | 125.94 |
| AD | North Coast Unified APCD | Winter | 2018 | 336.86             | 392.70 | 462.38 | 587.85 | 73.06                 | 84.68 | 100.60 | 126.24 |
| AD | North Coast Unified APCD | Winter | 2019 | 336.92             | 392.89 | 462.26 | 588.38 | 73.08                 | 84.72 | 100.65 | 126.52 |
| AD | North Coast Unified APCD | Winter | 2020 | 336.96             | 393.05 | 462.13 | 588.84 | 73.17                 | 84.80 | 100.71 | 126.78 |
| AD | North Coast Unified APCD | Winter | 2021 | 336.98             | 393.18 | 462.02 | 589.20 | 73.23                 | 84.92 | 100.77 | 126.99 |
| AD | North Coast Unified APCD | Winter | 2022 | 336.96             | 393.27 | 461.90 | 589.49 | 73.27                 | 85.02 | 100.82 | 127.17 |
| AD | North Coast Unified APCD | Winter | 2023 | 336.89             | 393.33 | 461.80 | 589.70 | 73.28                 | 85.12 | 100.86 | 127.37 |
| AD | North Coast Unified APCD | Winter | 2024 | 336.78             | 393.40 | 461.73 | 589.91 | 73.28                 | 85.20 | 100.89 | 127.56 |
| AD | North Coast Unified APCD | Winter | 2025 | 336.70             | 393.50 | 461.68 | 590.09 | 73.29                 | 85.30 | 100.92 | 127.72 |
| AD | North Coast Unified APCD | Winter | 2026 | 336.72             | 393.63 | 461.56 | 590.25 | 73.31                 | 85.41 | 100.94 | 127.88 |
| AD | North Coast Unified APCD | Winter | 2027 | 336.73             | 393.76 | 461.46 | 590.40 | 73.32                 | 85.51 | 100.96 | 128.03 |
| AD | North Coast Unified APCD | Winter | 2028 | 336.73             | 393.91 | 461.35 | 590.57 | 73.33                 | 85.61 | 100.97 | 128.17 |
| AD | North Coast Unified APCD | Winter | 2029 | 336.72             | 394.04 | 461.25 | 590.75 | 73.33                 | 85.70 | 100.97 | 128.30 |
| AD | North Coast Unified APCD | Winter | 2030 | 336.71             | 394.16 | 461.12 | 590.92 | 73.34                 | 85.78 | 100.96 | 128.43 |
| AD | North Coast Unified APCD | Winter | 2031 | 336.71             | 394.30 | 461.10 | 591.08 | 73.34                 | 85.86 | 100.97 | 128.55 |
| AD | North Coast Unified APCD | Winter | 2032 | 336.70             | 394.41 | 461.07 | 591.25 | 73.35                 | 85.94 | 100.97 | 128.67 |
| AD | North Coast Unified APCD | Winter | 2033 | 336.69             | 394.50 | 461.05 | 591.39 | 73.35                 | 86.01 | 100.97 | 128.77 |
| AD | North Coast Unified APCD | Winter | 2034 | 336.68             | 394.57 | 461.02 | 591.51 | 73.36                 | 86.07 | 100.98 | 128.87 |
| AD | North Coast Unified APCD | Winter | 2035 | 336.67             | 394.61 | 461.00 | 591.61 | 73.36                 | 86.12 | 100.98 | 128.96 |
| AD | Northern Sierra AQMD     | Annual | 2010 | 335.85             | 403.50 | 460.60 | 582.46 | 73.83                 | 93.66 | 100.49 | 125.24 |
| AD | Northern Sierra AQMD     | Annual | 2011 | 335.79             | 403.58 | 459.90 | 583.10 | 73.66                 | 92.12 | 100.45 | 125.33 |
| AD | Northern Sierra AQMD     | Annual | 2012 | 335.78             | 403.52 | 459.38 | 583.85 | 73.51                 | 90.81 | 100.45 | 125.45 |
| AD | Northern Sierra AQMD     | Annual | 2013 | 335.79             | 403.50 | 459.02 | 584.66 | 73.39                 | 89.69 | 100.44 | 125.61 |
| AD | Northern Sierra AQMD     | Annual | 2014 | 335.77             | 403.42 | 458.71 | 585.44 | 73.23                 | 88.70 | 100.46 | 125.78 |
| AD | Northern Sierra AQMD     | Annual | 2015 | 335.82             | 403.39 | 458.48 | 586.29 | 73.16                 | 87.84 | 100.50 | 125.98 |
| AD | Northern Sierra AQMD     | Annual | 2016 | 335.92             | 403.32 | 458.32 | 587.09 | 73.17                 | 87.09 | 100.56 | 126.21 |
| AD | Northern Sierra AQMD     | Annual | 2017 | 335.94             | 403.29 | 458.20 | 587.82 | 73.12                 | 86.34 | 100.55 | 126.44 |
| AD | Northern Sierra AQMD     | Annual | 2018 | 335.96             | 403.18 | 458.11 | 588.47 | 73.08                 | 85.76 | 100.59 | 126.67 |
| AD | Northern Sierra AQMD     | Annual | 2019 | 335.99             | 403.23 | 458.04 | 589.02 | 73.07                 | 85.48 | 100.62 | 126.89 |
| AD | Northern Sierra AQMD     | Annual | 2020 | 336.03             | 403.26 | 457.98 | 589.50 | 73.16                 | 85.41 | 100.69 | 127.10 |
| AD | Northern Sierra AQMD     | Annual | 2021 | 336.06             | 403.35 | 457.94 | 589.83 | 73.23                 | 85.46 | 100.76 | 127.22 |
| AD | Northern Sierra AQMD     | Annual | 2022 | 336.04             | 403.43 | 457.90 | 590.06 | 73.28                 | 85.51 | 100.82 | 127.27 |
| AD | Northern Sierra AQMD     | Annual | 2023 | 336.00             | 403.49 | 457.85 | 590.24 | 73.30                 | 85.55 | 100.87 | 127.44 |
| AD | Northern Sierra AQMD     | Annual | 2024 | 335.93             | 403.48 | 457.82 | 590.43 | 73.31                 | 85.58 | 100.90 | 127.60 |
| AD | Northern Sierra AQMD     | Annual | 2025 | 335.92             | 403.43 | 457.78 | 590.66 | 73.33                 | 85.65 | 100.93 | 127.77 |
| AD | Northern Sierra AQMD     | Annual | 2026 | 335.94             | 403.53 | 457.74 | 590.88 | 73.35                 | 85.73 | 100.96 | 127.93 |
| AD | Northern Sierra AQMD     | Annual | 2027 | 335.96             | 403.60 | 457.69 | 591.11 | 73.37                 | 85.80 | 100.97 | 128.07 |
| AD | Northern Sierra AQMD     | Annual | 2028 | 335.97             | 403.70 | 457.66 | 591.34 | 73.38                 | 85.86 | 100.98 | 128.21 |
| AD | Northern Sierra AQMD     | Annual | 2029 | 335.98             | 403.82 | 457.62 | 591.59 | 73.38                 | 85.92 | 100.98 | 128.33 |
| AD | Northern Sierra AQMD     | Annual | 2030 | 335.97             | 403.91 | 457.56 | 591.83 | 73.39                 | 85.98 | 100.97 | 128.46 |
| AD | Northern Sierra AQMD     | Annual | 2031 | 335.99             | 404.07 | 457.55 | 592.03 | 73.40                 | 86.03 | 100.98 | 128.58 |
| AD | Northern Sierra AQMD     | Annual | 2032 | 336.00             | 404.19 | 457.53 | 592.24 | 73.40                 | 86.08 | 100.98 | 128.69 |
| AD | Northern Sierra AQMD     | Annual | 2033 | 336.01             | 404.33 | 457.52 | 592.41 | 73.41                 | 86.13 | 100.98 | 128.80 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Northern Sierra AQMD | Annual | 2034 | 336.01             | 404.45 | 457.50 | 592.56 | 73.41                 | 86.17 | 100.99 | 128.89 |
| AD | Northern Sierra AQMD | Annual | 2035 | 336.01             | 404.53 | 457.50 | 592.68 | 73.42                 | 86.21 | 100.99 | 128.98 |
| AD | Northern Sierra AQMD | Summer | 2010 | 359.56             | 428.44 | 492.24 | 621.66 | 73.83                 | 93.66 | 100.49 | 125.24 |
| AD | Northern Sierra AQMD | Summer | 2011 | 359.74             | 429.15 | 491.87 | 622.40 | 73.66                 | 92.12 | 100.45 | 125.33 |
| AD | Northern Sierra AQMD | Summer | 2012 | 359.93             | 429.60 | 491.60 | 623.31 | 73.51                 | 90.81 | 100.45 | 125.45 |
| AD | Northern Sierra AQMD | Summer | 2013 | 360.10             | 429.97 | 491.44 | 624.34 | 73.39                 | 89.69 | 100.44 | 125.61 |
| AD | Northern Sierra AQMD | Summer | 2014 | 360.21             | 430.21 | 491.29 | 625.36 | 73.23                 | 88.70 | 100.46 | 125.78 |
| AD | Northern Sierra AQMD | Summer | 2015 | 360.36             | 430.46 | 491.19 | 626.49 | 73.16                 | 87.84 | 100.50 | 125.98 |
| AD | Northern Sierra AQMD | Summer | 2016 | 360.51             | 430.61 | 491.11 | 627.56 | 73.17                 | 87.09 | 100.56 | 126.21 |
| AD | Northern Sierra AQMD | Summer | 2017 | 360.57             | 430.78 | 491.05 | 628.52 | 73.12                 | 86.34 | 100.55 | 126.44 |
| AD | Northern Sierra AQMD | Summer | 2018 | 360.60             | 430.82 | 490.96 | 629.37 | 73.08                 | 85.76 | 100.59 | 126.67 |
| AD | Northern Sierra AQMD | Summer | 2019 | 360.63             | 430.98 | 490.90 | 630.09 | 73.07                 | 85.48 | 100.62 | 126.89 |
| AD | Northern Sierra AQMD | Summer | 2020 | 360.67             | 431.10 | 490.84 | 630.70 | 73.16                 | 85.41 | 100.69 | 127.10 |
| AD | Northern Sierra AQMD | Summer | 2021 | 360.69             | 431.25 | 490.78 | 631.15 | 73.23                 | 85.46 | 100.76 | 127.22 |
| AD | Northern Sierra AQMD | Summer | 2022 | 360.67             | 431.39 | 490.74 | 631.50 | 73.28                 | 85.51 | 100.82 | 127.27 |
| AD | Northern Sierra AQMD | Summer | 2023 | 360.63             | 431.52 | 490.69 | 631.75 | 73.30                 | 85.55 | 100.87 | 127.44 |
| AD | Northern Sierra AQMD | Summer | 2024 | 360.56             | 431.57 | 490.66 | 632.00 | 73.31                 | 85.58 | 100.90 | 127.60 |
| AD | Northern Sierra AQMD | Summer | 2025 | 360.55             | 431.55 | 490.62 | 632.26 | 73.33                 | 85.65 | 100.93 | 127.77 |
| AD | Northern Sierra AQMD | Summer | 2026 | 360.58             | 431.69 | 490.59 | 632.48 | 73.35                 | 85.73 | 100.96 | 127.93 |
| AD | Northern Sierra AQMD | Summer | 2027 | 360.60             | 431.79 | 490.57 | 632.71 | 73.37                 | 85.80 | 100.97 | 128.07 |
| AD | Northern Sierra AQMD | Summer | 2028 | 360.63             | 431.93 | 490.55 | 632.96 | 73.38                 | 85.86 | 100.98 | 128.21 |
| AD | Northern Sierra AQMD | Summer | 2029 | 360.65             | 432.08 | 490.53 | 633.23 | 73.38                 | 85.92 | 100.98 | 128.33 |
| AD | Northern Sierra AQMD | Summer | 2030 | 360.66             | 432.21 | 490.50 | 633.50 | 73.39                 | 85.98 | 100.97 | 128.46 |
| AD | Northern Sierra AQMD | Summer | 2031 | 360.68             | 432.40 | 490.49 | 633.75 | 73.40                 | 86.03 | 100.98 | 128.58 |
| AD | Northern Sierra AQMD | Summer | 2032 | 360.69             | 432.54 | 490.48 | 633.99 | 73.40                 | 86.08 | 100.98 | 128.69 |
| AD | Northern Sierra AQMD | Summer | 2033 | 360.71             | 432.70 | 490.47 | 634.21 | 73.41                 | 86.13 | 100.98 | 128.80 |
| AD | Northern Sierra AQMD | Summer | 2034 | 360.72             | 432.84 | 490.46 | 634.40 | 73.41                 | 86.17 | 100.99 | 128.89 |
| AD | Northern Sierra AQMD | Summer | 2035 | 360.71             | 432.93 | 490.45 | 634.56 | 73.42                 | 86.21 | 100.99 | 128.98 |
| AD | Northern Sierra AQMD | Winter | 2010 | 330.67             | 398.10 | 453.69 | 573.92 | 73.83                 | 93.66 | 100.49 | 125.24 |
| AD | Northern Sierra AQMD | Winter | 2011 | 330.56             | 398.05 | 452.91 | 574.54 | 73.66                 | 92.12 | 100.45 | 125.33 |
| AD | Northern Sierra AQMD | Winter | 2012 | 330.50             | 397.88 | 452.34 | 575.25 | 73.51                 | 90.81 | 100.45 | 125.45 |
| AD | Northern Sierra AQMD | Winter | 2013 | 330.48             | 397.78 | 451.93 | 576.01 | 73.39                 | 89.69 | 100.44 | 125.61 |
| AD | Northern Sierra AQMD | Winter | 2014 | 330.43             | 397.63 | 451.58 | 576.74 | 73.23                 | 88.70 | 100.46 | 125.78 |
| AD | Northern Sierra AQMD | Winter | 2015 | 330.46             | 397.55 | 451.33 | 577.53 | 73.16                 | 87.84 | 100.50 | 125.98 |
| AD | Northern Sierra AQMD | Winter | 2016 | 330.54             | 397.43 | 451.14 | 578.28 | 73.17                 | 87.09 | 100.56 | 126.21 |
| AD | Northern Sierra AQMD | Winter | 2017 | 330.55             | 397.35 | 451.02 | 578.95 | 73.12                 | 86.34 | 100.55 | 126.44 |
| AD | Northern Sierra AQMD | Winter | 2018 | 330.57             | 397.21 | 450.92 | 579.56 | 73.08                 | 85.76 | 100.59 | 126.67 |
| AD | Northern Sierra AQMD | Winter | 2019 | 330.60             | 397.23 | 450.85 | 580.08 | 73.07                 | 85.48 | 100.62 | 126.89 |
| AD | Northern Sierra AQMD | Winter | 2020 | 330.64             | 397.25 | 450.80 | 580.53 | 73.16                 | 85.41 | 100.69 | 127.10 |
| AD | Northern Sierra AQMD | Winter | 2021 | 330.68             | 397.32 | 450.76 | 580.82 | 73.23                 | 85.46 | 100.76 | 127.22 |
| AD | Northern Sierra AQMD | Winter | 2022 | 330.66             | 397.39 | 450.72 | 581.03 | 73.28                 | 85.51 | 100.82 | 127.27 |
| AD | Northern Sierra AQMD | Winter | 2023 | 330.62             | 397.44 | 450.67 | 581.20 | 73.30                 | 85.55 | 100.87 | 127.44 |
| AD | Northern Sierra AQMD | Winter | 2024 | 330.55             | 397.42 | 450.64 | 581.38 | 73.31                 | 85.58 | 100.90 | 127.60 |
| AD | Northern Sierra AQMD | Winter | 2025 | 330.53             | 397.35 | 450.60 | 581.60 | 73.33                 | 85.65 | 100.93 | 127.77 |
| AD | Northern Sierra AQMD | Winter | 2026 | 330.56             | 397.45 | 450.55 | 581.82 | 73.35                 | 85.73 | 100.96 | 127.93 |
| AD | Northern Sierra AQMD | Winter | 2027 | 330.57             | 397.51 | 450.50 | 582.04 | 73.37                 | 85.80 | 100.97 | 128.07 |
| AD | Northern Sierra AQMD | Winter | 2028 | 330.58             | 397.61 | 450.46 | 582.28 | 73.38                 | 85.86 | 100.98 | 128.21 |
| AD | Northern Sierra AQMD | Winter | 2029 | 330.58             | 397.72 | 450.42 | 582.52 | 73.38                 | 85.92 | 100.98 | 128.33 |
| AD | Northern Sierra AQMD | Winter | 2030 | 330.58             | 397.80 | 450.36 | 582.75 | 73.39                 | 85.98 | 100.97 | 128.46 |
| AD | Northern Sierra AQMD | Winter | 2031 | 330.60             | 397.96 | 450.34 | 582.95 | 73.40                 | 86.03 | 100.98 | 128.58 |
| AD | Northern Sierra AQMD | Winter | 2032 | 330.60             | 398.07 | 450.32 | 583.15 | 73.40                 | 86.08 | 100.98 | 128.69 |
| AD | Northern Sierra AQMD | Winter | 2033 | 330.61             | 398.20 | 450.31 | 583.31 | 73.41                 | 86.13 | 100.98 | 128.80 |
| AD | Northern Sierra AQMD | Winter | 2034 | 330.62             | 398.33 | 450.30 | 583.45 | 73.41                 | 86.17 | 100.99 | 128.89 |
| AD | Northern Sierra AQMD | Winter | 2035 | 330.61             | 398.41 | 450.29 | 583.56 | 73.42                 | 86.21 | 100.99 | 128.98 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Northern Sonoma County APCD | Annual | 2010 | 390.51             | 449.32 | 534.32 | 668.22 | 73.44                 | 86.67 | 100.89 | 124.24 |
| AD | Northern Sonoma County APCD | Annual | 2011 | 390.41             | 449.46 | 533.78 | 668.92 | 73.35                 | 86.07 | 100.76 | 124.42 |
| AD | Northern Sonoma County APCD | Annual | 2012 | 390.39             | 449.72 | 533.36 | 669.75 | 73.28                 | 85.75 | 100.71 | 124.64 |
| AD | Northern Sonoma County APCD | Annual | 2013 | 390.45             | 449.93 | 533.03 | 670.64 | 73.24                 | 85.48 | 100.70 | 124.89 |
| AD | Northern Sonoma County APCD | Annual | 2014 | 390.51             | 450.12 | 532.77 | 671.53 | 73.21                 | 85.23 | 100.66 | 125.14 |
| AD | Northern Sonoma County APCD | Annual | 2015 | 390.56             | 450.29 | 532.56 | 672.43 | 73.15                 | 84.99 | 100.59 | 125.42 |
| AD | Northern Sonoma County APCD | Annual | 2016 | 389.58             | 449.24 | 530.90 | 671.41 | 73.14                 | 84.86 | 100.60 | 125.69 |
| AD | Northern Sonoma County APCD | Annual | 2017 | 389.62             | 449.43 | 530.76 | 672.22 | 73.11                 | 84.74 | 100.59 | 125.97 |
| AD | Northern Sonoma County APCD | Annual | 2018 | 389.63             | 449.60 | 530.64 | 672.91 | 73.05                 | 84.67 | 100.59 | 126.25 |
| AD | Northern Sonoma County APCD | Annual | 2019 | 389.66             | 449.79 | 530.55 | 673.52 | 73.04                 | 84.68 | 100.60 | 126.51 |
| AD | Northern Sonoma County APCD | Annual | 2020 | 389.72             | 449.99 | 530.48 | 674.07 | 73.12                 | 84.77 | 100.66 | 126.75 |
| AD | Northern Sonoma County APCD | Annual | 2021 | 389.70             | 450.13 | 530.40 | 674.51 | 73.17                 | 84.88 | 100.73 | 126.95 |
| AD | Northern Sonoma County APCD | Annual | 2022 | 389.64             | 450.20 | 530.29 | 674.87 | 73.19                 | 84.96 | 100.77 | 127.13 |
| AD | Northern Sonoma County APCD | Annual | 2023 | 389.45             | 450.24 | 530.20 | 675.12 | 73.19                 | 85.04 | 100.81 | 127.31 |
| AD | Northern Sonoma County APCD | Annual | 2024 | 389.28             | 450.28 | 530.12 | 675.30 | 73.17                 | 85.12 | 100.85 | 127.48 |
| AD | Northern Sonoma County APCD | Annual | 2025 | 389.20             | 450.39 | 530.07 | 675.47 | 73.17                 | 85.21 | 100.89 | 127.63 |
| AD | Northern Sonoma County APCD | Annual | 2026 | 388.38             | 449.63 | 528.86 | 674.20 | 73.19                 | 85.33 | 100.92 | 127.79 |
| AD | Northern Sonoma County APCD | Annual | 2027 | 388.39             | 449.84 | 528.80 | 674.40 | 73.21                 | 85.43 | 100.94 | 127.93 |
| AD | Northern Sonoma County APCD | Annual | 2028 | 388.39             | 450.05 | 528.74 | 674.61 | 73.21                 | 85.53 | 100.95 | 128.07 |
| AD | Northern Sonoma County APCD | Annual | 2029 | 388.37             | 450.26 | 528.66 | 674.83 | 73.22                 | 85.63 | 100.96 | 128.20 |
| AD | Northern Sonoma County APCD | Annual | 2030 | 388.34             | 450.46 | 528.57 | 675.05 | 73.22                 | 85.71 | 100.96 | 128.32 |
| AD | Northern Sonoma County APCD | Annual | 2031 | 388.34             | 450.68 | 528.53 | 675.33 | 73.23                 | 85.80 | 100.96 | 128.45 |
| AD | Northern Sonoma County APCD | Annual | 2032 | 388.33             | 450.87 | 528.49 | 675.61 | 73.23                 | 85.88 | 100.97 | 128.57 |
| AD | Northern Sonoma County APCD | Annual | 2033 | 388.32             | 451.04 | 528.45 | 675.87 | 73.24                 | 85.96 | 100.97 | 128.69 |
| AD | Northern Sonoma County APCD | Annual | 2034 | 388.31             | 451.20 | 528.43 | 676.10 | 73.25                 | 86.03 | 100.98 | 128.79 |
| AD | Northern Sonoma County APCD | Annual | 2035 | 388.30             | 451.32 | 528.40 | 676.31 | 73.25                 | 86.08 | 100.98 | 128.89 |
| AD | Northern Sonoma County APCD | Summer | 2010 | 405.40             | 463.97 | 554.11 | 693.02 | 73.44                 | 86.67 | 100.89 | 124.24 |
| AD | Northern Sonoma County APCD | Summer | 2011 | 405.46             | 464.55 | 553.73 | 693.76 | 73.35                 | 86.07 | 100.76 | 124.42 |
| AD | Northern Sonoma County APCD | Summer | 2012 | 405.58             | 465.14 | 553.43 | 694.67 | 73.28                 | 85.75 | 100.71 | 124.64 |
| AD | Northern Sonoma County APCD | Summer | 2013 | 405.73             | 465.65 | 553.21 | 695.68 | 73.24                 | 85.48 | 100.70 | 124.89 |
| AD | Northern Sonoma County APCD | Summer | 2014 | 405.87             | 466.08 | 553.06 | 696.69 | 73.21                 | 85.23 | 100.66 | 125.14 |
| AD | Northern Sonoma County APCD | Summer | 2015 | 405.97             | 466.45 | 552.95 | 697.74 | 73.15                 | 84.99 | 100.59 | 125.42 |
| AD | Northern Sonoma County APCD | Summer | 2016 | 404.98             | 465.53 | 551.32 | 696.79 | 73.14                 | 84.86 | 100.60 | 125.69 |
| AD | Northern Sonoma County APCD | Summer | 2017 | 405.05             | 465.86 | 551.23 | 697.73 | 73.11                 | 84.74 | 100.59 | 125.97 |
| AD | Northern Sonoma County APCD | Summer | 2018 | 405.05             | 466.14 | 551.15 | 698.52 | 73.05                 | 84.67 | 100.59 | 126.25 |
| AD | Northern Sonoma County APCD | Summer | 2019 | 405.08             | 466.43 | 551.09 | 699.22 | 73.04                 | 84.68 | 100.60 | 126.51 |
| AD | Northern Sonoma County APCD | Summer | 2020 | 405.14             | 466.72 | 551.02 | 699.85 | 73.12                 | 84.77 | 100.66 | 126.75 |
| AD | Northern Sonoma County APCD | Summer | 2021 | 405.12             | 466.94 | 550.95 | 700.35 | 73.17                 | 84.88 | 100.73 | 126.95 |
| AD | Northern Sonoma County APCD | Summer | 2022 | 405.06             | 467.10 | 550.86 | 700.77 | 73.19                 | 84.96 | 100.77 | 127.13 |
| AD | Northern Sonoma County APCD | Summer | 2023 | 404.88             | 467.22 | 550.78 | 701.06 | 73.19                 | 85.04 | 100.81 | 127.31 |
| AD | Northern Sonoma County APCD | Summer | 2024 | 404.72             | 467.34 | 550.70 | 701.27 | 73.17                 | 85.12 | 100.85 | 127.48 |
| AD | Northern Sonoma County APCD | Summer | 2025 | 404.64             | 467.50 | 550.65 | 701.46 | 73.17                 | 85.21 | 100.89 | 127.63 |
| AD | Northern Sonoma County APCD | Summer | 2026 | 403.80             | 466.76 | 549.40 | 700.14 | 73.19                 | 85.33 | 100.92 | 127.79 |
| AD | Northern Sonoma County APCD | Summer | 2027 | 403.82             | 467.03 | 549.34 | 700.34 | 73.21                 | 85.43 | 100.94 | 127.93 |
| AD | Northern Sonoma County APCD | Summer | 2028 | 403.82             | 467.29 | 549.29 | 700.56 | 73.21                 | 85.53 | 100.95 | 128.07 |
| AD | Northern Sonoma County APCD | Summer | 2029 | 403.81             | 467.55 | 549.22 | 700.79 | 73.22                 | 85.63 | 100.96 | 128.20 |
| AD | Northern Sonoma County APCD | Summer | 2030 | 403.80             | 467.80 | 549.13 | 701.03 | 73.22                 | 85.71 | 100.96 | 128.32 |
| AD | Northern Sonoma County APCD | Summer | 2031 | 403.80             | 468.07 | 549.10 | 701.35 | 73.23                 | 85.80 | 100.96 | 128.45 |
| AD | Northern Sonoma County APCD | Summer | 2032 | 403.79             | 468.29 | 549.07 | 701.67 | 73.23                 | 85.88 | 100.97 | 128.57 |
| AD | Northern Sonoma County APCD | Summer | 2033 | 403.79             | 468.49 | 549.04 | 701.96 | 73.24                 | 85.96 | 100.97 | 128.69 |
| AD | Northern Sonoma County APCD | Summer | 2034 | 403.78             | 468.67 | 549.01 | 702.23 | 73.25                 | 86.03 | 100.98 | 128.79 |
| AD | Northern Sonoma County APCD | Summer | 2035 | 403.77             | 468.80 | 548.99 | 702.46 | 73.25                 | 86.08 | 100.98 | 128.89 |
| AD | Northern Sonoma County APCD | Winter | 2010 | 383.18             | 442.11 | 524.58 | 656.01 | 73.44                 | 86.67 | 100.89 | 124.24 |
| AD | Northern Sonoma County APCD | Winter | 2011 | 383.00             | 442.03 | 523.97 | 656.70 | 73.35                 | 86.07 | 100.76 | 124.42 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Northern Sonoma County APCD | Winter | 2012 | 382.92             | 442.12 | 523.49 | 657.49 | 73.28                 | 85.75 | 100.71 | 124.64 |
| AD | Northern Sonoma County APCD | Winter | 2013 | 382.92             | 442.20 | 523.10 | 658.32 | 73.24                 | 85.48 | 100.70 | 124.89 |
| AD | Northern Sonoma County APCD | Winter | 2014 | 382.95             | 442.27 | 522.78 | 659.14 | 73.21                 | 85.23 | 100.66 | 125.14 |
| AD | Northern Sonoma County APCD | Winter | 2015 | 382.97             | 442.33 | 522.52 | 659.97 | 73.15                 | 84.99 | 100.59 | 125.42 |
| AD | Northern Sonoma County APCD | Winter | 2016 | 382.00             | 441.23 | 520.85 | 658.92 | 73.14                 | 84.86 | 100.60 | 125.69 |
| AD | Northern Sonoma County APCD | Winter | 2017 | 382.03             | 441.35 | 520.68 | 659.67 | 73.11                 | 84.74 | 100.59 | 125.97 |
| AD | Northern Sonoma County APCD | Winter | 2018 | 382.04             | 441.46 | 520.55 | 660.31 | 73.05                 | 84.67 | 100.59 | 126.25 |
| AD | Northern Sonoma County APCD | Winter | 2019 | 382.06             | 441.60 | 520.45 | 660.88 | 73.04                 | 84.68 | 100.60 | 126.51 |
| AD | Northern Sonoma County APCD | Winter | 2020 | 382.13             | 441.75 | 520.37 | 661.39 | 73.12                 | 84.77 | 100.66 | 126.75 |
| AD | Northern Sonoma County APCD | Winter | 2021 | 382.11             | 441.85 | 520.28 | 661.79 | 73.17                 | 84.88 | 100.73 | 126.95 |
| AD | Northern Sonoma County APCD | Winter | 2022 | 382.05             | 441.88 | 520.16 | 662.13 | 73.19                 | 84.96 | 100.77 | 127.13 |
| AD | Northern Sonoma County APCD | Winter | 2023 | 381.86             | 441.88 | 520.07 | 662.35 | 73.19                 | 85.04 | 100.81 | 127.31 |
| AD | Northern Sonoma County APCD | Winter | 2024 | 381.68             | 441.89 | 519.99 | 662.52 | 73.17                 | 85.12 | 100.85 | 127.48 |
| AD | Northern Sonoma County APCD | Winter | 2025 | 381.60             | 441.97 | 519.94 | 662.68 | 73.17                 | 85.21 | 100.89 | 127.63 |
| AD | Northern Sonoma County APCD | Winter | 2026 | 380.80             | 441.20 | 518.76 | 661.43 | 73.19                 | 85.33 | 100.92 | 127.79 |
| AD | Northern Sonoma County APCD | Winter | 2027 | 380.81             | 441.38 | 518.69 | 661.63 | 73.21                 | 85.43 | 100.94 | 127.93 |
| AD | Northern Sonoma County APCD | Winter | 2028 | 380.79             | 441.56 | 518.63 | 661.84 | 73.21                 | 85.53 | 100.95 | 128.07 |
| AD | Northern Sonoma County APCD | Winter | 2029 | 380.77             | 441.75 | 518.54 | 662.05 | 73.22                 | 85.63 | 100.96 | 128.20 |
| AD | Northern Sonoma County APCD | Winter | 2030 | 380.74             | 441.93 | 518.44 | 662.26 | 73.22                 | 85.71 | 100.96 | 128.32 |
| AD | Northern Sonoma County APCD | Winter | 2031 | 380.73             | 442.12 | 518.40 | 662.52 | 73.23                 | 85.80 | 100.96 | 128.45 |
| AD | Northern Sonoma County APCD | Winter | 2032 | 380.72             | 442.30 | 518.36 | 662.79 | 73.23                 | 85.88 | 100.97 | 128.57 |
| AD | Northern Sonoma County APCD | Winter | 2033 | 380.71             | 442.46 | 518.33 | 663.03 | 73.24                 | 85.96 | 100.97 | 128.69 |
| AD | Northern Sonoma County APCD | Winter | 2034 | 380.70             | 442.60 | 518.30 | 663.25 | 73.25                 | 86.03 | 100.98 | 128.79 |
| AD | Northern Sonoma County APCD | Winter | 2035 | 380.69             | 442.72 | 518.27 | 663.43 | 73.25                 | 86.08 | 100.98 | 128.89 |
| AD | Placer County APCD          | Annual | 2010 | 330.80             | 382.95 | 453.87 | 573.60 | 73.15                 | 86.40 | 99.87  | 125.61 |
| AD | Placer County APCD          | Annual | 2011 | 330.96             | 383.35 | 453.67 | 574.14 | 73.10                 | 85.94 | 99.92  | 125.82 |
| AD | Placer County APCD          | Annual | 2012 | 331.12             | 383.73 | 453.52 | 574.71 | 73.06                 | 85.63 | 100.00 | 126.05 |
| AD | Placer County APCD          | Annual | 2013 | 331.32             | 384.06 | 453.41 | 575.29 | 73.08                 | 85.40 | 100.09 | 126.27 |
| AD | Placer County APCD          | Annual | 2014 | 331.48             | 384.35 | 453.34 | 575.86 | 73.07                 | 85.22 | 100.16 | 126.50 |
| AD | Placer County APCD          | Annual | 2015 | 331.65             | 384.62 | 453.29 | 576.42 | 73.11                 | 85.08 | 100.23 | 126.73 |
| AD | Placer County APCD          | Annual | 2016 | 331.81             | 384.88 | 453.26 | 576.96 | 73.18                 | 85.00 | 100.31 | 126.96 |
| AD | Placer County APCD          | Annual | 2017 | 331.93             | 385.06 | 453.23 | 577.48 | 73.23                 | 84.86 | 100.37 | 127.19 |
| AD | Placer County APCD          | Annual | 2018 | 332.03             | 385.26 | 453.21 | 577.92 | 73.27                 | 84.81 | 100.44 | 127.41 |
| AD | Placer County APCD          | Annual | 2019 | 331.81             | 385.22 | 453.03 | 577.86 | 73.33                 | 84.90 | 100.51 | 127.59 |
| AD | Placer County APCD          | Annual | 2020 | 331.89             | 385.39 | 453.01 | 578.18 | 73.41                 | 85.01 | 100.59 | 127.77 |
| AD | Placer County APCD          | Annual | 2021 | 331.94             | 385.58 | 452.99 | 578.41 | 73.48                 | 85.15 | 100.67 | 127.91 |
| AD | Placer County APCD          | Annual | 2022 | 331.98             | 385.74 | 452.97 | 578.60 | 73.53                 | 85.27 | 100.73 | 128.02 |
| AD | Placer County APCD          | Annual | 2023 | 332.00             | 385.86 | 452.94 | 578.76 | 73.57                 | 85.37 | 100.79 | 128.16 |
| AD | Placer County APCD          | Annual | 2024 | 332.00             | 385.96 | 452.93 | 578.88 | 73.59                 | 85.46 | 100.83 | 128.28 |
| AD | Placer County APCD          | Annual | 2025 | 332.00             | 386.05 | 452.91 | 579.01 | 73.61                 | 85.54 | 100.87 | 128.41 |
| AD | Placer County APCD          | Annual | 2026 | 332.02             | 386.16 | 452.89 | 579.13 | 73.63                 | 85.62 | 100.90 | 128.52 |
| AD | Placer County APCD          | Annual | 2027 | 332.04             | 386.27 | 452.88 | 579.25 | 73.64                 | 85.70 | 100.92 | 128.62 |
| AD | Placer County APCD          | Annual | 2028 | 332.05             | 386.37 | 452.86 | 579.37 | 73.65                 | 85.76 | 100.94 | 128.71 |
| AD | Placer County APCD          | Annual | 2029 | 332.05             | 386.48 | 452.84 | 579.49 | 73.66                 | 85.83 | 100.95 | 128.80 |
| AD | Placer County APCD          | Annual | 2030 | 332.06             | 386.59 | 452.82 | 579.61 | 73.67                 | 85.89 | 100.96 | 128.88 |
| AD | Placer County APCD          | Annual | 2031 | 332.06             | 386.69 | 452.81 | 579.74 | 73.67                 | 85.94 | 100.97 | 128.95 |
| AD | Placer County APCD          | Annual | 2032 | 332.06             | 386.79 | 452.80 | 579.86 | 73.68                 | 86.00 | 100.98 | 129.02 |
| AD | Placer County APCD          | Annual | 2033 | 332.06             | 386.87 | 452.79 | 579.98 | 73.68                 | 86.05 | 100.98 | 129.09 |
| AD | Placer County APCD          | Annual | 2034 | 332.06             | 386.95 | 452.79 | 580.09 | 73.68                 | 86.09 | 100.99 | 129.15 |
| AD | Placer County APCD          | Annual | 2035 | 332.06             | 387.01 | 452.78 | 580.18 | 73.68                 | 86.13 | 100.99 | 129.20 |
| AD | Placer County APCD          | Summer | 2010 | 366.87             | 419.79 | 499.91 | 632.16 | 73.15                 | 86.40 | 99.87  | 125.61 |
| AD | Placer County APCD          | Summer | 2011 | 367.20             | 420.83 | 499.86 | 632.72 | 73.10                 | 85.94 | 99.92  | 125.82 |
| AD | Placer County APCD          | Summer | 2012 | 367.51             | 421.72 | 499.86 | 633.38 | 73.06                 | 85.63 | 100.00 | 126.05 |
| AD | Placer County APCD          | Summer | 2013 | 367.83             | 422.43 | 499.88 | 634.06 | 73.08                 | 85.40 | 100.09 | 126.27 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Placer County APCD           | Summer | 2014 | 368.11             | 423.03 | 499.98 | 634.82 | 73.07                 | 85.22 | 100.16 | 126.50 |
| AD | Placer County APCD           | Summer | 2015 | 368.37             | 423.53 | 500.06 | 635.56 | 73.11                 | 85.08 | 100.23 | 126.73 |
| AD | Placer County APCD           | Summer | 2016 | 368.59             | 423.99 | 500.19 | 636.33 | 73.18                 | 85.00 | 100.31 | 126.96 |
| AD | Placer County APCD           | Summer | 2017 | 368.75             | 424.37 | 500.30 | 637.08 | 73.23                 | 84.86 | 100.37 | 127.19 |
| AD | Placer County APCD           | Summer | 2018 | 368.87             | 424.73 | 500.37 | 637.69 | 73.27                 | 84.81 | 100.44 | 127.41 |
| AD | Placer County APCD           | Summer | 2019 | 368.64             | 424.75 | 500.19 | 637.68 | 73.33                 | 84.90 | 100.51 | 127.59 |
| AD | Placer County APCD           | Summer | 2020 | 368.73             | 425.03 | 500.21 | 638.11 | 73.41                 | 85.01 | 100.59 | 127.77 |
| AD | Placer County APCD           | Summer | 2021 | 368.79             | 425.26 | 500.22 | 638.45 | 73.48                 | 85.15 | 100.67 | 127.91 |
| AD | Placer County APCD           | Summer | 2022 | 368.85             | 425.49 | 500.23 | 638.74 | 73.53                 | 85.27 | 100.73 | 128.02 |
| AD | Placer County APCD           | Summer | 2023 | 368.90             | 425.67 | 500.25 | 638.98 | 73.57                 | 85.37 | 100.79 | 128.16 |
| AD | Placer County APCD           | Summer | 2024 | 368.92             | 425.83 | 500.26 | 639.17 | 73.59                 | 85.46 | 100.83 | 128.28 |
| AD | Placer County APCD           | Summer | 2025 | 368.94             | 425.99 | 500.29 | 639.37 | 73.61                 | 85.54 | 100.87 | 128.41 |
| AD | Placer County APCD           | Summer | 2026 | 368.98             | 426.17 | 500.30 | 639.54 | 73.63                 | 85.62 | 100.90 | 128.52 |
| AD | Placer County APCD           | Summer | 2027 | 369.02             | 426.34 | 500.32 | 639.72 | 73.64                 | 85.70 | 100.92 | 128.62 |
| AD | Placer County APCD           | Summer | 2028 | 369.05             | 426.52 | 500.35 | 639.90 | 73.65                 | 85.76 | 100.94 | 128.71 |
| AD | Placer County APCD           | Summer | 2029 | 369.08             | 426.71 | 500.38 | 640.08 | 73.66                 | 85.83 | 100.95 | 128.80 |
| AD | Placer County APCD           | Summer | 2030 | 369.11             | 426.89 | 500.40 | 640.26 | 73.67                 | 85.89 | 100.96 | 128.88 |
| AD | Placer County APCD           | Summer | 2031 | 369.14             | 427.07 | 500.42 | 640.42 | 73.67                 | 85.94 | 100.97 | 128.95 |
| AD | Placer County APCD           | Summer | 2032 | 369.16             | 427.23 | 500.45 | 640.59 | 73.68                 | 86.00 | 100.98 | 129.02 |
| AD | Placer County APCD           | Summer | 2033 | 369.19             | 427.37 | 500.48 | 640.76 | 73.68                 | 86.05 | 100.98 | 129.09 |
| AD | Placer County APCD           | Summer | 2034 | 369.21             | 427.50 | 500.51 | 640.92 | 73.68                 | 86.09 | 100.99 | 129.15 |
| AD | Placer County APCD           | Summer | 2035 | 369.22             | 427.60 | 500.54 | 641.08 | 73.68                 | 86.13 | 100.99 | 129.20 |
| AD | Placer County APCD           | Winter | 2010 | 321.28             | 373.22 | 441.80 | 558.12 | 73.15                 | 86.40 | 99.87  | 125.61 |
| AD | Placer County APCD           | Winter | 2011 | 321.39             | 373.46 | 441.55 | 558.65 | 73.10                 | 85.94 | 99.92  | 125.82 |
| AD | Placer County APCD           | Winter | 2012 | 321.51             | 373.70 | 441.37 | 559.19 | 73.06                 | 85.63 | 100.00 | 126.05 |
| AD | Placer County APCD           | Winter | 2013 | 321.67             | 373.92 | 441.22 | 559.73 | 73.08                 | 85.40 | 100.09 | 126.27 |
| AD | Placer County APCD           | Winter | 2014 | 321.80             | 374.13 | 441.10 | 560.26 | 73.07                 | 85.22 | 100.16 | 126.50 |
| AD | Placer County APCD           | Winter | 2015 | 321.94             | 374.34 | 441.02 | 560.77 | 73.11                 | 85.08 | 100.23 | 126.73 |
| AD | Placer County APCD           | Winter | 2016 | 322.09             | 374.54 | 440.94 | 561.25 | 73.18                 | 85.00 | 100.31 | 126.96 |
| AD | Placer County APCD           | Winter | 2017 | 322.20             | 374.67 | 440.87 | 561.70 | 73.23                 | 84.86 | 100.37 | 127.19 |
| AD | Placer County APCD           | Winter | 2018 | 322.28             | 374.82 | 440.83 | 562.09 | 73.27                 | 84.81 | 100.44 | 127.41 |
| AD | Placer County APCD           | Winter | 2019 | 322.07             | 374.75 | 440.63 | 562.01 | 73.33                 | 84.90 | 100.51 | 127.59 |
| AD | Placer County APCD           | Winter | 2020 | 322.14             | 374.90 | 440.60 | 562.29 | 73.41                 | 85.01 | 100.59 | 127.77 |
| AD | Placer County APCD           | Winter | 2021 | 322.19             | 375.07 | 440.56 | 562.49 | 73.48                 | 85.15 | 100.67 | 127.91 |
| AD | Placer County APCD           | Winter | 2022 | 322.22             | 375.21 | 440.52 | 562.65 | 73.53                 | 85.27 | 100.73 | 128.02 |
| AD | Placer County APCD           | Winter | 2023 | 322.22             | 375.31 | 440.49 | 562.78 | 73.57                 | 85.37 | 100.79 | 128.16 |
| AD | Placer County APCD           | Winter | 2024 | 322.22             | 375.39 | 440.45 | 562.88 | 73.59                 | 85.46 | 100.83 | 128.28 |
| AD | Placer County APCD           | Winter | 2025 | 322.22             | 375.47 | 440.42 | 562.98 | 73.61                 | 85.54 | 100.87 | 128.41 |
| AD | Placer County APCD           | Winter | 2026 | 322.23             | 375.55 | 440.39 | 563.08 | 73.63                 | 85.62 | 100.90 | 128.52 |
| AD | Placer County APCD           | Winter | 2027 | 322.23             | 375.64 | 440.36 | 563.18 | 73.64                 | 85.70 | 100.92 | 128.62 |
| AD | Placer County APCD           | Winter | 2028 | 322.24             | 375.72 | 440.33 | 563.28 | 73.65                 | 85.76 | 100.94 | 128.71 |
| AD | Placer County APCD           | Winter | 2029 | 322.23             | 375.80 | 440.29 | 563.38 | 73.66                 | 85.83 | 100.95 | 128.80 |
| AD | Placer County APCD           | Winter | 2030 | 322.23             | 375.89 | 440.25 | 563.48 | 73.67                 | 85.89 | 100.96 | 128.88 |
| AD | Placer County APCD           | Winter | 2031 | 322.22             | 375.97 | 440.23 | 563.59 | 73.67                 | 85.94 | 100.97 | 128.95 |
| AD | Placer County APCD           | Winter | 2032 | 322.22             | 376.04 | 440.21 | 563.70 | 73.68                 | 86.00 | 100.98 | 129.02 |
| AD | Placer County APCD           | Winter | 2033 | 322.21             | 376.11 | 440.19 | 563.80 | 73.68                 | 86.05 | 100.98 | 129.09 |
| AD | Placer County APCD           | Winter | 2034 | 322.20             | 376.17 | 440.17 | 563.89 | 73.68                 | 86.09 | 100.99 | 129.15 |
| AD | Placer County APCD           | Winter | 2035 | 322.19             | 376.21 | 440.15 | 563.96 | 73.68                 | 86.13 | 100.99 | 129.20 |
| AD | Sacramento Metropolitan AQMD | Annual | 2010 | 338.27             | 388.45 | 463.58 | 584.38 | 72.89                 | 84.85 | 99.62  | 124.76 |
| AD | Sacramento Metropolitan AQMD | Annual | 2011 | 338.59             | 389.26 | 463.49 | 584.93 | 72.94                 | 84.61 | 99.69  | 124.96 |
| AD | Sacramento Metropolitan AQMD | Annual | 2012 | 338.89             | 389.98 | 463.44 | 585.56 | 73.00                 | 84.46 | 99.78  | 125.19 |
| AD | Sacramento Metropolitan AQMD | Annual | 2013 | 339.19             | 390.61 | 463.40 | 586.25 | 73.08                 | 84.39 | 99.88  | 125.44 |
| AD | Sacramento Metropolitan AQMD | Annual | 2014 | 339.46             | 391.17 | 463.38 | 586.94 | 73.15                 | 84.34 | 99.96  | 125.69 |
| AD | Sacramento Metropolitan AQMD | Annual | 2015 | 339.72             | 391.68 | 463.38 | 587.65 | 73.24                 | 84.33 | 100.03 | 125.96 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Sacramento Metropolitan AQMD | Annual | 2016 | 339.95             | 392.11 | 463.38 | 588.32 | 73.35                 | 84.32 | 100.13 | 126.23 |
| AD | Sacramento Metropolitan AQMD | Annual | 2017 | 340.12             | 392.49 | 463.38 | 588.95 | 73.41                 | 84.30 | 100.21 | 126.50 |
| AD | Sacramento Metropolitan AQMD | Annual | 2018 | 340.26             | 392.81 | 463.37 | 589.51 | 73.47                 | 84.32 | 100.29 | 126.76 |
| AD | Sacramento Metropolitan AQMD | Annual | 2019 | 338.61             | 391.09 | 460.99 | 586.96 | 73.53                 | 84.47 | 100.38 | 126.99 |
| AD | Sacramento Metropolitan AQMD | Annual | 2020 | 338.72             | 391.37 | 460.98 | 587.40 | 73.64                 | 84.63 | 100.47 | 127.20 |
| AD | Sacramento Metropolitan AQMD | Annual | 2021 | 338.80             | 391.64 | 460.97 | 587.73 | 73.72                 | 84.80 | 100.57 | 127.38 |
| AD | Sacramento Metropolitan AQMD | Annual | 2022 | 338.84             | 391.86 | 460.96 | 588.00 | 73.78                 | 84.95 | 100.64 | 127.54 |
| AD | Sacramento Metropolitan AQMD | Annual | 2023 | 338.86             | 392.04 | 460.94 | 588.22 | 73.82                 | 85.07 | 100.71 | 127.71 |
| AD | Sacramento Metropolitan AQMD | Annual | 2024 | 338.87             | 392.19 | 460.92 | 588.37 | 73.85                 | 85.19 | 100.76 | 127.86 |
| AD | Sacramento Metropolitan AQMD | Annual | 2025 | 338.88             | 392.32 | 460.91 | 588.52 | 73.87                 | 85.29 | 100.81 | 128.00 |
| AD | Sacramento Metropolitan AQMD | Annual | 2026 | 338.89             | 392.46 | 460.90 | 588.69 | 73.89                 | 85.39 | 100.85 | 128.15 |
| AD | Sacramento Metropolitan AQMD | Annual | 2027 | 338.90             | 392.59 | 460.89 | 588.86 | 73.91                 | 85.48 | 100.88 | 128.28 |
| AD | Sacramento Metropolitan AQMD | Annual | 2028 | 338.91             | 392.72 | 460.89 | 589.02 | 73.92                 | 85.56 | 100.90 | 128.39 |
| AD | Sacramento Metropolitan AQMD | Annual | 2029 | 338.91             | 392.85 | 460.87 | 589.18 | 73.93                 | 85.64 | 100.92 | 128.50 |
| AD | Sacramento Metropolitan AQMD | Annual | 2030 | 338.91             | 392.98 | 460.87 | 589.35 | 73.93                 | 85.71 | 100.93 | 128.60 |
| AD | Sacramento Metropolitan AQMD | Annual | 2031 | 338.92             | 393.12 | 460.86 | 589.51 | 73.94                 | 85.79 | 100.94 | 128.70 |
| AD | Sacramento Metropolitan AQMD | Annual | 2032 | 338.92             | 393.24 | 460.86 | 589.69 | 73.94                 | 85.85 | 100.95 | 128.80 |
| AD | Sacramento Metropolitan AQMD | Annual | 2033 | 338.92             | 393.34 | 460.85 | 589.84 | 73.95                 | 85.91 | 100.96 | 128.88 |
| AD | Sacramento Metropolitan AQMD | Annual | 2034 | 338.92             | 393.44 | 460.84 | 589.99 | 73.95                 | 85.97 | 100.96 | 128.96 |
| AD | Sacramento Metropolitan AQMD | Annual | 2035 | 338.92             | 393.51 | 460.84 | 590.12 | 73.95                 | 86.02 | 100.97 | 129.04 |
| AD | Sacramento Metropolitan AQMD | Summer | 2010 | 375.62             | 427.51 | 513.20 | 646.48 | 72.89                 | 84.85 | 99.62  | 124.76 |
| AD | Sacramento Metropolitan AQMD | Summer | 2011 | 376.19             | 429.01 | 513.26 | 646.92 | 72.94                 | 84.61 | 99.69  | 124.96 |
| AD | Sacramento Metropolitan AQMD | Summer | 2012 | 376.70             | 430.30 | 513.35 | 647.57 | 73.00                 | 84.46 | 99.78  | 125.19 |
| AD | Sacramento Metropolitan AQMD | Summer | 2013 | 377.16             | 431.37 | 513.46 | 648.38 | 73.08                 | 84.39 | 99.88  | 125.44 |
| AD | Sacramento Metropolitan AQMD | Summer | 2014 | 377.55             | 432.28 | 513.62 | 649.25 | 73.15                 | 84.34 | 99.96  | 125.69 |
| AD | Sacramento Metropolitan AQMD | Summer | 2015 | 377.89             | 433.05 | 513.77 | 650.20 | 73.24                 | 84.33 | 100.03 | 125.96 |
| AD | Sacramento Metropolitan AQMD | Summer | 2016 | 378.19             | 433.69 | 513.89 | 651.12 | 73.35                 | 84.32 | 100.13 | 126.23 |
| AD | Sacramento Metropolitan AQMD | Summer | 2017 | 378.39             | 434.26 | 513.97 | 651.99 | 73.41                 | 84.30 | 100.21 | 126.50 |
| AD | Sacramento Metropolitan AQMD | Summer | 2018 | 378.53             | 434.71 | 513.99 | 652.74 | 73.47                 | 84.32 | 100.29 | 126.76 |
| AD | Sacramento Metropolitan AQMD | Summer | 2019 | 376.67             | 432.84 | 511.33 | 650.00 | 73.53                 | 84.47 | 100.38 | 126.99 |
| AD | Sacramento Metropolitan AQMD | Summer | 2020 | 376.76             | 433.18 | 511.31 | 650.57 | 73.64                 | 84.63 | 100.47 | 127.20 |
| AD | Sacramento Metropolitan AQMD | Summer | 2021 | 376.83             | 433.55 | 511.26 | 650.99 | 73.72                 | 84.80 | 100.57 | 127.38 |
| AD | Sacramento Metropolitan AQMD | Summer | 2022 | 376.86             | 433.86 | 511.21 | 651.34 | 73.78                 | 84.95 | 100.64 | 127.54 |
| AD | Sacramento Metropolitan AQMD | Summer | 2023 | 376.88             | 434.12 | 511.16 | 651.60 | 73.82                 | 85.07 | 100.71 | 127.71 |
| AD | Sacramento Metropolitan AQMD | Summer | 2024 | 376.89             | 434.33 | 511.11 | 651.76 | 73.85                 | 85.19 | 100.76 | 127.86 |
| AD | Sacramento Metropolitan AQMD | Summer | 2025 | 376.91             | 434.52 | 511.07 | 651.91 | 73.87                 | 85.29 | 100.81 | 128.00 |
| AD | Sacramento Metropolitan AQMD | Summer | 2026 | 376.91             | 434.70 | 511.07 | 652.09 | 73.89                 | 85.39 | 100.85 | 128.15 |
| AD | Sacramento Metropolitan AQMD | Summer | 2027 | 376.93             | 434.88 | 511.07 | 652.26 | 73.91                 | 85.48 | 100.88 | 128.28 |
| AD | Sacramento Metropolitan AQMD | Summer | 2028 | 376.94             | 435.06 | 511.07 | 652.43 | 73.92                 | 85.56 | 100.90 | 128.39 |
| AD | Sacramento Metropolitan AQMD | Summer | 2029 | 376.95             | 435.25 | 511.08 | 652.61 | 73.93                 | 85.64 | 100.92 | 128.50 |
| AD | Sacramento Metropolitan AQMD | Summer | 2030 | 376.96             | 435.44 | 511.08 | 652.80 | 73.93                 | 85.71 | 100.93 | 128.60 |
| AD | Sacramento Metropolitan AQMD | Summer | 2031 | 376.96             | 435.63 | 511.08 | 652.97 | 73.94                 | 85.79 | 100.94 | 128.70 |
| AD | Sacramento Metropolitan AQMD | Summer | 2032 | 376.97             | 435.80 | 511.07 | 653.16 | 73.94                 | 85.85 | 100.95 | 128.80 |
| AD | Sacramento Metropolitan AQMD | Summer | 2033 | 376.98             | 435.94 | 511.07 | 653.35 | 73.95                 | 85.91 | 100.96 | 128.88 |
| AD | Sacramento Metropolitan AQMD | Summer | 2034 | 376.98             | 436.06 | 511.06 | 653.53 | 73.95                 | 85.97 | 100.96 | 128.96 |
| AD | Sacramento Metropolitan AQMD | Summer | 2035 | 376.98             | 436.16 | 511.05 | 653.69 | 73.95                 | 86.02 | 100.97 | 129.04 |
| AD | Sacramento Metropolitan AQMD | Winter | 2010 | 328.26             | 377.97 | 450.28 | 567.73 | 72.89                 | 84.85 | 99.62  | 124.76 |
| AD | Sacramento Metropolitan AQMD | Winter | 2011 | 328.50             | 378.59 | 450.15 | 568.31 | 72.94                 | 84.61 | 99.69  | 124.96 |
| AD | Sacramento Metropolitan AQMD | Winter | 2012 | 328.76             | 379.17 | 450.05 | 568.93 | 73.00                 | 84.46 | 99.78  | 125.19 |
| AD | Sacramento Metropolitan AQMD | Winter | 2013 | 329.01             | 379.69 | 449.97 | 569.59 | 73.08                 | 84.39 | 99.88  | 125.44 |
| AD | Sacramento Metropolitan AQMD | Winter | 2014 | 329.25             | 380.15 | 449.91 | 570.23 | 73.15                 | 84.34 | 99.96  | 125.69 |
| AD | Sacramento Metropolitan AQMD | Winter | 2015 | 329.48             | 380.58 | 449.87 | 570.88 | 73.24                 | 84.33 | 100.03 | 125.96 |
| AD | Sacramento Metropolitan AQMD | Winter | 2016 | 329.69             | 380.95 | 449.84 | 571.48 | 73.35                 | 84.32 | 100.13 | 126.23 |
| AD | Sacramento Metropolitan AQMD | Winter | 2017 | 329.86             | 381.29 | 449.81 | 572.05 | 73.41                 | 84.30 | 100.21 | 126.50 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                     | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                              |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Sacramento Metropolitan AQMD | Winter | 2018 | 329.99              | 381.58 | 449.80 | 572.55 | 73.47                 | 84.32 | 100.29 | 126.76 |
| AD | Sacramento Metropolitan AQMD | Winter | 2019 | 328.41              | 379.90 | 447.49 | 570.06 | 73.53                 | 84.47 | 100.38 | 126.99 |
| AD | Sacramento Metropolitan AQMD | Winter | 2020 | 328.52              | 380.16 | 447.49 | 570.46 | 73.64                 | 84.63 | 100.47 | 127.20 |
| AD | Sacramento Metropolitan AQMD | Winter | 2021 | 328.60              | 380.41 | 447.49 | 570.77 | 73.72                 | 84.80 | 100.57 | 127.38 |
| AD | Sacramento Metropolitan AQMD | Winter | 2022 | 328.65              | 380.61 | 447.49 | 571.03 | 73.78                 | 84.95 | 100.64 | 127.54 |
| AD | Sacramento Metropolitan AQMD | Winter | 2023 | 328.67              | 380.77 | 447.48 | 571.23 | 73.82                 | 85.07 | 100.71 | 127.71 |
| AD | Sacramento Metropolitan AQMD | Winter | 2024 | 328.67              | 380.89 | 447.47 | 571.38 | 73.85                 | 85.19 | 100.76 | 127.86 |
| AD | Sacramento Metropolitan AQMD | Winter | 2025 | 328.68              | 381.01 | 447.47 | 571.53 | 73.87                 | 85.29 | 100.81 | 128.00 |
| AD | Sacramento Metropolitan AQMD | Winter | 2026 | 328.70              | 381.14 | 447.46 | 571.70 | 73.89                 | 85.39 | 100.85 | 128.15 |
| AD | Sacramento Metropolitan AQMD | Winter | 2027 | 328.71              | 381.25 | 447.45 | 571.86 | 73.91                 | 85.48 | 100.88 | 128.28 |
| AD | Sacramento Metropolitan AQMD | Winter | 2028 | 328.72              | 381.37 | 447.43 | 572.02 | 73.92                 | 85.56 | 100.90 | 128.39 |
| AD | Sacramento Metropolitan AQMD | Winter | 2029 | 328.72              | 381.49 | 447.42 | 572.18 | 73.93                 | 85.64 | 100.92 | 128.50 |
| AD | Sacramento Metropolitan AQMD | Winter | 2030 | 328.72              | 381.60 | 447.41 | 572.34 | 73.93                 | 85.71 | 100.93 | 128.60 |
| AD | Sacramento Metropolitan AQMD | Winter | 2031 | 328.72              | 381.72 | 447.40 | 572.50 | 73.94                 | 85.79 | 100.94 | 128.70 |
| AD | Sacramento Metropolitan AQMD | Winter | 2032 | 328.72              | 381.83 | 447.39 | 572.67 | 73.94                 | 85.85 | 100.95 | 128.80 |
| AD | Sacramento Metropolitan AQMD | Winter | 2033 | 328.72              | 381.92 | 447.39 | 572.82 | 73.95                 | 85.91 | 100.96 | 128.88 |
| AD | Sacramento Metropolitan AQMD | Winter | 2034 | 328.72              | 382.01 | 447.38 | 572.96 | 73.95                 | 85.97 | 100.96 | 128.96 |
| AD | Sacramento Metropolitan AQMD | Winter | 2035 | 328.71              | 382.08 | 447.37 | 573.07 | 73.95                 | 86.02 | 100.97 | 129.04 |
| AD | San Diego County APCD        | Annual | 2010 | 352.52              | 405.15 | 482.46 | 610.22 | 72.99                 | 83.92 | 99.34  | 125.27 |
| AD | San Diego County APCD        | Annual | 2011 | 353.81              | 407.05 | 483.85 | 612.57 | 73.01                 | 83.88 | 99.44  | 125.44 |
| AD | San Diego County APCD        | Annual | 2012 | 354.03              | 407.67 | 483.80 | 613.09 | 73.05                 | 83.89 | 99.57  | 125.64 |
| AD | San Diego County APCD        | Annual | 2013 | 354.28              | 408.23 | 483.77 | 613.65 | 73.12                 | 83.94 | 99.70  | 125.85 |
| AD | San Diego County APCD        | Annual | 2014 | 354.50              | 408.76 | 483.75 | 614.21 | 73.17                 | 83.99 | 99.82  | 126.06 |
| AD | San Diego County APCD        | Annual | 2015 | 354.72              | 409.25 | 483.74 | 614.79 | 73.24                 | 84.07 | 99.93  | 126.29 |
| AD | San Diego County APCD        | Annual | 2016 | 354.92              | 409.69 | 483.74 | 615.32 | 73.32                 | 84.16 | 100.05 | 126.52 |
| AD | San Diego County APCD        | Annual | 2017 | 355.08              | 410.10 | 483.73 | 615.84 | 73.37                 | 84.25 | 100.15 | 126.74 |
| AD | San Diego County APCD        | Annual | 2018 | 355.21              | 410.47 | 483.74 | 616.29 | 73.41                 | 84.35 | 100.25 | 126.96 |
| AD | San Diego County APCD        | Annual | 2019 | 355.33              | 410.82 | 483.74 | 616.69 | 73.46                 | 84.52 | 100.35 | 127.15 |
| AD | San Diego County APCD        | Annual | 2020 | 355.43              | 411.15 | 483.75 | 617.07 | 73.55                 | 84.69 | 100.45 | 127.34 |
| AD | San Diego County APCD        | Annual | 2021 | 356.07              | 412.11 | 484.56 | 618.41 | 73.62                 | 84.87 | 100.55 | 127.52 |
| AD | San Diego County APCD        | Annual | 2022 | 356.11              | 412.36 | 484.56 | 618.69 | 73.67                 | 85.02 | 100.63 | 127.67 |
| AD | San Diego County APCD        | Annual | 2023 | 356.12              | 412.55 | 484.56 | 618.89 | 73.71                 | 85.15 | 100.70 | 127.83 |
| AD | San Diego County APCD        | Annual | 2024 | 356.12              | 412.71 | 484.55 | 619.06 | 73.72                 | 85.27 | 100.76 | 127.98 |
| AD | San Diego County APCD        | Annual | 2025 | 356.11              | 412.86 | 484.55 | 619.23 | 73.74                 | 85.38 | 100.81 | 128.12 |
| AD | San Diego County APCD        | Annual | 2026 | 356.13              | 413.01 | 484.54 | 619.39 | 73.76                 | 85.48 | 100.85 | 128.26 |
| AD | San Diego County APCD        | Annual | 2027 | 356.14              | 413.16 | 484.53 | 619.54 | 73.77                 | 85.57 | 100.88 | 128.38 |
| AD | San Diego County APCD        | Annual | 2028 | 356.15              | 413.30 | 484.51 | 619.69 | 73.78                 | 85.66 | 100.90 | 128.48 |
| AD | San Diego County APCD        | Annual | 2029 | 356.15              | 413.45 | 484.50 | 619.84 | 73.79                 | 85.74 | 100.92 | 128.58 |
| AD | San Diego County APCD        | Annual | 2030 | 356.14              | 413.59 | 484.49 | 619.98 | 73.79                 | 85.81 | 100.93 | 128.68 |
| AD | San Diego County APCD        | Annual | 2031 | 356.14              | 413.74 | 484.48 | 620.13 | 73.80                 | 85.89 | 100.94 | 128.77 |
| AD | San Diego County APCD        | Annual | 2032 | 356.14              | 413.87 | 484.48 | 620.29 | 73.80                 | 85.96 | 100.95 | 128.86 |
| AD | San Diego County APCD        | Annual | 2033 | 356.14              | 414.00 | 484.47 | 620.43 | 73.80                 | 86.02 | 100.96 | 128.93 |
| AD | San Diego County APCD        | Annual | 2034 | 356.13              | 414.10 | 484.46 | 620.55 | 73.80                 | 86.08 | 100.97 | 129.01 |
| AD | San Diego County APCD        | Annual | 2035 | 356.13              | 414.20 | 484.46 | 620.67 | 73.81                 | 86.13 | 100.97 | 129.08 |
| AD | San Diego County APCD        | Summer | 2010 | 372.46              | 426.19 | 509.00 | 643.64 | 72.99                 | 83.92 | 99.34  | 125.27 |
| AD | San Diego County APCD        | Summer | 2011 | 373.89              | 428.41 | 510.48 | 645.96 | 73.01                 | 83.88 | 99.44  | 125.44 |
| AD | San Diego County APCD        | Summer | 2012 | 374.19              | 429.26 | 510.46 | 646.43 | 73.05                 | 83.89 | 99.57  | 125.64 |
| AD | San Diego County APCD        | Summer | 2013 | 374.48              | 430.00 | 510.47 | 646.99 | 73.12                 | 83.94 | 99.70  | 125.85 |
| AD | San Diego County APCD        | Summer | 2014 | 374.75              | 430.67 | 510.51 | 647.60 | 73.17                 | 83.99 | 99.82  | 126.06 |
| AD | San Diego County APCD        | Summer | 2015 | 375.00              | 431.27 | 510.56 | 648.26 | 73.24                 | 84.07 | 99.93  | 126.29 |
| AD | San Diego County APCD        | Summer | 2016 | 375.24              | 431.81 | 510.61 | 648.90 | 73.32                 | 84.16 | 100.05 | 126.52 |
| AD | San Diego County APCD        | Summer | 2017 | 375.42              | 432.30 | 510.65 | 649.52 | 73.37                 | 84.25 | 100.15 | 126.74 |
| AD | San Diego County APCD        | Summer | 2018 | 375.55              | 432.74 | 510.67 | 650.05 | 73.41                 | 84.35 | 100.25 | 126.96 |
| AD | San Diego County APCD        | Summer | 2019 | 375.68              | 433.15 | 510.68 | 650.53 | 73.46                 | 84.52 | 100.35 | 127.15 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                        | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                                 |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | San Diego County APCD           | Summer | 2020 | 375.78             | 433.52 | 510.68 | 650.97 | 73.55                 | 84.69 | 100.45 | 127.34 |
| AD | San Diego County APCD           | Summer | 2021 | 376.47             | 434.60 | 511.57 | 652.47 | 73.62                 | 84.87 | 100.55 | 127.52 |
| AD | San Diego County APCD           | Summer | 2022 | 376.52             | 434.90 | 511.57 | 652.82 | 73.67                 | 85.02 | 100.63 | 127.67 |
| AD | San Diego County APCD           | Summer | 2023 | 376.54             | 435.14 | 511.57 | 653.07 | 73.71                 | 85.15 | 100.70 | 127.83 |
| AD | San Diego County APCD           | Summer | 2024 | 376.54             | 435.34 | 511.56 | 653.27 | 73.72                 | 85.27 | 100.76 | 127.98 |
| AD | San Diego County APCD           | Summer | 2025 | 376.54             | 435.52 | 511.56 | 653.45 | 73.74                 | 85.38 | 100.81 | 128.12 |
| AD | San Diego County APCD           | Summer | 2026 | 376.55             | 435.72 | 511.54 | 653.62 | 73.76                 | 85.48 | 100.85 | 128.26 |
| AD | San Diego County APCD           | Summer | 2027 | 376.56             | 435.90 | 511.53 | 653.77 | 73.77                 | 85.57 | 100.88 | 128.38 |
| AD | San Diego County APCD           | Summer | 2028 | 376.57             | 436.07 | 511.51 | 653.92 | 73.78                 | 85.66 | 100.90 | 128.48 |
| AD | San Diego County APCD           | Summer | 2029 | 376.58             | 436.25 | 511.49 | 654.06 | 73.79                 | 85.74 | 100.92 | 128.58 |
| AD | San Diego County APCD           | Summer | 2030 | 376.58             | 436.43 | 511.48 | 654.21 | 73.79                 | 85.81 | 100.93 | 128.68 |
| AD | San Diego County APCD           | Summer | 2031 | 376.57             | 436.61 | 511.47 | 654.35 | 73.80                 | 85.89 | 100.94 | 128.77 |
| AD | San Diego County APCD           | Summer | 2032 | 376.57             | 436.77 | 511.46 | 654.51 | 73.80                 | 85.96 | 100.95 | 128.86 |
| AD | San Diego County APCD           | Summer | 2033 | 376.57             | 436.92 | 511.45 | 654.65 | 73.80                 | 86.02 | 100.96 | 128.93 |
| AD | San Diego County APCD           | Summer | 2034 | 376.57             | 437.04 | 511.45 | 654.79 | 73.80                 | 86.08 | 100.97 | 129.01 |
| AD | San Diego County APCD           | Summer | 2035 | 376.57             | 437.14 | 511.44 | 654.92 | 73.81                 | 86.13 | 100.97 | 129.08 |
| AD | San Diego County APCD           | Winter | 2010 | 348.91             | 401.34 | 477.65 | 604.17 | 72.99                 | 83.92 | 99.34  | 125.27 |
| AD | San Diego County APCD           | Winter | 2011 | 350.18             | 403.18 | 479.04 | 606.53 | 73.01                 | 83.88 | 99.44  | 125.44 |
| AD | San Diego County APCD           | Winter | 2012 | 350.39             | 403.76 | 478.98 | 607.06 | 73.05                 | 83.89 | 99.57  | 125.64 |
| AD | San Diego County APCD           | Winter | 2013 | 350.62             | 404.30 | 478.94 | 607.62 | 73.12                 | 83.94 | 99.70  | 125.85 |
| AD | San Diego County APCD           | Winter | 2014 | 350.83             | 404.79 | 478.91 | 608.17 | 73.17                 | 83.99 | 99.82  | 126.06 |
| AD | San Diego County APCD           | Winter | 2015 | 351.05             | 405.26 | 478.89 | 608.73 | 73.24                 | 84.07 | 99.93  | 126.29 |
| AD | San Diego County APCD           | Winter | 2016 | 351.25             | 405.69 | 478.88 | 609.25 | 73.32                 | 84.16 | 100.05 | 126.52 |
| AD | San Diego County APCD           | Winter | 2017 | 351.40             | 406.08 | 478.87 | 609.75 | 73.37                 | 84.25 | 100.15 | 126.74 |
| AD | San Diego County APCD           | Winter | 2018 | 351.53             | 406.44 | 478.86 | 610.18 | 73.41                 | 84.35 | 100.25 | 126.96 |
| AD | San Diego County APCD           | Winter | 2019 | 351.65             | 406.78 | 478.87 | 610.57 | 73.46                 | 84.52 | 100.35 | 127.15 |
| AD | San Diego County APCD           | Winter | 2020 | 351.75             | 407.10 | 478.87 | 610.94 | 73.55                 | 84.69 | 100.45 | 127.34 |
| AD | San Diego County APCD           | Winter | 2021 | 352.38             | 408.04 | 479.67 | 612.25 | 73.62                 | 84.87 | 100.55 | 127.52 |
| AD | San Diego County APCD           | Winter | 2022 | 352.42             | 408.28 | 479.67 | 612.51 | 73.67                 | 85.02 | 100.63 | 127.67 |
| AD | San Diego County APCD           | Winter | 2023 | 352.43             | 408.47 | 479.67 | 612.71 | 73.71                 | 85.15 | 100.70 | 127.83 |
| AD | San Diego County APCD           | Winter | 2024 | 352.42             | 408.62 | 479.66 | 612.87 | 73.72                 | 85.27 | 100.76 | 127.98 |
| AD | San Diego County APCD           | Winter | 2025 | 352.42             | 408.75 | 479.66 | 613.03 | 73.74                 | 85.38 | 100.81 | 128.12 |
| AD | San Diego County APCD           | Winter | 2026 | 352.43             | 408.90 | 479.65 | 613.20 | 73.76                 | 85.48 | 100.85 | 128.26 |
| AD | San Diego County APCD           | Winter | 2027 | 352.44             | 409.04 | 479.64 | 613.35 | 73.77                 | 85.57 | 100.88 | 128.38 |
| AD | San Diego County APCD           | Winter | 2028 | 352.45             | 409.18 | 479.63 | 613.50 | 73.78                 | 85.66 | 100.90 | 128.48 |
| AD | San Diego County APCD           | Winter | 2029 | 352.45             | 409.32 | 479.62 | 613.64 | 73.79                 | 85.74 | 100.92 | 128.58 |
| AD | San Diego County APCD           | Winter | 2030 | 352.45             | 409.46 | 479.60 | 613.79 | 73.79                 | 85.81 | 100.93 | 128.68 |
| AD | San Diego County APCD           | Winter | 2031 | 352.44             | 409.60 | 479.60 | 613.94 | 73.80                 | 85.89 | 100.94 | 128.77 |
| AD | San Diego County APCD           | Winter | 2032 | 352.44             | 409.73 | 479.59 | 614.10 | 73.80                 | 85.96 | 100.95 | 128.86 |
| AD | San Diego County APCD           | Winter | 2033 | 352.44             | 409.85 | 479.59 | 614.23 | 73.80                 | 86.02 | 100.96 | 128.93 |
| AD | San Diego County APCD           | Winter | 2034 | 352.44             | 409.95 | 479.58 | 614.36 | 73.80                 | 86.08 | 100.97 | 129.01 |
| AD | San Diego County APCD           | Winter | 2035 | 352.43             | 410.04 | 479.57 | 614.47 | 73.81                 | 86.13 | 100.97 | 129.08 |
| AD | San Joaquin Valley Unified APCD | Annual | 2010 | 344.53             | 395.23 | 472.07 | 594.91 | 73.37                 | 85.32 | 100.36 | 124.58 |
| AD | San Joaquin Valley Unified APCD | Annual | 2011 | 344.79             | 396.17 | 471.84 | 595.64 | 73.37                 | 85.05 | 100.34 | 124.82 |
| AD | San Joaquin Valley Unified APCD | Annual | 2012 | 344.82             | 396.68 | 471.40 | 596.04 | 73.39                 | 84.87 | 100.35 | 125.07 |
| AD | San Joaquin Valley Unified APCD | Annual | 2013 | 345.18             | 397.48 | 471.50 | 597.02 | 73.43                 | 84.73 | 100.37 | 125.34 |
| AD | San Joaquin Valley Unified APCD | Annual | 2014 | 345.41             | 398.05 | 471.41 | 597.81 | 73.45                 | 84.65 | 100.38 | 125.62 |
| AD | San Joaquin Valley Unified APCD | Annual | 2015 | 346.20             | 399.25 | 472.24 | 599.62 | 73.50                 | 84.60 | 100.40 | 125.92 |
| AD | San Joaquin Valley Unified APCD | Annual | 2016 | 346.40             | 399.70 | 472.19 | 600.39 | 73.57                 | 84.57 | 100.44 | 126.22 |
| AD | San Joaquin Valley Unified APCD | Annual | 2017 | 346.53             | 400.08 | 472.14 | 601.11 | 73.60                 | 84.54 | 100.44 | 126.51 |
| AD | San Joaquin Valley Unified APCD | Annual | 2018 | 347.36             | 401.34 | 473.27 | 602.98 | 73.63                 | 84.56 | 100.47 | 126.79 |
| AD | San Joaquin Valley Unified APCD | Annual | 2019 | 347.49             | 401.71 | 473.29 | 603.59 | 73.68                 | 84.67 | 100.51 | 127.05 |
| AD | San Joaquin Valley Unified APCD | Annual | 2020 | 347.59             | 402.04 | 473.30 | 604.13 | 73.77                 | 84.83 | 100.58 | 127.28 |
| AD | San Joaquin Valley Unified APCD | Annual | 2021 | 347.55             | 402.06 | 472.98 | 604.31 | 73.84                 | 84.99 | 100.66 | 127.48 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                        | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                                 |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | San Joaquin Valley Unified APCD | Annual | 2022 | 347.60             | 402.27 | 472.95 | 604.67 | 73.89                 | 85.13 | 100.73 | 127.64 |
| AD | San Joaquin Valley Unified APCD | Annual | 2023 | 347.63             | 402.44 | 472.93 | 604.96 | 73.92                 | 85.25 | 100.78 | 127.82 |
| AD | San Joaquin Valley Unified APCD | Annual | 2024 | 347.85             | 403.02 | 473.49 | 605.81 | 73.94                 | 85.37 | 100.83 | 127.98 |
| AD | San Joaquin Valley Unified APCD | Annual | 2025 | 347.86             | 403.16 | 473.48 | 606.02 | 73.96                 | 85.47 | 100.86 | 128.14 |
| AD | San Joaquin Valley Unified APCD | Annual | 2026 | 348.71             | 404.36 | 474.80 | 607.63 | 73.98                 | 85.57 | 100.89 | 128.28 |
| AD | San Joaquin Valley Unified APCD | Annual | 2027 | 348.72             | 404.49 | 474.74 | 607.80 | 73.99                 | 85.65 | 100.92 | 128.41 |
| AD | San Joaquin Valley Unified APCD | Annual | 2028 | 348.73             | 404.62 | 474.69 | 607.97 | 74.00                 | 85.74 | 100.93 | 128.53 |
| AD | San Joaquin Valley Unified APCD | Annual | 2029 | 348.73             | 404.75 | 474.65 | 608.15 | 74.01                 | 85.81 | 100.94 | 128.63 |
| AD | San Joaquin Valley Unified APCD | Annual | 2030 | 348.73             | 404.88 | 474.61 | 608.33 | 74.01                 | 85.88 | 100.95 | 128.74 |
| AD | San Joaquin Valley Unified APCD | Annual | 2031 | 348.73             | 405.01 | 474.57 | 608.48 | 74.02                 | 85.95 | 100.96 | 128.83 |
| AD | San Joaquin Valley Unified APCD | Annual | 2032 | 348.73             | 405.13 | 474.53 | 608.63 | 74.02                 | 86.02 | 100.96 | 128.92 |
| AD | San Joaquin Valley Unified APCD | Annual | 2033 | 348.73             | 405.23 | 474.50 | 608.78 | 74.02                 | 86.07 | 100.97 | 129.00 |
| AD | San Joaquin Valley Unified APCD | Annual | 2034 | 348.73             | 405.32 | 474.47 | 608.91 | 74.03                 | 86.12 | 100.97 | 129.08 |
| AD | San Joaquin Valley Unified APCD | Annual | 2035 | 348.74             | 405.39 | 474.45 | 609.03 | 74.03                 | 86.17 | 100.98 | 129.15 |
| AD | San Joaquin Valley Unified APCD | Summer | 2010 | 378.79             | 430.24 | 517.12 | 652.23 | 73.37                 | 85.32 | 100.36 | 124.58 |
| AD | San Joaquin Valley Unified APCD | Summer | 2011 | 379.32             | 432.07 | 517.21 | 652.97 | 73.37                 | 85.05 | 100.34 | 124.82 |
| AD | San Joaquin Valley Unified APCD | Summer | 2012 | 379.51             | 433.17 | 516.96 | 653.39 | 73.39                 | 84.87 | 100.35 | 125.07 |
| AD | San Joaquin Valley Unified APCD | Summer | 2013 | 380.02             | 434.48 | 517.27 | 654.53 | 73.43                 | 84.73 | 100.37 | 125.34 |
| AD | San Joaquin Valley Unified APCD | Summer | 2014 | 380.35             | 435.44 | 517.38 | 655.51 | 73.45                 | 84.65 | 100.38 | 125.62 |
| AD | San Joaquin Valley Unified APCD | Summer | 2015 | 381.29             | 437.04 | 518.48 | 657.68 | 73.50                 | 84.60 | 100.40 | 125.92 |
| AD | San Joaquin Valley Unified APCD | Summer | 2016 | 381.55             | 437.73 | 518.55 | 658.71 | 73.57                 | 84.57 | 100.44 | 126.22 |
| AD | San Joaquin Valley Unified APCD | Summer | 2017 | 381.72             | 438.33 | 518.60 | 659.66 | 73.60                 | 84.54 | 100.44 | 126.51 |
| AD | San Joaquin Valley Unified APCD | Summer | 2018 | 382.62             | 439.83 | 519.89 | 661.84 | 73.63                 | 84.56 | 100.47 | 126.79 |
| AD | San Joaquin Valley Unified APCD | Summer | 2019 | 382.75             | 440.33 | 519.93 | 662.62 | 73.68                 | 84.67 | 100.51 | 127.05 |
| AD | San Joaquin Valley Unified APCD | Summer | 2020 | 382.86             | 440.77 | 519.95 | 663.30 | 73.77                 | 84.83 | 100.58 | 127.28 |
| AD | San Joaquin Valley Unified APCD | Summer | 2021 | 382.80             | 440.85 | 519.59 | 663.56 | 73.84                 | 84.99 | 100.66 | 127.48 |
| AD | San Joaquin Valley Unified APCD | Summer | 2022 | 382.85             | 441.14 | 519.54 | 664.00 | 73.89                 | 85.13 | 100.73 | 127.64 |
| AD | San Joaquin Valley Unified APCD | Summer | 2023 | 382.88             | 441.39 | 519.49 | 664.34 | 73.92                 | 85.25 | 100.78 | 127.82 |
| AD | San Joaquin Valley Unified APCD | Summer | 2024 | 383.14             | 442.10 | 520.11 | 665.29 | 73.94                 | 85.37 | 100.83 | 127.98 |
| AD | San Joaquin Valley Unified APCD | Summer | 2025 | 383.16             | 442.31 | 520.10 | 665.52 | 73.96                 | 85.47 | 100.86 | 128.14 |
| AD | San Joaquin Valley Unified APCD | Summer | 2026 | 384.09             | 443.68 | 521.54 | 667.23 | 73.98                 | 85.57 | 100.89 | 128.28 |
| AD | San Joaquin Valley Unified APCD | Summer | 2027 | 384.11             | 443.88 | 521.48 | 667.40 | 73.99                 | 85.65 | 100.92 | 128.41 |
| AD | San Joaquin Valley Unified APCD | Summer | 2028 | 384.12             | 444.07 | 521.44 | 667.58 | 74.00                 | 85.74 | 100.93 | 128.53 |
| AD | San Joaquin Valley Unified APCD | Summer | 2029 | 384.14             | 444.28 | 521.41 | 667.76 | 74.01                 | 85.81 | 100.94 | 128.63 |
| AD | San Joaquin Valley Unified APCD | Summer | 2030 | 384.15             | 444.48 | 521.38 | 667.96 | 74.01                 | 85.88 | 100.95 | 128.74 |
| AD | San Joaquin Valley Unified APCD | Summer | 2031 | 384.15             | 444.67 | 521.34 | 668.13 | 74.02                 | 85.95 | 100.96 | 128.83 |
| AD | San Joaquin Valley Unified APCD | Summer | 2032 | 384.15             | 444.83 | 521.31 | 668.31 | 74.02                 | 86.02 | 100.96 | 128.92 |
| AD | San Joaquin Valley Unified APCD | Summer | 2033 | 384.15             | 444.97 | 521.29 | 668.48 | 74.02                 | 86.07 | 100.97 | 129.00 |
| AD | San Joaquin Valley Unified APCD | Summer | 2034 | 384.16             | 445.10 | 521.27 | 668.66 | 74.03                 | 86.12 | 100.97 | 129.08 |
| AD | San Joaquin Valley Unified APCD | Summer | 2035 | 384.17             | 445.18 | 521.25 | 668.82 | 74.03                 | 86.17 | 100.98 | 129.15 |
| AD | San Joaquin Valley Unified APCD | Winter | 2010 | 331.71             | 382.09 | 455.17 | 573.36 | 73.37                 | 85.32 | 100.36 | 124.58 |
| AD | San Joaquin Valley Unified APCD | Winter | 2011 | 331.86             | 382.70 | 454.81 | 574.06 | 73.37                 | 85.05 | 100.34 | 124.82 |
| AD | San Joaquin Valley Unified APCD | Winter | 2012 | 331.84             | 382.98 | 454.30 | 574.45 | 73.39                 | 84.87 | 100.35 | 125.07 |
| AD | San Joaquin Valley Unified APCD | Winter | 2013 | 332.15             | 383.59 | 454.32 | 575.38 | 73.43                 | 84.73 | 100.37 | 125.34 |
| AD | San Joaquin Valley Unified APCD | Winter | 2014 | 332.34             | 384.02 | 454.16 | 576.11 | 73.45                 | 84.65 | 100.38 | 125.62 |
| AD | San Joaquin Valley Unified APCD | Winter | 2015 | 333.08             | 385.08 | 454.89 | 577.78 | 73.50                 | 84.60 | 100.40 | 125.92 |
| AD | San Joaquin Valley Unified APCD | Winter | 2016 | 333.25             | 385.43 | 454.79 | 578.46 | 73.57                 | 84.57 | 100.44 | 126.22 |
| AD | San Joaquin Valley Unified APCD | Winter | 2017 | 333.38             | 385.74 | 454.71 | 579.09 | 73.60                 | 84.54 | 100.44 | 126.51 |
| AD | San Joaquin Valley Unified APCD | Winter | 2018 | 334.17             | 386.90 | 455.78 | 580.83 | 73.63                 | 84.56 | 100.47 | 126.79 |
| AD | San Joaquin Valley Unified APCD | Winter | 2019 | 334.29             | 387.21 | 455.78 | 581.37 | 73.68                 | 84.67 | 100.51 | 127.05 |
| AD | San Joaquin Valley Unified APCD | Winter | 2020 | 334.40             | 387.49 | 455.79 | 581.86 | 73.77                 | 84.83 | 100.58 | 127.28 |
| AD | San Joaquin Valley Unified APCD | Winter | 2021 | 334.35             | 387.50 | 455.49 | 582.01 | 73.84                 | 84.99 | 100.66 | 127.48 |
| AD | San Joaquin Valley Unified APCD | Winter | 2022 | 334.40             | 387.67 | 455.46 | 582.34 | 73.89                 | 85.13 | 100.73 | 127.64 |
| AD | San Joaquin Valley Unified APCD | Winter | 2023 | 334.42             | 387.81 | 455.44 | 582.61 | 73.92                 | 85.25 | 100.78 | 127.82 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                        | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                                 |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | San Joaquin Valley Unified APCD | Winter | 2024 | 334.63             | 388.34 | 455.98 | 583.42 | 73.94                 | 85.37 | 100.83 | 127.98 |
| AD | San Joaquin Valley Unified APCD | Winter | 2025 | 334.64             | 388.44 | 455.97 | 583.62 | 73.96                 | 85.47 | 100.86 | 128.14 |
| AD | San Joaquin Valley Unified APCD | Winter | 2026 | 335.45             | 389.58 | 457.23 | 585.17 | 73.98                 | 85.57 | 100.89 | 128.28 |
| AD | San Joaquin Valley Unified APCD | Winter | 2027 | 335.46             | 389.68 | 457.17 | 585.33 | 73.99                 | 85.65 | 100.92 | 128.41 |
| AD | San Joaquin Valley Unified APCD | Winter | 2028 | 335.46             | 389.78 | 457.12 | 585.50 | 74.00                 | 85.74 | 100.93 | 128.53 |
| AD | San Joaquin Valley Unified APCD | Winter | 2029 | 335.46             | 389.88 | 457.06 | 585.66 | 74.01                 | 85.81 | 100.94 | 128.63 |
| AD | San Joaquin Valley Unified APCD | Winter | 2030 | 335.45             | 389.98 | 457.02 | 585.83 | 74.01                 | 85.88 | 100.95 | 128.74 |
| AD | San Joaquin Valley Unified APCD | Winter | 2031 | 335.45             | 390.08 | 456.97 | 585.97 | 74.02                 | 85.95 | 100.96 | 128.83 |
| AD | San Joaquin Valley Unified APCD | Winter | 2032 | 335.44             | 390.18 | 456.93 | 586.11 | 74.02                 | 86.02 | 100.96 | 128.92 |
| AD | San Joaquin Valley Unified APCD | Winter | 2033 | 335.44             | 390.27 | 456.89 | 586.24 | 74.02                 | 86.07 | 100.97 | 129.00 |
| AD | San Joaquin Valley Unified APCD | Winter | 2034 | 335.44             | 390.34 | 456.86 | 586.35 | 74.03                 | 86.12 | 100.97 | 129.08 |
| AD | San Joaquin Valley Unified APCD | Winter | 2035 | 335.44             | 390.41 | 456.83 | 586.45 | 74.03                 | 86.17 | 100.98 | 129.15 |
| AD | San Luis Obispo County APCD     | Annual | 2010 | 323.71             | 378.06 | 444.34 | 556.25 | 73.66                 | 90.73 | 100.02 | 124.73 |
| AD | San Luis Obispo County APCD     | Annual | 2011 | 323.66             | 377.48 | 443.78 | 556.86 | 73.53                 | 89.58 | 100.04 | 124.90 |
| AD | San Luis Obispo County APCD     | Annual | 2012 | 323.65             | 377.05 | 443.34 | 557.51 | 73.41                 | 88.66 | 100.08 | 125.11 |
| AD | San Luis Obispo County APCD     | Annual | 2013 | 323.72             | 376.63 | 442.99 | 558.19 | 73.36                 | 87.82 | 100.14 | 125.34 |
| AD | San Luis Obispo County APCD     | Annual | 2014 | 323.79             | 376.32 | 442.72 | 558.85 | 73.31                 | 87.15 | 100.20 | 125.58 |
| AD | San Luis Obispo County APCD     | Annual | 2015 | 323.89             | 376.00 | 442.50 | 559.54 | 73.31                 | 86.48 | 100.25 | 125.85 |
| AD | San Luis Obispo County APCD     | Annual | 2016 | 323.99             | 375.75 | 442.33 | 560.18 | 73.31                 | 85.95 | 100.33 | 126.11 |
| AD | San Luis Obispo County APCD     | Annual | 2017 | 324.07             | 375.53 | 442.19 | 560.79 | 73.31                 | 85.47 | 100.39 | 126.38 |
| AD | San Luis Obispo County APCD     | Annual | 2018 | 324.12             | 375.39 | 442.08 | 561.33 | 73.30                 | 85.15 | 100.47 | 126.64 |
| AD | San Luis Obispo County APCD     | Annual | 2019 | 324.17             | 375.38 | 441.99 | 561.79 | 73.31                 | 85.03 | 100.54 | 126.87 |
| AD | San Luis Obispo County APCD     | Annual | 2020 | 324.24             | 375.40 | 441.92 | 562.20 | 73.40                 | 85.04 | 100.62 | 127.10 |
| AD | San Luis Obispo County APCD     | Annual | 2021 | 324.29             | 375.51 | 441.85 | 562.51 | 73.47                 | 85.15 | 100.70 | 127.27 |
| AD | San Luis Obispo County APCD     | Annual | 2022 | 324.32             | 375.62 | 441.79 | 562.77 | 73.52                 | 85.25 | 100.76 | 127.41 |
| AD | San Luis Obispo County APCD     | Annual | 2023 | 324.30             | 375.69 | 441.73 | 562.97 | 73.56                 | 85.34 | 100.82 | 127.59 |
| AD | San Luis Obispo County APCD     | Annual | 2024 | 324.27             | 375.76 | 441.66 | 563.12 | 73.57                 | 85.42 | 100.86 | 127.74 |
| AD | San Luis Obispo County APCD     | Annual | 2025 | 324.25             | 375.82 | 441.61 | 563.29 | 73.59                 | 85.49 | 100.89 | 127.90 |
| AD | San Luis Obispo County APCD     | Annual | 2026 | 324.27             | 375.91 | 441.54 | 563.46 | 73.61                 | 85.57 | 100.92 | 128.06 |
| AD | San Luis Obispo County APCD     | Annual | 2027 | 324.28             | 375.99 | 441.47 | 563.63 | 73.63                 | 85.63 | 100.94 | 128.19 |
| AD | San Luis Obispo County APCD     | Annual | 2028 | 324.28             | 376.07 | 441.40 | 563.80 | 73.64                 | 85.68 | 100.95 | 128.31 |
| AD | San Luis Obispo County APCD     | Annual | 2029 | 324.27             | 376.16 | 441.32 | 563.96 | 73.64                 | 85.74 | 100.95 | 128.43 |
| AD | San Luis Obispo County APCD     | Annual | 2030 | 324.26             | 376.24 | 441.24 | 564.13 | 73.65                 | 85.79 | 100.95 | 128.54 |
| AD | San Luis Obispo County APCD     | Annual | 2031 | 324.26             | 376.33 | 441.20 | 564.31 | 73.65                 | 85.84 | 100.96 | 128.65 |
| AD | San Luis Obispo County APCD     | Annual | 2032 | 324.26             | 376.41 | 441.16 | 564.49 | 73.66                 | 85.88 | 100.96 | 128.75 |
| AD | San Luis Obispo County APCD     | Annual | 2033 | 324.25             | 376.48 | 441.13 | 564.65 | 73.66                 | 85.92 | 100.97 | 128.84 |
| AD | San Luis Obispo County APCD     | Annual | 2034 | 324.25             | 376.54 | 441.10 | 564.79 | 73.67                 | 85.96 | 100.97 | 128.93 |
| AD | San Luis Obispo County APCD     | Annual | 2035 | 324.24             | 376.60 | 441.08 | 564.92 | 73.67                 | 86.00 | 100.97 | 129.01 |
| AD | San Luis Obispo County APCD     | Summer | 2010 | 337.08             | 392.11 | 461.85 | 578.62 | 73.66                 | 90.73 | 100.02 | 124.73 |
| AD | San Luis Obispo County APCD     | Summer | 2011 | 337.15             | 391.73 | 461.44 | 579.22 | 73.53                 | 89.58 | 100.04 | 124.90 |
| AD | San Luis Obispo County APCD     | Summer | 2012 | 337.23             | 391.46 | 461.13 | 579.91 | 73.41                 | 88.66 | 100.08 | 125.11 |
| AD | San Luis Obispo County APCD     | Summer | 2013 | 337.36             | 391.21 | 460.89 | 580.65 | 73.36                 | 87.82 | 100.14 | 125.34 |
| AD | San Luis Obispo County APCD     | Summer | 2014 | 337.49             | 391.02 | 460.71 | 581.40 | 73.31                 | 87.15 | 100.20 | 125.58 |
| AD | San Luis Obispo County APCD     | Summer | 2015 | 337.63             | 390.82 | 460.57 | 582.19 | 73.31                 | 86.48 | 100.25 | 125.85 |
| AD | San Luis Obispo County APCD     | Summer | 2016 | 337.76             | 390.68 | 460.46 | 582.94 | 73.31                 | 85.95 | 100.33 | 126.11 |
| AD | San Luis Obispo County APCD     | Summer | 2017 | 337.85             | 390.56 | 460.36 | 583.64 | 73.31                 | 85.47 | 100.39 | 126.38 |
| AD | San Luis Obispo County APCD     | Summer | 2018 | 337.91             | 390.51 | 460.26 | 584.25 | 73.30                 | 85.15 | 100.47 | 126.64 |
| AD | San Luis Obispo County APCD     | Summer | 2019 | 337.96             | 390.55 | 460.18 | 584.77 | 73.31                 | 85.03 | 100.54 | 126.87 |
| AD | San Luis Obispo County APCD     | Summer | 2020 | 338.03             | 390.62 | 460.11 | 585.24 | 73.40                 | 85.04 | 100.62 | 127.10 |
| AD | San Luis Obispo County APCD     | Summer | 2021 | 338.07             | 390.76 | 460.04 | 585.58 | 73.47                 | 85.15 | 100.70 | 127.27 |
| AD | San Luis Obispo County APCD     | Summer | 2022 | 338.10             | 390.89 | 459.97 | 585.87 | 73.52                 | 85.25 | 100.76 | 127.41 |
| AD | San Luis Obispo County APCD     | Summer | 2023 | 338.08             | 390.99 | 459.91 | 586.10 | 73.56                 | 85.34 | 100.82 | 127.59 |
| AD | San Luis Obispo County APCD     | Summer | 2024 | 338.05             | 391.07 | 459.85 | 586.26 | 73.57                 | 85.42 | 100.86 | 127.74 |
| AD | San Luis Obispo County APCD     | Summer | 2025 | 338.04             | 391.16 | 459.80 | 586.42 | 73.59                 | 85.49 | 100.89 | 127.90 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|-----------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | San Luis Obispo County APCD | Summer | 2026 | 338.05             | 391.26 | 459.73 | 586.60 | 73.61                 | 85.57 | 100.92 | 128.06 |
| AD | San Luis Obispo County APCD | Summer | 2027 | 338.07             | 391.36 | 459.67 | 586.77 | 73.63                 | 85.63 | 100.94 | 128.19 |
| AD | San Luis Obispo County APCD | Summer | 2028 | 338.07             | 391.45 | 459.61 | 586.94 | 73.64                 | 85.68 | 100.95 | 128.31 |
| AD | San Luis Obispo County APCD | Summer | 2029 | 338.07             | 391.55 | 459.54 | 587.11 | 73.64                 | 85.74 | 100.95 | 128.43 |
| AD | San Luis Obispo County APCD | Summer | 2030 | 338.06             | 391.65 | 459.47 | 587.29 | 73.65                 | 85.79 | 100.95 | 128.54 |
| AD | San Luis Obispo County APCD | Summer | 2031 | 338.06             | 391.75 | 459.44 | 587.47 | 73.65                 | 85.84 | 100.96 | 128.65 |
| AD | San Luis Obispo County APCD | Summer | 2032 | 338.06             | 391.85 | 459.41 | 587.66 | 73.66                 | 85.88 | 100.96 | 128.75 |
| AD | San Luis Obispo County APCD | Summer | 2033 | 338.06             | 391.93 | 459.38 | 587.84 | 73.66                 | 85.92 | 100.97 | 128.84 |
| AD | San Luis Obispo County APCD | Summer | 2034 | 338.06             | 391.99 | 459.35 | 588.00 | 73.67                 | 85.96 | 100.97 | 128.93 |
| AD | San Luis Obispo County APCD | Summer | 2035 | 338.05             | 392.05 | 459.33 | 588.14 | 73.67                 | 86.00 | 100.97 | 129.01 |
| AD | San Luis Obispo County APCD | Winter | 2010 | 321.04             | 375.26 | 440.86 | 551.80 | 73.66                 | 90.73 | 100.02 | 124.73 |
| AD | San Luis Obispo County APCD | Winter | 2011 | 320.97             | 374.65 | 440.26 | 552.41 | 73.53                 | 89.58 | 100.04 | 124.90 |
| AD | San Luis Obispo County APCD | Winter | 2012 | 320.95             | 374.18 | 439.80 | 553.05 | 73.41                 | 88.66 | 100.08 | 125.11 |
| AD | San Luis Obispo County APCD | Winter | 2013 | 321.01             | 373.73 | 439.43 | 553.72 | 73.36                 | 87.82 | 100.14 | 125.34 |
| AD | San Luis Obispo County APCD | Winter | 2014 | 321.07             | 373.40 | 439.14 | 554.36 | 73.31                 | 87.15 | 100.20 | 125.58 |
| AD | San Luis Obispo County APCD | Winter | 2015 | 321.16             | 373.05 | 438.90 | 555.03 | 73.31                 | 86.48 | 100.25 | 125.85 |
| AD | San Luis Obispo County APCD | Winter | 2016 | 321.25             | 372.78 | 438.72 | 555.65 | 73.31                 | 85.95 | 100.33 | 126.11 |
| AD | San Luis Obispo County APCD | Winter | 2017 | 321.32             | 372.53 | 438.57 | 556.25 | 73.31                 | 85.47 | 100.39 | 126.38 |
| AD | San Luis Obispo County APCD | Winter | 2018 | 321.37             | 372.38 | 438.46 | 556.77 | 73.30                 | 85.15 | 100.47 | 126.64 |
| AD | San Luis Obispo County APCD | Winter | 2019 | 321.42             | 372.35 | 438.37 | 557.21 | 73.31                 | 85.03 | 100.54 | 126.87 |
| AD | San Luis Obispo County APCD | Winter | 2020 | 321.50             | 372.37 | 438.30 | 557.61 | 73.40                 | 85.04 | 100.62 | 127.10 |
| AD | San Luis Obispo County APCD | Winter | 2021 | 321.55             | 372.47 | 438.23 | 557.91 | 73.47                 | 85.15 | 100.70 | 127.27 |
| AD | San Luis Obispo County APCD | Winter | 2022 | 321.57             | 372.57 | 438.17 | 558.16 | 73.52                 | 85.25 | 100.76 | 127.41 |
| AD | San Luis Obispo County APCD | Winter | 2023 | 321.56             | 372.64 | 438.10 | 558.37 | 73.56                 | 85.34 | 100.82 | 127.59 |
| AD | San Luis Obispo County APCD | Winter | 2024 | 321.53             | 372.71 | 438.04 | 558.51 | 73.57                 | 85.42 | 100.86 | 127.74 |
| AD | San Luis Obispo County APCD | Winter | 2025 | 321.51             | 372.77 | 437.99 | 558.68 | 73.59                 | 85.49 | 100.89 | 127.90 |
| AD | San Luis Obispo County APCD | Winter | 2026 | 321.52             | 372.85 | 437.92 | 558.85 | 73.61                 | 85.57 | 100.92 | 128.06 |
| AD | San Luis Obispo County APCD | Winter | 2027 | 321.53             | 372.93 | 437.84 | 559.02 | 73.63                 | 85.63 | 100.94 | 128.19 |
| AD | San Luis Obispo County APCD | Winter | 2028 | 321.53             | 373.01 | 437.77 | 559.19 | 73.64                 | 85.68 | 100.95 | 128.31 |
| AD | San Luis Obispo County APCD | Winter | 2029 | 321.52             | 373.09 | 437.69 | 559.35 | 73.64                 | 85.74 | 100.95 | 128.43 |
| AD | San Luis Obispo County APCD | Winter | 2030 | 321.51             | 373.17 | 437.61 | 559.52 | 73.65                 | 85.79 | 100.95 | 128.54 |
| AD | San Luis Obispo County APCD | Winter | 2031 | 321.51             | 373.25 | 437.57 | 559.69 | 73.65                 | 85.84 | 100.96 | 128.65 |
| AD | San Luis Obispo County APCD | Winter | 2032 | 321.51             | 373.33 | 437.53 | 559.87 | 73.66                 | 85.88 | 100.96 | 128.75 |
| AD | San Luis Obispo County APCD | Winter | 2033 | 321.50             | 373.40 | 437.50 | 560.03 | 73.66                 | 85.92 | 100.97 | 128.84 |
| AD | San Luis Obispo County APCD | Winter | 2034 | 321.50             | 373.46 | 437.47 | 560.17 | 73.67                 | 85.96 | 100.97 | 128.93 |
| AD | San Luis Obispo County APCD | Winter | 2035 | 321.49             | 373.52 | 437.45 | 560.29 | 73.67                 | 86.00 | 100.97 | 129.01 |
| AD | Santa Barbara County APCD   | Annual | 2010 | 310.84             | 363.09 | 427.75 | 535.11 | 73.30                 | 88.99 | 99.96  | 124.67 |
| AD | Santa Barbara County APCD   | Annual | 2011 | 310.88             | 362.63 | 427.11 | 535.68 | 73.27                 | 88.16 | 99.98  | 124.88 |
| AD | Santa Barbara County APCD   | Annual | 2012 | 310.95             | 362.25 | 426.61 | 536.31 | 73.24                 | 87.48 | 100.03 | 125.11 |
| AD | Santa Barbara County APCD   | Annual | 2013 | 311.07             | 361.91 | 426.21 | 536.98 | 73.26                 | 86.88 | 100.11 | 125.37 |
| AD | Santa Barbara County APCD   | Annual | 2014 | 311.18             | 361.62 | 425.89 | 537.62 | 73.27                 | 86.37 | 100.18 | 125.64 |
| AD | Santa Barbara County APCD   | Annual | 2015 | 313.00             | 363.39 | 428.01 | 541.26 | 73.31                 | 85.95 | 100.25 | 125.92 |
| AD | Santa Barbara County APCD   | Annual | 2016 | 313.13             | 363.16 | 427.81 | 541.86 | 73.36                 | 85.55 | 100.33 | 126.20 |
| AD | Santa Barbara County APCD   | Annual | 2017 | 313.22             | 362.94 | 427.65 | 542.43 | 73.38                 | 85.18 | 100.40 | 126.48 |
| AD | Santa Barbara County APCD   | Annual | 2018 | 313.28             | 362.85 | 427.53 | 542.93 | 73.40                 | 85.00 | 100.47 | 126.74 |
| AD | Santa Barbara County APCD   | Annual | 2019 | 313.35             | 362.86 | 427.43 | 543.35 | 73.43                 | 84.95 | 100.55 | 126.99 |
| AD | Santa Barbara County APCD   | Annual | 2020 | 313.43             | 362.88 | 427.35 | 543.74 | 73.53                 | 84.99 | 100.64 | 127.22 |
| AD | Santa Barbara County APCD   | Annual | 2021 | 313.48             | 362.96 | 427.30 | 543.99 | 73.59                 | 85.09 | 100.71 | 127.38 |
| AD | Santa Barbara County APCD   | Annual | 2022 | 313.49             | 363.03 | 427.24 | 544.20 | 73.64                 | 85.18 | 100.77 | 127.51 |
| AD | Santa Barbara County APCD   | Annual | 2023 | 313.48             | 363.09 | 427.17 | 544.37 | 73.67                 | 85.26 | 100.82 | 127.66 |
| AD | Santa Barbara County APCD   | Annual | 2024 | 313.44             | 363.12 | 427.11 | 544.49 | 73.68                 | 85.33 | 100.86 | 127.80 |
| AD | Santa Barbara County APCD   | Annual | 2025 | 313.43             | 363.17 | 427.06 | 544.63 | 73.70                 | 85.40 | 100.90 | 127.95 |
| AD | Santa Barbara County APCD   | Annual | 2026 | 311.28             | 360.68 | 423.96 | 540.92 | 73.71                 | 85.47 | 100.92 | 128.08 |
| AD | Santa Barbara County APCD   | Annual | 2027 | 311.28             | 360.75 | 423.88 | 541.07 | 73.73                 | 85.52 | 100.94 | 128.21 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                  | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                           |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Santa Barbara County APCD | Annual | 2028 | 311.28             | 360.82 | 423.82 | 541.22 | 73.74                 | 85.58 | 100.95 | 128.32 |
| AD | Santa Barbara County APCD | Annual | 2029 | 311.28             | 360.90 | 423.73 | 541.36 | 73.74                 | 85.63 | 100.95 | 128.43 |
| AD | Santa Barbara County APCD | Annual | 2030 | 311.26             | 360.97 | 423.64 | 541.52 | 73.75                 | 85.67 | 100.95 | 128.53 |
| AD | Santa Barbara County APCD | Annual | 2031 | 311.26             | 361.06 | 423.58 | 541.68 | 73.75                 | 85.72 | 100.96 | 128.63 |
| AD | Santa Barbara County APCD | Annual | 2032 | 311.25             | 361.13 | 423.54 | 541.85 | 73.76                 | 85.77 | 100.96 | 128.73 |
| AD | Santa Barbara County APCD | Annual | 2033 | 311.25             | 361.21 | 423.50 | 542.00 | 73.76                 | 85.81 | 100.96 | 128.82 |
| AD | Santa Barbara County APCD | Annual | 2034 | 311.24             | 361.27 | 423.46 | 542.14 | 73.76                 | 85.85 | 100.97 | 128.90 |
| AD | Santa Barbara County APCD | Annual | 2035 | 311.24             | 361.32 | 423.43 | 542.26 | 73.77                 | 85.88 | 100.97 | 128.98 |
| AD | Santa Barbara County APCD | Summer | 2010 | 318.00             | 370.60 | 437.04 | 547.10 | 73.30                 | 88.99 | 99.96  | 124.67 |
| AD | Santa Barbara County APCD | Summer | 2011 | 318.11             | 370.21 | 436.50 | 547.67 | 73.27                 | 88.16 | 99.98  | 124.88 |
| AD | Santa Barbara County APCD | Summer | 2012 | 318.23             | 369.92 | 436.07 | 548.31 | 73.24                 | 87.48 | 100.03 | 125.11 |
| AD | Santa Barbara County APCD | Summer | 2013 | 318.39             | 369.65 | 435.73 | 549.01 | 73.26                 | 86.88 | 100.11 | 125.37 |
| AD | Santa Barbara County APCD | Summer | 2014 | 318.53             | 369.43 | 435.47 | 549.69 | 73.27                 | 86.37 | 100.18 | 125.64 |
| AD | Santa Barbara County APCD | Summer | 2015 | 320.38             | 371.28 | 437.66 | 553.41 | 73.31                 | 85.95 | 100.25 | 125.92 |
| AD | Santa Barbara County APCD | Summer | 2016 | 320.52             | 371.11 | 437.49 | 554.06 | 73.36                 | 85.55 | 100.33 | 126.20 |
| AD | Santa Barbara County APCD | Summer | 2017 | 320.61             | 370.94 | 437.35 | 554.68 | 73.38                 | 85.18 | 100.40 | 126.48 |
| AD | Santa Barbara County APCD | Summer | 2018 | 320.68             | 370.90 | 437.24 | 555.21 | 73.40                 | 85.00 | 100.47 | 126.74 |
| AD | Santa Barbara County APCD | Summer | 2019 | 320.75             | 370.93 | 437.14 | 555.67 | 73.43                 | 84.95 | 100.55 | 126.99 |
| AD | Santa Barbara County APCD | Summer | 2020 | 320.82             | 370.99 | 437.07 | 556.08 | 73.53                 | 84.99 | 100.64 | 127.22 |
| AD | Santa Barbara County APCD | Summer | 2021 | 320.86             | 371.07 | 437.00 | 556.34 | 73.59                 | 85.09 | 100.71 | 127.38 |
| AD | Santa Barbara County APCD | Summer | 2022 | 320.87             | 371.15 | 436.93 | 556.55 | 73.64                 | 85.18 | 100.77 | 127.51 |
| AD | Santa Barbara County APCD | Summer | 2023 | 320.85             | 371.21 | 436.86 | 556.71 | 73.67                 | 85.26 | 100.82 | 127.66 |
| AD | Santa Barbara County APCD | Summer | 2024 | 320.82             | 371.26 | 436.79 | 556.83 | 73.68                 | 85.33 | 100.86 | 127.80 |
| AD | Santa Barbara County APCD | Summer | 2025 | 320.80             | 371.31 | 436.74 | 556.96 | 73.70                 | 85.40 | 100.90 | 127.95 |
| AD | Santa Barbara County APCD | Summer | 2026 | 318.61             | 368.79 | 433.59 | 553.19 | 73.71                 | 85.47 | 100.92 | 128.08 |
| AD | Santa Barbara County APCD | Summer | 2027 | 318.61             | 368.86 | 433.51 | 553.33 | 73.73                 | 85.52 | 100.94 | 128.21 |
| AD | Santa Barbara County APCD | Summer | 2028 | 318.62             | 368.94 | 433.45 | 553.48 | 73.74                 | 85.58 | 100.95 | 128.32 |
| AD | Santa Barbara County APCD | Summer | 2029 | 318.61             | 369.02 | 433.37 | 553.64 | 73.74                 | 85.63 | 100.95 | 128.43 |
| AD | Santa Barbara County APCD | Summer | 2030 | 318.60             | 369.11 | 433.28 | 553.80 | 73.75                 | 85.67 | 100.95 | 128.53 |
| AD | Santa Barbara County APCD | Summer | 2031 | 318.60             | 369.20 | 433.24 | 553.96 | 73.75                 | 85.72 | 100.96 | 128.63 |
| AD | Santa Barbara County APCD | Summer | 2032 | 318.60             | 369.29 | 433.20 | 554.14 | 73.76                 | 85.77 | 100.96 | 128.73 |
| AD | Santa Barbara County APCD | Summer | 2033 | 318.60             | 369.37 | 433.17 | 554.30 | 73.76                 | 85.81 | 100.96 | 128.82 |
| AD | Santa Barbara County APCD | Summer | 2034 | 318.59             | 369.44 | 433.13 | 554.45 | 73.76                 | 85.85 | 100.97 | 128.90 |
| AD | Santa Barbara County APCD | Summer | 2035 | 318.59             | 369.50 | 433.10 | 554.58 | 73.77                 | 85.88 | 100.97 | 128.98 |
| AD | Santa Barbara County APCD | Winter | 2010 | 310.39             | 362.63 | 427.17 | 534.37 | 73.30                 | 88.99 | 99.96  | 124.67 |
| AD | Santa Barbara County APCD | Winter | 2011 | 310.43             | 362.16 | 426.53 | 534.94 | 73.27                 | 88.16 | 99.98  | 124.88 |
| AD | Santa Barbara County APCD | Winter | 2012 | 310.50             | 361.77 | 426.02 | 535.57 | 73.24                 | 87.48 | 100.03 | 125.11 |
| AD | Santa Barbara County APCD | Winter | 2013 | 310.62             | 361.43 | 425.62 | 536.23 | 73.26                 | 86.88 | 100.11 | 125.37 |
| AD | Santa Barbara County APCD | Winter | 2014 | 310.73             | 361.13 | 425.30 | 536.87 | 73.27                 | 86.37 | 100.18 | 125.64 |
| AD | Santa Barbara County APCD | Winter | 2015 | 312.55             | 362.90 | 427.42 | 540.51 | 73.31                 | 85.95 | 100.25 | 125.92 |
| AD | Santa Barbara County APCD | Winter | 2016 | 312.67             | 362.67 | 427.21 | 541.11 | 73.36                 | 85.55 | 100.33 | 126.20 |
| AD | Santa Barbara County APCD | Winter | 2017 | 312.76             | 362.45 | 427.05 | 541.68 | 73.38                 | 85.18 | 100.40 | 126.48 |
| AD | Santa Barbara County APCD | Winter | 2018 | 312.83             | 362.36 | 426.93 | 542.17 | 73.40                 | 85.00 | 100.47 | 126.74 |
| AD | Santa Barbara County APCD | Winter | 2019 | 312.90             | 362.36 | 426.83 | 542.59 | 73.43                 | 84.95 | 100.55 | 126.99 |
| AD | Santa Barbara County APCD | Winter | 2020 | 312.97             | 362.38 | 426.75 | 542.98 | 73.53                 | 84.99 | 100.64 | 127.22 |
| AD | Santa Barbara County APCD | Winter | 2021 | 313.02             | 362.45 | 426.70 | 543.23 | 73.59                 | 85.09 | 100.71 | 127.38 |
| AD | Santa Barbara County APCD | Winter | 2022 | 313.04             | 362.53 | 426.64 | 543.44 | 73.64                 | 85.18 | 100.77 | 127.51 |
| AD | Santa Barbara County APCD | Winter | 2023 | 313.02             | 362.58 | 426.57 | 543.61 | 73.67                 | 85.26 | 100.82 | 127.66 |
| AD | Santa Barbara County APCD | Winter | 2024 | 312.99             | 362.62 | 426.51 | 543.73 | 73.68                 | 85.33 | 100.86 | 127.80 |
| AD | Santa Barbara County APCD | Winter | 2025 | 312.98             | 362.66 | 426.46 | 543.87 | 73.70                 | 85.40 | 100.90 | 127.95 |
| AD | Santa Barbara County APCD | Winter | 2026 | 310.82             | 360.18 | 423.37 | 540.16 | 73.71                 | 85.47 | 100.92 | 128.08 |
| AD | Santa Barbara County APCD | Winter | 2027 | 310.83             | 360.25 | 423.29 | 540.31 | 73.73                 | 85.52 | 100.94 | 128.21 |
| AD | Santa Barbara County APCD | Winter | 2028 | 310.83             | 360.32 | 423.22 | 540.46 | 73.74                 | 85.58 | 100.95 | 128.32 |
| AD | Santa Barbara County APCD | Winter | 2029 | 310.82             | 360.40 | 423.14 | 540.60 | 73.74                 | 85.63 | 100.95 | 128.43 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location                  | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                           |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Santa Barbara County APCD | Winter | 2030 | 310.81             | 360.47 | 423.04 | 540.76 | 73.75                 | 85.67 | 100.95 | 128.53 |
| AD | Santa Barbara County APCD | Winter | 2031 | 310.80             | 360.55 | 422.99 | 540.92 | 73.75                 | 85.72 | 100.96 | 128.63 |
| AD | Santa Barbara County APCD | Winter | 2032 | 310.80             | 360.63 | 422.94 | 541.09 | 73.76                 | 85.77 | 100.96 | 128.73 |
| AD | Santa Barbara County APCD | Winter | 2033 | 310.80             | 360.70 | 422.90 | 541.24 | 73.76                 | 85.81 | 100.96 | 128.82 |
| AD | Santa Barbara County APCD | Winter | 2034 | 310.79             | 360.76 | 422.87 | 541.38 | 73.76                 | 85.85 | 100.97 | 128.90 |
| AD | Santa Barbara County APCD | Winter | 2035 | 310.78             | 360.82 | 422.83 | 541.50 | 73.77                 | 85.88 | 100.97 | 128.98 |
| AD | Shasta County AQMD        | Annual | 2010 | 350.80             | 413.29 | 482.10 | 601.62 | 74.15                 | 98.71 | 101.24 | 125.46 |
| AD | Shasta County AQMD        | Annual | 2011 | 350.90             | 412.33 | 481.45 | 602.23 | 73.97                 | 96.26 | 101.09 | 125.49 |
| AD | Shasta County AQMD        | Annual | 2012 | 351.01             | 411.55 | 480.95 | 602.95 | 73.79                 | 94.20 | 101.00 | 125.59 |
| AD | Shasta County AQMD        | Annual | 2013 | 351.16             | 410.88 | 480.56 | 603.76 | 73.67                 | 92.45 | 100.93 | 125.73 |
| AD | Shasta County AQMD        | Annual | 2014 | 351.28             | 410.22 | 480.26 | 604.58 | 73.54                 | 90.71 | 100.85 | 125.88 |
| AD | Shasta County AQMD        | Annual | 2015 | 351.43             | 409.72 | 480.02 | 605.45 | 73.48                 | 89.34 | 100.76 | 126.07 |
| AD | Shasta County AQMD        | Annual | 2016 | 351.59             | 409.32 | 479.82 | 606.30 | 73.48                 | 88.23 | 100.75 | 126.28 |
| AD | Shasta County AQMD        | Annual | 2017 | 351.70             | 408.85 | 479.65 | 607.09 | 73.46                 | 86.94 | 100.68 | 126.51 |
| AD | Shasta County AQMD        | Annual | 2018 | 351.78             | 408.50 | 479.51 | 607.77 | 73.42                 | 85.93 | 100.65 | 126.73 |
| AD | Shasta County AQMD        | Annual | 2019 | 351.86             | 408.40 | 479.39 | 608.38 | 73.43                 | 85.58 | 100.66 | 126.93 |
| AD | Shasta County AQMD        | Annual | 2020 | 351.92             | 408.34 | 479.30 | 608.94 | 73.52                 | 85.46 | 100.71 | 127.12 |
| AD | Shasta County AQMD        | Annual | 2021 | 351.97             | 408.41 | 479.21 | 609.29 | 73.59                 | 85.54 | 100.78 | 127.19 |
| AD | Shasta County AQMD        | Annual | 2022 | 352.00             | 408.47 | 479.13 | 609.57 | 73.64                 | 85.60 | 100.83 | 127.24 |
| AD | Shasta County AQMD        | Annual | 2023 | 351.99             | 408.52 | 479.04 | 609.77 | 73.67                 | 85.66 | 100.87 | 127.40 |
| AD | Shasta County AQMD        | Annual | 2024 | 351.96             | 408.57 | 478.97 | 609.93 | 73.69                 | 85.71 | 100.90 | 127.56 |
| AD | Shasta County AQMD        | Annual | 2025 | 351.96             | 408.62 | 478.91 | 610.13 | 73.71                 | 85.77 | 100.93 | 127.72 |
| AD | Shasta County AQMD        | Annual | 2026 | 351.98             | 408.69 | 478.84 | 610.34 | 73.73                 | 85.83 | 100.95 | 127.89 |
| AD | Shasta County AQMD        | Annual | 2027 | 351.99             | 408.74 | 478.77 | 610.55 | 73.74                 | 85.87 | 100.96 | 128.04 |
| AD | Shasta County AQMD        | Annual | 2028 | 352.00             | 408.80 | 478.71 | 610.77 | 73.75                 | 85.92 | 100.97 | 128.18 |
| AD | Shasta County AQMD        | Annual | 2029 | 352.00             | 408.87 | 478.63 | 610.99 | 73.76                 | 85.96 | 100.97 | 128.31 |
| AD | Shasta County AQMD        | Annual | 2030 | 351.99             | 408.94 | 478.56 | 611.21 | 73.76                 | 86.00 | 100.96 | 128.43 |
| AD | Shasta County AQMD        | Annual | 2031 | 351.99             | 409.00 | 478.53 | 611.45 | 73.77                 | 86.04 | 100.96 | 128.55 |
| AD | Shasta County AQMD        | Annual | 2032 | 351.99             | 409.07 | 478.50 | 611.69 | 73.78                 | 86.08 | 100.96 | 128.67 |
| AD | Shasta County AQMD        | Annual | 2033 | 351.98             | 409.12 | 478.47 | 611.91 | 73.78                 | 86.11 | 100.97 | 128.77 |
| AD | Shasta County AQMD        | Annual | 2034 | 351.98             | 409.16 | 478.44 | 612.11 | 73.78                 | 86.14 | 100.97 | 128.87 |
| AD | Shasta County AQMD        | Annual | 2035 | 351.97             | 409.20 | 478.42 | 612.29 | 73.79                 | 86.17 | 100.97 | 128.96 |
| AD | Shasta County AQMD        | Summer | 2010 | 377.12             | 440.81 | 516.16 | 644.42 | 74.15                 | 98.71 | 101.24 | 125.46 |
| AD | Shasta County AQMD        | Summer | 2011 | 377.45             | 440.35 | 515.97 | 645.10 | 73.97                 | 96.26 | 101.09 | 125.49 |
| AD | Shasta County AQMD        | Summer | 2012 | 377.75             | 439.98 | 515.82 | 645.96 | 73.79                 | 94.20 | 101.00 | 125.59 |
| AD | Shasta County AQMD        | Summer | 2013 | 378.03             | 439.65 | 515.70 | 646.99 | 73.67                 | 92.45 | 100.93 | 125.73 |
| AD | Shasta County AQMD        | Summer | 2014 | 378.26             | 439.31 | 515.62 | 648.05 | 73.54                 | 90.71 | 100.85 | 125.88 |
| AD | Shasta County AQMD        | Summer | 2015 | 378.49             | 439.05 | 515.56 | 649.19 | 73.48                 | 89.34 | 100.76 | 126.07 |
| AD | Shasta County AQMD        | Summer | 2016 | 378.71             | 438.86 | 515.49 | 650.32 | 73.48                 | 88.23 | 100.75 | 126.28 |
| AD | Shasta County AQMD        | Summer | 2017 | 378.85             | 438.66 | 515.40 | 651.36 | 73.46                 | 86.94 | 100.68 | 126.51 |
| AD | Shasta County AQMD        | Summer | 2018 | 378.93             | 438.50 | 515.27 | 652.24 | 73.42                 | 85.93 | 100.65 | 126.73 |
| AD | Shasta County AQMD        | Summer | 2019 | 379.01             | 438.48 | 515.17 | 653.03 | 73.43                 | 85.58 | 100.66 | 126.93 |
| AD | Shasta County AQMD        | Summer | 2020 | 379.07             | 438.49 | 515.07 | 653.75 | 73.52                 | 85.46 | 100.71 | 127.12 |
| AD | Shasta County AQMD        | Summer | 2021 | 379.11             | 438.58 | 514.97 | 654.24 | 73.59                 | 85.54 | 100.78 | 127.19 |
| AD | Shasta County AQMD        | Summer | 2022 | 379.12             | 438.68 | 514.88 | 654.63 | 73.64                 | 85.60 | 100.83 | 127.24 |
| AD | Shasta County AQMD        | Summer | 2023 | 379.11             | 438.76 | 514.80 | 654.91 | 73.67                 | 85.66 | 100.87 | 127.40 |
| AD | Shasta County AQMD        | Summer | 2024 | 379.10             | 438.85 | 514.73 | 655.11 | 73.69                 | 85.71 | 100.90 | 127.56 |
| AD | Shasta County AQMD        | Summer | 2025 | 379.11             | 438.93 | 514.68 | 655.32 | 73.71                 | 85.77 | 100.93 | 127.72 |
| AD | Shasta County AQMD        | Summer | 2026 | 379.13             | 439.02 | 514.61 | 655.54 | 73.73                 | 85.83 | 100.95 | 127.89 |
| AD | Shasta County AQMD        | Summer | 2027 | 379.15             | 439.10 | 514.56 | 655.77 | 73.74                 | 85.87 | 100.96 | 128.04 |
| AD | Shasta County AQMD        | Summer | 2028 | 379.16             | 439.18 | 514.51 | 656.00 | 73.75                 | 85.92 | 100.97 | 128.18 |
| AD | Shasta County AQMD        | Summer | 2029 | 379.17             | 439.28 | 514.46 | 656.24 | 73.76                 | 85.96 | 100.97 | 128.31 |
| AD | Shasta County AQMD        | Summer | 2030 | 379.18             | 439.37 | 514.41 | 656.49 | 73.76                 | 86.00 | 100.96 | 128.43 |
| AD | Shasta County AQMD        | Summer | 2031 | 379.17             | 439.46 | 514.40 | 656.77 | 73.77                 | 86.04 | 100.96 | 128.55 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Shasta County AQMD   | Summer | 2032 | 379.17             | 439.53 | 514.40 | 657.05 | 73.78                 | 86.08 | 100.96 | 128.67 |
| AD | Shasta County AQMD   | Summer | 2033 | 379.17             | 439.59 | 514.38 | 657.31 | 73.78                 | 86.11 | 100.97 | 128.77 |
| AD | Shasta County AQMD   | Summer | 2034 | 379.16             | 439.64 | 514.37 | 657.55 | 73.78                 | 86.14 | 100.97 | 128.87 |
| AD | Shasta County AQMD   | Summer | 2035 | 379.16             | 439.67 | 514.35 | 657.77 | 73.79                 | 86.17 | 100.97 | 128.96 |
| AD | Shasta County AQMD   | Winter | 2010 | 339.28             | 401.24 | 467.18 | 582.88 | 74.15                 | 98.71 | 101.24 | 125.46 |
| AD | Shasta County AQMD   | Winter | 2011 | 339.28             | 400.06 | 466.34 | 583.46 | 73.97                 | 96.26 | 101.09 | 125.49 |
| AD | Shasta County AQMD   | Winter | 2012 | 339.31             | 399.10 | 465.69 | 584.12 | 73.79                 | 94.20 | 101.00 | 125.59 |
| AD | Shasta County AQMD   | Winter | 2013 | 339.39             | 398.29 | 465.18 | 584.84 | 73.67                 | 92.45 | 100.93 | 125.73 |
| AD | Shasta County AQMD   | Winter | 2014 | 339.47             | 397.49 | 464.78 | 585.56 | 73.54                 | 90.71 | 100.85 | 125.88 |
| AD | Shasta County AQMD   | Winter | 2015 | 339.58             | 396.87 | 464.45 | 586.30 | 73.48                 | 89.34 | 100.76 | 126.07 |
| AD | Shasta County AQMD   | Winter | 2016 | 339.72             | 396.38 | 464.21 | 587.03 | 73.48                 | 88.23 | 100.75 | 126.28 |
| AD | Shasta County AQMD   | Winter | 2017 | 339.82             | 395.81 | 464.01 | 587.71 | 73.46                 | 86.94 | 100.68 | 126.51 |
| AD | Shasta County AQMD   | Winter | 2018 | 339.89             | 395.36 | 463.85 | 588.30 | 73.42                 | 85.93 | 100.65 | 126.73 |
| AD | Shasta County AQMD   | Winter | 2019 | 339.97             | 395.23 | 463.73 | 588.83 | 73.43                 | 85.58 | 100.66 | 126.93 |
| AD | Shasta County AQMD   | Winter | 2020 | 340.04             | 395.15 | 463.64 | 589.32 | 73.52                 | 85.46 | 100.71 | 127.12 |
| AD | Shasta County AQMD   | Winter | 2021 | 340.09             | 395.20 | 463.55 | 589.61 | 73.59                 | 85.54 | 100.78 | 127.19 |
| AD | Shasta County AQMD   | Winter | 2022 | 340.12             | 395.24 | 463.47 | 589.84 | 73.64                 | 85.60 | 100.83 | 127.24 |
| AD | Shasta County AQMD   | Winter | 2023 | 340.11             | 395.29 | 463.39 | 590.01 | 73.67                 | 85.66 | 100.87 | 127.40 |
| AD | Shasta County AQMD   | Winter | 2024 | 340.09             | 395.32 | 463.31 | 590.15 | 73.69                 | 85.71 | 100.90 | 127.56 |
| AD | Shasta County AQMD   | Winter | 2025 | 340.08             | 395.35 | 463.25 | 590.34 | 73.71                 | 85.77 | 100.93 | 127.72 |
| AD | Shasta County AQMD   | Winter | 2026 | 340.10             | 395.41 | 463.18 | 590.55 | 73.73                 | 85.83 | 100.95 | 127.89 |
| AD | Shasta County AQMD   | Winter | 2027 | 340.11             | 395.45 | 463.10 | 590.76 | 73.74                 | 85.87 | 100.96 | 128.04 |
| AD | Shasta County AQMD   | Winter | 2028 | 340.11             | 395.50 | 463.03 | 590.97 | 73.75                 | 85.92 | 100.97 | 128.18 |
| AD | Shasta County AQMD   | Winter | 2029 | 340.10             | 395.56 | 462.95 | 591.18 | 73.76                 | 85.96 | 100.97 | 128.31 |
| AD | Shasta County AQMD   | Winter | 2030 | 340.09             | 395.62 | 462.87 | 591.39 | 73.76                 | 86.00 | 100.96 | 128.43 |
| AD | Shasta County AQMD   | Winter | 2031 | 340.09             | 395.67 | 462.82 | 591.61 | 73.77                 | 86.04 | 100.96 | 128.55 |
| AD | Shasta County AQMD   | Winter | 2032 | 340.09             | 395.73 | 462.78 | 591.84 | 73.78                 | 86.08 | 100.96 | 128.67 |
| AD | Shasta County AQMD   | Winter | 2033 | 340.08             | 395.78 | 462.74 | 592.04 | 73.78                 | 86.11 | 100.97 | 128.77 |
| AD | Shasta County AQMD   | Winter | 2034 | 340.08             | 395.82 | 462.71 | 592.22 | 73.78                 | 86.14 | 100.97 | 128.87 |
| AD | Shasta County AQMD   | Winter | 2035 | 340.07             | 395.85 | 462.69 | 592.38 | 73.79                 | 86.17 | 100.97 | 128.96 |
| AD | Siskiyou County APCD | Annual | 2010 | 378.80             | 444.35 | 519.95 | 649.03 | 74.19                 | 93.56 | 102.24 | 125.12 |
| AD | Siskiyou County APCD | Annual | 2011 | 378.73             | 443.52 | 519.19 | 649.67 | 74.04                 | 92.11 | 102.01 | 125.20 |
| AD | Siskiyou County APCD | Annual | 2012 | 378.70             | 442.82 | 518.58 | 650.49 | 73.88                 | 90.89 | 101.82 | 125.30 |
| AD | Siskiyou County APCD | Annual | 2013 | 378.69             | 442.25 | 518.06 | 651.35 | 73.68                 | 89.89 | 101.54 | 125.46 |
| AD | Siskiyou County APCD | Annual | 2014 | 378.76             | 441.72 | 517.67 | 652.21 | 73.60                 | 88.92 | 101.36 | 125.61 |
| AD | Siskiyou County APCD | Annual | 2015 | 378.86             | 441.26 | 517.36 | 653.09 | 73.55                 | 88.04 | 101.18 | 125.82 |
| AD | Siskiyou County APCD | Annual | 2016 | 378.97             | 440.88 | 517.10 | 653.95 | 73.55                 | 87.27 | 101.06 | 126.05 |
| AD | Siskiyou County APCD | Annual | 2017 | 379.02             | 440.51 | 516.88 | 654.72 | 73.49                 | 86.50 | 100.90 | 126.29 |
| AD | Siskiyou County APCD | Annual | 2018 | 379.03             | 440.25 | 516.71 | 655.39 | 73.41                 | 85.98 | 100.79 | 126.52 |
| AD | Siskiyou County APCD | Annual | 2019 | 379.07             | 440.11 | 516.58 | 655.97 | 73.39                 | 85.68 | 100.76 | 126.74 |
| AD | Siskiyou County APCD | Annual | 2020 | 379.14             | 439.98 | 516.47 | 656.46 | 73.48                 | 85.54 | 100.80 | 126.95 |
| AD | Siskiyou County APCD | Annual | 2021 | 379.12             | 439.88 | 516.35 | 656.80 | 73.52                 | 85.53 | 100.84 | 127.11 |
| AD | Siskiyou County APCD | Annual | 2022 | 379.05             | 439.72 | 516.23 | 657.04 | 73.53                 | 85.50 | 100.87 | 127.20 |
| AD | Siskiyou County APCD | Annual | 2023 | 378.90             | 439.60 | 516.12 | 657.19 | 73.51                 | 85.48 | 100.89 | 127.36 |
| AD | Siskiyou County APCD | Annual | 2024 | 378.77             | 439.53 | 516.02 | 657.33 | 73.48                 | 85.50 | 100.91 | 127.52 |
| AD | Siskiyou County APCD | Annual | 2025 | 378.71             | 439.58 | 515.95 | 657.44 | 73.49                 | 85.56 | 100.93 | 127.67 |
| AD | Siskiyou County APCD | Annual | 2026 | 378.72             | 439.71 | 515.87 | 657.62 | 73.51                 | 85.65 | 100.95 | 127.82 |
| AD | Siskiyou County APCD | Annual | 2027 | 378.72             | 439.84 | 515.80 | 657.81 | 73.52                 | 85.73 | 100.97 | 127.97 |
| AD | Siskiyou County APCD | Annual | 2028 | 378.72             | 439.97 | 515.74 | 658.01 | 73.53                 | 85.81 | 100.98 | 128.11 |
| AD | Siskiyou County APCD | Annual | 2029 | 378.70             | 440.10 | 515.67 | 658.20 | 73.53                 | 85.88 | 100.98 | 128.23 |
| AD | Siskiyou County APCD | Annual | 2030 | 378.68             | 440.21 | 515.58 | 658.40 | 73.54                 | 85.95 | 100.97 | 128.36 |
| AD | Siskiyou County APCD | Annual | 2031 | 378.67             | 440.34 | 515.53 | 658.68 | 73.54                 | 86.01 | 100.97 | 128.49 |
| AD | Siskiyou County APCD | Annual | 2032 | 378.67             | 440.44 | 515.49 | 658.96 | 73.55                 | 86.07 | 100.98 | 128.62 |
| AD | Siskiyou County APCD | Annual | 2033 | 378.66             | 440.54 | 515.46 | 659.20 | 73.55                 | 86.13 | 100.98 | 128.73 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Siskiyou County APCD | Annual | 2034 | 378.65              | 440.63 | 515.42 | 659.41 | 73.56                 | 86.18 | 100.98 | 128.83 |
| AD | Siskiyou County APCD | Annual | 2035 | 378.64              | 440.70 | 515.40 | 659.60 | 73.56                 | 86.22 | 100.99 | 128.93 |
| AD | Siskiyou County APCD | Summer | 2010 | 393.78              | 458.70 | 539.46 | 673.02 | 74.19                 | 93.56 | 102.24 | 125.12 |
| AD | Siskiyou County APCD | Summer | 2011 | 393.90              | 458.44 | 538.93 | 673.75 | 74.04                 | 92.11 | 102.01 | 125.20 |
| AD | Siskiyou County APCD | Summer | 2012 | 394.02              | 458.19 | 538.51 | 674.72 | 73.88                 | 90.89 | 101.82 | 125.30 |
| AD | Siskiyou County APCD | Summer | 2013 | 394.12              | 457.97 | 538.18 | 675.77 | 73.68                 | 89.89 | 101.54 | 125.46 |
| AD | Siskiyou County APCD | Summer | 2014 | 394.26              | 457.73 | 537.93 | 676.82 | 73.60                 | 88.92 | 101.36 | 125.61 |
| AD | Siskiyou County APCD | Summer | 2015 | 394.41              | 457.52 | 537.74 | 677.91 | 73.55                 | 88.04 | 101.18 | 125.82 |
| AD | Siskiyou County APCD | Summer | 2016 | 394.55              | 457.35 | 537.58 | 678.96 | 73.55                 | 87.27 | 101.06 | 126.05 |
| AD | Siskiyou County APCD | Summer | 2017 | 394.62              | 457.17 | 537.43 | 679.91 | 73.49                 | 86.50 | 100.90 | 126.29 |
| AD | Siskiyou County APCD | Summer | 2018 | 394.63              | 457.04 | 537.29 | 680.74 | 73.41                 | 85.98 | 100.79 | 126.52 |
| AD | Siskiyou County APCD | Summer | 2019 | 394.66              | 457.01 | 537.18 | 681.46 | 73.39                 | 85.68 | 100.76 | 126.74 |
| AD | Siskiyou County APCD | Summer | 2020 | 394.72              | 456.98 | 537.09 | 682.06 | 73.48                 | 85.54 | 100.80 | 126.95 |
| AD | Siskiyou County APCD | Summer | 2021 | 394.69              | 456.95 | 536.97 | 682.49 | 73.52                 | 85.53 | 100.84 | 127.11 |
| AD | Siskiyou County APCD | Summer | 2022 | 394.62              | 456.88 | 536.86 | 682.82 | 73.53                 | 85.50 | 100.87 | 127.20 |
| AD | Siskiyou County APCD | Summer | 2023 | 394.48              | 456.83 | 536.76 | 683.03 | 73.51                 | 85.48 | 100.89 | 127.36 |
| AD | Siskiyou County APCD | Summer | 2024 | 394.35              | 456.84 | 536.67 | 683.22 | 73.48                 | 85.50 | 100.91 | 127.52 |
| AD | Siskiyou County APCD | Summer | 2025 | 394.30              | 456.94 | 536.61 | 683.38 | 73.49                 | 85.56 | 100.93 | 127.67 |
| AD | Siskiyou County APCD | Summer | 2026 | 394.32              | 457.11 | 536.53 | 683.57 | 73.51                 | 85.65 | 100.95 | 127.82 |
| AD | Siskiyou County APCD | Summer | 2027 | 394.33              | 457.28 | 536.46 | 683.78 | 73.52                 | 85.73 | 100.97 | 127.97 |
| AD | Siskiyou County APCD | Summer | 2028 | 394.34              | 457.44 | 536.40 | 684.00 | 73.53                 | 85.81 | 100.98 | 128.11 |
| AD | Siskiyou County APCD | Summer | 2029 | 394.33              | 457.61 | 536.34 | 684.23 | 73.53                 | 85.88 | 100.98 | 128.23 |
| AD | Siskiyou County APCD | Summer | 2030 | 394.32              | 457.77 | 536.26 | 684.47 | 73.54                 | 85.95 | 100.97 | 128.36 |
| AD | Siskiyou County APCD | Summer | 2031 | 394.32              | 457.91 | 536.23 | 684.79 | 73.54                 | 86.01 | 100.97 | 128.49 |
| AD | Siskiyou County APCD | Summer | 2032 | 394.32              | 458.04 | 536.21 | 685.10 | 73.55                 | 86.07 | 100.98 | 128.62 |
| AD | Siskiyou County APCD | Summer | 2033 | 394.31              | 458.15 | 536.18 | 685.38 | 73.55                 | 86.13 | 100.98 | 128.73 |
| AD | Siskiyou County APCD | Summer | 2034 | 394.30              | 458.25 | 536.16 | 685.63 | 73.56                 | 86.18 | 100.98 | 128.83 |
| AD | Siskiyou County APCD | Summer | 2035 | 394.29              | 458.31 | 536.14 | 685.85 | 73.56                 | 86.22 | 100.99 | 128.93 |
| AD | Siskiyou County APCD | Winter | 2010 | 373.71              | 439.47 | 513.32 | 640.88 | 74.19                 | 93.56 | 102.24 | 125.12 |
| AD | Siskiyou County APCD | Winter | 2011 | 373.57              | 438.45 | 512.48 | 641.49 | 74.04                 | 92.11 | 102.01 | 125.20 |
| AD | Siskiyou County APCD | Winter | 2012 | 373.50              | 437.60 | 511.81 | 642.25 | 73.88                 | 90.89 | 101.82 | 125.30 |
| AD | Siskiyou County APCD | Winter | 2013 | 373.45              | 436.91 | 511.23 | 643.06 | 73.68                 | 89.89 | 101.54 | 125.46 |
| AD | Siskiyou County APCD | Winter | 2014 | 373.49              | 436.28 | 510.79 | 643.86 | 73.60                 | 88.92 | 101.36 | 125.61 |
| AD | Siskiyou County APCD | Winter | 2015 | 373.58              | 435.74 | 510.43 | 644.66 | 73.55                 | 88.04 | 101.18 | 125.82 |
| AD | Siskiyou County APCD | Winter | 2016 | 373.68              | 435.28 | 510.15 | 645.45 | 73.55                 | 87.27 | 101.06 | 126.05 |
| AD | Siskiyou County APCD | Winter | 2017 | 373.73              | 434.85 | 509.90 | 646.16 | 73.49                 | 86.50 | 100.90 | 126.29 |
| AD | Siskiyou County APCD | Winter | 2018 | 373.74              | 434.55 | 509.71 | 646.78 | 73.41                 | 85.98 | 100.79 | 126.52 |
| AD | Siskiyou County APCD | Winter | 2019 | 373.78              | 434.37 | 509.58 | 647.31 | 73.39                 | 85.68 | 100.76 | 126.74 |
| AD | Siskiyou County APCD | Winter | 2020 | 373.85              | 434.21 | 509.47 | 647.77 | 73.48                 | 85.54 | 100.80 | 126.95 |
| AD | Siskiyou County APCD | Winter | 2021 | 373.83              | 434.08 | 509.34 | 648.08 | 73.52                 | 85.53 | 100.84 | 127.11 |
| AD | Siskiyou County APCD | Winter | 2022 | 373.76              | 433.89 | 509.22 | 648.29 | 73.53                 | 85.50 | 100.87 | 127.20 |
| AD | Siskiyou County APCD | Winter | 2023 | 373.61              | 433.74 | 509.10 | 648.41 | 73.51                 | 85.48 | 100.89 | 127.36 |
| AD | Siskiyou County APCD | Winter | 2024 | 373.47              | 433.65 | 509.00 | 648.53 | 73.48                 | 85.50 | 100.91 | 127.52 |
| AD | Siskiyou County APCD | Winter | 2025 | 373.42              | 433.68 | 508.93 | 648.63 | 73.49                 | 85.56 | 100.93 | 127.67 |
| AD | Siskiyou County APCD | Winter | 2026 | 373.42              | 433.81 | 508.85 | 648.81 | 73.51                 | 85.65 | 100.95 | 127.82 |
| AD | Siskiyou County APCD | Winter | 2027 | 373.42              | 433.92 | 508.79 | 648.99 | 73.52                 | 85.73 | 100.97 | 127.97 |
| AD | Siskiyou County APCD | Winter | 2028 | 373.41              | 434.03 | 508.72 | 649.17 | 73.53                 | 85.81 | 100.98 | 128.11 |
| AD | Siskiyou County APCD | Winter | 2029 | 373.39              | 434.14 | 508.65 | 649.35 | 73.53                 | 85.88 | 100.98 | 128.23 |
| AD | Siskiyou County APCD | Winter | 2030 | 373.36              | 434.25 | 508.56 | 649.55 | 73.54                 | 85.95 | 100.97 | 128.36 |
| AD | Siskiyou County APCD | Winter | 2031 | 373.36              | 434.37 | 508.50 | 649.81 | 73.54                 | 86.01 | 100.97 | 128.49 |
| AD | Siskiyou County APCD | Winter | 2032 | 373.35              | 434.47 | 508.45 | 650.08 | 73.55                 | 86.07 | 100.98 | 128.62 |
| AD | Siskiyou County APCD | Winter | 2033 | 373.34              | 434.56 | 508.42 | 650.30 | 73.55                 | 86.13 | 100.98 | 128.73 |
| AD | Siskiyou County APCD | Winter | 2034 | 373.34              | 434.64 | 508.38 | 650.51 | 73.56                 | 86.18 | 100.98 | 128.83 |
| AD | Siskiyou County APCD | Winter | 2035 | 373.33              | 434.71 | 508.36 | 650.69 | 73.56                 | 86.22 | 100.99 | 128.93 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location         | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | South Coast AQMD | Annual | 2010 | 358.02             | 409.62 | 488.99 | 615.32 | 73.21                 | 84.05 | 99.45  | 125.25 |
| AD | South Coast AQMD | Annual | 2011 | 358.54             | 410.54 | 489.35 | 616.40 | 73.23                 | 84.00 | 99.55  | 125.44 |
| AD | South Coast AQMD | Annual | 2012 | 358.67             | 410.92 | 489.13 | 616.69 | 73.27                 | 83.99 | 99.67  | 125.65 |
| AD | South Coast AQMD | Annual | 2013 | 358.87             | 411.39 | 488.96 | 617.06 | 73.33                 | 84.01 | 99.79  | 125.87 |
| AD | South Coast AQMD | Annual | 2014 | 359.01             | 411.72 | 488.78 | 617.39 | 73.38                 | 84.02 | 99.90  | 126.09 |
| AD | South Coast AQMD | Annual | 2015 | 359.50             | 412.41 | 489.04 | 618.24 | 73.44                 | 84.08 | 100.01 | 126.32 |
| AD | South Coast AQMD | Annual | 2016 | 359.61             | 412.72 | 488.91 | 618.65 | 73.51                 | 84.14 | 100.13 | 126.56 |
| AD | South Coast AQMD | Annual | 2017 | 359.68             | 413.00 | 488.78 | 619.05 | 73.56                 | 84.22 | 100.22 | 126.80 |
| AD | South Coast AQMD | Annual | 2018 | 359.73             | 413.24 | 488.67 | 619.36 | 73.60                 | 84.30 | 100.30 | 127.02 |
| AD | South Coast AQMD | Annual | 2019 | 359.09             | 412.70 | 487.70 | 618.61 | 73.64                 | 84.46 | 100.39 | 127.22 |
| AD | South Coast AQMD | Annual | 2020 | 359.10             | 412.90 | 487.57 | 618.81 | 73.73                 | 84.62 | 100.49 | 127.42 |
| AD | South Coast AQMD | Annual | 2021 | 359.90             | 414.07 | 488.59 | 620.47 | 73.80                 | 84.79 | 100.58 | 127.58 |
| AD | South Coast AQMD | Annual | 2022 | 359.87             | 414.24 | 488.50 | 620.64 | 73.85                 | 84.93 | 100.66 | 127.72 |
| AD | South Coast AQMD | Annual | 2023 | 359.81             | 414.36 | 488.41 | 620.74 | 73.88                 | 85.06 | 100.72 | 127.88 |
| AD | South Coast AQMD | Annual | 2024 | 361.75             | 416.75 | 490.99 | 624.15 | 73.90                 | 85.17 | 100.77 | 128.02 |
| AD | South Coast AQMD | Annual | 2025 | 361.67             | 416.81 | 490.90 | 624.21 | 73.92                 | 85.28 | 100.82 | 128.15 |
| AD | South Coast AQMD | Annual | 2026 | 361.63             | 416.90 | 490.79 | 624.27 | 73.94                 | 85.38 | 100.85 | 128.28 |
| AD | South Coast AQMD | Annual | 2027 | 361.58             | 416.99 | 490.68 | 624.32 | 73.95                 | 85.47 | 100.88 | 128.40 |
| AD | South Coast AQMD | Annual | 2028 | 361.52             | 417.07 | 490.57 | 624.36 | 73.96                 | 85.56 | 100.90 | 128.50 |
| AD | South Coast AQMD | Annual | 2029 | 361.45             | 417.16 | 490.46 | 624.40 | 73.97                 | 85.64 | 100.92 | 128.60 |
| AD | South Coast AQMD | Annual | 2030 | 361.38             | 417.24 | 490.34 | 624.44 | 73.97                 | 85.72 | 100.93 | 128.69 |
| AD | South Coast AQMD | Annual | 2031 | 361.74             | 417.83 | 490.77 | 625.15 | 73.98                 | 85.80 | 100.94 | 128.78 |
| AD | South Coast AQMD | Annual | 2032 | 361.68             | 417.92 | 490.68 | 625.19 | 73.98                 | 85.87 | 100.95 | 128.87 |
| AD | South Coast AQMD | Annual | 2033 | 361.62             | 417.98 | 490.58 | 625.22 | 73.99                 | 85.93 | 100.96 | 128.95 |
| AD | South Coast AQMD | Annual | 2034 | 361.55             | 418.03 | 490.49 | 625.24 | 73.99                 | 85.99 | 100.96 | 129.02 |
| AD | South Coast AQMD | Annual | 2035 | 361.48             | 418.05 | 490.39 | 625.25 | 73.99                 | 86.05 | 100.97 | 129.09 |
| AD | South Coast AQMD | Summer | 2010 | 376.35             | 428.81 | 513.13 | 646.58 | 73.21                 | 84.05 | 99.45  | 125.25 |
| AD | South Coast AQMD | Summer | 2011 | 376.97             | 430.12 | 513.62 | 647.72 | 73.23                 | 84.00 | 99.55  | 125.44 |
| AD | South Coast AQMD | Summer | 2012 | 377.16             | 430.78 | 513.49 | 648.06 | 73.27                 | 83.99 | 99.67  | 125.65 |
| AD | South Coast AQMD | Summer | 2013 | 377.42             | 431.49 | 513.42 | 648.53 | 73.33                 | 84.01 | 99.79  | 125.87 |
| AD | South Coast AQMD | Summer | 2014 | 377.59             | 432.01 | 513.33 | 648.98 | 73.38                 | 84.02 | 99.90  | 126.09 |
| AD | South Coast AQMD | Summer | 2015 | 378.15             | 432.89 | 513.72 | 650.01 | 73.44                 | 84.08 | 100.01 | 126.32 |
| AD | South Coast AQMD | Summer | 2016 | 378.30             | 433.33 | 513.68 | 650.59 | 73.51                 | 84.14 | 100.13 | 126.56 |
| AD | South Coast AQMD | Summer | 2017 | 378.41             | 433.75 | 513.63 | 651.14 | 73.56                 | 84.22 | 100.22 | 126.80 |
| AD | South Coast AQMD | Summer | 2018 | 378.49             | 434.09 | 513.58 | 651.59 | 73.60                 | 84.30 | 100.30 | 127.02 |
| AD | South Coast AQMD | Summer | 2019 | 377.86             | 433.63 | 512.63 | 650.96 | 73.64                 | 84.46 | 100.39 | 127.22 |
| AD | South Coast AQMD | Summer | 2020 | 377.91             | 433.94 | 512.56 | 651.31 | 73.73                 | 84.62 | 100.49 | 127.42 |
| AD | South Coast AQMD | Summer | 2021 | 378.79             | 435.26 | 513.67 | 653.16 | 73.80                 | 84.79 | 100.58 | 127.58 |
| AD | South Coast AQMD | Summer | 2022 | 378.78             | 435.52 | 513.61 | 653.41 | 73.85                 | 84.93 | 100.66 | 127.72 |
| AD | South Coast AQMD | Summer | 2023 | 378.75             | 435.72 | 513.53 | 653.58 | 73.88                 | 85.06 | 100.72 | 127.88 |
| AD | South Coast AQMD | Summer | 2024 | 380.85             | 438.35 | 516.31 | 657.27 | 73.90                 | 85.17 | 100.77 | 128.02 |
| AD | South Coast AQMD | Summer | 2025 | 380.80             | 438.49 | 516.23 | 657.36 | 73.92                 | 85.28 | 100.82 | 128.15 |
| AD | South Coast AQMD | Summer | 2026 | 380.78             | 438.66 | 516.15 | 657.45 | 73.94                 | 85.38 | 100.85 | 128.28 |
| AD | South Coast AQMD | Summer | 2027 | 380.75             | 438.81 | 516.07 | 657.53 | 73.95                 | 85.47 | 100.88 | 128.40 |
| AD | South Coast AQMD | Summer | 2028 | 380.72             | 438.96 | 515.99 | 657.60 | 73.96                 | 85.56 | 100.90 | 128.50 |
| AD | South Coast AQMD | Summer | 2029 | 380.68             | 439.12 | 515.91 | 657.67 | 73.97                 | 85.64 | 100.92 | 128.60 |
| AD | South Coast AQMD | Summer | 2030 | 380.64             | 439.28 | 515.83 | 657.75 | 73.97                 | 85.72 | 100.93 | 128.69 |
| AD | South Coast AQMD | Summer | 2031 | 381.06             | 439.99 | 516.35 | 658.58 | 73.98                 | 85.80 | 100.94 | 128.78 |
| AD | South Coast AQMD | Summer | 2032 | 381.02             | 440.15 | 516.29 | 658.68 | 73.98                 | 85.87 | 100.95 | 128.87 |
| AD | South Coast AQMD | Summer | 2033 | 380.98             | 440.27 | 516.23 | 658.77 | 73.99                 | 85.93 | 100.96 | 128.95 |
| AD | South Coast AQMD | Summer | 2034 | 380.94             | 440.37 | 516.16 | 658.85 | 73.99                 | 85.99 | 100.96 | 129.02 |
| AD | South Coast AQMD | Summer | 2035 | 380.89             | 440.43 | 516.10 | 658.92 | 73.99                 | 86.05 | 100.97 | 129.09 |
| AD | South Coast AQMD | Winter | 2010 | 352.29             | 403.80 | 481.47 | 605.90 | 73.21                 | 84.05 | 99.45  | 125.25 |
| AD | South Coast AQMD | Winter | 2011 | 352.78             | 404.63 | 481.81 | 606.99 | 73.23                 | 84.00 | 99.55  | 125.44 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location           | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|--------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                    |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | South Coast AQMD   | Winter | 2012 | 352.90              | 404.95 | 481.58 | 607.30 | 73.27                 | 83.99 | 99.67  | 125.65 |
| AD | South Coast AQMD   | Winter | 2013 | 353.09              | 405.36 | 481.40 | 607.67 | 73.33                 | 84.01 | 99.79  | 125.87 |
| AD | South Coast AQMD   | Winter | 2014 | 353.22              | 405.65 | 481.21 | 608.00 | 73.38                 | 84.02 | 99.90  | 126.09 |
| AD | South Coast AQMD   | Winter | 2015 | 353.70              | 406.30 | 481.45 | 608.82 | 73.44                 | 84.08 | 100.01 | 126.32 |
| AD | South Coast AQMD   | Winter | 2016 | 353.80              | 406.58 | 481.31 | 609.21 | 73.51                 | 84.14 | 100.13 | 126.56 |
| AD | South Coast AQMD   | Winter | 2017 | 353.87              | 406.84 | 481.17 | 609.58 | 73.56                 | 84.22 | 100.22 | 126.80 |
| AD | South Coast AQMD   | Winter | 2018 | 353.92              | 407.05 | 481.05 | 609.87 | 73.60                 | 84.30 | 100.30 | 127.02 |
| AD | South Coast AQMD   | Winter | 2019 | 353.29              | 406.51 | 480.09 | 609.12 | 73.64                 | 84.46 | 100.39 | 127.22 |
| AD | South Coast AQMD   | Winter | 2020 | 353.30              | 406.69 | 479.97 | 609.30 | 73.73                 | 84.62 | 100.49 | 127.42 |
| AD | South Coast AQMD   | Winter | 2021 | 354.09              | 407.83 | 480.97 | 610.93 | 73.80                 | 84.79 | 100.58 | 127.58 |
| AD | South Coast AQMD   | Winter | 2022 | 354.06              | 407.98 | 480.89 | 611.09 | 73.85                 | 84.93 | 100.66 | 127.72 |
| AD | South Coast AQMD   | Winter | 2023 | 354.00              | 408.09 | 480.80 | 611.19 | 73.88                 | 85.06 | 100.72 | 127.88 |
| AD | South Coast AQMD   | Winter | 2024 | 355.90              | 410.41 | 483.33 | 614.52 | 73.90                 | 85.17 | 100.77 | 128.02 |
| AD | South Coast AQMD   | Winter | 2025 | 355.82              | 410.46 | 483.24 | 614.58 | 73.92                 | 85.28 | 100.82 | 128.15 |
| AD | South Coast AQMD   | Winter | 2026 | 355.78              | 410.54 | 483.14 | 614.65 | 73.94                 | 85.38 | 100.85 | 128.28 |
| AD | South Coast AQMD   | Winter | 2027 | 355.73              | 410.61 | 483.03 | 614.70 | 73.95                 | 85.47 | 100.88 | 128.40 |
| AD | South Coast AQMD   | Winter | 2028 | 355.68              | 410.69 | 482.93 | 614.74 | 73.96                 | 85.56 | 100.90 | 128.50 |
| AD | South Coast AQMD   | Winter | 2029 | 355.61              | 410.76 | 482.82 | 614.79 | 73.97                 | 85.64 | 100.92 | 128.60 |
| AD | South Coast AQMD   | Winter | 2030 | 355.54              | 410.84 | 482.71 | 614.83 | 73.97                 | 85.72 | 100.93 | 128.69 |
| AD | South Coast AQMD   | Winter | 2031 | 355.89              | 411.39 | 483.12 | 615.52 | 73.98                 | 85.80 | 100.94 | 128.78 |
| AD | South Coast AQMD   | Winter | 2032 | 355.83              | 411.47 | 483.03 | 615.56 | 73.98                 | 85.87 | 100.95 | 128.87 |
| AD | South Coast AQMD   | Winter | 2033 | 355.77              | 411.53 | 482.94 | 615.59 | 73.99                 | 85.93 | 100.96 | 128.95 |
| AD | South Coast AQMD   | Winter | 2034 | 355.71              | 411.57 | 482.84 | 615.61 | 73.99                 | 85.99 | 100.96 | 129.02 |
| AD | South Coast AQMD   | Winter | 2035 | 355.64              | 411.60 | 482.75 | 615.61 | 73.99                 | 86.05 | 100.97 | 129.09 |
| AD | Tehama County APCD | Annual | 2010 | 347.71              | 408.08 | 478.44 | 596.20 | 73.92                 | 97.65 | 101.75 | 125.26 |
| AD | Tehama County APCD | Annual | 2011 | 347.75              | 407.21 | 477.63 | 596.79 | 73.75                 | 95.12 | 101.53 | 125.31 |
| AD | Tehama County APCD | Annual | 2012 | 347.86              | 406.66 | 477.01 | 597.48 | 73.65                 | 93.32 | 101.40 | 125.42 |
| AD | Tehama County APCD | Annual | 2013 | 347.97              | 406.10 | 476.53 | 598.29 | 73.54                 | 91.52 | 101.28 | 125.55 |
| AD | Tehama County APCD | Annual | 2014 | 348.09              | 405.68 | 476.15 | 599.09 | 73.46                 | 90.11 | 101.17 | 125.71 |
| AD | Tehama County APCD | Annual | 2015 | 348.24              | 405.38 | 475.85 | 599.96 | 73.44                 | 88.97 | 101.03 | 125.89 |
| AD | Tehama County APCD | Annual | 2016 | 348.39              | 405.05 | 475.61 | 600.78 | 73.43                 | 87.78 | 100.95 | 126.12 |
| AD | Tehama County APCD | Annual | 2017 | 348.50              | 404.72 | 475.41 | 601.55 | 73.42                 | 86.61 | 100.84 | 126.35 |
| AD | Tehama County APCD | Annual | 2018 | 348.57              | 404.51 | 475.24 | 602.23 | 73.38                 | 85.79 | 100.77 | 126.58 |
| AD | Tehama County APCD | Annual | 2019 | 348.67              | 404.46 | 475.11 | 602.83 | 73.42                 | 85.46 | 100.74 | 126.78 |
| AD | Tehama County APCD | Annual | 2020 | 348.75              | 404.42 | 475.00 | 603.36 | 73.52                 | 85.32 | 100.77 | 126.99 |
| AD | Tehama County APCD | Annual | 2021 | 348.82              | 404.51 | 474.91 | 603.73 | 73.60                 | 85.40 | 100.84 | 127.12 |
| AD | Tehama County APCD | Annual | 2022 | 348.84              | 404.58 | 474.81 | 603.99 | 73.65                 | 85.48 | 100.88 | 127.15 |
| AD | Tehama County APCD | Annual | 2023 | 348.83              | 404.65 | 474.72 | 604.17 | 73.68                 | 85.54 | 100.91 | 127.32 |
| AD | Tehama County APCD | Annual | 2024 | 348.79              | 404.72 | 474.64 | 604.33 | 73.69                 | 85.61 | 100.94 | 127.48 |
| AD | Tehama County APCD | Annual | 2025 | 348.78              | 404.78 | 474.58 | 604.54 | 73.71                 | 85.67 | 100.96 | 127.66 |
| AD | Tehama County APCD | Annual | 2026 | 348.80              | 404.87 | 474.51 | 604.75 | 73.74                 | 85.74 | 100.98 | 127.82 |
| AD | Tehama County APCD | Annual | 2027 | 348.82              | 404.95 | 474.43 | 604.97 | 73.75                 | 85.80 | 100.99 | 127.98 |
| AD | Tehama County APCD | Annual | 2028 | 348.82              | 405.02 | 474.36 | 605.19 | 73.76                 | 85.86 | 100.99 | 128.12 |
| AD | Tehama County APCD | Annual | 2029 | 348.82              | 405.11 | 474.28 | 605.40 | 73.77                 | 85.91 | 100.98 | 128.26 |
| AD | Tehama County APCD | Annual | 2030 | 348.81              | 405.19 | 474.20 | 605.62 | 73.77                 | 85.96 | 100.97 | 128.38 |
| AD | Tehama County APCD | Annual | 2031 | 348.81              | 405.27 | 474.16 | 605.87 | 73.78                 | 86.01 | 100.97 | 128.51 |
| AD | Tehama County APCD | Annual | 2032 | 348.81              | 405.34 | 474.13 | 606.13 | 73.78                 | 86.06 | 100.97 | 128.63 |
| AD | Tehama County APCD | Annual | 2033 | 348.80              | 405.40 | 474.10 | 606.35 | 73.79                 | 86.10 | 100.97 | 128.74 |
| AD | Tehama County APCD | Annual | 2034 | 348.80              | 405.45 | 474.07 | 606.55 | 73.79                 | 86.14 | 100.97 | 128.85 |
| AD | Tehama County APCD | Annual | 2035 | 348.79              | 405.50 | 474.05 | 606.73 | 73.80                 | 86.17 | 100.98 | 128.94 |
| AD | Tehama County APCD | Summer | 2010 | 383.41              | 444.94 | 524.62 | 654.31 | 73.92                 | 97.65 | 101.75 | 125.26 |
| AD | Tehama County APCD | Summer | 2011 | 383.77              | 445.00 | 524.52 | 654.97 | 73.75                 | 95.12 | 101.53 | 125.31 |
| AD | Tehama County APCD | Summer | 2012 | 384.14              | 445.10 | 524.43 | 655.86 | 73.65                 | 93.32 | 101.40 | 125.42 |
| AD | Tehama County APCD | Summer | 2013 | 384.45              | 445.13 | 524.35 | 656.99 | 73.54                 | 91.52 | 101.28 | 125.55 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Tehama County APCD   | Summer | 2014 | 384.73             | 445.13 | 524.29 | 658.11 | 73.46                 | 90.11 | 101.17 | 125.71 |
| AD | Tehama County APCD   | Summer | 2015 | 385.00             | 445.18 | 524.25 | 659.39 | 73.44                 | 88.97 | 101.03 | 125.89 |
| AD | Tehama County APCD   | Summer | 2016 | 385.23             | 445.19 | 524.18 | 660.60 | 73.43                 | 87.78 | 100.95 | 126.12 |
| AD | Tehama County APCD   | Summer | 2017 | 385.39             | 445.19 | 524.07 | 661.71 | 73.42                 | 86.61 | 100.84 | 126.35 |
| AD | Tehama County APCD   | Summer | 2018 | 385.47             | 445.18 | 523.93 | 662.69 | 73.38                 | 85.79 | 100.77 | 126.58 |
| AD | Tehama County APCD   | Summer | 2019 | 385.58             | 445.24 | 523.81 | 663.55 | 73.42                 | 85.46 | 100.74 | 126.78 |
| AD | Tehama County APCD   | Summer | 2020 | 385.65             | 445.32 | 523.70 | 664.29 | 73.52                 | 85.32 | 100.77 | 126.99 |
| AD | Tehama County APCD   | Summer | 2021 | 385.70             | 445.43 | 523.58 | 664.83 | 73.60                 | 85.40 | 100.84 | 127.12 |
| AD | Tehama County APCD   | Summer | 2022 | 385.72             | 445.55 | 523.48 | 665.26 | 73.65                 | 85.48 | 100.88 | 127.15 |
| AD | Tehama County APCD   | Summer | 2023 | 385.71             | 445.67 | 523.40 | 665.55 | 73.68                 | 85.54 | 100.91 | 127.32 |
| AD | Tehama County APCD   | Summer | 2024 | 385.66             | 445.84 | 523.33 | 665.79 | 73.69                 | 85.61 | 100.94 | 127.48 |
| AD | Tehama County APCD   | Summer | 2025 | 385.66             | 445.99 | 523.29 | 666.03 | 73.71                 | 85.67 | 100.96 | 127.66 |
| AD | Tehama County APCD   | Summer | 2026 | 385.69             | 446.14 | 523.22 | 666.24 | 73.74                 | 85.74 | 100.98 | 127.82 |
| AD | Tehama County APCD   | Summer | 2027 | 385.72             | 446.27 | 523.16 | 666.46 | 73.75                 | 85.80 | 100.99 | 127.98 |
| AD | Tehama County APCD   | Summer | 2028 | 385.74             | 446.39 | 523.12 | 666.69 | 73.76                 | 85.86 | 100.99 | 128.12 |
| AD | Tehama County APCD   | Summer | 2029 | 385.76             | 446.52 | 523.06 | 666.94 | 73.77                 | 85.91 | 100.98 | 128.26 |
| AD | Tehama County APCD   | Summer | 2030 | 385.77             | 446.65 | 523.02 | 667.20 | 73.77                 | 85.96 | 100.97 | 128.38 |
| AD | Tehama County APCD   | Summer | 2031 | 385.77             | 446.77 | 523.01 | 667.51 | 73.78                 | 86.01 | 100.97 | 128.51 |
| AD | Tehama County APCD   | Summer | 2032 | 385.77             | 446.86 | 523.00 | 667.82 | 73.78                 | 86.06 | 100.97 | 128.63 |
| AD | Tehama County APCD   | Summer | 2033 | 385.77             | 446.94 | 522.99 | 668.11 | 73.79                 | 86.10 | 100.97 | 128.74 |
| AD | Tehama County APCD   | Summer | 2034 | 385.77             | 447.00 | 522.97 | 668.39 | 73.79                 | 86.14 | 100.97 | 128.85 |
| AD | Tehama County APCD   | Summer | 2035 | 385.76             | 447.05 | 522.96 | 668.63 | 73.80                 | 86.17 | 100.98 | 128.94 |
| AD | Tehama County APCD   | Winter | 2010 | 339.88             | 399.98 | 468.30 | 583.44 | 73.92                 | 97.65 | 101.75 | 125.26 |
| AD | Tehama County APCD   | Winter | 2011 | 339.84             | 398.91 | 467.33 | 584.01 | 73.75                 | 95.12 | 101.53 | 125.31 |
| AD | Tehama County APCD   | Winter | 2012 | 339.89             | 398.22 | 466.60 | 584.66 | 73.65                 | 93.32 | 101.40 | 125.42 |
| AD | Tehama County APCD   | Winter | 2013 | 339.96             | 397.53 | 466.03 | 585.41 | 73.54                 | 91.52 | 101.28 | 125.55 |
| AD | Tehama County APCD   | Winter | 2014 | 340.05             | 397.02 | 465.58 | 586.13 | 73.46                 | 90.11 | 101.17 | 125.71 |
| AD | Tehama County APCD   | Winter | 2015 | 340.18             | 396.64 | 465.23 | 586.91 | 73.44                 | 88.97 | 101.03 | 125.89 |
| AD | Tehama County APCD   | Winter | 2016 | 340.30             | 396.23 | 464.95 | 587.65 | 73.43                 | 87.78 | 100.95 | 126.12 |
| AD | Tehama County APCD   | Winter | 2017 | 340.40             | 395.84 | 464.72 | 588.34 | 73.42                 | 86.61 | 100.84 | 126.35 |
| AD | Tehama County APCD   | Winter | 2018 | 340.46             | 395.57 | 464.55 | 588.96 | 73.38                 | 85.79 | 100.77 | 126.58 |
| AD | Tehama County APCD   | Winter | 2019 | 340.57             | 395.50 | 464.42 | 589.50 | 73.42                 | 85.46 | 100.74 | 126.78 |
| AD | Tehama County APCD   | Winter | 2020 | 340.65             | 395.45 | 464.31 | 589.99 | 73.52                 | 85.32 | 100.77 | 126.99 |
| AD | Tehama County APCD   | Winter | 2021 | 340.72             | 395.53 | 464.22 | 590.32 | 73.60                 | 85.40 | 100.84 | 127.12 |
| AD | Tehama County APCD   | Winter | 2022 | 340.75             | 395.59 | 464.13 | 590.54 | 73.65                 | 85.48 | 100.88 | 127.15 |
| AD | Tehama County APCD   | Winter | 2023 | 340.74             | 395.64 | 464.04 | 590.70 | 73.68                 | 85.54 | 100.91 | 127.32 |
| AD | Tehama County APCD   | Winter | 2024 | 340.69             | 395.69 | 463.95 | 590.84 | 73.69                 | 85.61 | 100.94 | 127.48 |
| AD | Tehama County APCD   | Winter | 2025 | 340.69             | 395.73 | 463.89 | 591.04 | 73.71                 | 85.67 | 100.96 | 127.66 |
| AD | Tehama County APCD   | Winter | 2026 | 340.71             | 395.81 | 463.81 | 591.25 | 73.74                 | 85.74 | 100.98 | 127.82 |
| AD | Tehama County APCD   | Winter | 2027 | 340.72             | 395.87 | 463.73 | 591.47 | 73.75                 | 85.80 | 100.99 | 127.98 |
| AD | Tehama County APCD   | Winter | 2028 | 340.72             | 395.94 | 463.66 | 591.68 | 73.76                 | 85.86 | 100.99 | 128.12 |
| AD | Tehama County APCD   | Winter | 2029 | 340.71             | 396.01 | 463.57 | 591.89 | 73.77                 | 85.91 | 100.98 | 128.26 |
| AD | Tehama County APCD   | Winter | 2030 | 340.70             | 396.08 | 463.49 | 592.11 | 73.77                 | 85.96 | 100.97 | 128.38 |
| AD | Tehama County APCD   | Winter | 2031 | 340.69             | 396.15 | 463.44 | 592.34 | 73.78                 | 86.01 | 100.97 | 128.51 |
| AD | Tehama County APCD   | Winter | 2032 | 340.69             | 396.22 | 463.40 | 592.58 | 73.78                 | 86.06 | 100.97 | 128.63 |
| AD | Tehama County APCD   | Winter | 2033 | 340.69             | 396.28 | 463.36 | 592.79 | 73.79                 | 86.10 | 100.97 | 128.74 |
| AD | Tehama County APCD   | Winter | 2034 | 340.68             | 396.33 | 463.33 | 592.98 | 73.79                 | 86.14 | 100.97 | 128.85 |
| AD | Tehama County APCD   | Winter | 2035 | 340.68             | 396.38 | 463.31 | 593.14 | 73.80                 | 86.17 | 100.98 | 128.94 |
| AD | Tuolumne County APCD | Annual | 2010 | 351.80             | 409.05 | 482.29 | 602.53 | 74.53                 | 90.23 | 101.65 | 124.41 |
| AD | Tuolumne County APCD | Annual | 2011 | 351.82             | 408.95 | 481.75 | 603.20 | 74.32                 | 89.28 | 101.47 | 124.55 |
| AD | Tuolumne County APCD | Annual | 2012 | 351.88             | 408.91 | 481.33 | 604.01 | 74.15                 | 88.59 | 101.37 | 124.74 |
| AD | Tuolumne County APCD | Annual | 2013 | 351.99             | 408.83 | 480.99 | 604.89 | 74.02                 | 87.89 | 101.25 | 124.97 |
| AD | Tuolumne County APCD | Annual | 2014 | 352.09             | 408.75 | 480.72 | 605.77 | 73.90                 | 87.27 | 101.07 | 125.20 |
| AD | Tuolumne County APCD | Annual | 2015 | 352.23             | 408.71 | 480.51 | 606.66 | 73.86                 | 86.74 | 100.95 | 125.47 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Tuolomne County APCD | Annual | 2016 | 352.33             | 408.71 | 480.34 | 607.53 | 73.81                 | 86.35 | 100.89 | 125.75 |
| AD | Tuolomne County APCD | Annual | 2017 | 352.40             | 408.66 | 480.19 | 608.32 | 73.73                 | 85.87 | 100.79 | 126.04 |
| AD | Tuolomne County APCD | Annual | 2018 | 352.44             | 408.65 | 480.07 | 609.00 | 73.66                 | 85.55 | 100.74 | 126.32 |
| AD | Tuolomne County APCD | Annual | 2019 | 352.50             | 408.66 | 479.98 | 609.60 | 73.64                 | 85.35 | 100.71 | 126.58 |
| AD | Tuolomne County APCD | Annual | 2020 | 352.53             | 408.71 | 479.91 | 610.12 | 73.71                 | 85.33 | 100.75 | 126.82 |
| AD | Tuolomne County APCD | Annual | 2021 | 352.52             | 408.72 | 479.81 | 610.51 | 73.75                 | 85.36 | 100.79 | 127.02 |
| AD | Tuolomne County APCD | Annual | 2022 | 352.49             | 408.72 | 479.74 | 610.83 | 73.77                 | 85.39 | 100.83 | 127.18 |
| AD | Tuolomne County APCD | Annual | 2023 | 352.42             | 408.71 | 479.67 | 611.05 | 73.77                 | 85.42 | 100.87 | 127.37 |
| AD | Tuolomne County APCD | Annual | 2024 | 352.35             | 408.71 | 479.60 | 611.23 | 73.76                 | 85.46 | 100.89 | 127.55 |
| AD | Tuolomne County APCD | Annual | 2025 | 352.30             | 408.78 | 479.56 | 611.41 | 73.76                 | 85.53 | 100.93 | 127.72 |
| AD | Tuolomne County APCD | Annual | 2026 | 352.31             | 408.91 | 479.51 | 611.58 | 73.78                 | 85.63 | 100.95 | 127.88 |
| AD | Tuolomne County APCD | Annual | 2027 | 352.31             | 409.03 | 479.46 | 611.78 | 73.79                 | 85.72 | 100.97 | 128.03 |
| AD | Tuolomne County APCD | Annual | 2028 | 352.31             | 409.16 | 479.41 | 611.96 | 73.80                 | 85.80 | 100.98 | 128.17 |
| AD | Tuolomne County APCD | Annual | 2029 | 352.30             | 409.28 | 479.35 | 612.15 | 73.80                 | 85.87 | 100.98 | 128.30 |
| AD | Tuolomne County APCD | Annual | 2030 | 352.29             | 409.39 | 479.30 | 612.34 | 73.81                 | 85.94 | 100.98 | 128.42 |
| AD | Tuolomne County APCD | Annual | 2031 | 352.28             | 409.51 | 479.27 | 612.58 | 73.81                 | 86.01 | 100.98 | 128.55 |
| AD | Tuolomne County APCD | Annual | 2032 | 352.28             | 409.62 | 479.24 | 612.83 | 73.82                 | 86.08 | 100.98 | 128.67 |
| AD | Tuolomne County APCD | Annual | 2033 | 352.28             | 409.71 | 479.22 | 613.04 | 73.82                 | 86.13 | 100.99 | 128.78 |
| AD | Tuolomne County APCD | Annual | 2034 | 352.28             | 409.79 | 479.20 | 613.24 | 73.83                 | 86.19 | 100.99 | 128.88 |
| AD | Tuolomne County APCD | Annual | 2035 | 352.27             | 409.86 | 479.19 | 613.41 | 73.83                 | 86.23 | 101.00 | 128.97 |
| AD | Tuolomne County APCD | Summer | 2010 | 379.58             | 436.17 | 518.68 | 647.34 | 74.53                 | 90.23 | 101.65 | 124.41 |
| AD | Tuolomne County APCD | Summer | 2011 | 379.89             | 437.05 | 518.44 | 648.13 | 74.32                 | 89.28 | 101.47 | 124.55 |
| AD | Tuolomne County APCD | Summer | 2012 | 380.18             | 437.74 | 518.26 | 649.15 | 74.15                 | 88.59 | 101.37 | 124.74 |
| AD | Tuolomne County APCD | Summer | 2013 | 380.45             | 438.26 | 518.15 | 650.32 | 74.02                 | 87.89 | 101.25 | 124.97 |
| AD | Tuolomne County APCD | Summer | 2014 | 380.68             | 438.66 | 518.10 | 651.50 | 73.90                 | 87.27 | 101.07 | 125.20 |
| AD | Tuolomne County APCD | Summer | 2015 | 380.90             | 439.01 | 518.08 | 652.73 | 73.86                 | 86.74 | 100.95 | 125.47 |
| AD | Tuolomne County APCD | Summer | 2016 | 381.07             | 439.30 | 518.06 | 653.92 | 73.81                 | 86.35 | 100.89 | 125.75 |
| AD | Tuolomne County APCD | Summer | 2017 | 381.16             | 439.53 | 518.01 | 654.99 | 73.73                 | 85.87 | 100.79 | 126.04 |
| AD | Tuolomne County APCD | Summer | 2018 | 381.20             | 439.71 | 517.96 | 655.91 | 73.66                 | 85.55 | 100.74 | 126.32 |
| AD | Tuolomne County APCD | Summer | 2019 | 381.25             | 439.89 | 517.91 | 656.72 | 73.64                 | 85.35 | 100.71 | 126.58 |
| AD | Tuolomne County APCD | Summer | 2020 | 381.27             | 440.08 | 517.84 | 657.42 | 73.71                 | 85.33 | 100.75 | 126.82 |
| AD | Tuolomne County APCD | Summer | 2021 | 381.25             | 440.21 | 517.77 | 657.94 | 73.75                 | 85.36 | 100.79 | 127.02 |
| AD | Tuolomne County APCD | Summer | 2022 | 381.21             | 440.34 | 517.69 | 658.37 | 73.77                 | 85.39 | 100.83 | 127.18 |
| AD | Tuolomne County APCD | Summer | 2023 | 381.14             | 440.44 | 517.62 | 658.69 | 73.77                 | 85.42 | 100.87 | 127.37 |
| AD | Tuolomne County APCD | Summer | 2024 | 381.08             | 440.54 | 517.57 | 658.94 | 73.76                 | 85.46 | 100.89 | 127.55 |
| AD | Tuolomne County APCD | Summer | 2025 | 381.03             | 440.66 | 517.52 | 659.17 | 73.76                 | 85.53 | 100.93 | 127.72 |
| AD | Tuolomne County APCD | Summer | 2026 | 381.05             | 440.87 | 517.48 | 659.35 | 73.78                 | 85.63 | 100.95 | 127.88 |
| AD | Tuolomne County APCD | Summer | 2027 | 381.07             | 441.05 | 517.44 | 659.54 | 73.79                 | 85.72 | 100.97 | 128.03 |
| AD | Tuolomne County APCD | Summer | 2028 | 381.08             | 441.24 | 517.40 | 659.75 | 73.80                 | 85.80 | 100.98 | 128.17 |
| AD | Tuolomne County APCD | Summer | 2029 | 381.09             | 441.43 | 517.36 | 659.96 | 73.80                 | 85.87 | 100.98 | 128.30 |
| AD | Tuolomne County APCD | Summer | 2030 | 381.09             | 441.61 | 517.32 | 660.19 | 73.81                 | 85.94 | 100.98 | 128.42 |
| AD | Tuolomne County APCD | Summer | 2031 | 381.10             | 441.78 | 517.30 | 660.50 | 73.81                 | 86.01 | 100.98 | 128.55 |
| AD | Tuolomne County APCD | Summer | 2032 | 381.10             | 441.93 | 517.28 | 660.80 | 73.82                 | 86.08 | 100.98 | 128.67 |
| AD | Tuolomne County APCD | Summer | 2033 | 381.09             | 442.04 | 517.26 | 661.07 | 73.82                 | 86.13 | 100.99 | 128.78 |
| AD | Tuolomne County APCD | Summer | 2034 | 381.09             | 442.15 | 517.24 | 661.33 | 73.83                 | 86.19 | 100.99 | 128.88 |
| AD | Tuolomne County APCD | Summer | 2035 | 381.08             | 442.22 | 517.22 | 661.55 | 73.83                 | 86.23 | 101.00 | 128.97 |
| AD | Tuolomne County APCD | Winter | 2010 | 345.75             | 403.14 | 474.37 | 592.78 | 74.53                 | 90.23 | 101.65 | 124.41 |
| AD | Tuolomne County APCD | Winter | 2011 | 345.71             | 402.84 | 473.77 | 593.43 | 74.32                 | 89.28 | 101.47 | 124.55 |
| AD | Tuolomne County APCD | Winter | 2012 | 345.72             | 402.64 | 473.30 | 594.19 | 74.15                 | 88.59 | 101.37 | 124.74 |
| AD | Tuolomne County APCD | Winter | 2013 | 345.79             | 402.42 | 472.91 | 595.00 | 74.02                 | 87.89 | 101.25 | 124.97 |
| AD | Tuolomne County APCD | Winter | 2014 | 345.87             | 402.24 | 472.59 | 595.82 | 73.90                 | 87.27 | 101.07 | 125.20 |
| AD | Tuolomne County APCD | Winter | 2015 | 345.99             | 402.12 | 472.33 | 596.64 | 73.86                 | 86.74 | 100.95 | 125.47 |
| AD | Tuolomne County APCD | Winter | 2016 | 346.08             | 402.05 | 472.13 | 597.43 | 73.81                 | 86.35 | 100.89 | 125.75 |
| AD | Tuolomne County APCD | Winter | 2017 | 346.14             | 401.95 | 471.96 | 598.16 | 73.73                 | 85.87 | 100.79 | 126.04 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location             | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                      |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Tuolumne County APCD | Winter | 2018 | 346.19             | 401.89 | 471.83 | 598.79 | 73.66                 | 85.55 | 100.74 | 126.32 |
| AD | Tuolumne County APCD | Winter | 2019 | 346.24             | 401.87 | 471.73 | 599.34 | 73.64                 | 85.35 | 100.71 | 126.58 |
| AD | Tuolumne County APCD | Winter | 2020 | 346.28             | 401.88 | 471.65 | 599.83 | 73.71                 | 85.33 | 100.75 | 126.82 |
| AD | Tuolumne County APCD | Winter | 2021 | 346.27             | 401.86 | 471.55 | 600.19 | 73.75                 | 85.36 | 100.79 | 127.02 |
| AD | Tuolumne County APCD | Winter | 2022 | 346.24             | 401.84 | 471.48 | 600.48 | 73.77                 | 85.39 | 100.83 | 127.18 |
| AD | Tuolumne County APCD | Winter | 2023 | 346.16             | 401.81 | 471.41 | 600.69 | 73.77                 | 85.42 | 100.87 | 127.37 |
| AD | Tuolumne County APCD | Winter | 2024 | 346.10             | 401.78 | 471.34 | 600.85 | 73.76                 | 85.46 | 100.89 | 127.55 |
| AD | Tuolumne County APCD | Winter | 2025 | 346.04             | 401.84 | 471.30 | 601.01 | 73.76                 | 85.53 | 100.93 | 127.72 |
| AD | Tuolumne County APCD | Winter | 2026 | 346.05             | 401.96 | 471.25 | 601.19 | 73.78                 | 85.63 | 100.95 | 127.88 |
| AD | Tuolumne County APCD | Winter | 2027 | 346.05             | 402.06 | 471.20 | 601.38 | 73.79                 | 85.72 | 100.97 | 128.03 |
| AD | Tuolumne County APCD | Winter | 2028 | 346.04             | 402.17 | 471.14 | 601.56 | 73.80                 | 85.80 | 100.98 | 128.17 |
| AD | Tuolumne County APCD | Winter | 2029 | 346.03             | 402.28 | 471.08 | 601.74 | 73.80                 | 85.87 | 100.98 | 128.30 |
| AD | Tuolumne County APCD | Winter | 2030 | 346.02             | 402.38 | 471.02 | 601.93 | 73.81                 | 85.94 | 100.98 | 128.42 |
| AD | Tuolumne County APCD | Winter | 2031 | 346.01             | 402.49 | 470.99 | 602.16 | 73.81                 | 86.01 | 100.98 | 128.55 |
| AD | Tuolumne County APCD | Winter | 2032 | 346.01             | 402.59 | 470.97 | 602.39 | 73.82                 | 86.08 | 100.98 | 128.67 |
| AD | Tuolumne County APCD | Winter | 2033 | 346.01             | 402.67 | 470.95 | 602.59 | 73.82                 | 86.13 | 100.99 | 128.78 |
| AD | Tuolumne County APCD | Winter | 2034 | 346.01             | 402.75 | 470.93 | 602.77 | 73.83                 | 86.19 | 100.99 | 128.88 |
| AD | Tuolumne County APCD | Winter | 2035 | 346.00             | 402.81 | 470.91 | 602.93 | 73.83                 | 86.23 | 101.00 | 128.97 |
| AD | Ventura County APCD  | Annual | 2010 | 333.21             | 383.06 | 456.23 | 576.41 | 73.39                 | 83.96 | 99.49  | 125.11 |
| AD | Ventura County APCD  | Annual | 2011 | 334.06             | 384.40 | 457.06 | 578.10 | 73.37                 | 83.90 | 99.58  | 125.31 |
| AD | Ventura County APCD  | Annual | 2012 | 334.23             | 384.93 | 456.97 | 578.64 | 73.35                 | 83.91 | 99.69  | 125.52 |
| AD | Ventura County APCD  | Annual | 2013 | 334.46             | 385.44 | 456.97 | 579.27 | 73.37                 | 83.94 | 99.80  | 125.74 |
| AD | Ventura County APCD  | Annual | 2014 | 334.61             | 385.87 | 456.92 | 579.81 | 73.35                 | 83.96 | 99.91  | 125.96 |
| AD | Ventura County APCD  | Annual | 2015 | 336.96             | 388.79 | 459.88 | 584.16 | 73.37                 | 84.01 | 100.00 | 126.20 |
| AD | Ventura County APCD  | Annual | 2016 | 337.13             | 389.18 | 459.85 | 584.69 | 73.42                 | 84.08 | 100.11 | 126.44 |
| AD | Ventura County APCD  | Annual | 2017 | 337.26             | 389.54 | 459.83 | 585.20 | 73.44                 | 84.15 | 100.20 | 126.68 |
| AD | Ventura County APCD  | Annual | 2018 | 337.37             | 389.86 | 459.82 | 585.65 | 73.47                 | 84.25 | 100.29 | 126.90 |
| AD | Ventura County APCD  | Annual | 2019 | 338.59             | 391.47 | 461.34 | 587.98 | 73.51                 | 84.41 | 100.38 | 127.11 |
| AD | Ventura County APCD  | Annual | 2020 | 338.68             | 391.75 | 461.34 | 588.35 | 73.61                 | 84.58 | 100.48 | 127.31 |
| AD | Ventura County APCD  | Annual | 2021 | 340.62             | 394.18 | 463.90 | 591.89 | 73.68                 | 84.75 | 100.57 | 127.48 |
| AD | Ventura County APCD  | Annual | 2022 | 340.66             | 394.41 | 463.89 | 592.14 | 73.73                 | 84.90 | 100.65 | 127.62 |
| AD | Ventura County APCD  | Annual | 2023 | 340.67             | 394.58 | 463.88 | 592.33 | 73.77                 | 85.03 | 100.71 | 127.78 |
| AD | Ventura County APCD  | Annual | 2024 | 342.13             | 396.43 | 465.87 | 595.04 | 73.79                 | 85.15 | 100.77 | 127.93 |
| AD | Ventura County APCD  | Annual | 2025 | 342.13             | 396.57 | 465.87 | 595.19 | 73.81                 | 85.26 | 100.81 | 128.07 |
| AD | Ventura County APCD  | Annual | 2026 | 342.15             | 396.72 | 465.85 | 595.36 | 73.83                 | 85.37 | 100.85 | 128.21 |
| AD | Ventura County APCD  | Annual | 2027 | 342.16             | 396.87 | 465.84 | 595.51 | 73.84                 | 85.46 | 100.88 | 128.33 |
| AD | Ventura County APCD  | Annual | 2028 | 342.17             | 397.01 | 465.82 | 595.67 | 73.85                 | 85.55 | 100.90 | 128.45 |
| AD | Ventura County APCD  | Annual | 2029 | 342.17             | 397.16 | 465.80 | 595.81 | 73.86                 | 85.64 | 100.92 | 128.55 |
| AD | Ventura County APCD  | Annual | 2030 | 342.17             | 397.31 | 465.79 | 595.97 | 73.86                 | 85.72 | 100.93 | 128.65 |
| AD | Ventura County APCD  | Annual | 2031 | 343.80             | 399.36 | 468.01 | 598.97 | 73.87                 | 85.80 | 100.94 | 128.74 |
| AD | Ventura County APCD  | Annual | 2032 | 343.79             | 399.50 | 468.00 | 599.13 | 73.88                 | 85.87 | 100.95 | 128.83 |
| AD | Ventura County APCD  | Annual | 2033 | 343.79             | 399.63 | 467.99 | 599.27 | 73.88                 | 85.94 | 100.96 | 128.92 |
| AD | Ventura County APCD  | Annual | 2034 | 343.79             | 399.74 | 467.98 | 599.40 | 73.88                 | 86.00 | 100.96 | 128.99 |
| AD | Ventura County APCD  | Annual | 2035 | 343.79             | 399.84 | 467.97 | 599.52 | 73.89                 | 86.06 | 100.97 | 129.06 |
| AD | Ventura County APCD  | Summer | 2010 | 347.83             | 398.15 | 475.58 | 600.79 | 73.39                 | 83.96 | 99.49  | 125.11 |
| AD | Ventura County APCD  | Summer | 2011 | 348.77             | 399.76 | 476.48 | 602.48 | 73.37                 | 83.90 | 99.58  | 125.31 |
| AD | Ventura County APCD  | Summer | 2012 | 348.98             | 400.46 | 476.42 | 602.99 | 73.35                 | 83.91 | 99.69  | 125.52 |
| AD | Ventura County APCD  | Summer | 2013 | 349.27             | 401.14 | 476.48 | 603.66 | 73.37                 | 83.94 | 99.80  | 125.74 |
| AD | Ventura County APCD  | Summer | 2014 | 349.45             | 401.68 | 476.48 | 604.24 | 73.35                 | 83.96 | 99.91  | 125.96 |
| AD | Ventura County APCD  | Summer | 2015 | 351.94             | 404.82 | 479.63 | 608.85 | 73.37                 | 84.01 | 100.00 | 126.20 |
| AD | Ventura County APCD  | Summer | 2016 | 352.14             | 405.30 | 479.65 | 609.45 | 73.42                 | 84.08 | 100.11 | 126.44 |
| AD | Ventura County APCD  | Summer | 2017 | 352.28             | 405.73 | 479.66 | 610.04 | 73.44                 | 84.15 | 100.20 | 126.68 |
| AD | Ventura County APCD  | Summer | 2018 | 352.41             | 406.11 | 479.66 | 610.55 | 73.47                 | 84.25 | 100.29 | 126.90 |
| AD | Ventura County APCD  | Summer | 2019 | 353.67             | 407.82 | 481.25 | 613.02 | 73.51                 | 84.41 | 100.38 | 127.11 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location            | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|---------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                     |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Ventura County APCD | Summer | 2020 | 353.77              | 408.15 | 481.25 | 613.43 | 73.61                 | 84.58 | 100.48 | 127.31 |
| AD | Ventura County APCD | Summer | 2021 | 355.80              | 410.74 | 483.94 | 617.18 | 73.68                 | 84.75 | 100.57 | 127.48 |
| AD | Ventura County APCD | Summer | 2022 | 355.84              | 411.01 | 483.93 | 617.47 | 73.73                 | 84.90 | 100.65 | 127.62 |
| AD | Ventura County APCD | Summer | 2023 | 355.85              | 411.23 | 483.92 | 617.68 | 73.77                 | 85.03 | 100.71 | 127.78 |
| AD | Ventura County APCD | Summer | 2024 | 357.40              | 413.22 | 486.02 | 620.55 | 73.79                 | 85.15 | 100.77 | 127.93 |
| AD | Ventura County APCD | Summer | 2025 | 357.40              | 413.40 | 486.01 | 620.72 | 73.81                 | 85.26 | 100.81 | 128.07 |
| AD | Ventura County APCD | Summer | 2026 | 357.42              | 413.59 | 486.00 | 620.90 | 73.83                 | 85.37 | 100.85 | 128.21 |
| AD | Ventura County APCD | Summer | 2027 | 357.43              | 413.77 | 485.98 | 621.06 | 73.84                 | 85.46 | 100.88 | 128.33 |
| AD | Ventura County APCD | Summer | 2028 | 357.44              | 413.94 | 485.96 | 621.21 | 73.85                 | 85.55 | 100.90 | 128.45 |
| AD | Ventura County APCD | Summer | 2029 | 357.45              | 414.12 | 485.94 | 621.36 | 73.86                 | 85.64 | 100.92 | 128.55 |
| AD | Ventura County APCD | Summer | 2030 | 357.45              | 414.30 | 485.93 | 621.52 | 73.86                 | 85.72 | 100.93 | 128.65 |
| AD | Ventura County APCD | Summer | 2031 | 359.14              | 416.47 | 488.25 | 624.65 | 73.87                 | 85.80 | 100.94 | 128.74 |
| AD | Ventura County APCD | Summer | 2032 | 359.14              | 416.64 | 488.24 | 624.81 | 73.88                 | 85.87 | 100.95 | 128.83 |
| AD | Ventura County APCD | Summer | 2033 | 359.14              | 416.79 | 488.23 | 624.96 | 73.88                 | 85.94 | 100.96 | 128.92 |
| AD | Ventura County APCD | Summer | 2034 | 359.13              | 416.92 | 488.22 | 625.10 | 73.88                 | 86.00 | 100.96 | 128.99 |
| AD | Ventura County APCD | Summer | 2035 | 359.13              | 417.02 | 488.21 | 625.23 | 73.89                 | 86.06 | 100.97 | 129.06 |
| AD | Ventura County APCD | Winter | 2010 | 330.44              | 380.19 | 452.56 | 571.78 | 73.39                 | 83.96 | 99.49  | 125.11 |
| AD | Ventura County APCD | Winter | 2011 | 331.27              | 381.49 | 453.38 | 573.48 | 73.37                 | 83.90 | 99.58  | 125.31 |
| AD | Ventura County APCD | Winter | 2012 | 331.43              | 381.98 | 453.29 | 574.02 | 73.35                 | 83.91 | 99.69  | 125.52 |
| AD | Ventura County APCD | Winter | 2013 | 331.65              | 382.46 | 453.27 | 574.64 | 73.37                 | 83.94 | 99.80  | 125.74 |
| AD | Ventura County APCD | Winter | 2014 | 331.80              | 382.87 | 453.21 | 575.18 | 73.35                 | 83.96 | 99.91  | 125.96 |
| AD | Ventura County APCD | Winter | 2015 | 334.12              | 385.75 | 456.13 | 579.48 | 73.37                 | 84.01 | 100.00 | 126.20 |
| AD | Ventura County APCD | Winter | 2016 | 334.29              | 386.12 | 456.10 | 579.99 | 73.42                 | 84.08 | 100.11 | 126.44 |
| AD | Ventura County APCD | Winter | 2017 | 334.41              | 386.47 | 456.07 | 580.49 | 73.44                 | 84.15 | 100.20 | 126.68 |
| AD | Ventura County APCD | Winter | 2018 | 334.52              | 386.78 | 456.06 | 580.93 | 73.47                 | 84.25 | 100.29 | 126.90 |
| AD | Ventura County APCD | Winter | 2019 | 335.73              | 388.37 | 457.57 | 583.24 | 73.51                 | 84.41 | 100.38 | 127.11 |
| AD | Ventura County APCD | Winter | 2020 | 335.82              | 388.65 | 457.57 | 583.59 | 73.61                 | 84.58 | 100.48 | 127.31 |
| AD | Ventura County APCD | Winter | 2021 | 337.74              | 391.05 | 460.10 | 587.10 | 73.68                 | 84.75 | 100.57 | 127.48 |
| AD | Ventura County APCD | Winter | 2022 | 337.78              | 391.26 | 460.10 | 587.34 | 73.73                 | 84.90 | 100.65 | 127.62 |
| AD | Ventura County APCD | Winter | 2023 | 337.80              | 391.43 | 460.09 | 587.53 | 73.77                 | 85.03 | 100.71 | 127.78 |
| AD | Ventura County APCD | Winter | 2024 | 339.24              | 393.25 | 462.06 | 590.20 | 73.79                 | 85.15 | 100.77 | 127.93 |
| AD | Ventura County APCD | Winter | 2025 | 339.24              | 393.38 | 462.05 | 590.36 | 73.81                 | 85.26 | 100.81 | 128.07 |
| AD | Ventura County APCD | Winter | 2026 | 339.26              | 393.53 | 462.04 | 590.52 | 73.83                 | 85.37 | 100.85 | 128.21 |
| AD | Ventura County APCD | Winter | 2027 | 339.27              | 393.67 | 462.02 | 590.68 | 73.84                 | 85.46 | 100.88 | 128.33 |
| AD | Ventura County APCD | Winter | 2028 | 339.28              | 393.81 | 462.01 | 590.83 | 73.85                 | 85.55 | 100.90 | 128.45 |
| AD | Ventura County APCD | Winter | 2029 | 339.28              | 393.95 | 461.99 | 590.98 | 73.86                 | 85.64 | 100.92 | 128.55 |
| AD | Ventura County APCD | Winter | 2030 | 339.28              | 394.09 | 461.98 | 591.13 | 73.86                 | 85.72 | 100.93 | 128.65 |
| AD | Ventura County APCD | Winter | 2031 | 340.89              | 396.12 | 464.18 | 594.11 | 73.87                 | 85.80 | 100.94 | 128.74 |
| AD | Ventura County APCD | Winter | 2032 | 340.89              | 396.26 | 464.17 | 594.27 | 73.88                 | 85.87 | 100.95 | 128.83 |
| AD | Ventura County APCD | Winter | 2033 | 340.89              | 396.38 | 464.16 | 594.41 | 73.88                 | 85.94 | 100.96 | 128.92 |
| AD | Ventura County APCD | Winter | 2034 | 340.89              | 396.49 | 464.15 | 594.54 | 73.88                 | 86.00 | 100.96 | 128.99 |
| AD | Ventura County APCD | Winter | 2035 | 340.88              | 396.58 | 464.14 | 594.65 | 73.89                 | 86.06 | 100.97 | 129.06 |
| AD | Yolo/Solano AQMD    | Annual | 2010 | 348.81              | 400.50 | 478.26 | 603.67 | 73.04                 | 85.15 | 99.95  | 124.98 |
| AD | Yolo/Solano AQMD    | Annual | 2011 | 348.99              | 401.18 | 477.99 | 604.06 | 73.05                 | 84.88 | 99.97  | 125.17 |
| AD | Yolo/Solano AQMD    | Annual | 2012 | 349.17              | 401.79 | 477.76 | 604.52 | 73.06                 | 84.74 | 100.04 | 125.39 |
| AD | Yolo/Solano AQMD    | Annual | 2013 | 349.34              | 402.29 | 477.57 | 605.02 | 73.08                 | 84.59 | 100.09 | 125.62 |
| AD | Yolo/Solano AQMD    | Annual | 2014 | 349.51              | 402.73 | 477.42 | 605.55 | 73.11                 | 84.49 | 100.15 | 125.86 |
| AD | Yolo/Solano AQMD    | Annual | 2015 | 349.67              | 403.13 | 477.29 | 606.07 | 73.16                 | 84.45 | 100.19 | 126.11 |
| AD | Yolo/Solano AQMD    | Annual | 2016 | 353.97              | 408.29 | 483.02 | 614.15 | 73.24                 | 84.45 | 100.26 | 126.36 |
| AD | Yolo/Solano AQMD    | Annual | 2017 | 354.05              | 408.52 | 482.92 | 614.62 | 73.29                 | 84.39 | 100.28 | 126.61 |
| AD | Yolo/Solano AQMD    | Annual | 2018 | 354.10              | 408.72 | 482.83 | 615.03 | 73.36                 | 84.42 | 100.33 | 126.85 |
| AD | Yolo/Solano AQMD    | Annual | 2019 | 353.42              | 408.16 | 481.76 | 614.16 | 73.42                 | 84.51 | 100.39 | 127.06 |
| AD | Yolo/Solano AQMD    | Annual | 2020 | 353.47              | 408.43 | 481.69 | 614.50 | 73.52                 | 84.64 | 100.48 | 127.26 |
| AD | Yolo/Solano AQMD    | Annual | 2021 | 353.51              | 408.63 | 481.65 | 614.75 | 73.60                 | 84.80 | 100.57 | 127.42 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location         | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Yolo/Solano AQMD | Annual | 2022 | 353.51             | 408.79 | 481.60 | 614.94 | 73.65                 | 84.93 | 100.65 | 127.57 |
| AD | Yolo/Solano AQMD | Annual | 2023 | 353.48             | 408.91 | 481.54 | 615.07 | 73.69                 | 85.05 | 100.71 | 127.73 |
| AD | Yolo/Solano AQMD | Annual | 2024 | 353.46             | 409.04 | 481.46 | 615.10 | 73.72                 | 85.17 | 100.76 | 127.87 |
| AD | Yolo/Solano AQMD | Annual | 2025 | 353.44             | 409.16 | 481.39 | 615.14 | 73.74                 | 85.26 | 100.81 | 128.01 |
| AD | Yolo/Solano AQMD | Annual | 2026 | 354.57             | 410.57 | 482.91 | 617.16 | 73.77                 | 85.36 | 100.84 | 128.15 |
| AD | Yolo/Solano AQMD | Annual | 2027 | 354.57             | 410.67 | 482.84 | 617.13 | 73.78                 | 85.45 | 100.87 | 128.27 |
| AD | Yolo/Solano AQMD | Annual | 2028 | 354.56             | 410.76 | 482.78 | 617.10 | 73.79                 | 85.53 | 100.90 | 128.39 |
| AD | Yolo/Solano AQMD | Annual | 2029 | 354.54             | 410.86 | 482.71 | 617.07 | 73.80                 | 85.61 | 100.91 | 128.49 |
| AD | Yolo/Solano AQMD | Annual | 2030 | 354.51             | 410.96 | 482.64 | 617.06 | 73.80                 | 85.69 | 100.92 | 128.59 |
| AD | Yolo/Solano AQMD | Annual | 2031 | 354.46             | 411.07 | 482.56 | 617.24 | 73.81                 | 85.76 | 100.94 | 128.69 |
| AD | Yolo/Solano AQMD | Annual | 2032 | 354.41             | 411.16 | 482.49 | 617.41 | 73.81                 | 85.83 | 100.94 | 128.79 |
| AD | Yolo/Solano AQMD | Annual | 2033 | 354.36             | 411.24 | 482.41 | 617.56 | 73.82                 | 85.89 | 100.95 | 128.88 |
| AD | Yolo/Solano AQMD | Annual | 2034 | 354.31             | 411.30 | 482.34 | 617.69 | 73.82                 | 85.95 | 100.96 | 128.96 |
| AD | Yolo/Solano AQMD | Annual | 2035 | 354.26             | 411.34 | 482.27 | 617.80 | 73.82                 | 86.00 | 100.96 | 129.03 |
| AD | Yolo/Solano AQMD | Summer | 2010 | 384.05             | 437.08 | 524.93 | 662.32 | 73.04                 | 85.15 | 99.95  | 124.98 |
| AD | Yolo/Solano AQMD | Summer | 2011 | 384.41             | 438.40 | 524.78 | 662.58 | 73.05                 | 84.88 | 99.97  | 125.17 |
| AD | Yolo/Solano AQMD | Summer | 2012 | 384.74             | 439.53 | 524.67 | 663.02 | 73.06                 | 84.74 | 100.04 | 125.39 |
| AD | Yolo/Solano AQMD | Summer | 2013 | 385.03             | 440.45 | 524.60 | 663.61 | 73.08                 | 84.59 | 100.09 | 125.62 |
| AD | Yolo/Solano AQMD | Summer | 2014 | 385.29             | 441.23 | 524.61 | 664.29 | 73.11                 | 84.49 | 100.15 | 125.86 |
| AD | Yolo/Solano AQMD | Summer | 2015 | 385.53             | 441.88 | 524.63 | 665.02 | 73.16                 | 84.45 | 100.19 | 126.11 |
| AD | Yolo/Solano AQMD | Summer | 2016 | 390.28             | 447.65 | 531.00 | 673.98 | 73.24                 | 84.45 | 100.26 | 126.36 |
| AD | Yolo/Solano AQMD | Summer | 2017 | 390.39             | 448.07 | 531.01 | 674.67 | 73.29                 | 84.39 | 100.28 | 126.61 |
| AD | Yolo/Solano AQMD | Summer | 2018 | 390.46             | 448.37 | 530.97 | 675.24 | 73.36                 | 84.42 | 100.33 | 126.85 |
| AD | Yolo/Solano AQMD | Summer | 2019 | 389.67             | 447.80 | 529.75 | 674.33 | 73.42                 | 84.51 | 100.39 | 127.06 |
| AD | Yolo/Solano AQMD | Summer | 2020 | 389.71             | 448.17 | 529.67 | 674.78 | 73.52                 | 84.64 | 100.48 | 127.26 |
| AD | Yolo/Solano AQMD | Summer | 2021 | 389.75             | 448.46 | 529.61 | 675.11 | 73.60                 | 84.80 | 100.57 | 127.42 |
| AD | Yolo/Solano AQMD | Summer | 2022 | 389.75             | 448.70 | 529.53 | 675.38 | 73.65                 | 84.93 | 100.65 | 127.57 |
| AD | Yolo/Solano AQMD | Summer | 2023 | 389.71             | 448.91 | 529.44 | 675.56 | 73.69                 | 85.05 | 100.71 | 127.73 |
| AD | Yolo/Solano AQMD | Summer | 2024 | 389.70             | 449.12 | 529.33 | 675.60 | 73.72                 | 85.17 | 100.76 | 127.87 |
| AD | Yolo/Solano AQMD | Summer | 2025 | 389.68             | 449.31 | 529.24 | 675.64 | 73.74                 | 85.26 | 100.81 | 128.01 |
| AD | Yolo/Solano AQMD | Summer | 2026 | 390.91             | 450.90 | 530.91 | 677.83 | 73.77                 | 85.36 | 100.84 | 128.15 |
| AD | Yolo/Solano AQMD | Summer | 2027 | 390.91             | 451.05 | 530.86 | 677.80 | 73.78                 | 85.45 | 100.87 | 128.27 |
| AD | Yolo/Solano AQMD | Summer | 2028 | 390.90             | 451.20 | 530.81 | 677.78 | 73.79                 | 85.53 | 100.90 | 128.39 |
| AD | Yolo/Solano AQMD | Summer | 2029 | 390.89             | 451.36 | 530.75 | 677.76 | 73.80                 | 85.61 | 100.91 | 128.49 |
| AD | Yolo/Solano AQMD | Summer | 2030 | 390.87             | 451.53 | 530.69 | 677.75 | 73.80                 | 85.69 | 100.92 | 128.59 |
| AD | Yolo/Solano AQMD | Summer | 2031 | 390.81             | 451.70 | 530.61 | 677.97 | 73.81                 | 85.76 | 100.94 | 128.69 |
| AD | Yolo/Solano AQMD | Summer | 2032 | 390.76             | 451.83 | 530.54 | 678.19 | 73.81                 | 85.83 | 100.94 | 128.79 |
| AD | Yolo/Solano AQMD | Summer | 2033 | 390.71             | 451.94 | 530.46 | 678.37 | 73.82                 | 85.89 | 100.95 | 128.88 |
| AD | Yolo/Solano AQMD | Summer | 2034 | 390.67             | 452.04 | 530.39 | 678.55 | 73.82                 | 85.95 | 100.96 | 128.96 |
| AD | Yolo/Solano AQMD | Summer | 2035 | 390.62             | 452.10 | 530.31 | 678.71 | 73.82                 | 86.00 | 100.96 | 129.03 |
| AD | Yolo/Solano AQMD | Winter | 2010 | 339.81             | 391.18 | 466.38 | 588.76 | 73.04                 | 85.15 | 99.95  | 124.98 |
| AD | Yolo/Solano AQMD | Winter | 2011 | 339.95             | 391.68 | 466.07 | 589.17 | 73.05                 | 84.88 | 99.97  | 125.17 |
| AD | Yolo/Solano AQMD | Winter | 2012 | 340.09             | 392.16 | 465.81 | 589.62 | 73.06                 | 84.74 | 100.04 | 125.39 |
| AD | Yolo/Solano AQMD | Winter | 2013 | 340.23             | 392.54 | 465.57 | 590.10 | 73.08                 | 84.59 | 100.09 | 125.62 |
| AD | Yolo/Solano AQMD | Winter | 2014 | 340.36             | 392.90 | 465.38 | 590.58 | 73.11                 | 84.49 | 100.15 | 125.86 |
| AD | Yolo/Solano AQMD | Winter | 2015 | 340.50             | 393.23 | 465.21 | 591.05 | 73.16                 | 84.45 | 100.19 | 126.11 |
| AD | Yolo/Solano AQMD | Winter | 2016 | 344.68             | 398.23 | 470.76 | 598.89 | 73.24                 | 84.45 | 100.26 | 126.36 |
| AD | Yolo/Solano AQMD | Winter | 2017 | 344.76             | 398.41 | 470.64 | 599.30 | 73.29                 | 84.39 | 100.28 | 126.61 |
| AD | Yolo/Solano AQMD | Winter | 2018 | 344.80             | 398.57 | 470.54 | 599.66 | 73.36                 | 84.42 | 100.33 | 126.85 |
| AD | Yolo/Solano AQMD | Winter | 2019 | 344.16             | 398.04 | 469.52 | 598.83 | 73.42                 | 84.51 | 100.39 | 127.06 |
| AD | Yolo/Solano AQMD | Winter | 2020 | 344.20             | 398.28 | 469.45 | 599.14 | 73.52                 | 84.64 | 100.48 | 127.26 |
| AD | Yolo/Solano AQMD | Winter | 2021 | 344.25             | 398.45 | 469.41 | 599.36 | 73.60                 | 84.80 | 100.57 | 127.42 |
| AD | Yolo/Solano AQMD | Winter | 2022 | 344.25             | 398.59 | 469.37 | 599.54 | 73.65                 | 84.93 | 100.65 | 127.57 |
| AD | Yolo/Solano AQMD | Winter | 2023 | 344.21             | 398.69 | 469.31 | 599.65 | 73.69                 | 85.05 | 100.71 | 127.73 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|    | Location         | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|----|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|    |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| AD | Yolo/Solano AQMD | Winter | 2024 | 344.19             | 398.80 | 469.24 | 599.67 | 73.72                 | 85.17 | 100.76 | 127.87 |
| AD | Yolo/Solano AQMD | Winter | 2025 | 344.17             | 398.89 | 469.17 | 599.71 | 73.74                 | 85.26 | 100.81 | 128.01 |
| AD | Yolo/Solano AQMD | Winter | 2026 | 345.28             | 400.27 | 470.65 | 601.67 | 73.77                 | 85.36 | 100.84 | 128.15 |
| AD | Yolo/Solano AQMD | Winter | 2027 | 345.27             | 400.35 | 470.58 | 601.64 | 73.78                 | 85.45 | 100.87 | 128.27 |
| AD | Yolo/Solano AQMD | Winter | 2028 | 345.26             | 400.42 | 470.51 | 601.60 | 73.79                 | 85.53 | 100.90 | 128.39 |
| AD | Yolo/Solano AQMD | Winter | 2029 | 345.24             | 400.50 | 470.43 | 601.57 | 73.80                 | 85.61 | 100.91 | 128.49 |
| AD | Yolo/Solano AQMD | Winter | 2030 | 345.21             | 400.59 | 470.36 | 601.54 | 73.80                 | 85.69 | 100.92 | 128.59 |
| AD | Yolo/Solano AQMD | Winter | 2031 | 345.15             | 400.68 | 470.28 | 601.72 | 73.81                 | 85.76 | 100.94 | 128.69 |
| AD | Yolo/Solano AQMD | Winter | 2032 | 345.10             | 400.75 | 470.21 | 601.88 | 73.81                 | 85.83 | 100.94 | 128.79 |
| AD | Yolo/Solano AQMD | Winter | 2033 | 345.05             | 400.82 | 470.13 | 602.01 | 73.82                 | 85.89 | 100.95 | 128.88 |
| AD | Yolo/Solano AQMD | Winter | 2034 | 345.00             | 400.87 | 470.05 | 602.13 | 73.82                 | 85.95 | 100.96 | 128.96 |
| AD | Yolo/Solano AQMD | Winter | 2035 | 344.95             | 400.90 | 469.98 | 602.23 | 73.82                 | 86.00 | 100.96 | 129.03 |
| C  | Alameda (SF)     | Annual | 2010 | 339.24             | 389.56 | 464.06 | 585.20 | 72.90                 | 84.16 | 99.41  | 124.70 |
| C  | Alameda (SF)     | Annual | 2011 | 339.37             | 390.02 | 463.94 | 585.71 | 72.95                 | 84.06 | 99.50  | 124.89 |
| C  | Alameda (SF)     | Annual | 2012 | 339.53             | 390.50 | 463.85 | 586.29 | 73.01                 | 84.04 | 99.62  | 125.11 |
| C  | Alameda (SF)     | Annual | 2013 | 339.73             | 390.93 | 463.79 | 586.90 | 73.09                 | 84.03 | 99.75  | 125.34 |
| C  | Alameda (SF)     | Annual | 2014 | 339.91             | 391.34 | 463.74 | 587.52 | 73.16                 | 84.04 | 99.85  | 125.58 |
| C  | Alameda (SF)     | Annual | 2015 | 340.11             | 391.74 | 463.71 | 588.15 | 73.24                 | 84.08 | 99.96  | 125.84 |
| C  | Alameda (SF)     | Annual | 2016 | 340.29             | 392.13 | 463.69 | 588.75 | 73.33                 | 84.14 | 100.07 | 126.09 |
| C  | Alameda (SF)     | Annual | 2017 | 340.43             | 392.49 | 463.67 | 589.32 | 73.39                 | 84.20 | 100.16 | 126.35 |
| C  | Alameda (SF)     | Annual | 2018 | 340.55             | 392.81 | 463.66 | 589.82 | 73.43                 | 84.28 | 100.25 | 126.59 |
| C  | Alameda (SF)     | Annual | 2019 | 340.66             | 393.13 | 463.66 | 590.26 | 73.49                 | 84.42 | 100.34 | 126.81 |
| C  | Alameda (SF)     | Annual | 2020 | 340.77             | 393.43 | 463.66 | 590.66 | 73.60                 | 84.58 | 100.44 | 127.03 |
| C  | Alameda (SF)     | Annual | 2021 | 340.84             | 393.69 | 463.67 | 590.99 | 73.67                 | 84.75 | 100.53 | 127.21 |
| C  | Alameda (SF)     | Annual | 2022 | 340.88             | 393.91 | 463.66 | 591.27 | 73.73                 | 84.89 | 100.62 | 127.35 |
| C  | Alameda (SF)     | Annual | 2023 | 340.88             | 394.08 | 463.65 | 591.48 | 73.77                 | 85.02 | 100.68 | 127.52 |
| C  | Alameda (SF)     | Annual | 2024 | 340.86             | 394.22 | 463.64 | 591.66 | 73.79                 | 85.14 | 100.74 | 127.68 |
| C  | Alameda (SF)     | Annual | 2025 | 340.85             | 394.35 | 463.64 | 591.84 | 73.81                 | 85.24 | 100.79 | 127.84 |
| C  | Alameda (SF)     | Annual | 2026 | 340.87             | 394.50 | 463.62 | 592.03 | 73.83                 | 85.34 | 100.83 | 127.99 |
| C  | Alameda (SF)     | Annual | 2027 | 340.88             | 394.65 | 463.61 | 592.20 | 73.85                 | 85.44 | 100.86 | 128.12 |
| C  | Alameda (SF)     | Annual | 2028 | 340.88             | 394.80 | 463.59 | 592.38 | 73.86                 | 85.52 | 100.89 | 128.25 |
| C  | Alameda (SF)     | Annual | 2029 | 340.88             | 394.96 | 463.57 | 592.55 | 73.87                 | 85.61 | 100.90 | 128.36 |
| C  | Alameda (SF)     | Annual | 2030 | 340.87             | 395.12 | 463.56 | 592.72 | 73.87                 | 85.69 | 100.92 | 128.47 |
| C  | Alameda (SF)     | Annual | 2031 | 340.87             | 395.28 | 463.55 | 592.91 | 73.88                 | 85.76 | 100.93 | 128.58 |
| C  | Alameda (SF)     | Annual | 2032 | 340.87             | 395.44 | 463.54 | 593.10 | 73.88                 | 85.84 | 100.94 | 128.68 |
| C  | Alameda (SF)     | Annual | 2033 | 340.86             | 395.58 | 463.53 | 593.27 | 73.89                 | 85.90 | 100.95 | 128.77 |
| C  | Alameda (SF)     | Annual | 2034 | 340.86             | 395.71 | 463.52 | 593.42 | 73.89                 | 85.97 | 100.95 | 128.86 |
| C  | Alameda (SF)     | Annual | 2035 | 340.85             | 395.82 | 463.51 | 593.56 | 73.89                 | 86.02 | 100.96 | 128.94 |
| C  | Alameda (SF)     | Summer | 2010 | 366.44             | 417.66 | 500.31 | 630.82 | 72.90                 | 84.16 | 99.41  | 124.70 |
| C  | Alameda (SF)     | Summer | 2011 | 366.76             | 418.54 | 500.25 | 631.22 | 72.95                 | 84.06 | 99.50  | 124.89 |
| C  | Alameda (SF)     | Summer | 2012 | 367.07             | 419.37 | 500.24 | 631.77 | 73.01                 | 84.04 | 99.62  | 125.11 |
| C  | Alameda (SF)     | Summer | 2013 | 367.38             | 420.09 | 500.26 | 632.43 | 73.09                 | 84.03 | 99.75  | 125.34 |
| C  | Alameda (SF)     | Summer | 2014 | 367.65             | 420.75 | 500.31 | 633.13 | 73.16                 | 84.04 | 99.85  | 125.58 |
| C  | Alameda (SF)     | Summer | 2015 | 367.91             | 421.35 | 500.37 | 633.90 | 73.24                 | 84.08 | 99.96  | 125.84 |
| C  | Alameda (SF)     | Summer | 2016 | 368.14             | 421.93 | 500.44 | 634.66 | 73.33                 | 84.14 | 100.07 | 126.09 |
| C  | Alameda (SF)     | Summer | 2017 | 368.30             | 422.46 | 500.49 | 635.39 | 73.39                 | 84.20 | 100.16 | 126.35 |
| C  | Alameda (SF)     | Summer | 2018 | 368.43             | 422.93 | 500.51 | 636.01 | 73.43                 | 84.28 | 100.25 | 126.59 |
| C  | Alameda (SF)     | Summer | 2019 | 368.55             | 423.36 | 500.53 | 636.55 | 73.49                 | 84.42 | 100.34 | 126.81 |
| C  | Alameda (SF)     | Summer | 2020 | 368.65             | 423.76 | 500.53 | 637.05 | 73.60                 | 84.58 | 100.44 | 127.03 |
| C  | Alameda (SF)     | Summer | 2021 | 368.73             | 424.11 | 500.53 | 637.46 | 73.67                 | 84.75 | 100.53 | 127.21 |
| C  | Alameda (SF)     | Summer | 2022 | 368.76             | 424.41 | 500.53 | 637.82 | 73.73                 | 84.89 | 100.62 | 127.35 |
| C  | Alameda (SF)     | Summer | 2023 | 368.76             | 424.66 | 500.51 | 638.09 | 73.77                 | 85.02 | 100.68 | 127.52 |
| C  | Alameda (SF)     | Summer | 2024 | 368.74             | 424.87 | 500.49 | 638.33 | 73.79                 | 85.14 | 100.74 | 127.68 |
| C  | Alameda (SF)     | Summer | 2025 | 368.73             | 425.06 | 500.48 | 638.54 | 73.81                 | 85.24 | 100.79 | 127.84 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Alameda (SF) | Summer | 2026 | 368.75             | 425.27 | 500.46 | 638.75 | 73.83                 | 85.34 | 100.83 | 127.99 |
| C | Alameda (SF) | Summer | 2027 | 368.77             | 425.48 | 500.44 | 638.94 | 73.85                 | 85.44 | 100.86 | 128.12 |
| C | Alameda (SF) | Summer | 2028 | 368.78             | 425.70 | 500.42 | 639.12 | 73.86                 | 85.52 | 100.89 | 128.25 |
| C | Alameda (SF) | Summer | 2029 | 368.78             | 425.92 | 500.39 | 639.31 | 73.87                 | 85.61 | 100.90 | 128.36 |
| C | Alameda (SF) | Summer | 2030 | 368.78             | 426.15 | 500.38 | 639.50 | 73.87                 | 85.69 | 100.92 | 128.47 |
| C | Alameda (SF) | Summer | 2031 | 368.79             | 426.39 | 500.37 | 639.69 | 73.88                 | 85.76 | 100.93 | 128.58 |
| C | Alameda (SF) | Summer | 2032 | 368.79             | 426.60 | 500.36 | 639.89 | 73.88                 | 85.84 | 100.94 | 128.68 |
| C | Alameda (SF) | Summer | 2033 | 368.80             | 426.78 | 500.35 | 640.08 | 73.89                 | 85.90 | 100.95 | 128.77 |
| C | Alameda (SF) | Summer | 2034 | 368.80             | 426.95 | 500.35 | 640.26 | 73.89                 | 85.97 | 100.95 | 128.86 |
| C | Alameda (SF) | Summer | 2035 | 368.79             | 427.08 | 500.34 | 640.42 | 73.89                 | 86.02 | 100.96 | 128.94 |
| C | Alameda (SF) | Winter | 2010 | 336.52             | 386.75 | 460.43 | 580.64 | 72.90                 | 84.16 | 99.41  | 124.70 |
| C | Alameda (SF) | Winter | 2011 | 336.63             | 387.17 | 460.31 | 581.17 | 72.95                 | 84.06 | 99.50  | 124.89 |
| C | Alameda (SF) | Winter | 2012 | 336.78             | 387.61 | 460.22 | 581.74 | 73.01                 | 84.04 | 99.62  | 125.11 |
| C | Alameda (SF) | Winter | 2013 | 336.96             | 388.01 | 460.15 | 582.35 | 73.09                 | 84.03 | 99.75  | 125.34 |
| C | Alameda (SF) | Winter | 2014 | 337.14             | 388.40 | 460.09 | 582.96 | 73.16                 | 84.04 | 99.85  | 125.58 |
| C | Alameda (SF) | Winter | 2015 | 337.33             | 388.78 | 460.05 | 583.58 | 73.24                 | 84.08 | 99.96  | 125.84 |
| C | Alameda (SF) | Winter | 2016 | 337.51             | 389.15 | 460.02 | 584.16 | 73.33                 | 84.14 | 100.07 | 126.09 |
| C | Alameda (SF) | Winter | 2017 | 337.65             | 389.50 | 459.99 | 584.72 | 73.39                 | 84.20 | 100.16 | 126.35 |
| C | Alameda (SF) | Winter | 2018 | 337.76             | 389.80 | 459.98 | 585.20 | 73.43                 | 84.28 | 100.25 | 126.59 |
| C | Alameda (SF) | Winter | 2019 | 337.87             | 390.11 | 459.98 | 585.63 | 73.49                 | 84.42 | 100.34 | 126.81 |
| C | Alameda (SF) | Winter | 2020 | 337.98             | 390.40 | 459.98 | 586.02 | 73.60                 | 84.58 | 100.44 | 127.03 |
| C | Alameda (SF) | Winter | 2021 | 338.06             | 390.65 | 459.98 | 586.34 | 73.67                 | 84.75 | 100.53 | 127.21 |
| C | Alameda (SF) | Winter | 2022 | 338.09             | 390.86 | 459.98 | 586.61 | 73.73                 | 84.89 | 100.62 | 127.35 |
| C | Alameda (SF) | Winter | 2023 | 338.09             | 391.02 | 459.97 | 586.82 | 73.77                 | 85.02 | 100.68 | 127.52 |
| C | Alameda (SF) | Winter | 2024 | 338.07             | 391.15 | 459.96 | 586.99 | 73.79                 | 85.14 | 100.74 | 127.68 |
| C | Alameda (SF) | Winter | 2025 | 338.07             | 391.28 | 459.95 | 587.17 | 73.81                 | 85.24 | 100.79 | 127.84 |
| C | Alameda (SF) | Winter | 2026 | 338.08             | 391.42 | 459.94 | 587.36 | 73.83                 | 85.34 | 100.83 | 127.99 |
| C | Alameda (SF) | Winter | 2027 | 338.09             | 391.57 | 459.93 | 587.53 | 73.85                 | 85.44 | 100.86 | 128.12 |
| C | Alameda (SF) | Winter | 2028 | 338.10             | 391.72 | 459.91 | 587.71 | 73.86                 | 85.52 | 100.89 | 128.25 |
| C | Alameda (SF) | Winter | 2029 | 338.09             | 391.87 | 459.89 | 587.88 | 73.87                 | 85.61 | 100.90 | 128.36 |
| C | Alameda (SF) | Winter | 2030 | 338.08             | 392.02 | 459.87 | 588.05 | 73.87                 | 85.69 | 100.92 | 128.47 |
| C | Alameda (SF) | Winter | 2031 | 338.08             | 392.17 | 459.87 | 588.23 | 73.88                 | 85.76 | 100.93 | 128.58 |
| C | Alameda (SF) | Winter | 2032 | 338.07             | 392.33 | 459.86 | 588.42 | 73.88                 | 85.84 | 100.94 | 128.68 |
| C | Alameda (SF) | Winter | 2033 | 338.07             | 392.47 | 459.85 | 588.59 | 73.89                 | 85.90 | 100.95 | 128.77 |
| C | Alameda (SF) | Winter | 2034 | 338.07             | 392.59 | 459.84 | 588.74 | 73.89                 | 85.97 | 100.95 | 128.86 |
| C | Alameda (SF) | Winter | 2035 | 338.06             | 392.70 | 459.83 | 588.87 | 73.89                 | 86.02 | 100.96 | 128.94 |
| C | Alpine (GBV) | Annual | 2010 | 319.94             | 373.91 | 436.04 | 546.24 | 77.24                 | 91.37 | 100.57 | 125.68 |
| C | Alpine (GBV) | Annual | 2011 | 319.54             | 373.51 | 435.72 | 546.98 | 76.26                 | 90.65 | 100.32 | 125.51 |
| C | Alpine (GBV) | Annual | 2012 | 319.25             | 372.89 | 435.50 | 547.57 | 75.15                 | 89.58 | 100.40 | 125.56 |
| C | Alpine (GBV) | Annual | 2013 | 319.18             | 372.57 | 435.22 | 548.28 | 74.57                 | 89.04 | 99.96  | 125.68 |
| C | Alpine (GBV) | Annual | 2014 | 319.32             | 372.32 | 435.07 | 548.95 | 74.52                 | 88.58 | 100.09 | 125.82 |
| C | Alpine (GBV) | Annual | 2015 | 319.45             | 372.11 | 434.95 | 549.66 | 74.47                 | 88.18 | 100.23 | 126.00 |
| C | Alpine (GBV) | Annual | 2016 | 319.56             | 371.52 | 434.86 | 550.33 | 74.44                 | 87.12 | 100.36 | 126.21 |
| C | Alpine (GBV) | Annual | 2017 | 319.49             | 371.33 | 434.79 | 550.99 | 73.94                 | 86.73 | 100.49 | 126.44 |
| C | Alpine (GBV) | Annual | 2018 | 319.46             | 370.85 | 434.73 | 551.66 | 73.66                 | 85.86 | 100.61 | 126.58 |
| C | Alpine (GBV) | Annual | 2019 | 319.51             | 370.58 | 434.66 | 552.11 | 73.60                 | 85.37 | 100.54 | 126.79 |
| C | Alpine (GBV) | Annual | 2020 | 319.52             | 370.53 | 434.63 | 552.59 | 73.65                 | 85.36 | 100.64 | 126.94 |
| C | Alpine (GBV) | Annual | 2021 | 319.35             | 370.39 | 434.54 | 552.76 | 73.53                 | 85.37 | 100.70 | 126.88 |
| C | Alpine (GBV) | Annual | 2022 | 319.41             | 370.29 | 434.41 | 553.01 | 73.61                 | 85.39 | 100.71 | 126.98 |
| C | Alpine (GBV) | Annual | 2023 | 319.45             | 370.13 | 434.39 | 553.18 | 73.67                 | 85.39 | 100.78 | 127.17 |
| C | Alpine (GBV) | Annual | 2024 | 319.20             | 370.08 | 434.37 | 553.31 | 73.50                 | 85.44 | 100.83 | 127.34 |
| C | Alpine (GBV) | Annual | 2025 | 319.16             | 370.11 | 434.34 | 553.52 | 73.49                 | 85.51 | 100.88 | 127.53 |
| C | Alpine (GBV) | Annual | 2026 | 319.16             | 370.24 | 434.32 | 553.65 | 73.52                 | 85.61 | 100.91 | 127.67 |
| C | Alpine (GBV) | Annual | 2027 | 319.16             | 370.37 | 434.30 | 553.84 | 73.53                 | 85.71 | 100.94 | 127.83 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Alpine (GBV) | Annual | 2028 | 319.14             | 370.50 | 434.23 | 554.01 | 73.53                 | 85.80 | 100.95 | 127.98 |
| C | Alpine (GBV) | Annual | 2029 | 319.14             | 370.62 | 434.21 | 554.25 | 73.54                 | 85.89 | 100.97 | 128.13 |
| C | Alpine (GBV) | Annual | 2030 | 319.14             | 370.74 | 434.16 | 554.47 | 73.55                 | 85.96 | 100.97 | 128.27 |
| C | Alpine (GBV) | Annual | 2031 | 319.13             | 370.85 | 434.14 | 554.72 | 73.56                 | 86.04 | 100.98 | 128.41 |
| C | Alpine (GBV) | Annual | 2032 | 319.13             | 370.96 | 434.12 | 554.98 | 73.56                 | 86.10 | 100.99 | 128.55 |
| C | Alpine (GBV) | Annual | 2033 | 319.13             | 371.06 | 434.10 | 555.21 | 73.57                 | 86.17 | 100.99 | 128.68 |
| C | Alpine (GBV) | Annual | 2034 | 319.13             | 371.14 | 434.09 | 555.41 | 73.57                 | 86.23 | 101.00 | 128.80 |
| C | Alpine (GBV) | Annual | 2035 | 319.12             | 371.21 | 434.06 | 555.61 | 73.58                 | 86.27 | 101.00 | 128.90 |
| C | Alpine (GBV) | Summer | 2010 | 322.05             | 375.88 | 438.84 | 549.63 | 77.24                 | 91.37 | 100.57 | 125.68 |
| C | Alpine (GBV) | Summer | 2011 | 321.67             | 375.54 | 438.54 | 550.39 | 76.26                 | 90.65 | 100.32 | 125.51 |
| C | Alpine (GBV) | Summer | 2012 | 321.42             | 374.98 | 438.32 | 550.99 | 75.15                 | 89.58 | 100.40 | 125.56 |
| C | Alpine (GBV) | Summer | 2013 | 321.36             | 374.72 | 438.06 | 551.73 | 74.57                 | 89.04 | 99.96  | 125.68 |
| C | Alpine (GBV) | Summer | 2014 | 321.50             | 374.50 | 437.93 | 552.42 | 74.52                 | 88.58 | 100.09 | 125.82 |
| C | Alpine (GBV) | Summer | 2015 | 321.64             | 374.32 | 437.81 | 553.16 | 74.47                 | 88.18 | 100.23 | 126.00 |
| C | Alpine (GBV) | Summer | 2016 | 321.76             | 373.78 | 437.73 | 553.86 | 74.44                 | 87.12 | 100.36 | 126.21 |
| C | Alpine (GBV) | Summer | 2017 | 321.69             | 373.61 | 437.66 | 554.54 | 73.94                 | 86.73 | 100.49 | 126.44 |
| C | Alpine (GBV) | Summer | 2018 | 321.65             | 373.16 | 437.61 | 555.23 | 73.66                 | 85.86 | 100.61 | 126.58 |
| C | Alpine (GBV) | Summer | 2019 | 321.70             | 372.92 | 437.55 | 555.70 | 73.60                 | 85.37 | 100.54 | 126.79 |
| C | Alpine (GBV) | Summer | 2020 | 321.71             | 372.88 | 437.52 | 556.20 | 73.65                 | 85.36 | 100.64 | 126.94 |
| C | Alpine (GBV) | Summer | 2021 | 321.54             | 372.76 | 437.44 | 556.38 | 73.53                 | 85.37 | 100.70 | 126.88 |
| C | Alpine (GBV) | Summer | 2022 | 321.60             | 372.67 | 437.31 | 556.63 | 73.61                 | 85.39 | 100.71 | 126.98 |
| C | Alpine (GBV) | Summer | 2023 | 321.64             | 372.52 | 437.29 | 556.81 | 73.67                 | 85.39 | 100.78 | 127.17 |
| C | Alpine (GBV) | Summer | 2024 | 321.39             | 372.48 | 437.27 | 556.95 | 73.50                 | 85.44 | 100.83 | 127.34 |
| C | Alpine (GBV) | Summer | 2025 | 321.35             | 372.52 | 437.24 | 557.16 | 73.49                 | 85.51 | 100.88 | 127.53 |
| C | Alpine (GBV) | Summer | 2026 | 321.36             | 372.65 | 437.22 | 557.29 | 73.52                 | 85.61 | 100.91 | 127.67 |
| C | Alpine (GBV) | Summer | 2027 | 321.36             | 372.79 | 437.20 | 557.48 | 73.53                 | 85.71 | 100.94 | 127.83 |
| C | Alpine (GBV) | Summer | 2028 | 321.34             | 372.93 | 437.12 | 557.66 | 73.53                 | 85.80 | 100.95 | 127.98 |
| C | Alpine (GBV) | Summer | 2029 | 321.34             | 373.07 | 437.11 | 557.90 | 73.54                 | 85.89 | 100.97 | 128.13 |
| C | Alpine (GBV) | Summer | 2030 | 321.34             | 373.19 | 437.06 | 558.13 | 73.55                 | 85.96 | 100.97 | 128.27 |
| C | Alpine (GBV) | Summer | 2031 | 321.34             | 373.31 | 437.04 | 558.38 | 73.56                 | 86.04 | 100.98 | 128.41 |
| C | Alpine (GBV) | Summer | 2032 | 321.33             | 373.42 | 437.02 | 558.64 | 73.56                 | 86.10 | 100.99 | 128.55 |
| C | Alpine (GBV) | Summer | 2033 | 321.33             | 373.52 | 437.00 | 558.87 | 73.57                 | 86.17 | 100.99 | 128.68 |
| C | Alpine (GBV) | Summer | 2034 | 321.33             | 373.61 | 436.99 | 559.09 | 73.57                 | 86.23 | 101.00 | 128.80 |
| C | Alpine (GBV) | Summer | 2035 | 321.32             | 373.68 | 436.96 | 559.29 | 73.58                 | 86.27 | 101.00 | 128.90 |
| C | Alpine (GBV) | Winter | 2010 | 321.45             | 375.32 | 438.05 | 548.67 | 77.24                 | 91.37 | 100.57 | 125.68 |
| C | Alpine (GBV) | Winter | 2011 | 321.07             | 374.96 | 437.74 | 549.42 | 76.26                 | 90.65 | 100.32 | 125.51 |
| C | Alpine (GBV) | Winter | 2012 | 320.80             | 374.39 | 437.52 | 550.02 | 75.15                 | 89.58 | 100.40 | 125.56 |
| C | Alpine (GBV) | Winter | 2013 | 320.74             | 374.11 | 437.26 | 550.75 | 74.57                 | 89.04 | 99.96  | 125.68 |
| C | Alpine (GBV) | Winter | 2014 | 320.88             | 373.88 | 437.12 | 551.43 | 74.52                 | 88.58 | 100.09 | 125.82 |
| C | Alpine (GBV) | Winter | 2015 | 321.02             | 373.69 | 437.00 | 552.16 | 74.47                 | 88.18 | 100.23 | 126.00 |
| C | Alpine (GBV) | Winter | 2016 | 321.14             | 373.14 | 436.91 | 552.86 | 74.44                 | 87.12 | 100.36 | 126.21 |
| C | Alpine (GBV) | Winter | 2017 | 321.06             | 372.96 | 436.85 | 553.53 | 73.94                 | 86.73 | 100.49 | 126.44 |
| C | Alpine (GBV) | Winter | 2018 | 321.03             | 372.51 | 436.79 | 554.22 | 73.66                 | 85.86 | 100.61 | 126.58 |
| C | Alpine (GBV) | Winter | 2019 | 321.08             | 372.25 | 436.73 | 554.68 | 73.60                 | 85.37 | 100.54 | 126.79 |
| C | Alpine (GBV) | Winter | 2020 | 321.09             | 372.21 | 436.70 | 555.17 | 73.65                 | 85.36 | 100.64 | 126.94 |
| C | Alpine (GBV) | Winter | 2021 | 320.92             | 372.08 | 436.62 | 555.35 | 73.53                 | 85.37 | 100.70 | 126.88 |
| C | Alpine (GBV) | Winter | 2022 | 320.98             | 371.99 | 436.49 | 555.60 | 73.61                 | 85.39 | 100.71 | 126.98 |
| C | Alpine (GBV) | Winter | 2023 | 321.02             | 371.84 | 436.47 | 555.78 | 73.67                 | 85.39 | 100.78 | 127.17 |
| C | Alpine (GBV) | Winter | 2024 | 320.77             | 371.80 | 436.44 | 555.92 | 73.50                 | 85.44 | 100.83 | 127.34 |
| C | Alpine (GBV) | Winter | 2025 | 320.73             | 371.84 | 436.42 | 556.12 | 73.49                 | 85.51 | 100.88 | 127.53 |
| C | Alpine (GBV) | Winter | 2026 | 320.74             | 371.97 | 436.40 | 556.26 | 73.52                 | 85.61 | 100.91 | 127.67 |
| C | Alpine (GBV) | Winter | 2027 | 320.74             | 372.11 | 436.38 | 556.45 | 73.53                 | 85.71 | 100.94 | 127.83 |
| C | Alpine (GBV) | Winter | 2028 | 320.71             | 372.24 | 436.30 | 556.62 | 73.53                 | 85.80 | 100.95 | 127.98 |
| C | Alpine (GBV) | Winter | 2029 | 320.71             | 372.37 | 436.29 | 556.87 | 73.54                 | 85.89 | 100.97 | 128.13 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Alpine (GBV) | Winter | 2030 | 320.71             | 372.49 | 436.23 | 557.09 | 73.55                 | 85.96 | 100.97 | 128.27 |
| C | Alpine (GBV) | Winter | 2031 | 320.71             | 372.61 | 436.21 | 557.34 | 73.56                 | 86.04 | 100.98 | 128.41 |
| C | Alpine (GBV) | Winter | 2032 | 320.71             | 372.72 | 436.20 | 557.60 | 73.56                 | 86.10 | 100.99 | 128.55 |
| C | Alpine (GBV) | Winter | 2033 | 320.71             | 372.82 | 436.18 | 557.83 | 73.57                 | 86.17 | 100.99 | 128.68 |
| C | Alpine (GBV) | Winter | 2034 | 320.70             | 372.91 | 436.17 | 558.05 | 73.57                 | 86.23 | 101.00 | 128.80 |
| C | Alpine (GBV) | Winter | 2035 | 320.70             | 372.98 | 436.14 | 558.25 | 73.58                 | 86.27 | 101.00 | 128.90 |
| C | Amador (MC)  | Annual | 2010 | 304.65             | 351.36 | 416.56 | 520.77 | 74.42                 | 88.71 | 101.28 | 124.30 |
| C | Amador (MC)  | Annual | 2011 | 304.66             | 351.60 | 416.18 | 521.37 | 74.22                 | 87.90 | 101.12 | 124.48 |
| C | Amador (MC)  | Annual | 2012 | 304.71             | 351.83 | 415.89 | 522.08 | 74.04                 | 87.30 | 101.03 | 124.70 |
| C | Amador (MC)  | Annual | 2013 | 304.79             | 351.99 | 415.66 | 522.86 | 73.92                 | 86.76 | 100.95 | 124.94 |
| C | Amador (MC)  | Annual | 2014 | 304.86             | 352.15 | 415.48 | 523.60 | 73.78                 | 86.37 | 100.90 | 125.21 |
| C | Amador (MC)  | Annual | 2015 | 304.98             | 352.29 | 415.35 | 524.39 | 73.76                 | 85.97 | 100.78 | 125.49 |
| C | Amador (MC)  | Annual | 2016 | 305.08             | 352.44 | 415.24 | 525.15 | 73.74                 | 85.71 | 100.76 | 125.78 |
| C | Amador (MC)  | Annual | 2017 | 305.13             | 352.54 | 415.14 | 525.85 | 73.67                 | 85.39 | 100.65 | 126.08 |
| C | Amador (MC)  | Annual | 2018 | 305.17             | 352.64 | 415.05 | 526.46 | 73.63                 | 85.21 | 100.62 | 126.36 |
| C | Amador (MC)  | Annual | 2019 | 305.20             | 352.73 | 414.99 | 526.98 | 73.61                 | 85.07 | 100.64 | 126.62 |
| C | Amador (MC)  | Annual | 2020 | 305.25             | 352.84 | 414.93 | 527.43 | 73.70                 | 85.10 | 100.70 | 126.87 |
| C | Amador (MC)  | Annual | 2021 | 305.27             | 352.92 | 414.87 | 527.78 | 73.76                 | 85.17 | 100.76 | 127.07 |
| C | Amador (MC)  | Annual | 2022 | 305.25             | 352.98 | 414.81 | 528.07 | 73.79                 | 85.24 | 100.80 | 127.21 |
| C | Amador (MC)  | Annual | 2023 | 305.17             | 353.01 | 414.75 | 528.29 | 73.79                 | 85.29 | 100.83 | 127.40 |
| C | Amador (MC)  | Annual | 2024 | 305.08             | 353.05 | 414.70 | 528.47 | 73.77                 | 85.35 | 100.86 | 127.58 |
| C | Amador (MC)  | Annual | 2025 | 305.03             | 353.13 | 414.66 | 528.63 | 73.78                 | 85.43 | 100.90 | 127.75 |
| C | Amador (MC)  | Annual | 2026 | 305.04             | 353.24 | 414.62 | 528.79 | 73.80                 | 85.53 | 100.92 | 127.91 |
| C | Amador (MC)  | Annual | 2027 | 305.05             | 353.36 | 414.57 | 528.95 | 73.81                 | 85.62 | 100.94 | 128.05 |
| C | Amador (MC)  | Annual | 2028 | 305.05             | 353.48 | 414.54 | 529.12 | 73.82                 | 85.70 | 100.96 | 128.19 |
| C | Amador (MC)  | Annual | 2029 | 305.04             | 353.60 | 414.51 | 529.29 | 73.83                 | 85.78 | 100.96 | 128.32 |
| C | Amador (MC)  | Annual | 2030 | 305.03             | 353.72 | 414.47 | 529.46 | 73.83                 | 85.85 | 100.96 | 128.44 |
| C | Amador (MC)  | Annual | 2031 | 305.02             | 353.84 | 414.44 | 529.67 | 73.83                 | 85.93 | 100.97 | 128.56 |
| C | Amador (MC)  | Annual | 2032 | 305.02             | 353.95 | 414.42 | 529.88 | 73.84                 | 85.99 | 100.97 | 128.68 |
| C | Amador (MC)  | Annual | 2033 | 305.01             | 354.05 | 414.40 | 530.07 | 73.84                 | 86.06 | 100.98 | 128.78 |
| C | Amador (MC)  | Annual | 2034 | 305.01             | 354.14 | 414.39 | 530.24 | 73.85                 | 86.11 | 100.98 | 128.88 |
| C | Amador (MC)  | Annual | 2035 | 305.01             | 354.21 | 414.37 | 530.39 | 73.85                 | 86.16 | 100.98 | 128.97 |
| C | Amador (MC)  | Summer | 2010 | 335.39             | 381.81 | 456.97 | 570.78 | 74.42                 | 88.71 | 101.28 | 124.30 |
| C | Amador (MC)  | Summer | 2011 | 335.69             | 383.05 | 456.90 | 571.49 | 74.22                 | 87.90 | 101.12 | 124.48 |
| C | Amador (MC)  | Summer | 2012 | 335.97             | 384.03 | 456.85 | 572.39 | 74.04                 | 87.30 | 101.03 | 124.70 |
| C | Amador (MC)  | Summer | 2013 | 336.23             | 384.81 | 456.85 | 573.45 | 73.92                 | 86.76 | 100.95 | 124.94 |
| C | Amador (MC)  | Summer | 2014 | 336.43             | 385.43 | 456.87 | 574.47 | 73.78                 | 86.37 | 100.90 | 125.21 |
| C | Amador (MC)  | Summer | 2015 | 336.65             | 385.97 | 456.94 | 575.58 | 73.76                 | 85.97 | 100.78 | 125.49 |
| C | Amador (MC)  | Summer | 2016 | 336.82             | 386.42 | 456.98 | 576.67 | 73.74                 | 85.71 | 100.76 | 125.78 |
| C | Amador (MC)  | Summer | 2017 | 336.90             | 386.79 | 457.00 | 577.65 | 73.67                 | 85.39 | 100.65 | 126.08 |
| C | Amador (MC)  | Summer | 2018 | 336.95             | 387.08 | 456.98 | 578.50 | 73.63                 | 85.21 | 100.62 | 126.36 |
| C | Amador (MC)  | Summer | 2019 | 336.99             | 387.35 | 456.95 | 579.23 | 73.61                 | 85.07 | 100.64 | 126.62 |
| C | Amador (MC)  | Summer | 2020 | 337.02             | 387.58 | 456.90 | 579.85 | 73.70                 | 85.10 | 100.70 | 126.87 |
| C | Amador (MC)  | Summer | 2021 | 337.03             | 387.78 | 456.85 | 580.34 | 73.76                 | 85.17 | 100.76 | 127.07 |
| C | Amador (MC)  | Summer | 2022 | 337.01             | 387.96 | 456.79 | 580.75 | 73.79                 | 85.24 | 100.80 | 127.21 |
| C | Amador (MC)  | Summer | 2023 | 336.93             | 388.10 | 456.74 | 581.05 | 73.79                 | 85.29 | 100.83 | 127.40 |
| C | Amador (MC)  | Summer | 2024 | 336.85             | 388.24 | 456.69 | 581.30 | 73.77                 | 85.35 | 100.86 | 127.58 |
| C | Amador (MC)  | Summer | 2025 | 336.80             | 388.38 | 456.65 | 581.51 | 73.78                 | 85.43 | 100.90 | 127.75 |
| C | Amador (MC)  | Summer | 2026 | 336.83             | 388.54 | 456.62 | 581.67 | 73.80                 | 85.53 | 100.92 | 127.91 |
| C | Amador (MC)  | Summer | 2027 | 336.85             | 388.70 | 456.59 | 581.84 | 73.81                 | 85.62 | 100.94 | 128.05 |
| C | Amador (MC)  | Summer | 2028 | 336.86             | 388.88 | 456.57 | 582.04 | 73.82                 | 85.70 | 100.96 | 128.19 |
| C | Amador (MC)  | Summer | 2029 | 336.87             | 389.06 | 456.55 | 582.24 | 73.83                 | 85.78 | 100.96 | 128.32 |
| C | Amador (MC)  | Summer | 2030 | 336.87             | 389.25 | 456.52 | 582.44 | 73.83                 | 85.85 | 100.96 | 128.44 |
| C | Amador (MC)  | Summer | 2031 | 336.87             | 389.46 | 456.50 | 582.71 | 73.83                 | 85.93 | 100.97 | 128.56 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Amador (MC) | Summer | 2032 | 336.87              | 389.62 | 456.48 | 582.98 | 73.84                 | 85.99 | 100.97 | 128.68 |
| C | Amador (MC) | Summer | 2033 | 336.86              | 389.77 | 456.47 | 583.23 | 73.84                 | 86.06 | 100.98 | 128.78 |
| C | Amador (MC) | Summer | 2034 | 336.85              | 389.90 | 456.45 | 583.45 | 73.85                 | 86.11 | 100.98 | 128.88 |
| C | Amador (MC) | Summer | 2035 | 336.85              | 389.98 | 456.44 | 583.66 | 73.85                 | 86.16 | 100.98 | 128.97 |
| C | Amador (MC) | Winter | 2010 | 295.29              | 342.08 | 404.24 | 505.53 | 74.42                 | 88.71 | 101.28 | 124.30 |
| C | Amador (MC) | Winter | 2011 | 295.21              | 342.02 | 403.78 | 506.10 | 74.22                 | 87.90 | 101.12 | 124.48 |
| C | Amador (MC) | Winter | 2012 | 295.18              | 342.01 | 403.41 | 506.75 | 74.04                 | 87.30 | 101.03 | 124.70 |
| C | Amador (MC) | Winter | 2013 | 295.22              | 341.99 | 403.11 | 507.45 | 73.92                 | 86.76 | 100.95 | 124.94 |
| C | Amador (MC) | Winter | 2014 | 295.24              | 342.01 | 402.87 | 508.11 | 73.78                 | 86.37 | 100.90 | 125.21 |
| C | Amador (MC) | Winter | 2015 | 295.33              | 342.02 | 402.67 | 508.79 | 73.76                 | 85.97 | 100.78 | 125.49 |
| C | Amador (MC) | Winter | 2016 | 295.41              | 342.08 | 402.52 | 509.45 | 73.74                 | 85.71 | 100.76 | 125.78 |
| C | Amador (MC) | Winter | 2017 | 295.45              | 342.10 | 402.38 | 510.06 | 73.67                 | 85.39 | 100.65 | 126.08 |
| C | Amador (MC) | Winter | 2018 | 295.49              | 342.14 | 402.28 | 510.60 | 73.63                 | 85.21 | 100.62 | 126.36 |
| C | Amador (MC) | Winter | 2019 | 295.52              | 342.18 | 402.21 | 511.06 | 73.61                 | 85.07 | 100.64 | 126.62 |
| C | Amador (MC) | Winter | 2020 | 295.57              | 342.25 | 402.15 | 511.46 | 73.70                 | 85.10 | 100.70 | 126.87 |
| C | Amador (MC) | Winter | 2021 | 295.59              | 342.29 | 402.08 | 511.77 | 73.76                 | 85.17 | 100.76 | 127.07 |
| C | Amador (MC) | Winter | 2022 | 295.58              | 342.32 | 402.02 | 512.02 | 73.79                 | 85.24 | 100.80 | 127.21 |
| C | Amador (MC) | Winter | 2023 | 295.49              | 342.32 | 401.95 | 512.21 | 73.79                 | 85.29 | 100.83 | 127.40 |
| C | Amador (MC) | Winter | 2024 | 295.40              | 342.33 | 401.90 | 512.37 | 73.77                 | 85.35 | 100.86 | 127.58 |
| C | Amador (MC) | Winter | 2025 | 295.35              | 342.39 | 401.87 | 512.52 | 73.78                 | 85.43 | 100.90 | 127.75 |
| C | Amador (MC) | Winter | 2026 | 295.36              | 342.49 | 401.82 | 512.68 | 73.80                 | 85.53 | 100.92 | 127.91 |
| C | Amador (MC) | Winter | 2027 | 295.36              | 342.59 | 401.77 | 512.84 | 73.81                 | 85.62 | 100.94 | 128.05 |
| C | Amador (MC) | Winter | 2028 | 295.35              | 342.69 | 401.74 | 513.00 | 73.82                 | 85.70 | 100.96 | 128.19 |
| C | Amador (MC) | Winter | 2029 | 295.34              | 342.79 | 401.70 | 513.16 | 73.83                 | 85.78 | 100.96 | 128.32 |
| C | Amador (MC) | Winter | 2030 | 295.32              | 342.89 | 401.65 | 513.32 | 73.83                 | 85.85 | 100.96 | 128.44 |
| C | Amador (MC) | Winter | 2031 | 295.32              | 342.99 | 401.63 | 513.51 | 73.83                 | 85.93 | 100.97 | 128.56 |
| C | Amador (MC) | Winter | 2032 | 295.32              | 343.09 | 401.61 | 513.70 | 73.84                 | 85.99 | 100.97 | 128.68 |
| C | Amador (MC) | Winter | 2033 | 295.31              | 343.17 | 401.59 | 513.88 | 73.84                 | 86.06 | 100.98 | 128.78 |
| C | Amador (MC) | Winter | 2034 | 295.31              | 343.24 | 401.57 | 514.03 | 73.85                 | 86.11 | 100.98 | 128.88 |
| C | Amador (MC) | Winter | 2035 | 295.30              | 343.31 | 401.56 | 514.17 | 73.85                 | 86.16 | 100.98 | 128.97 |
| C | Butte (SV)  | Annual | 2010 | 339.87              | 396.33 | 466.79 | 582.59 | 73.74                 | 93.40 | 101.05 | 125.37 |
| C | Butte (SV)  | Annual | 2011 | 340.16              | 396.11 | 466.41 | 583.82 | 73.64                 | 91.64 | 100.92 | 125.50 |
| C | Butte (SV)  | Annual | 2012 | 340.27              | 395.85 | 465.90 | 584.74 | 73.58                 | 90.38 | 100.87 | 125.67 |
| C | Butte (SV)  | Annual | 2013 | 340.39              | 395.57 | 465.50 | 585.71 | 73.53                 | 89.20 | 100.81 | 125.88 |
| C | Butte (SV)  | Annual | 2014 | 340.47              | 395.32 | 465.20 | 586.62 | 73.46                 | 88.16 | 100.77 | 126.08 |
| C | Butte (SV)  | Annual | 2015 | 340.60              | 395.14 | 464.96 | 587.52 | 73.45                 | 87.30 | 100.75 | 126.32 |
| C | Butte (SV)  | Annual | 2016 | 342.35              | 396.92 | 466.99 | 591.13 | 73.49                 | 86.64 | 100.74 | 126.57 |
| C | Butte (SV)  | Annual | 2017 | 342.42              | 396.78 | 466.81 | 591.87 | 73.48                 | 85.98 | 100.71 | 126.82 |
| C | Butte (SV)  | Annual | 2018 | 342.44              | 396.68 | 466.66 | 592.50 | 73.44                 | 85.49 | 100.70 | 127.05 |
| C | Butte (SV)  | Annual | 2019 | 342.48              | 396.71 | 466.54 | 593.04 | 73.45                 | 85.31 | 100.70 | 127.27 |
| C | Butte (SV)  | Annual | 2020 | 342.53              | 396.78 | 466.44 | 593.51 | 73.54                 | 85.30 | 100.76 | 127.47 |
| C | Butte (SV)  | Annual | 2021 | 343.10              | 397.55 | 467.11 | 594.81 | 73.60                 | 85.41 | 100.82 | 127.57 |
| C | Butte (SV)  | Annual | 2022 | 343.10              | 397.67 | 467.03 | 595.07 | 73.64                 | 85.50 | 100.87 | 127.65 |
| C | Butte (SV)  | Annual | 2023 | 343.08              | 397.75 | 466.95 | 595.27 | 73.67                 | 85.58 | 100.90 | 127.82 |
| C | Butte (SV)  | Annual | 2024 | 343.02              | 397.84 | 466.88 | 595.42 | 73.68                 | 85.66 | 100.93 | 127.97 |
| C | Butte (SV)  | Annual | 2025 | 343.01              | 397.92 | 466.82 | 595.60 | 73.70                 | 85.73 | 100.96 | 128.12 |
| C | Butte (SV)  | Annual | 2026 | 343.02              | 398.03 | 466.75 | 595.77 | 73.72                 | 85.80 | 100.97 | 128.26 |
| C | Butte (SV)  | Annual | 2027 | 343.02              | 398.12 | 466.69 | 595.94 | 73.73                 | 85.86 | 100.98 | 128.39 |
| C | Butte (SV)  | Annual | 2028 | 343.02              | 398.22 | 466.63 | 596.11 | 73.74                 | 85.92 | 100.99 | 128.51 |
| C | Butte (SV)  | Annual | 2029 | 343.02              | 398.31 | 466.55 | 596.28 | 73.74                 | 85.97 | 100.99 | 128.62 |
| C | Butte (SV)  | Annual | 2030 | 343.01              | 398.40 | 466.48 | 596.45 | 73.75                 | 86.02 | 100.98 | 128.72 |
| C | Butte (SV)  | Annual | 2031 | 343.01              | 398.49 | 466.45 | 596.62 | 73.75                 | 86.07 | 100.98 | 128.82 |
| C | Butte (SV)  | Annual | 2032 | 343.01              | 398.57 | 466.42 | 596.79 | 73.76                 | 86.12 | 100.99 | 128.91 |
| C | Butte (SV)  | Annual | 2033 | 343.00              | 398.64 | 466.40 | 596.95 | 73.76                 | 86.15 | 100.99 | 128.99 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location   | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |            |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Butte (SV) | Annual | 2034 | 343.00             | 398.69 | 466.38 | 597.09 | 73.76                 | 86.19 | 100.99 | 129.06 |
| C | Butte (SV) | Annual | 2035 | 342.99             | 398.74 | 466.36 | 597.22 | 73.77                 | 86.22 | 100.99 | 129.13 |
| C | Butte (SV) | Summer | 2010 | 378.25             | 435.25 | 516.75 | 645.70 | 73.74                 | 93.40 | 101.05 | 125.37 |
| C | Butte (SV) | Summer | 2011 | 379.01             | 436.21 | 517.19 | 647.27 | 73.64                 | 91.64 | 100.92 | 125.50 |
| C | Butte (SV) | Summer | 2012 | 379.48             | 436.79 | 517.26 | 648.57 | 73.58                 | 90.38 | 100.87 | 125.67 |
| C | Butte (SV) | Summer | 2013 | 379.86             | 437.26 | 517.34 | 649.98 | 73.53                 | 89.20 | 100.81 | 125.88 |
| C | Butte (SV) | Summer | 2014 | 380.14             | 437.60 | 517.39 | 651.33 | 73.46                 | 88.16 | 100.77 | 126.08 |
| C | Butte (SV) | Summer | 2015 | 380.40             | 437.90 | 517.40 | 652.65 | 73.45                 | 87.30 | 100.75 | 126.32 |
| C | Butte (SV) | Summer | 2016 | 382.44             | 440.27 | 519.84 | 656.95 | 73.49                 | 86.64 | 100.74 | 126.57 |
| C | Butte (SV) | Summer | 2017 | 382.54             | 440.50 | 519.76 | 658.01 | 73.48                 | 85.98 | 100.71 | 126.82 |
| C | Butte (SV) | Summer | 2018 | 382.56             | 440.67 | 519.63 | 658.88 | 73.44                 | 85.49 | 100.70 | 127.05 |
| C | Butte (SV) | Summer | 2019 | 382.59             | 440.87 | 519.51 | 659.62 | 73.45                 | 85.31 | 100.70 | 127.27 |
| C | Butte (SV) | Summer | 2020 | 382.63             | 441.06 | 519.39 | 660.26 | 73.54                 | 85.30 | 100.76 | 127.47 |
| C | Butte (SV) | Summer | 2021 | 383.24             | 442.01 | 520.14 | 661.82 | 73.60                 | 85.41 | 100.82 | 127.57 |
| C | Butte (SV) | Summer | 2022 | 383.23             | 442.21 | 520.05 | 662.21 | 73.64                 | 85.50 | 100.87 | 127.65 |
| C | Butte (SV) | Summer | 2023 | 383.21             | 442.39 | 519.98 | 662.50 | 73.67                 | 85.58 | 100.90 | 127.82 |
| C | Butte (SV) | Summer | 2024 | 383.15             | 442.57 | 519.92 | 662.70 | 73.68                 | 85.66 | 100.93 | 127.97 |
| C | Butte (SV) | Summer | 2025 | 383.13             | 442.73 | 519.88 | 662.89 | 73.70                 | 85.73 | 100.96 | 128.12 |
| C | Butte (SV) | Summer | 2026 | 383.15             | 442.89 | 519.81 | 663.05 | 73.72                 | 85.80 | 100.97 | 128.26 |
| C | Butte (SV) | Summer | 2027 | 383.17             | 443.04 | 519.76 | 663.21 | 73.73                 | 85.86 | 100.98 | 128.39 |
| C | Butte (SV) | Summer | 2028 | 383.19             | 443.19 | 519.72 | 663.40 | 73.74                 | 85.92 | 100.99 | 128.51 |
| C | Butte (SV) | Summer | 2029 | 383.21             | 443.35 | 519.67 | 663.59 | 73.74                 | 85.97 | 100.99 | 128.62 |
| C | Butte (SV) | Summer | 2030 | 383.22             | 443.50 | 519.63 | 663.79 | 73.75                 | 86.02 | 100.98 | 128.72 |
| C | Butte (SV) | Summer | 2031 | 383.22             | 443.64 | 519.62 | 663.97 | 73.75                 | 86.07 | 100.98 | 128.82 |
| C | Butte (SV) | Summer | 2032 | 383.22             | 443.74 | 519.61 | 664.16 | 73.76                 | 86.12 | 100.99 | 128.91 |
| C | Butte (SV) | Summer | 2033 | 383.22             | 443.83 | 519.60 | 664.35 | 73.76                 | 86.15 | 100.99 | 128.99 |
| C | Butte (SV) | Summer | 2034 | 383.22             | 443.91 | 519.59 | 664.54 | 73.76                 | 86.19 | 100.99 | 129.06 |
| C | Butte (SV) | Summer | 2035 | 383.21             | 443.96 | 519.58 | 664.71 | 73.77                 | 86.22 | 100.99 | 129.13 |
| C | Butte (SV) | Winter | 2010 | 328.68             | 384.98 | 452.21 | 564.18 | 73.74                 | 93.40 | 101.05 | 125.37 |
| C | Butte (SV) | Winter | 2011 | 328.82             | 384.41 | 451.61 | 565.32 | 73.64                 | 91.64 | 100.92 | 125.50 |
| C | Butte (SV) | Winter | 2012 | 328.84             | 383.90 | 450.92 | 566.13 | 73.58                 | 90.38 | 100.87 | 125.67 |
| C | Butte (SV) | Winter | 2013 | 328.87             | 383.41 | 450.39 | 566.96 | 73.53                 | 89.20 | 100.81 | 125.88 |
| C | Butte (SV) | Winter | 2014 | 328.90             | 382.99 | 449.98 | 567.75 | 73.46                 | 88.16 | 100.77 | 126.08 |
| C | Butte (SV) | Winter | 2015 | 328.99             | 382.67 | 449.66 | 568.52 | 73.45                 | 87.30 | 100.75 | 126.32 |
| C | Butte (SV) | Winter | 2016 | 330.67             | 384.27 | 451.57 | 571.94 | 73.49                 | 86.64 | 100.74 | 126.57 |
| C | Butte (SV) | Winter | 2017 | 330.72             | 384.03 | 451.37 | 572.58 | 73.48                 | 85.98 | 100.71 | 126.82 |
| C | Butte (SV) | Winter | 2018 | 330.74             | 383.86 | 451.21 | 573.14 | 73.44                 | 85.49 | 100.70 | 127.05 |
| C | Butte (SV) | Winter | 2019 | 330.78             | 383.84 | 451.09 | 573.62 | 73.45                 | 85.31 | 100.70 | 127.27 |
| C | Butte (SV) | Winter | 2020 | 330.84             | 383.86 | 450.99 | 574.04 | 73.54                 | 85.30 | 100.76 | 127.47 |
| C | Butte (SV) | Winter | 2021 | 331.40             | 384.59 | 451.65 | 575.26 | 73.60                 | 85.41 | 100.82 | 127.57 |
| C | Butte (SV) | Winter | 2022 | 331.39             | 384.68 | 451.56 | 575.49 | 73.64                 | 85.50 | 100.87 | 127.65 |
| C | Butte (SV) | Winter | 2023 | 331.38             | 384.73 | 451.48 | 575.67 | 73.67                 | 85.58 | 100.90 | 127.82 |
| C | Butte (SV) | Winter | 2024 | 331.32             | 384.80 | 451.41 | 575.80 | 73.68                 | 85.66 | 100.93 | 127.97 |
| C | Butte (SV) | Winter | 2025 | 331.30             | 384.86 | 451.35 | 575.97 | 73.70                 | 85.73 | 100.96 | 128.12 |
| C | Butte (SV) | Winter | 2026 | 331.31             | 384.94 | 451.28 | 576.14 | 73.72                 | 85.80 | 100.97 | 128.26 |
| C | Butte (SV) | Winter | 2027 | 331.31             | 385.02 | 451.21 | 576.32 | 73.73                 | 85.86 | 100.98 | 128.39 |
| C | Butte (SV) | Winter | 2028 | 331.31             | 385.10 | 451.14 | 576.48 | 73.74                 | 85.92 | 100.99 | 128.51 |
| C | Butte (SV) | Winter | 2029 | 331.30             | 385.18 | 451.06 | 576.65 | 73.74                 | 85.97 | 100.99 | 128.62 |
| C | Butte (SV) | Winter | 2030 | 331.28             | 385.25 | 450.98 | 576.81 | 73.75                 | 86.02 | 100.98 | 128.72 |
| C | Butte (SV) | Winter | 2031 | 331.28             | 385.33 | 450.94 | 576.98 | 73.75                 | 86.07 | 100.98 | 128.82 |
| C | Butte (SV) | Winter | 2032 | 331.28             | 385.40 | 450.91 | 577.14 | 73.76                 | 86.12 | 100.99 | 128.91 |
| C | Butte (SV) | Winter | 2033 | 331.27             | 385.45 | 450.88 | 577.29 | 73.76                 | 86.15 | 100.99 | 128.99 |
| C | Butte (SV) | Winter | 2034 | 331.27             | 385.51 | 450.86 | 577.42 | 73.76                 | 86.19 | 100.99 | 129.06 |
| C | Butte (SV) | Winter | 2035 | 331.26             | 385.55 | 450.84 | 577.54 | 73.77                 | 86.22 | 100.99 | 129.13 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Calaveras (MC) | Annual | 2010 | 339.15             | 393.21 | 464.59 | 580.79 | 74.52                 | 89.63 | 101.49 | 124.52 |
| C | Calaveras (MC) | Annual | 2011 | 339.17             | 393.31 | 464.13 | 581.44 | 74.31                 | 88.76 | 101.30 | 124.68 |
| C | Calaveras (MC) | Annual | 2012 | 339.22             | 393.39 | 463.78 | 582.21 | 74.10                 | 88.01 | 101.21 | 124.87 |
| C | Calaveras (MC) | Annual | 2013 | 339.30             | 393.43 | 463.49 | 583.06 | 73.93                 | 87.36 | 101.13 | 125.10 |
| C | Calaveras (MC) | Annual | 2014 | 339.36             | 393.46 | 463.27 | 583.88 | 73.74                 | 86.82 | 101.00 | 125.34 |
| C | Calaveras (MC) | Annual | 2015 | 339.48             | 393.52 | 463.10 | 584.75 | 73.70                 | 86.38 | 100.93 | 125.59 |
| C | Calaveras (MC) | Annual | 2016 | 339.59             | 393.59 | 462.96 | 585.57 | 73.69                 | 86.07 | 100.88 | 125.88 |
| C | Calaveras (MC) | Annual | 2017 | 339.64             | 393.63 | 462.83 | 586.35 | 73.61                 | 85.70 | 100.81 | 126.15 |
| C | Calaveras (MC) | Annual | 2018 | 339.66             | 393.65 | 462.73 | 587.01 | 73.51                 | 85.38 | 100.75 | 126.42 |
| C | Calaveras (MC) | Annual | 2019 | 339.69             | 393.73 | 462.65 | 587.57 | 73.48                 | 85.28 | 100.71 | 126.69 |
| C | Calaveras (MC) | Annual | 2020 | 339.72             | 393.81 | 462.58 | 588.07 | 73.55                 | 85.28 | 100.76 | 126.92 |
| C | Calaveras (MC) | Annual | 2021 | 339.70             | 393.86 | 462.51 | 588.43 | 73.59                 | 85.33 | 100.81 | 127.08 |
| C | Calaveras (MC) | Annual | 2022 | 339.67             | 393.90 | 462.43 | 588.75 | 73.61                 | 85.38 | 100.85 | 127.26 |
| C | Calaveras (MC) | Annual | 2023 | 339.61             | 393.93 | 462.36 | 588.97 | 73.61                 | 85.43 | 100.87 | 127.44 |
| C | Calaveras (MC) | Annual | 2024 | 339.52             | 393.92 | 462.29 | 589.14 | 73.58                 | 85.45 | 100.89 | 127.61 |
| C | Calaveras (MC) | Annual | 2025 | 339.50             | 393.98 | 462.24 | 589.30 | 73.59                 | 85.52 | 100.92 | 127.77 |
| C | Calaveras (MC) | Annual | 2026 | 339.51             | 394.11 | 462.19 | 589.48 | 73.61                 | 85.62 | 100.94 | 127.93 |
| C | Calaveras (MC) | Annual | 2027 | 339.51             | 394.23 | 462.13 | 589.67 | 73.62                 | 85.70 | 100.96 | 128.08 |
| C | Calaveras (MC) | Annual | 2028 | 339.51             | 394.36 | 462.10 | 589.86 | 73.63                 | 85.78 | 100.97 | 128.21 |
| C | Calaveras (MC) | Annual | 2029 | 339.50             | 394.48 | 462.05 | 590.05 | 73.64                 | 85.86 | 100.97 | 128.34 |
| C | Calaveras (MC) | Annual | 2030 | 339.49             | 394.60 | 462.00 | 590.25 | 73.64                 | 85.93 | 100.97 | 128.46 |
| C | Calaveras (MC) | Annual | 2031 | 339.49             | 394.71 | 461.98 | 590.48 | 73.65                 | 86.00 | 100.98 | 128.58 |
| C | Calaveras (MC) | Annual | 2032 | 339.49             | 394.82 | 461.96 | 590.71 | 73.65                 | 86.06 | 100.98 | 128.70 |
| C | Calaveras (MC) | Annual | 2033 | 339.49             | 394.90 | 461.94 | 590.91 | 73.65                 | 86.12 | 100.98 | 128.81 |
| C | Calaveras (MC) | Annual | 2034 | 339.48             | 394.98 | 461.92 | 591.10 | 73.66                 | 86.17 | 100.99 | 128.90 |
| C | Calaveras (MC) | Annual | 2035 | 339.48             | 395.05 | 461.91 | 591.26 | 73.66                 | 86.21 | 100.99 | 128.99 |
| C | Calaveras (MC) | Summer | 2010 | 371.79             | 425.53 | 507.37 | 633.67 | 74.52                 | 89.63 | 101.49 | 124.52 |
| C | Calaveras (MC) | Summer | 2011 | 372.10             | 426.67 | 507.24 | 634.43 | 74.31                 | 88.76 | 101.30 | 124.68 |
| C | Calaveras (MC) | Summer | 2012 | 372.38             | 427.56 | 507.15 | 635.42 | 74.10                 | 88.01 | 101.21 | 124.87 |
| C | Calaveras (MC) | Summer | 2013 | 372.63             | 428.25 | 507.10 | 636.56 | 73.93                 | 87.36 | 101.13 | 125.10 |
| C | Calaveras (MC) | Summer | 2014 | 372.82             | 428.79 | 507.12 | 637.70 | 73.74                 | 86.82 | 101.00 | 125.34 |
| C | Calaveras (MC) | Summer | 2015 | 373.03             | 429.26 | 507.15 | 638.94 | 73.70                 | 86.38 | 100.93 | 125.59 |
| C | Calaveras (MC) | Summer | 2016 | 373.20             | 429.64 | 507.18 | 640.12 | 73.69                 | 86.07 | 100.88 | 125.88 |
| C | Calaveras (MC) | Summer | 2017 | 373.29             | 429.96 | 507.18 | 641.21 | 73.61                 | 85.70 | 100.81 | 126.15 |
| C | Calaveras (MC) | Summer | 2018 | 373.31             | 430.20 | 507.15 | 642.13 | 73.51                 | 85.38 | 100.75 | 126.42 |
| C | Calaveras (MC) | Summer | 2019 | 373.34             | 430.44 | 507.12 | 642.91 | 73.48                 | 85.28 | 100.71 | 126.69 |
| C | Calaveras (MC) | Summer | 2020 | 373.36             | 430.67 | 507.07 | 643.60 | 73.55                 | 85.28 | 100.76 | 126.92 |
| C | Calaveras (MC) | Summer | 2021 | 373.33             | 430.84 | 507.00 | 644.13 | 73.59                 | 85.33 | 100.81 | 127.08 |
| C | Calaveras (MC) | Summer | 2022 | 373.30             | 431.01 | 506.94 | 644.57 | 73.61                 | 85.38 | 100.85 | 127.26 |
| C | Calaveras (MC) | Summer | 2023 | 373.24             | 431.15 | 506.88 | 644.89 | 73.61                 | 85.43 | 100.87 | 127.44 |
| C | Calaveras (MC) | Summer | 2024 | 373.18             | 431.27 | 506.81 | 645.12 | 73.58                 | 85.45 | 100.89 | 127.61 |
| C | Calaveras (MC) | Summer | 2025 | 373.16             | 431.40 | 506.76 | 645.32 | 73.59                 | 85.52 | 100.92 | 127.77 |
| C | Calaveras (MC) | Summer | 2026 | 373.18             | 431.61 | 506.71 | 645.52 | 73.61                 | 85.62 | 100.94 | 127.93 |
| C | Calaveras (MC) | Summer | 2027 | 373.19             | 431.81 | 506.66 | 645.72 | 73.62                 | 85.70 | 100.96 | 128.08 |
| C | Calaveras (MC) | Summer | 2028 | 373.20             | 432.01 | 506.63 | 645.94 | 73.63                 | 85.78 | 100.97 | 128.21 |
| C | Calaveras (MC) | Summer | 2029 | 373.21             | 432.20 | 506.60 | 646.17 | 73.64                 | 85.86 | 100.97 | 128.34 |
| C | Calaveras (MC) | Summer | 2030 | 373.22             | 432.39 | 506.57 | 646.41 | 73.64                 | 85.93 | 100.97 | 128.46 |
| C | Calaveras (MC) | Summer | 2031 | 373.22             | 432.56 | 506.56 | 646.71 | 73.65                 | 86.00 | 100.98 | 128.58 |
| C | Calaveras (MC) | Summer | 2032 | 373.21             | 432.71 | 506.56 | 646.99 | 73.65                 | 86.06 | 100.98 | 128.70 |
| C | Calaveras (MC) | Summer | 2033 | 373.21             | 432.83 | 506.55 | 647.26 | 73.65                 | 86.12 | 100.98 | 128.81 |
| C | Calaveras (MC) | Summer | 2034 | 373.20             | 432.93 | 506.54 | 647.51 | 73.66                 | 86.17 | 100.99 | 128.90 |
| C | Calaveras (MC) | Summer | 2035 | 373.19             | 433.00 | 506.53 | 647.73 | 73.66                 | 86.21 | 100.99 | 128.99 |
| C | Calaveras (MC) | Winter | 2010 | 329.78             | 383.93 | 452.30 | 565.59 | 74.52                 | 89.63 | 101.49 | 124.52 |
| C | Calaveras (MC) | Winter | 2011 | 329.72             | 383.73 | 451.75 | 566.21 | 74.31                 | 88.76 | 101.30 | 124.68 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Calaveras (MC) | Winter | 2012 | 329.69             | 383.57 | 451.31 | 566.92 | 74.10                 | 88.01 | 101.21 | 124.87 |
| C | Calaveras (MC) | Winter | 2013 | 329.72             | 383.42 | 450.96 | 567.68 | 73.93                 | 87.36 | 101.13 | 125.10 |
| C | Calaveras (MC) | Winter | 2014 | 329.75             | 383.31 | 450.67 | 568.42 | 73.74                 | 86.82 | 101.00 | 125.34 |
| C | Calaveras (MC) | Winter | 2015 | 329.84             | 383.25 | 450.44 | 569.19 | 73.70                 | 86.38 | 100.93 | 125.59 |
| C | Calaveras (MC) | Winter | 2016 | 329.93             | 383.24 | 450.25 | 569.90 | 73.69                 | 86.07 | 100.88 | 125.88 |
| C | Calaveras (MC) | Winter | 2017 | 329.98             | 383.20 | 450.09 | 570.59 | 73.61                 | 85.70 | 100.81 | 126.15 |
| C | Calaveras (MC) | Winter | 2018 | 329.99             | 383.15 | 449.97 | 571.17 | 73.51                 | 85.38 | 100.75 | 126.42 |
| C | Calaveras (MC) | Winter | 2019 | 330.02             | 383.18 | 449.87 | 571.67 | 73.48                 | 85.28 | 100.71 | 126.69 |
| C | Calaveras (MC) | Winter | 2020 | 330.05             | 383.22 | 449.80 | 572.12 | 73.55                 | 85.28 | 100.76 | 126.92 |
| C | Calaveras (MC) | Winter | 2021 | 330.04             | 383.24 | 449.72 | 572.43 | 73.59                 | 85.33 | 100.81 | 127.08 |
| C | Calaveras (MC) | Winter | 2022 | 330.01             | 383.24 | 449.64 | 572.72 | 73.61                 | 85.38 | 100.85 | 127.26 |
| C | Calaveras (MC) | Winter | 2023 | 329.94             | 383.24 | 449.56 | 572.90 | 73.61                 | 85.43 | 100.87 | 127.44 |
| C | Calaveras (MC) | Winter | 2024 | 329.85             | 383.19 | 449.49 | 573.05 | 73.58                 | 85.45 | 100.89 | 127.61 |
| C | Calaveras (MC) | Winter | 2025 | 329.83             | 383.23 | 449.45 | 573.20 | 73.59                 | 85.52 | 100.92 | 127.77 |
| C | Calaveras (MC) | Winter | 2026 | 329.84             | 383.34 | 449.40 | 573.38 | 73.61                 | 85.62 | 100.94 | 127.93 |
| C | Calaveras (MC) | Winter | 2027 | 329.84             | 383.44 | 449.34 | 573.56 | 73.62                 | 85.70 | 100.96 | 128.08 |
| C | Calaveras (MC) | Winter | 2028 | 329.83             | 383.54 | 449.30 | 573.75 | 73.63                 | 85.78 | 100.97 | 128.21 |
| C | Calaveras (MC) | Winter | 2029 | 329.82             | 383.64 | 449.25 | 573.93 | 73.64                 | 85.86 | 100.97 | 128.34 |
| C | Calaveras (MC) | Winter | 2030 | 329.81             | 383.74 | 449.19 | 574.11 | 73.64                 | 85.93 | 100.97 | 128.46 |
| C | Calaveras (MC) | Winter | 2031 | 329.80             | 383.84 | 449.17 | 574.32 | 73.65                 | 86.00 | 100.98 | 128.58 |
| C | Calaveras (MC) | Winter | 2032 | 329.80             | 383.93 | 449.14 | 574.54 | 73.65                 | 86.06 | 100.98 | 128.70 |
| C | Calaveras (MC) | Winter | 2033 | 329.80             | 384.01 | 449.12 | 574.73 | 73.65                 | 86.12 | 100.98 | 128.81 |
| C | Calaveras (MC) | Winter | 2034 | 329.80             | 384.08 | 449.11 | 574.89 | 73.66                 | 86.17 | 100.99 | 128.90 |
| C | Calaveras (MC) | Winter | 2035 | 329.79             | 384.14 | 449.09 | 575.04 | 73.66                 | 86.21 | 100.99 | 128.99 |
| C | Colusa (SV)    | Annual | 2010 | 336.15             | 393.71 | 462.59 | 577.05 | 73.02                 | 94.44 | 100.85 | 124.61 |
| C | Colusa (SV)    | Annual | 2011 | 336.30             | 393.20 | 461.94 | 577.64 | 73.01                 | 92.76 | 100.79 | 124.78 |
| C | Colusa (SV)    | Annual | 2012 | 336.46             | 392.86 | 461.43 | 578.32 | 73.01                 | 91.49 | 100.76 | 124.99 |
| C | Colusa (SV)    | Annual | 2013 | 336.61             | 392.53 | 461.04 | 579.07 | 73.01                 | 90.33 | 100.78 | 125.24 |
| C | Colusa (SV)    | Annual | 2014 | 336.76             | 392.14 | 460.74 | 579.85 | 73.01                 | 89.10 | 100.78 | 125.48 |
| C | Colusa (SV)    | Annual | 2015 | 336.94             | 391.90 | 460.48 | 580.66 | 73.07                 | 88.20 | 100.70 | 125.75 |
| C | Colusa (SV)    | Annual | 2016 | 337.08             | 391.55 | 460.28 | 581.44 | 73.11                 | 87.13 | 100.69 | 126.03 |
| C | Colusa (SV)    | Annual | 2017 | 337.18             | 391.40 | 460.11 | 582.19 | 73.11                 | 86.50 | 100.69 | 126.31 |
| C | Colusa (SV)    | Annual | 2018 | 337.27             | 391.20 | 459.97 | 582.84 | 73.14                 | 85.83 | 100.67 | 126.58 |
| C | Colusa (SV)    | Annual | 2019 | 337.32             | 391.11 | 459.85 | 583.42 | 73.14                 | 85.43 | 100.69 | 126.82 |
| C | Colusa (SV)    | Annual | 2020 | 337.37             | 391.06 | 459.75 | 583.92 | 73.23                 | 85.29 | 100.77 | 127.05 |
| C | Colusa (SV)    | Annual | 2021 | 337.43             | 391.13 | 459.66 | 584.31 | 73.30                 | 85.37 | 100.83 | 127.21 |
| C | Colusa (SV)    | Annual | 2022 | 337.40             | 391.19 | 459.57 | 584.63 | 73.33                 | 85.43 | 100.88 | 127.34 |
| C | Colusa (SV)    | Annual | 2023 | 337.39             | 391.29 | 459.49 | 584.89 | 73.36                 | 85.52 | 100.91 | 127.52 |
| C | Colusa (SV)    | Annual | 2024 | 337.37             | 391.34 | 459.41 | 585.10 | 73.37                 | 85.59 | 100.94 | 127.69 |
| C | Colusa (SV)    | Annual | 2025 | 337.36             | 391.40 | 459.36 | 585.31 | 73.39                 | 85.65 | 100.97 | 127.86 |
| C | Colusa (SV)    | Annual | 2026 | 337.37             | 391.51 | 459.27 | 585.53 | 73.41                 | 85.73 | 100.99 | 128.02 |
| C | Colusa (SV)    | Annual | 2027 | 337.38             | 391.61 | 459.21 | 585.75 | 73.42                 | 85.79 | 101.00 | 128.16 |
| C | Colusa (SV)    | Annual | 2028 | 337.39             | 391.73 | 459.15 | 585.97 | 73.43                 | 85.86 | 101.01 | 128.30 |
| C | Colusa (SV)    | Annual | 2029 | 337.40             | 391.84 | 459.07 | 586.18 | 73.44                 | 85.92 | 101.01 | 128.42 |
| C | Colusa (SV)    | Annual | 2030 | 337.38             | 391.95 | 458.99 | 586.40 | 73.44                 | 85.97 | 101.00 | 128.54 |
| C | Colusa (SV)    | Annual | 2031 | 337.38             | 392.05 | 458.95 | 586.61 | 73.45                 | 86.03 | 101.00 | 128.66 |
| C | Colusa (SV)    | Annual | 2032 | 337.38             | 392.15 | 458.92 | 586.83 | 73.45                 | 86.08 | 101.00 | 128.77 |
| C | Colusa (SV)    | Annual | 2033 | 337.38             | 392.24 | 458.89 | 587.03 | 73.46                 | 86.13 | 101.01 | 128.87 |
| C | Colusa (SV)    | Annual | 2034 | 337.37             | 392.31 | 458.85 | 587.21 | 73.46                 | 86.17 | 101.01 | 128.96 |
| C | Colusa (SV)    | Annual | 2035 | 337.36             | 392.37 | 458.83 | 587.37 | 73.47                 | 86.21 | 101.01 | 129.05 |
| C | Colusa (SV)    | Summer | 2010 | 369.11             | 427.03 | 505.43 | 632.25 | 73.02                 | 94.44 | 100.85 | 124.61 |
| C | Colusa (SV)    | Summer | 2011 | 369.53             | 427.36 | 505.34 | 632.77 | 73.01                 | 92.76 | 100.79 | 124.78 |
| C | Colusa (SV)    | Summer | 2012 | 369.90             | 427.67 | 505.27 | 633.46 | 73.01                 | 91.49 | 100.76 | 124.99 |
| C | Colusa (SV)    | Summer | 2013 | 370.21             | 427.88 | 505.20 | 634.32 | 73.01                 | 90.33 | 100.78 | 125.24 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location          | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Colusa (SV)       | Summer | 2014 | 370.47             | 427.99 | 505.17 | 635.26 | 73.01                 | 89.10 | 100.78 | 125.48 |
| C | Colusa (SV)       | Summer | 2015 | 370.74             | 428.12 | 505.15 | 636.30 | 73.07                 | 88.20 | 100.70 | 125.75 |
| C | Colusa (SV)       | Summer | 2016 | 370.94             | 428.19 | 505.10 | 637.33 | 73.11                 | 87.13 | 100.69 | 126.03 |
| C | Colusa (SV)       | Summer | 2017 | 371.07             | 428.29 | 505.00 | 638.32 | 73.11                 | 86.50 | 100.69 | 126.31 |
| C | Colusa (SV)       | Summer | 2018 | 371.17             | 428.34 | 504.89 | 639.18 | 73.14                 | 85.83 | 100.67 | 126.58 |
| C | Colusa (SV)       | Summer | 2019 | 371.22             | 428.46 | 504.77 | 639.93 | 73.14                 | 85.43 | 100.69 | 126.82 |
| C | Colusa (SV)       | Summer | 2020 | 371.26             | 428.58 | 504.65 | 640.57 | 73.23                 | 85.29 | 100.77 | 127.05 |
| C | Colusa (SV)       | Summer | 2021 | 371.31             | 428.73 | 504.55 | 641.07 | 73.30                 | 85.37 | 100.83 | 127.21 |
| C | Colusa (SV)       | Summer | 2022 | 371.28             | 428.87 | 504.46 | 641.49 | 73.33                 | 85.43 | 100.88 | 127.34 |
| C | Colusa (SV)       | Summer | 2023 | 371.27             | 429.02 | 504.39 | 641.81 | 73.36                 | 85.52 | 100.91 | 127.52 |
| C | Colusa (SV)       | Summer | 2024 | 371.27             | 429.15 | 504.32 | 642.06 | 73.37                 | 85.59 | 100.94 | 127.69 |
| C | Colusa (SV)       | Summer | 2025 | 371.27             | 429.27 | 504.27 | 642.28 | 73.39                 | 85.65 | 100.97 | 127.86 |
| C | Colusa (SV)       | Summer | 2026 | 371.29             | 429.45 | 504.21 | 642.53 | 73.41                 | 85.73 | 100.99 | 128.02 |
| C | Colusa (SV)       | Summer | 2027 | 371.32             | 429.59 | 504.17 | 642.78 | 73.42                 | 85.79 | 101.00 | 128.16 |
| C | Colusa (SV)       | Summer | 2028 | 371.34             | 429.79 | 504.14 | 643.02 | 73.43                 | 85.86 | 101.01 | 128.30 |
| C | Colusa (SV)       | Summer | 2029 | 371.35             | 429.96 | 504.09 | 643.27 | 73.44                 | 85.92 | 101.01 | 128.42 |
| C | Colusa (SV)       | Summer | 2030 | 371.36             | 430.13 | 504.04 | 643.51 | 73.44                 | 85.97 | 101.00 | 128.54 |
| C | Colusa (SV)       | Summer | 2031 | 371.36             | 430.29 | 504.05 | 643.74 | 73.45                 | 86.03 | 101.00 | 128.66 |
| C | Colusa (SV)       | Summer | 2032 | 371.36             | 430.43 | 504.04 | 643.98 | 73.45                 | 86.08 | 101.00 | 128.77 |
| C | Colusa (SV)       | Summer | 2033 | 371.36             | 430.55 | 504.04 | 644.21 | 73.46                 | 86.13 | 101.01 | 128.87 |
| C | Colusa (SV)       | Summer | 2034 | 371.36             | 430.64 | 504.02 | 644.42 | 73.46                 | 86.17 | 101.01 | 128.96 |
| C | Colusa (SV)       | Summer | 2035 | 371.35             | 430.71 | 504.00 | 644.62 | 73.47                 | 86.21 | 101.01 | 129.05 |
| C | Colusa (SV)       | Winter | 2010 | 325.06             | 382.50 | 448.17 | 558.47 | 73.02                 | 94.44 | 100.85 | 124.61 |
| C | Colusa (SV)       | Winter | 2011 | 325.11             | 381.70 | 447.33 | 559.09 | 73.01                 | 92.76 | 100.79 | 124.78 |
| C | Colusa (SV)       | Winter | 2012 | 325.20             | 381.15 | 446.68 | 559.76 | 73.01                 | 91.49 | 100.76 | 124.99 |
| C | Colusa (SV)       | Winter | 2013 | 325.30             | 380.64 | 446.18 | 560.48 | 73.01                 | 90.33 | 100.78 | 125.24 |
| C | Colusa (SV)       | Winter | 2014 | 325.41             | 380.08 | 445.78 | 561.20 | 73.01                 | 89.10 | 100.78 | 125.48 |
| C | Colusa (SV)       | Winter | 2015 | 325.57             | 379.70 | 445.45 | 561.93 | 73.07                 | 88.20 | 100.70 | 125.75 |
| C | Colusa (SV)       | Winter | 2016 | 325.69             | 379.22 | 445.20 | 562.63 | 73.11                 | 87.13 | 100.69 | 126.03 |
| C | Colusa (SV)       | Winter | 2017 | 325.77             | 378.98 | 445.00 | 563.29 | 73.11                 | 86.50 | 100.69 | 126.31 |
| C | Colusa (SV)       | Winter | 2018 | 325.86             | 378.69 | 444.85 | 563.88 | 73.14                 | 85.83 | 100.67 | 126.58 |
| C | Colusa (SV)       | Winter | 2019 | 325.91             | 378.54 | 444.73 | 564.40 | 73.14                 | 85.43 | 100.69 | 126.82 |
| C | Colusa (SV)       | Winter | 2020 | 325.96             | 378.43 | 444.64 | 564.86 | 73.23                 | 85.29 | 100.77 | 127.05 |
| C | Colusa (SV)       | Winter | 2021 | 326.03             | 378.48 | 444.56 | 565.20 | 73.30                 | 85.37 | 100.83 | 127.21 |
| C | Colusa (SV)       | Winter | 2022 | 326.00             | 378.50 | 444.46 | 565.49 | 73.33                 | 85.43 | 100.88 | 127.34 |
| C | Colusa (SV)       | Winter | 2023 | 325.99             | 378.59 | 444.38 | 565.73 | 73.36                 | 85.52 | 100.91 | 127.52 |
| C | Colusa (SV)       | Winter | 2024 | 325.96             | 378.62 | 444.30 | 565.93 | 73.37                 | 85.59 | 100.94 | 127.69 |
| C | Colusa (SV)       | Winter | 2025 | 325.94             | 378.65 | 444.24 | 566.14 | 73.39                 | 85.65 | 100.97 | 127.86 |
| C | Colusa (SV)       | Winter | 2026 | 325.95             | 378.74 | 444.15 | 566.35 | 73.41                 | 85.73 | 100.99 | 128.02 |
| C | Colusa (SV)       | Winter | 2027 | 325.96             | 378.83 | 444.08 | 566.56 | 73.42                 | 85.79 | 101.00 | 128.16 |
| C | Colusa (SV)       | Winter | 2028 | 325.96             | 378.92 | 444.01 | 566.77 | 73.43                 | 85.86 | 101.01 | 128.30 |
| C | Colusa (SV)       | Winter | 2029 | 325.97             | 379.01 | 443.92 | 566.97 | 73.44                 | 85.92 | 101.01 | 128.42 |
| C | Colusa (SV)       | Winter | 2030 | 325.95             | 379.10 | 443.83 | 567.18 | 73.44                 | 85.97 | 101.00 | 128.54 |
| C | Colusa (SV)       | Winter | 2031 | 325.95             | 379.18 | 443.78 | 567.38 | 73.45                 | 86.03 | 101.00 | 128.66 |
| C | Colusa (SV)       | Winter | 2032 | 325.95             | 379.27 | 443.73 | 567.59 | 73.45                 | 86.08 | 101.00 | 128.77 |
| C | Colusa (SV)       | Winter | 2033 | 325.94             | 379.34 | 443.70 | 567.78 | 73.46                 | 86.13 | 101.01 | 128.87 |
| C | Colusa (SV)       | Winter | 2034 | 325.93             | 379.41 | 443.65 | 567.95 | 73.46                 | 86.17 | 101.01 | 128.96 |
| C | Colusa (SV)       | Winter | 2035 | 325.92             | 379.46 | 443.62 | 568.10 | 73.47                 | 86.21 | 101.01 | 129.05 |
| C | Contra Costa (SF) | Annual | 2010 | 337.72             | 388.00 | 461.97 | 582.83 | 73.09                 | 84.25 | 99.46  | 124.66 |
| C | Contra Costa (SF) | Annual | 2011 | 337.88             | 388.46 | 461.87 | 583.33 | 73.11                 | 84.14 | 99.56  | 124.86 |
| C | Contra Costa (SF) | Annual | 2012 | 338.04             | 388.95 | 461.80 | 583.91 | 73.13                 | 84.12 | 99.66  | 125.09 |
| C | Contra Costa (SF) | Annual | 2013 | 338.24             | 389.39 | 461.74 | 584.52 | 73.18                 | 84.12 | 99.78  | 125.33 |
| C | Contra Costa (SF) | Annual | 2014 | 338.41             | 389.81 | 461.71 | 585.13 | 73.21                 | 84.13 | 99.88  | 125.58 |
| C | Contra Costa (SF) | Annual | 2015 | 338.60             | 390.21 | 461.69 | 585.76 | 73.27                 | 84.16 | 99.98  | 125.84 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location          | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                   |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Contra Costa (SF) | Annual | 2016 | 338.79              | 390.60 | 461.68 | 586.37 | 73.35                 | 84.23 | 100.09 | 126.11 |
| C | Contra Costa (SF) | Annual | 2017 | 338.93              | 390.94 | 461.67 | 586.95 | 73.40                 | 84.27 | 100.17 | 126.37 |
| C | Contra Costa (SF) | Annual | 2018 | 339.06              | 391.27 | 461.66 | 587.46 | 73.45                 | 84.35 | 100.26 | 126.62 |
| C | Contra Costa (SF) | Annual | 2019 | 339.18              | 391.60 | 461.67 | 587.90 | 73.51                 | 84.48 | 100.35 | 126.86 |
| C | Contra Costa (SF) | Annual | 2020 | 339.28              | 391.89 | 461.67 | 588.30 | 73.61                 | 84.63 | 100.45 | 127.08 |
| C | Contra Costa (SF) | Annual | 2021 | 339.36              | 392.15 | 461.67 | 588.63 | 73.69                 | 84.80 | 100.54 | 127.27 |
| C | Contra Costa (SF) | Annual | 2022 | 339.41              | 392.38 | 461.67 | 588.91 | 73.75                 | 84.95 | 100.62 | 127.42 |
| C | Contra Costa (SF) | Annual | 2023 | 339.42              | 392.56 | 461.66 | 589.13 | 73.79                 | 85.08 | 100.69 | 127.59 |
| C | Contra Costa (SF) | Annual | 2024 | 339.40              | 392.71 | 461.65 | 589.30 | 73.81                 | 85.19 | 100.75 | 127.75 |
| C | Contra Costa (SF) | Annual | 2025 | 339.41              | 392.84 | 461.65 | 589.47 | 73.84                 | 85.30 | 100.80 | 127.91 |
| C | Contra Costa (SF) | Annual | 2026 | 339.43              | 393.00 | 461.64 | 589.64 | 73.86                 | 85.40 | 100.84 | 128.05 |
| C | Contra Costa (SF) | Annual | 2027 | 339.44              | 393.15 | 461.62 | 589.81 | 73.88                 | 85.49 | 100.87 | 128.18 |
| C | Contra Costa (SF) | Annual | 2028 | 339.44              | 393.31 | 461.61 | 589.98 | 73.89                 | 85.58 | 100.89 | 128.30 |
| C | Contra Costa (SF) | Annual | 2029 | 339.44              | 393.47 | 461.59 | 590.14 | 73.90                 | 85.66 | 100.91 | 128.41 |
| C | Contra Costa (SF) | Annual | 2030 | 339.44              | 393.63 | 461.58 | 590.31 | 73.90                 | 85.74 | 100.92 | 128.52 |
| C | Contra Costa (SF) | Annual | 2031 | 339.44              | 393.80 | 461.57 | 590.49 | 73.91                 | 85.82 | 100.93 | 128.62 |
| C | Contra Costa (SF) | Annual | 2032 | 339.44              | 393.97 | 461.56 | 590.67 | 73.91                 | 85.89 | 100.94 | 128.72 |
| C | Contra Costa (SF) | Annual | 2033 | 339.44              | 394.11 | 461.55 | 590.84 | 73.92                 | 85.96 | 100.95 | 128.82 |
| C | Contra Costa (SF) | Annual | 2034 | 339.43              | 394.24 | 461.54 | 590.99 | 73.92                 | 86.02 | 100.96 | 128.90 |
| C | Contra Costa (SF) | Annual | 2035 | 339.43              | 394.36 | 461.53 | 591.12 | 73.92                 | 86.08 | 100.96 | 128.98 |
| C | Contra Costa (SF) | Summer | 2010 | 368.96              | 420.20 | 503.53 | 635.26 | 73.09                 | 84.25 | 99.46  | 124.66 |
| C | Contra Costa (SF) | Summer | 2011 | 369.30              | 421.14 | 503.46 | 635.62 | 73.11                 | 84.14 | 99.56  | 124.86 |
| C | Contra Costa (SF) | Summer | 2012 | 369.63              | 422.03 | 503.44 | 636.15 | 73.13                 | 84.12 | 99.66  | 125.09 |
| C | Contra Costa (SF) | Summer | 2013 | 369.95              | 422.81 | 503.47 | 636.80 | 73.18                 | 84.12 | 99.78  | 125.33 |
| C | Contra Costa (SF) | Summer | 2014 | 370.23              | 423.51 | 503.55 | 637.51 | 73.21                 | 84.13 | 99.88  | 125.58 |
| C | Contra Costa (SF) | Summer | 2015 | 370.49              | 424.14 | 503.64 | 638.30 | 73.27                 | 84.16 | 99.98  | 125.84 |
| C | Contra Costa (SF) | Summer | 2016 | 370.73              | 424.73 | 503.73 | 639.09 | 73.35                 | 84.23 | 100.09 | 126.11 |
| C | Contra Costa (SF) | Summer | 2017 | 370.91              | 425.27 | 503.81 | 639.85 | 73.40                 | 84.27 | 100.17 | 126.37 |
| C | Contra Costa (SF) | Summer | 2018 | 371.04              | 425.77 | 503.86 | 640.51 | 73.45                 | 84.35 | 100.26 | 126.62 |
| C | Contra Costa (SF) | Summer | 2019 | 371.16              | 426.23 | 503.89 | 641.07 | 73.51                 | 84.48 | 100.35 | 126.86 |
| C | Contra Costa (SF) | Summer | 2020 | 371.26              | 426.65 | 503.90 | 641.58 | 73.61                 | 84.63 | 100.45 | 127.08 |
| C | Contra Costa (SF) | Summer | 2021 | 371.34              | 427.00 | 503.90 | 641.99 | 73.69                 | 84.80 | 100.54 | 127.27 |
| C | Contra Costa (SF) | Summer | 2022 | 371.39              | 427.32 | 503.89 | 642.34 | 73.75                 | 84.95 | 100.62 | 127.42 |
| C | Contra Costa (SF) | Summer | 2023 | 371.40              | 427.58 | 503.87 | 642.59 | 73.79                 | 85.08 | 100.69 | 127.59 |
| C | Contra Costa (SF) | Summer | 2024 | 371.39              | 427.81 | 503.84 | 642.79 | 73.81                 | 85.19 | 100.75 | 127.75 |
| C | Contra Costa (SF) | Summer | 2025 | 371.39              | 428.02 | 503.82 | 642.98 | 73.84                 | 85.30 | 100.80 | 127.91 |
| C | Contra Costa (SF) | Summer | 2026 | 371.41              | 428.24 | 503.80 | 643.16 | 73.86                 | 85.40 | 100.84 | 128.05 |
| C | Contra Costa (SF) | Summer | 2027 | 371.43              | 428.46 | 503.77 | 643.33 | 73.88                 | 85.49 | 100.87 | 128.18 |
| C | Contra Costa (SF) | Summer | 2028 | 371.44              | 428.69 | 503.76 | 643.49 | 73.89                 | 85.58 | 100.89 | 128.30 |
| C | Contra Costa (SF) | Summer | 2029 | 371.45              | 428.93 | 503.74 | 643.66 | 73.90                 | 85.66 | 100.91 | 128.41 |
| C | Contra Costa (SF) | Summer | 2030 | 371.45              | 429.16 | 503.72 | 643.84 | 73.90                 | 85.74 | 100.92 | 128.52 |
| C | Contra Costa (SF) | Summer | 2031 | 371.45              | 429.42 | 503.71 | 644.04 | 73.91                 | 85.82 | 100.93 | 128.62 |
| C | Contra Costa (SF) | Summer | 2032 | 371.46              | 429.64 | 503.71 | 644.25 | 73.91                 | 85.89 | 100.94 | 128.72 |
| C | Contra Costa (SF) | Summer | 2033 | 371.46              | 429.83 | 503.70 | 644.45 | 73.92                 | 85.96 | 100.95 | 128.82 |
| C | Contra Costa (SF) | Summer | 2034 | 371.46              | 430.01 | 503.69 | 644.64 | 73.92                 | 86.02 | 100.96 | 128.90 |
| C | Contra Costa (SF) | Summer | 2035 | 371.46              | 430.14 | 503.69 | 644.81 | 73.92                 | 86.08 | 100.96 | 128.98 |
| C | Contra Costa (SF) | Winter | 2010 | 333.44              | 383.59 | 456.28 | 575.64 | 73.09                 | 84.25 | 99.46  | 124.66 |
| C | Contra Costa (SF) | Winter | 2011 | 333.57              | 383.99 | 456.17 | 576.17 | 73.11                 | 84.14 | 99.56  | 124.86 |
| C | Contra Costa (SF) | Winter | 2012 | 333.71              | 384.41 | 456.09 | 576.75 | 73.13                 | 84.12 | 99.66  | 125.09 |
| C | Contra Costa (SF) | Winter | 2013 | 333.89              | 384.81 | 456.03 | 577.35 | 73.18                 | 84.12 | 99.78  | 125.33 |
| C | Contra Costa (SF) | Winter | 2014 | 334.06              | 385.19 | 455.97 | 577.95 | 73.21                 | 84.13 | 99.88  | 125.58 |
| C | Contra Costa (SF) | Winter | 2015 | 334.23              | 385.56 | 455.94 | 578.56 | 73.27                 | 84.16 | 99.98  | 125.84 |
| C | Contra Costa (SF) | Winter | 2016 | 334.42              | 385.92 | 455.91 | 579.14 | 73.35                 | 84.23 | 100.09 | 126.11 |
| C | Contra Costa (SF) | Winter | 2017 | 334.55              | 386.24 | 455.89 | 579.70 | 73.40                 | 84.27 | 100.17 | 126.37 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location          | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Contra Costa (SF) | Winter | 2018 | 334.68             | 386.55 | 455.88 | 580.19 | 73.45                 | 84.35 | 100.26 | 126.62 |
| C | Contra Costa (SF) | Winter | 2019 | 334.80             | 386.85 | 455.88 | 580.61 | 73.51                 | 84.48 | 100.35 | 126.86 |
| C | Contra Costa (SF) | Winter | 2020 | 334.90             | 387.12 | 455.88 | 581.00 | 73.61                 | 84.63 | 100.45 | 127.08 |
| C | Contra Costa (SF) | Winter | 2021 | 334.98             | 387.38 | 455.89 | 581.32 | 73.69                 | 84.80 | 100.54 | 127.27 |
| C | Contra Costa (SF) | Winter | 2022 | 335.03             | 387.59 | 455.89 | 581.59 | 73.75                 | 84.95 | 100.62 | 127.42 |
| C | Contra Costa (SF) | Winter | 2023 | 335.04             | 387.76 | 455.88 | 581.80 | 73.79                 | 85.08 | 100.69 | 127.59 |
| C | Contra Costa (SF) | Winter | 2024 | 335.02             | 387.90 | 455.87 | 581.97 | 73.81                 | 85.19 | 100.75 | 127.75 |
| C | Contra Costa (SF) | Winter | 2025 | 335.02             | 388.02 | 455.87 | 582.14 | 73.84                 | 85.30 | 100.80 | 127.91 |
| C | Contra Costa (SF) | Winter | 2026 | 335.04             | 388.17 | 455.86 | 582.31 | 73.86                 | 85.40 | 100.84 | 128.05 |
| C | Contra Costa (SF) | Winter | 2027 | 335.06             | 388.31 | 455.85 | 582.48 | 73.88                 | 85.49 | 100.87 | 128.18 |
| C | Contra Costa (SF) | Winter | 2028 | 335.06             | 388.46 | 455.84 | 582.64 | 73.89                 | 85.58 | 100.89 | 128.30 |
| C | Contra Costa (SF) | Winter | 2029 | 335.06             | 388.61 | 455.82 | 582.81 | 73.90                 | 85.66 | 100.91 | 128.41 |
| C | Contra Costa (SF) | Winter | 2030 | 335.05             | 388.77 | 455.80 | 582.97 | 73.90                 | 85.74 | 100.92 | 128.52 |
| C | Contra Costa (SF) | Winter | 2031 | 335.05             | 388.93 | 455.80 | 583.15 | 73.91                 | 85.82 | 100.93 | 128.62 |
| C | Contra Costa (SF) | Winter | 2032 | 335.05             | 389.08 | 455.79 | 583.33 | 73.91                 | 85.89 | 100.94 | 128.72 |
| C | Contra Costa (SF) | Winter | 2033 | 335.05             | 389.22 | 455.78 | 583.49 | 73.92                 | 85.96 | 100.95 | 128.82 |
| C | Contra Costa (SF) | Winter | 2034 | 335.04             | 389.34 | 455.77 | 583.64 | 73.92                 | 86.02 | 100.96 | 128.90 |
| C | Contra Costa (SF) | Winter | 2035 | 335.04             | 389.45 | 455.76 | 583.77 | 73.92                 | 86.08 | 100.96 | 128.98 |
| C | Del Norte (NC)    | Annual | 2010 | 353.30             | 405.98 | 485.33 | 605.59 | 73.80                 | 85.57 | 100.54 | 124.43 |
| C | Del Norte (NC)    | Annual | 2011 | 353.26             | 406.47 | 484.59 | 606.29 | 73.68                 | 85.27 | 100.49 | 124.61 |
| C | Del Norte (NC)    | Annual | 2012 | 353.28             | 406.97 | 484.01 | 607.12 | 73.58                 | 85.14 | 100.48 | 124.82 |
| C | Del Norte (NC)    | Annual | 2013 | 353.37             | 407.31 | 483.54 | 607.97 | 73.54                 | 84.86 | 100.50 | 125.08 |
| C | Del Norte (NC)    | Annual | 2014 | 353.52             | 407.69 | 483.17 | 608.82 | 73.58                 | 84.78 | 100.50 | 125.32 |
| C | Del Norte (NC)    | Annual | 2015 | 353.58             | 408.04 | 482.87 | 609.68 | 73.49                 | 84.68 | 100.48 | 125.58 |
| C | Del Norte (NC)    | Annual | 2016 | 353.72             | 408.34 | 482.64 | 610.47 | 73.52                 | 84.60 | 100.54 | 125.88 |
| C | Del Norte (NC)    | Annual | 2017 | 353.79             | 408.62 | 482.46 | 611.23 | 73.50                 | 84.54 | 100.61 | 126.18 |
| C | Del Norte (NC)    | Annual | 2018 | 353.86             | 408.91 | 482.31 | 611.89 | 73.48                 | 84.59 | 100.64 | 126.45 |
| C | Del Norte (NC)    | Annual | 2019 | 353.93             | 409.17 | 482.19 | 612.44 | 73.50                 | 84.69 | 100.67 | 126.70 |
| C | Del Norte (NC)    | Annual | 2020 | 354.00             | 409.40 | 482.10 | 612.93 | 73.59                 | 84.81 | 100.74 | 126.94 |
| C | Del Norte (NC)    | Annual | 2021 | 354.01             | 409.58 | 482.02 | 613.29 | 73.64                 | 84.94 | 100.81 | 127.14 |
| C | Del Norte (NC)    | Annual | 2022 | 353.98             | 409.71 | 481.94 | 613.59 | 73.67                 | 85.06 | 100.86 | 127.30 |
| C | Del Norte (NC)    | Annual | 2023 | 353.92             | 409.83 | 481.85 | 613.81 | 73.68                 | 85.17 | 100.89 | 127.49 |
| C | Del Norte (NC)    | Annual | 2024 | 353.85             | 409.93 | 481.77 | 613.99 | 73.68                 | 85.27 | 100.92 | 127.66 |
| C | Del Norte (NC)    | Annual | 2025 | 353.80             | 410.06 | 481.71 | 614.17 | 73.69                 | 85.38 | 100.96 | 127.83 |
| C | Del Norte (NC)    | Annual | 2026 | 353.81             | 410.21 | 481.63 | 614.35 | 73.71                 | 85.49 | 100.97 | 127.98 |
| C | Del Norte (NC)    | Annual | 2027 | 353.82             | 410.35 | 481.57 | 614.55 | 73.72                 | 85.59 | 100.99 | 128.13 |
| C | Del Norte (NC)    | Annual | 2028 | 353.82             | 410.50 | 481.51 | 614.76 | 73.73                 | 85.68 | 101.00 | 128.27 |
| C | Del Norte (NC)    | Annual | 2029 | 353.81             | 410.65 | 481.44 | 614.96 | 73.74                 | 85.77 | 101.00 | 128.39 |
| C | Del Norte (NC)    | Annual | 2030 | 353.79             | 410.80 | 481.36 | 615.16 | 73.74                 | 85.86 | 101.00 | 128.51 |
| C | Del Norte (NC)    | Annual | 2031 | 353.79             | 410.94 | 481.32 | 615.37 | 73.75                 | 85.94 | 101.00 | 128.63 |
| C | Del Norte (NC)    | Annual | 2032 | 353.79             | 411.09 | 481.28 | 615.58 | 73.75                 | 86.02 | 101.01 | 128.74 |
| C | Del Norte (NC)    | Annual | 2033 | 353.78             | 411.21 | 481.24 | 615.77 | 73.76                 | 86.09 | 101.01 | 128.84 |
| C | Del Norte (NC)    | Annual | 2034 | 353.78             | 411.32 | 481.21 | 615.94 | 73.76                 | 86.15 | 101.01 | 128.93 |
| C | Del Norte (NC)    | Annual | 2035 | 353.77             | 411.41 | 481.19 | 616.08 | 73.77                 | 86.20 | 101.02 | 129.01 |
| C | Del Norte (NC)    | Summer | 2010 | 356.62             | 409.26 | 489.68 | 611.00 | 73.80                 | 85.57 | 100.54 | 124.43 |
| C | Del Norte (NC)    | Summer | 2011 | 356.62             | 409.85 | 488.99 | 611.70 | 73.68                 | 85.27 | 100.49 | 124.61 |
| C | Del Norte (NC)    | Summer | 2012 | 356.66             | 410.43 | 488.44 | 612.56 | 73.58                 | 85.14 | 100.48 | 124.82 |
| C | Del Norte (NC)    | Summer | 2013 | 356.78             | 410.84 | 488.01 | 613.44 | 73.54                 | 84.86 | 100.50 | 125.08 |
| C | Del Norte (NC)    | Summer | 2014 | 356.95             | 411.27 | 487.66 | 614.32 | 73.58                 | 84.78 | 100.50 | 125.32 |
| C | Del Norte (NC)    | Summer | 2015 | 357.01             | 411.66 | 487.38 | 615.22 | 73.49                 | 84.68 | 100.48 | 125.58 |
| C | Del Norte (NC)    | Summer | 2016 | 357.16             | 412.00 | 487.17 | 616.05 | 73.52                 | 84.60 | 100.54 | 125.88 |
| C | Del Norte (NC)    | Summer | 2017 | 357.24             | 412.31 | 487.00 | 616.84 | 73.50                 | 84.54 | 100.61 | 126.18 |
| C | Del Norte (NC)    | Summer | 2018 | 357.30             | 412.61 | 486.86 | 617.53 | 73.48                 | 84.59 | 100.64 | 126.45 |
| C | Del Norte (NC)    | Summer | 2019 | 357.37             | 412.90 | 486.74 | 618.11 | 73.50                 | 84.69 | 100.67 | 126.70 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Del Norte (NC) | Summer | 2020 | 357.44             | 413.14 | 486.65 | 618.61 | 73.59                 | 84.81 | 100.74 | 126.94 |
| C | Del Norte (NC) | Summer | 2021 | 357.45             | 413.33 | 486.57 | 618.99 | 73.64                 | 84.94 | 100.81 | 127.14 |
| C | Del Norte (NC) | Summer | 2022 | 357.42             | 413.48 | 486.48 | 619.30 | 73.67                 | 85.06 | 100.86 | 127.30 |
| C | Del Norte (NC) | Summer | 2023 | 357.36             | 413.62 | 486.39 | 619.53 | 73.68                 | 85.17 | 100.89 | 127.49 |
| C | Del Norte (NC) | Summer | 2024 | 357.29             | 413.72 | 486.32 | 619.72 | 73.68                 | 85.27 | 100.92 | 127.66 |
| C | Del Norte (NC) | Summer | 2025 | 357.24             | 413.86 | 486.26 | 619.90 | 73.69                 | 85.38 | 100.96 | 127.83 |
| C | Del Norte (NC) | Summer | 2026 | 357.26             | 414.02 | 486.18 | 620.09 | 73.71                 | 85.49 | 100.97 | 127.98 |
| C | Del Norte (NC) | Summer | 2027 | 357.26             | 414.18 | 486.12 | 620.29 | 73.72                 | 85.59 | 100.99 | 128.13 |
| C | Del Norte (NC) | Summer | 2028 | 357.27             | 414.33 | 486.06 | 620.50 | 73.73                 | 85.68 | 101.00 | 128.27 |
| C | Del Norte (NC) | Summer | 2029 | 357.26             | 414.49 | 485.99 | 620.71 | 73.74                 | 85.77 | 101.00 | 128.39 |
| C | Del Norte (NC) | Summer | 2030 | 357.24             | 414.65 | 485.91 | 620.91 | 73.74                 | 85.86 | 101.00 | 128.51 |
| C | Del Norte (NC) | Summer | 2031 | 357.24             | 414.80 | 485.87 | 621.13 | 73.75                 | 85.94 | 101.00 | 128.63 |
| C | Del Norte (NC) | Summer | 2032 | 357.24             | 414.95 | 485.84 | 621.34 | 73.75                 | 86.02 | 101.01 | 128.74 |
| C | Del Norte (NC) | Summer | 2033 | 357.23             | 415.08 | 485.80 | 621.53 | 73.76                 | 86.09 | 101.01 | 128.84 |
| C | Del Norte (NC) | Summer | 2034 | 357.23             | 415.20 | 485.78 | 621.71 | 73.76                 | 86.15 | 101.01 | 128.93 |
| C | Del Norte (NC) | Summer | 2035 | 357.22             | 415.29 | 485.75 | 621.85 | 73.77                 | 86.20 | 101.02 | 129.01 |
| C | Del Norte (NC) | Winter | 2010 | 351.96             | 404.67 | 483.59 | 603.42 | 73.80                 | 85.57 | 100.54 | 124.43 |
| C | Del Norte (NC) | Winter | 2011 | 351.91             | 405.12 | 482.83 | 604.11 | 73.68                 | 85.27 | 100.49 | 124.61 |
| C | Del Norte (NC) | Winter | 2012 | 351.92             | 405.58 | 482.23 | 604.93 | 73.58                 | 85.14 | 100.48 | 124.82 |
| C | Del Norte (NC) | Winter | 2013 | 352.00             | 405.90 | 481.75 | 605.77 | 73.54                 | 84.86 | 100.50 | 125.08 |
| C | Del Norte (NC) | Winter | 2014 | 352.15             | 406.26 | 481.37 | 606.61 | 73.58                 | 84.78 | 100.50 | 125.32 |
| C | Del Norte (NC) | Winter | 2015 | 352.20             | 406.58 | 481.06 | 607.45 | 73.49                 | 84.68 | 100.48 | 125.58 |
| C | Del Norte (NC) | Winter | 2016 | 352.34             | 406.87 | 480.82 | 608.23 | 73.52                 | 84.60 | 100.54 | 125.88 |
| C | Del Norte (NC) | Winter | 2017 | 352.41             | 407.14 | 480.64 | 608.97 | 73.50                 | 84.54 | 100.61 | 126.18 |
| C | Del Norte (NC) | Winter | 2018 | 352.47             | 407.42 | 480.49 | 609.63 | 73.48                 | 84.59 | 100.64 | 126.45 |
| C | Del Norte (NC) | Winter | 2019 | 352.55             | 407.68 | 480.37 | 610.17 | 73.50                 | 84.69 | 100.67 | 126.70 |
| C | Del Norte (NC) | Winter | 2020 | 352.62             | 407.90 | 480.28 | 610.65 | 73.59                 | 84.81 | 100.74 | 126.94 |
| C | Del Norte (NC) | Winter | 2021 | 352.63             | 408.07 | 480.20 | 611.00 | 73.64                 | 84.94 | 100.81 | 127.14 |
| C | Del Norte (NC) | Winter | 2022 | 352.60             | 408.20 | 480.11 | 611.29 | 73.67                 | 85.06 | 100.86 | 127.30 |
| C | Del Norte (NC) | Winter | 2023 | 352.53             | 408.31 | 480.02 | 611.52 | 73.68                 | 85.17 | 100.89 | 127.49 |
| C | Del Norte (NC) | Winter | 2024 | 352.46             | 408.40 | 479.94 | 611.69 | 73.68                 | 85.27 | 100.92 | 127.66 |
| C | Del Norte (NC) | Winter | 2025 | 352.42             | 408.53 | 479.89 | 611.86 | 73.69                 | 85.38 | 100.96 | 127.83 |
| C | Del Norte (NC) | Winter | 2026 | 352.43             | 408.68 | 479.81 | 612.05 | 73.71                 | 85.49 | 100.97 | 127.98 |
| C | Del Norte (NC) | Winter | 2027 | 352.43             | 408.82 | 479.75 | 612.25 | 73.72                 | 85.59 | 100.99 | 128.13 |
| C | Del Norte (NC) | Winter | 2028 | 352.44             | 408.96 | 479.68 | 612.45 | 73.73                 | 85.68 | 101.00 | 128.27 |
| C | Del Norte (NC) | Winter | 2029 | 352.43             | 409.11 | 479.61 | 612.65 | 73.74                 | 85.77 | 101.00 | 128.39 |
| C | Del Norte (NC) | Winter | 2030 | 352.41             | 409.25 | 479.53 | 612.85 | 73.74                 | 85.86 | 101.00 | 128.51 |
| C | Del Norte (NC) | Winter | 2031 | 352.41             | 409.39 | 479.49 | 613.06 | 73.75                 | 85.94 | 101.00 | 128.63 |
| C | Del Norte (NC) | Winter | 2032 | 352.40             | 409.53 | 479.45 | 613.27 | 73.75                 | 86.02 | 101.01 | 128.74 |
| C | Del Norte (NC) | Winter | 2033 | 352.40             | 409.66 | 479.41 | 613.45 | 73.76                 | 86.09 | 101.01 | 128.84 |
| C | Del Norte (NC) | Winter | 2034 | 352.39             | 409.77 | 479.38 | 613.62 | 73.76                 | 86.15 | 101.01 | 128.93 |
| C | Del Norte (NC) | Winter | 2035 | 352.38             | 409.86 | 479.36 | 613.76 | 73.77                 | 86.20 | 101.02 | 129.01 |
| C | El Dorado (LT) | Annual | 2010 | 363.47             | 420.59 | 499.06 | 619.88 | 74.08                 | 86.91 | 99.84  | 122.94 |
| C | El Dorado (LT) | Annual | 2011 | 363.51             | 420.75 | 498.59 | 620.83 | 73.91                 | 86.42 | 99.87  | 123.15 |
| C | El Dorado (LT) | Annual | 2012 | 363.61             | 420.94 | 498.22 | 621.97 | 73.79                 | 86.06 | 99.97  | 123.43 |
| C | El Dorado (LT) | Annual | 2013 | 363.76             | 421.15 | 497.91 | 623.17 | 73.76                 | 85.79 | 100.05 | 123.76 |
| C | El Dorado (LT) | Annual | 2014 | 363.85             | 421.29 | 497.66 | 624.33 | 73.56                 | 85.48 | 100.11 | 124.10 |
| C | El Dorado (LT) | Annual | 2015 | 363.99             | 421.51 | 497.47 | 625.56 | 73.53                 | 85.30 | 100.19 | 124.47 |
| C | El Dorado (LT) | Annual | 2016 | 364.13             | 421.67 | 497.31 | 626.72 | 73.54                 | 85.07 | 100.27 | 124.86 |
| C | El Dorado (LT) | Annual | 2017 | 364.23             | 421.87 | 497.19 | 627.80 | 73.55                 | 84.93 | 100.33 | 125.23 |
| C | El Dorado (LT) | Annual | 2018 | 364.27             | 422.03 | 497.10 | 628.75 | 73.43                 | 84.84 | 100.40 | 125.59 |
| C | El Dorado (LT) | Annual | 2019 | 364.31             | 422.23 | 497.04 | 629.59 | 73.36                 | 84.85 | 100.48 | 125.93 |
| C | El Dorado (LT) | Annual | 2020 | 364.34             | 422.39 | 496.99 | 630.30 | 73.43                 | 84.91 | 100.58 | 126.25 |
| C | El Dorado (LT) | Annual | 2021 | 364.31             | 422.53 | 496.95 | 630.87 | 73.45                 | 85.03 | 100.67 | 126.51 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | El Dorado (LT) | Annual | 2022 | 364.27             | 422.64 | 496.89 | 631.38 | 73.45                 | 85.13 | 100.74 | 126.75 |
| C | El Dorado (LT) | Annual | 2023 | 364.23             | 422.72 | 496.84 | 631.78 | 73.45                 | 85.22 | 100.79 | 127.00 |
| C | El Dorado (LT) | Annual | 2024 | 364.12             | 422.76 | 496.80 | 632.08 | 73.39                 | 85.30 | 100.84 | 127.22 |
| C | El Dorado (LT) | Annual | 2025 | 364.10             | 422.89 | 496.76 | 632.37 | 73.40                 | 85.40 | 100.89 | 127.42 |
| C | El Dorado (LT) | Annual | 2026 | 364.10             | 423.07 | 496.72 | 632.65 | 73.42                 | 85.51 | 100.92 | 127.61 |
| C | El Dorado (LT) | Annual | 2027 | 364.11             | 423.22 | 496.68 | 632.93 | 73.43                 | 85.61 | 100.94 | 127.79 |
| C | El Dorado (LT) | Annual | 2028 | 364.11             | 423.39 | 496.64 | 633.22 | 73.44                 | 85.71 | 100.96 | 127.95 |
| C | El Dorado (LT) | Annual | 2029 | 364.10             | 423.55 | 496.60 | 633.51 | 73.44                 | 85.80 | 100.98 | 128.11 |
| C | El Dorado (LT) | Annual | 2030 | 364.09             | 423.70 | 496.55 | 633.80 | 73.44                 | 85.88 | 100.98 | 128.26 |
| C | El Dorado (LT) | Annual | 2031 | 364.10             | 423.86 | 496.51 | 634.10 | 73.45                 | 85.96 | 100.99 | 128.40 |
| C | El Dorado (LT) | Annual | 2032 | 364.10             | 424.01 | 496.48 | 634.41 | 73.45                 | 86.03 | 101.00 | 128.54 |
| C | El Dorado (LT) | Annual | 2033 | 364.10             | 424.14 | 496.46 | 634.69 | 73.46                 | 86.10 | 101.00 | 128.66 |
| C | El Dorado (LT) | Annual | 2034 | 364.10             | 424.26 | 496.43 | 634.93 | 73.46                 | 86.16 | 101.01 | 128.78 |
| C | El Dorado (LT) | Annual | 2035 | 364.09             | 424.36 | 496.41 | 635.15 | 73.47                 | 86.21 | 101.01 | 128.88 |
| C | El Dorado (LT) | Summer | 2010 | 362.83             | 419.96 | 498.22 | 618.85 | 74.08                 | 86.91 | 99.84  | 122.94 |
| C | El Dorado (LT) | Summer | 2011 | 362.86             | 420.10 | 497.75 | 619.79 | 73.91                 | 86.42 | 99.87  | 123.15 |
| C | El Dorado (LT) | Summer | 2012 | 362.96             | 420.28 | 497.37 | 620.93 | 73.79                 | 86.06 | 99.97  | 123.43 |
| C | El Dorado (LT) | Summer | 2013 | 363.10             | 420.47 | 497.05 | 622.12 | 73.76                 | 85.79 | 100.05 | 123.76 |
| C | El Dorado (LT) | Summer | 2014 | 363.19             | 420.61 | 496.80 | 623.28 | 73.56                 | 85.48 | 100.11 | 124.10 |
| C | El Dorado (LT) | Summer | 2015 | 363.33             | 420.82 | 496.60 | 624.50 | 73.53                 | 85.30 | 100.19 | 124.47 |
| C | El Dorado (LT) | Summer | 2016 | 363.47             | 420.97 | 496.44 | 625.65 | 73.54                 | 85.07 | 100.27 | 124.86 |
| C | El Dorado (LT) | Summer | 2017 | 363.57             | 421.16 | 496.32 | 626.72 | 73.55                 | 84.93 | 100.33 | 125.23 |
| C | El Dorado (LT) | Summer | 2018 | 363.61             | 421.32 | 496.23 | 627.67 | 73.43                 | 84.84 | 100.40 | 125.59 |
| C | El Dorado (LT) | Summer | 2019 | 363.65             | 421.51 | 496.16 | 628.50 | 73.36                 | 84.85 | 100.48 | 125.93 |
| C | El Dorado (LT) | Summer | 2020 | 363.67             | 421.67 | 496.12 | 629.21 | 73.43                 | 84.91 | 100.58 | 126.25 |
| C | El Dorado (LT) | Summer | 2021 | 363.65             | 421.81 | 496.07 | 629.78 | 73.45                 | 85.03 | 100.67 | 126.51 |
| C | El Dorado (LT) | Summer | 2022 | 363.61             | 421.92 | 496.02 | 630.28 | 73.45                 | 85.13 | 100.74 | 126.75 |
| C | El Dorado (LT) | Summer | 2023 | 363.57             | 421.99 | 495.97 | 630.68 | 73.45                 | 85.22 | 100.79 | 127.00 |
| C | El Dorado (LT) | Summer | 2024 | 363.46             | 422.03 | 495.92 | 630.99 | 73.39                 | 85.30 | 100.84 | 127.22 |
| C | El Dorado (LT) | Summer | 2025 | 363.44             | 422.16 | 495.89 | 631.27 | 73.40                 | 85.40 | 100.89 | 127.42 |
| C | El Dorado (LT) | Summer | 2026 | 363.44             | 422.33 | 495.85 | 631.55 | 73.42                 | 85.51 | 100.92 | 127.61 |
| C | El Dorado (LT) | Summer | 2027 | 363.45             | 422.49 | 495.80 | 631.83 | 73.43                 | 85.61 | 100.94 | 127.79 |
| C | El Dorado (LT) | Summer | 2028 | 363.44             | 422.65 | 495.77 | 632.12 | 73.44                 | 85.71 | 100.96 | 127.95 |
| C | El Dorado (LT) | Summer | 2029 | 363.44             | 422.81 | 495.73 | 632.41 | 73.44                 | 85.80 | 100.98 | 128.11 |
| C | El Dorado (LT) | Summer | 2030 | 363.43             | 422.96 | 495.68 | 632.70 | 73.44                 | 85.88 | 100.98 | 128.26 |
| C | El Dorado (LT) | Summer | 2031 | 363.43             | 423.12 | 495.64 | 633.00 | 73.45                 | 85.96 | 100.99 | 128.40 |
| C | El Dorado (LT) | Summer | 2032 | 363.43             | 423.26 | 495.61 | 633.31 | 73.45                 | 86.03 | 101.00 | 128.54 |
| C | El Dorado (LT) | Summer | 2033 | 363.43             | 423.40 | 495.58 | 633.58 | 73.46                 | 86.10 | 101.00 | 128.66 |
| C | El Dorado (LT) | Summer | 2034 | 363.43             | 423.51 | 495.56 | 633.82 | 73.46                 | 86.16 | 101.01 | 128.78 |
| C | El Dorado (LT) | Summer | 2035 | 363.43             | 423.62 | 495.53 | 634.04 | 73.47                 | 86.21 | 101.01 | 128.88 |
| C | El Dorado (LT) | Winter | 2010 | 362.83             | 419.96 | 498.22 | 618.85 | 74.08                 | 86.91 | 99.84  | 122.94 |
| C | El Dorado (LT) | Winter | 2011 | 362.86             | 420.10 | 497.75 | 619.79 | 73.91                 | 86.42 | 99.87  | 123.15 |
| C | El Dorado (LT) | Winter | 2012 | 362.96             | 420.28 | 497.37 | 620.93 | 73.79                 | 86.06 | 99.97  | 123.43 |
| C | El Dorado (LT) | Winter | 2013 | 363.10             | 420.47 | 497.05 | 622.12 | 73.76                 | 85.79 | 100.05 | 123.76 |
| C | El Dorado (LT) | Winter | 2014 | 363.19             | 420.61 | 496.80 | 623.28 | 73.56                 | 85.48 | 100.11 | 124.10 |
| C | El Dorado (LT) | Winter | 2015 | 363.33             | 420.82 | 496.60 | 624.50 | 73.53                 | 85.30 | 100.19 | 124.47 |
| C | El Dorado (LT) | Winter | 2016 | 363.47             | 420.97 | 496.44 | 625.65 | 73.54                 | 85.07 | 100.27 | 124.86 |
| C | El Dorado (LT) | Winter | 2017 | 363.57             | 421.16 | 496.32 | 626.72 | 73.55                 | 84.93 | 100.33 | 125.23 |
| C | El Dorado (LT) | Winter | 2018 | 363.61             | 421.32 | 496.23 | 627.67 | 73.43                 | 84.84 | 100.40 | 125.59 |
| C | El Dorado (LT) | Winter | 2019 | 363.65             | 421.51 | 496.16 | 628.50 | 73.36                 | 84.85 | 100.48 | 125.93 |
| C | El Dorado (LT) | Winter | 2020 | 363.67             | 421.67 | 496.12 | 629.21 | 73.43                 | 84.91 | 100.58 | 126.25 |
| C | El Dorado (LT) | Winter | 2021 | 363.65             | 421.81 | 496.07 | 629.78 | 73.45                 | 85.03 | 100.67 | 126.51 |
| C | El Dorado (LT) | Winter | 2022 | 363.61             | 421.92 | 496.02 | 630.28 | 73.45                 | 85.13 | 100.74 | 126.75 |
| C | El Dorado (LT) | Winter | 2023 | 363.57             | 421.99 | 495.97 | 630.68 | 73.45                 | 85.22 | 100.79 | 127.00 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | El Dorado (LT) | Winter | 2024 | 363.46              | 422.03 | 495.92 | 630.99 | 73.39                 | 85.30 | 100.84 | 127.22 |
| C | El Dorado (LT) | Winter | 2025 | 363.44              | 422.16 | 495.89 | 631.27 | 73.40                 | 85.40 | 100.89 | 127.42 |
| C | El Dorado (LT) | Winter | 2026 | 363.44              | 422.33 | 495.85 | 631.55 | 73.42                 | 85.51 | 100.92 | 127.61 |
| C | El Dorado (LT) | Winter | 2027 | 363.45              | 422.49 | 495.80 | 631.83 | 73.43                 | 85.61 | 100.94 | 127.79 |
| C | El Dorado (LT) | Winter | 2028 | 363.44              | 422.65 | 495.77 | 632.12 | 73.44                 | 85.71 | 100.96 | 127.95 |
| C | El Dorado (LT) | Winter | 2029 | 363.44              | 422.81 | 495.73 | 632.41 | 73.44                 | 85.80 | 100.98 | 128.11 |
| C | El Dorado (LT) | Winter | 2030 | 363.43              | 422.96 | 495.68 | 632.70 | 73.44                 | 85.88 | 100.98 | 128.26 |
| C | El Dorado (LT) | Winter | 2031 | 363.43              | 423.12 | 495.64 | 633.00 | 73.45                 | 85.96 | 100.99 | 128.40 |
| C | El Dorado (LT) | Winter | 2032 | 363.43              | 423.26 | 495.61 | 633.31 | 73.45                 | 86.03 | 101.00 | 128.54 |
| C | El Dorado (LT) | Winter | 2033 | 363.43              | 423.40 | 495.58 | 633.58 | 73.46                 | 86.10 | 101.00 | 128.66 |
| C | El Dorado (LT) | Winter | 2034 | 363.43              | 423.51 | 495.56 | 633.82 | 73.46                 | 86.16 | 101.01 | 128.78 |
| C | El Dorado (LT) | Winter | 2035 | 363.43              | 423.62 | 495.53 | 634.04 | 73.47                 | 86.21 | 101.01 | 128.88 |
| C | El Dorado (MC) | Annual | 2010 | 341.76              | 395.46 | 468.95 | 590.66 | 73.77                 | 88.15 | 100.13 | 125.49 |
| C | El Dorado (MC) | Annual | 2011 | 342.05              | 395.72 | 468.70 | 591.19 | 73.66                 | 87.38 | 100.12 | 125.61 |
| C | El Dorado (MC) | Annual | 2012 | 342.34              | 396.02 | 468.51 | 591.78 | 73.58                 | 86.83 | 100.17 | 125.76 |
| C | El Dorado (MC) | Annual | 2013 | 342.60              | 396.27 | 468.36 | 592.41 | 73.49                 | 86.35 | 100.21 | 125.94 |
| C | El Dorado (MC) | Annual | 2014 | 342.84              | 396.49 | 468.26 | 593.06 | 73.40                 | 85.94 | 100.24 | 126.13 |
| C | El Dorado (MC) | Annual | 2015 | 343.06              | 396.70 | 468.18 | 593.72 | 73.38                 | 85.57 | 100.28 | 126.34 |
| C | El Dorado (MC) | Annual | 2016 | 343.27              | 396.90 | 468.13 | 594.34 | 73.40                 | 85.26 | 100.33 | 126.56 |
| C | El Dorado (MC) | Annual | 2017 | 343.44              | 397.07 | 468.08 | 594.94 | 73.42                 | 84.99 | 100.35 | 126.78 |
| C | El Dorado (MC) | Annual | 2018 | 343.57              | 397.22 | 468.03 | 595.46 | 73.41                 | 84.78 | 100.39 | 126.99 |
| C | El Dorado (MC) | Annual | 2019 | 339.95              | 393.13 | 462.91 | 589.40 | 73.43                 | 84.80 | 100.45 | 127.18 |
| C | El Dorado (MC) | Annual | 2020 | 340.04              | 393.35 | 462.88 | 589.78 | 73.52                 | 84.89 | 100.54 | 127.35 |
| C | El Dorado (MC) | Annual | 2021 | 340.11              | 393.57 | 462.85 | 590.02 | 73.60                 | 85.04 | 100.62 | 127.46 |
| C | El Dorado (MC) | Annual | 2022 | 340.16              | 393.76 | 462.81 | 590.22 | 73.66                 | 85.17 | 100.69 | 127.54 |
| C | El Dorado (MC) | Annual | 2023 | 340.19              | 393.90 | 462.78 | 590.36 | 73.70                 | 85.27 | 100.74 | 127.69 |
| C | El Dorado (MC) | Annual | 2024 | 340.20              | 394.02 | 462.75 | 590.47 | 73.72                 | 85.37 | 100.79 | 127.82 |
| C | El Dorado (MC) | Annual | 2025 | 340.22              | 394.12 | 462.73 | 590.61 | 73.75                 | 85.46 | 100.83 | 127.96 |
| C | El Dorado (MC) | Annual | 2026 | 340.23              | 394.26 | 462.70 | 590.76 | 73.77                 | 85.55 | 100.87 | 128.09 |
| C | El Dorado (MC) | Annual | 2027 | 340.24              | 394.39 | 462.67 | 590.90 | 73.78                 | 85.64 | 100.89 | 128.21 |
| C | El Dorado (MC) | Annual | 2028 | 340.25              | 394.53 | 462.65 | 591.06 | 73.79                 | 85.72 | 100.91 | 128.32 |
| C | El Dorado (MC) | Annual | 2029 | 340.25              | 394.66 | 462.61 | 591.21 | 73.80                 | 85.79 | 100.92 | 128.43 |
| C | El Dorado (MC) | Annual | 2030 | 340.25              | 394.80 | 462.58 | 591.37 | 73.81                 | 85.86 | 100.93 | 128.53 |
| C | El Dorado (MC) | Annual | 2031 | 340.26              | 394.95 | 462.56 | 591.56 | 73.81                 | 85.93 | 100.94 | 128.63 |
| C | El Dorado (MC) | Annual | 2032 | 340.26              | 395.08 | 462.54 | 591.75 | 73.82                 | 86.00 | 100.94 | 128.73 |
| C | El Dorado (MC) | Annual | 2033 | 340.26              | 395.20 | 462.53 | 591.93 | 73.82                 | 86.06 | 100.95 | 128.82 |
| C | El Dorado (MC) | Annual | 2034 | 340.26              | 395.30 | 462.51 | 592.08 | 73.82                 | 86.11 | 100.96 | 128.91 |
| C | El Dorado (MC) | Annual | 2035 | 340.26              | 395.39 | 462.50 | 592.22 | 73.83                 | 86.16 | 100.96 | 128.99 |
| C | El Dorado (MC) | Summer | 2010 | 375.93              | 429.67 | 513.60 | 646.77 | 73.77                 | 88.15 | 100.13 | 125.49 |
| C | El Dorado (MC) | Summer | 2011 | 376.40              | 430.73 | 513.53 | 647.24 | 73.66                 | 87.38 | 100.12 | 125.61 |
| C | El Dorado (MC) | Summer | 2012 | 376.82              | 431.64 | 513.49 | 647.88 | 73.58                 | 86.83 | 100.17 | 125.76 |
| C | El Dorado (MC) | Summer | 2013 | 377.19              | 432.39 | 513.51 | 648.63 | 73.49                 | 86.35 | 100.21 | 125.94 |
| C | El Dorado (MC) | Summer | 2014 | 377.52              | 433.03 | 513.58 | 649.46 | 73.40                 | 85.94 | 100.24 | 126.13 |
| C | El Dorado (MC) | Summer | 2015 | 377.80              | 433.58 | 513.65 | 650.36 | 73.38                 | 85.57 | 100.28 | 126.34 |
| C | El Dorado (MC) | Summer | 2016 | 378.06              | 434.07 | 513.72 | 651.21 | 73.40                 | 85.26 | 100.33 | 126.56 |
| C | El Dorado (MC) | Summer | 2017 | 378.25              | 434.50 | 513.77 | 652.04 | 73.42                 | 84.99 | 100.35 | 126.78 |
| C | El Dorado (MC) | Summer | 2018 | 378.38              | 434.84 | 513.78 | 652.74 | 73.41                 | 84.78 | 100.39 | 126.99 |
| C | El Dorado (MC) | Summer | 2019 | 374.39              | 430.51 | 508.19 | 646.23 | 73.43                 | 84.80 | 100.45 | 127.18 |
| C | El Dorado (MC) | Summer | 2020 | 374.46              | 430.84 | 508.14 | 646.71 | 73.52                 | 84.89 | 100.54 | 127.35 |
| C | El Dorado (MC) | Summer | 2021 | 374.53              | 431.14 | 508.05 | 646.99 | 73.60                 | 85.04 | 100.62 | 127.46 |
| C | El Dorado (MC) | Summer | 2022 | 374.58              | 431.41 | 507.98 | 647.24 | 73.66                 | 85.17 | 100.69 | 127.54 |
| C | El Dorado (MC) | Summer | 2023 | 374.61              | 431.64 | 507.91 | 647.42 | 73.70                 | 85.27 | 100.74 | 127.69 |
| C | El Dorado (MC) | Summer | 2024 | 374.62              | 431.82 | 507.88 | 647.54 | 73.72                 | 85.37 | 100.79 | 127.82 |
| C | El Dorado (MC) | Summer | 2025 | 374.63              | 432.00 | 507.85 | 647.66 | 73.75                 | 85.46 | 100.83 | 127.96 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | El Dorado (MC) | Summer | 2026 | 374.64             | 432.19 | 507.84 | 647.82 | 73.77                 | 85.55 | 100.87 | 128.09 |
| C | El Dorado (MC) | Summer | 2027 | 374.65             | 432.39 | 507.84 | 647.97 | 73.78                 | 85.64 | 100.89 | 128.21 |
| C | El Dorado (MC) | Summer | 2028 | 374.65             | 432.59 | 507.83 | 648.14 | 73.79                 | 85.72 | 100.91 | 128.32 |
| C | El Dorado (MC) | Summer | 2029 | 374.66             | 432.80 | 507.82 | 648.31 | 73.80                 | 85.79 | 100.92 | 128.43 |
| C | El Dorado (MC) | Summer | 2030 | 374.67             | 433.02 | 507.80 | 648.50 | 73.81                 | 85.86 | 100.93 | 128.53 |
| C | El Dorado (MC) | Summer | 2031 | 374.67             | 433.23 | 507.79 | 648.74 | 73.81                 | 85.93 | 100.94 | 128.63 |
| C | El Dorado (MC) | Summer | 2032 | 374.68             | 433.42 | 507.77 | 648.97 | 73.82                 | 86.00 | 100.94 | 128.73 |
| C | El Dorado (MC) | Summer | 2033 | 374.68             | 433.57 | 507.76 | 649.20 | 73.82                 | 86.06 | 100.95 | 128.82 |
| C | El Dorado (MC) | Summer | 2034 | 374.68             | 433.70 | 507.74 | 649.41 | 73.82                 | 86.11 | 100.96 | 128.91 |
| C | El Dorado (MC) | Summer | 2035 | 374.68             | 433.81 | 507.72 | 649.60 | 73.83                 | 86.16 | 100.96 | 128.99 |
| C | El Dorado (MC) | Winter | 2010 | 333.35             | 387.05 | 457.96 | 576.85 | 73.77                 | 88.15 | 100.13 | 125.49 |
| C | El Dorado (MC) | Winter | 2011 | 333.60             | 387.11 | 457.67 | 577.39 | 73.66                 | 87.38 | 100.12 | 125.61 |
| C | El Dorado (MC) | Winter | 2012 | 333.85             | 387.25 | 457.44 | 577.98 | 73.58                 | 86.83 | 100.17 | 125.76 |
| C | El Dorado (MC) | Winter | 2013 | 334.09             | 387.38 | 457.26 | 578.58 | 73.49                 | 86.35 | 100.21 | 125.94 |
| C | El Dorado (MC) | Winter | 2014 | 334.30             | 387.50 | 457.11 | 579.18 | 73.40                 | 85.94 | 100.24 | 126.13 |
| C | El Dorado (MC) | Winter | 2015 | 334.51             | 387.62 | 457.00 | 579.79 | 73.38                 | 85.57 | 100.28 | 126.34 |
| C | El Dorado (MC) | Winter | 2016 | 334.71             | 387.75 | 456.91 | 580.35 | 73.40                 | 85.26 | 100.33 | 126.56 |
| C | El Dorado (MC) | Winter | 2017 | 334.88             | 387.86 | 456.83 | 580.89 | 73.42                 | 84.99 | 100.35 | 126.78 |
| C | El Dorado (MC) | Winter | 2018 | 335.00             | 387.97 | 456.78 | 581.36 | 73.41                 | 84.78 | 100.39 | 126.99 |
| C | El Dorado (MC) | Winter | 2019 | 331.47             | 383.93 | 451.76 | 575.41 | 73.43                 | 84.80 | 100.45 | 127.18 |
| C | El Dorado (MC) | Winter | 2020 | 331.56             | 384.12 | 451.74 | 575.77 | 73.52                 | 84.89 | 100.54 | 127.35 |
| C | El Dorado (MC) | Winter | 2021 | 331.64             | 384.32 | 451.72 | 575.99 | 73.60                 | 85.04 | 100.62 | 127.46 |
| C | El Dorado (MC) | Winter | 2022 | 331.69             | 384.49 | 451.69 | 576.18 | 73.66                 | 85.17 | 100.69 | 127.54 |
| C | El Dorado (MC) | Winter | 2023 | 331.72             | 384.61 | 451.67 | 576.32 | 73.70                 | 85.27 | 100.74 | 127.69 |
| C | El Dorado (MC) | Winter | 2024 | 331.73             | 384.71 | 451.64 | 576.42 | 73.72                 | 85.37 | 100.79 | 127.82 |
| C | El Dorado (MC) | Winter | 2025 | 331.74             | 384.80 | 451.62 | 576.56 | 73.75                 | 85.46 | 100.83 | 127.96 |
| C | El Dorado (MC) | Winter | 2026 | 331.76             | 384.92 | 451.58 | 576.71 | 73.77                 | 85.55 | 100.87 | 128.09 |
| C | El Dorado (MC) | Winter | 2027 | 331.77             | 385.03 | 451.55 | 576.86 | 73.78                 | 85.64 | 100.89 | 128.21 |
| C | El Dorado (MC) | Winter | 2028 | 331.78             | 385.15 | 451.52 | 577.01 | 73.79                 | 85.72 | 100.91 | 128.32 |
| C | El Dorado (MC) | Winter | 2029 | 331.78             | 385.27 | 451.48 | 577.15 | 73.80                 | 85.79 | 100.92 | 128.43 |
| C | El Dorado (MC) | Winter | 2030 | 331.78             | 385.40 | 451.44 | 577.31 | 73.81                 | 85.86 | 100.93 | 128.53 |
| C | El Dorado (MC) | Winter | 2031 | 331.78             | 385.52 | 451.42 | 577.49 | 73.81                 | 85.93 | 100.94 | 128.63 |
| C | El Dorado (MC) | Winter | 2032 | 331.78             | 385.64 | 451.41 | 577.67 | 73.82                 | 86.00 | 100.94 | 128.73 |
| C | El Dorado (MC) | Winter | 2033 | 331.78             | 385.75 | 451.39 | 577.83 | 73.82                 | 86.06 | 100.95 | 128.82 |
| C | El Dorado (MC) | Winter | 2034 | 331.79             | 385.85 | 451.38 | 577.97 | 73.82                 | 86.11 | 100.96 | 128.91 |
| C | El Dorado (MC) | Winter | 2035 | 331.78             | 385.93 | 451.36 | 578.10 | 73.83                 | 86.16 | 100.96 | 128.99 |
| C | Fresno (SJV)   | Annual | 2010 | 332.59             | 381.43 | 455.63 | 572.39 | 73.33                 | 85.16 | 100.40 | 124.69 |
| C | Fresno (SJV)   | Annual | 2011 | 332.92             | 382.33 | 455.40 | 573.13 | 73.36                 | 84.93 | 100.38 | 124.93 |
| C | Fresno (SJV)   | Annual | 2012 | 333.28             | 383.14 | 455.34 | 574.01 | 73.39                 | 84.78 | 100.39 | 125.18 |
| C | Fresno (SJV)   | Annual | 2013 | 333.73             | 383.96 | 455.45 | 575.09 | 73.44                 | 84.70 | 100.41 | 125.46 |
| C | Fresno (SJV)   | Annual | 2014 | 333.96             | 384.49 | 455.36 | 575.85 | 73.49                 | 84.64 | 100.42 | 125.73 |
| C | Fresno (SJV)   | Annual | 2015 | 334.75             | 385.63 | 456.06 | 577.60 | 73.55                 | 84.63 | 100.44 | 126.02 |
| C | Fresno (SJV)   | Annual | 2016 | 334.94             | 386.04 | 456.00 | 578.34 | 73.62                 | 84.61 | 100.47 | 126.31 |
| C | Fresno (SJV)   | Annual | 2017 | 335.07             | 386.40 | 455.95 | 579.02 | 73.64                 | 84.59 | 100.48 | 126.59 |
| C | Fresno (SJV)   | Annual | 2018 | 336.24             | 387.94 | 457.37 | 581.46 | 73.67                 | 84.60 | 100.50 | 126.85 |
| C | Fresno (SJV)   | Annual | 2019 | 336.33             | 388.23 | 457.33 | 581.97 | 73.72                 | 84.71 | 100.53 | 127.09 |
| C | Fresno (SJV)   | Annual | 2020 | 336.41             | 388.50 | 457.29 | 582.43 | 73.81                 | 84.86 | 100.60 | 127.31 |
| C | Fresno (SJV)   | Annual | 2021 | 336.48             | 388.79 | 457.28 | 582.85 | 73.87                 | 85.02 | 100.68 | 127.50 |
| C | Fresno (SJV)   | Annual | 2022 | 336.50             | 389.03 | 457.25 | 583.19 | 73.92                 | 85.17 | 100.74 | 127.66 |
| C | Fresno (SJV)   | Annual | 2023 | 336.51             | 389.23 | 457.23 | 583.46 | 73.95                 | 85.29 | 100.80 | 127.85 |
| C | Fresno (SJV)   | Annual | 2024 | 336.38             | 389.25 | 457.03 | 583.43 | 73.97                 | 85.40 | 100.84 | 128.01 |
| C | Fresno (SJV)   | Annual | 2025 | 336.38             | 389.39 | 457.00 | 583.60 | 73.99                 | 85.50 | 100.87 | 128.16 |
| C | Fresno (SJV)   | Annual | 2026 | 338.35             | 391.81 | 459.63 | 587.16 | 74.01                 | 85.60 | 100.90 | 128.30 |
| C | Fresno (SJV)   | Annual | 2027 | 338.36             | 391.96 | 459.61 | 587.32 | 74.02                 | 85.68 | 100.92 | 128.43 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Fresno (SJV) | Annual | 2028 | 338.36             | 392.10 | 459.58 | 587.48 | 74.03                 | 85.76 | 100.94 | 128.54 |
| C | Fresno (SJV) | Annual | 2029 | 338.36             | 392.24 | 459.56 | 587.63 | 74.04                 | 85.84 | 100.95 | 128.65 |
| C | Fresno (SJV) | Annual | 2030 | 338.36             | 392.37 | 459.53 | 587.79 | 74.04                 | 85.91 | 100.96 | 128.75 |
| C | Fresno (SJV) | Annual | 2031 | 338.36             | 392.50 | 459.52 | 587.96 | 74.05                 | 85.98 | 100.96 | 128.84 |
| C | Fresno (SJV) | Annual | 2032 | 338.36             | 392.62 | 459.51 | 588.13 | 74.05                 | 86.04 | 100.97 | 128.93 |
| C | Fresno (SJV) | Annual | 2033 | 338.36             | 392.72 | 459.49 | 588.28 | 74.05                 | 86.09 | 100.97 | 129.01 |
| C | Fresno (SJV) | Annual | 2034 | 338.36             | 392.81 | 459.48 | 588.42 | 74.06                 | 86.14 | 100.98 | 129.09 |
| C | Fresno (SJV) | Annual | 2035 | 338.35             | 392.88 | 459.47 | 588.54 | 74.06                 | 86.18 | 100.98 | 129.16 |
| C | Fresno (SJV) | Summer | 2010 | 365.89             | 415.42 | 499.30 | 627.61 | 73.33                 | 85.16 | 100.40 | 124.69 |
| C | Fresno (SJV) | Summer | 2011 | 366.50             | 417.15 | 499.37 | 628.38 | 73.36                 | 84.93 | 100.38 | 124.93 |
| C | Fresno (SJV) | Summer | 2012 | 367.06             | 418.57 | 499.55 | 629.35 | 73.39                 | 84.78 | 100.39 | 125.18 |
| C | Fresno (SJV) | Summer | 2013 | 367.66             | 419.86 | 499.87 | 630.59 | 73.44                 | 84.70 | 100.41 | 125.46 |
| C | Fresno (SJV) | Summer | 2014 | 368.00             | 420.76 | 499.96 | 631.54 | 73.49                 | 84.64 | 100.42 | 125.73 |
| C | Fresno (SJV) | Summer | 2015 | 368.92             | 422.24 | 500.90 | 633.61 | 73.55                 | 84.63 | 100.44 | 126.02 |
| C | Fresno (SJV) | Summer | 2016 | 369.16             | 422.88 | 500.97 | 634.57 | 73.62                 | 84.61 | 100.47 | 126.31 |
| C | Fresno (SJV) | Summer | 2017 | 369.31             | 423.43 | 501.00 | 635.46 | 73.64                 | 84.59 | 100.48 | 126.59 |
| C | Fresno (SJV) | Summer | 2018 | 370.58             | 425.21 | 502.58 | 638.22 | 73.67                 | 84.60 | 100.50 | 126.85 |
| C | Fresno (SJV) | Summer | 2019 | 370.66             | 425.60 | 502.55 | 638.86 | 73.72                 | 84.71 | 100.53 | 127.09 |
| C | Fresno (SJV) | Summer | 2020 | 370.71             | 425.96 | 502.50 | 639.43 | 73.81                 | 84.86 | 100.60 | 127.31 |
| C | Fresno (SJV) | Summer | 2021 | 370.80             | 426.40 | 502.51 | 640.00 | 73.87                 | 85.02 | 100.68 | 127.50 |
| C | Fresno (SJV) | Summer | 2022 | 370.85             | 426.76 | 502.50 | 640.46 | 73.92                 | 85.17 | 100.74 | 127.66 |
| C | Fresno (SJV) | Summer | 2023 | 370.87             | 427.06 | 502.48 | 640.80 | 73.95                 | 85.29 | 100.80 | 127.85 |
| C | Fresno (SJV) | Summer | 2024 | 370.73             | 427.16 | 502.25 | 640.76 | 73.97                 | 85.40 | 100.84 | 128.01 |
| C | Fresno (SJV) | Summer | 2025 | 370.73             | 427.39 | 502.21 | 640.93 | 73.99                 | 85.50 | 100.87 | 128.16 |
| C | Fresno (SJV) | Summer | 2026 | 372.91             | 430.11 | 505.12 | 644.84 | 74.01                 | 85.60 | 100.90 | 128.30 |
| C | Fresno (SJV) | Summer | 2027 | 372.92             | 430.32 | 505.10 | 644.98 | 74.02                 | 85.68 | 100.92 | 128.43 |
| C | Fresno (SJV) | Summer | 2028 | 372.93             | 430.52 | 505.08 | 645.13 | 74.03                 | 85.76 | 100.94 | 128.54 |
| C | Fresno (SJV) | Summer | 2029 | 372.94             | 430.72 | 505.05 | 645.28 | 74.04                 | 85.84 | 100.95 | 128.65 |
| C | Fresno (SJV) | Summer | 2030 | 372.94             | 430.92 | 505.03 | 645.45 | 74.04                 | 85.91 | 100.96 | 128.75 |
| C | Fresno (SJV) | Summer | 2031 | 372.93             | 431.10 | 505.02 | 645.63 | 74.05                 | 85.98 | 100.96 | 128.84 |
| C | Fresno (SJV) | Summer | 2032 | 372.93             | 431.26 | 505.01 | 645.82 | 74.05                 | 86.04 | 100.97 | 128.93 |
| C | Fresno (SJV) | Summer | 2033 | 372.93             | 431.39 | 505.00 | 646.00 | 74.05                 | 86.09 | 100.97 | 129.01 |
| C | Fresno (SJV) | Summer | 2034 | 372.93             | 431.50 | 504.99 | 646.18 | 74.06                 | 86.14 | 100.98 | 129.09 |
| C | Fresno (SJV) | Summer | 2035 | 372.92             | 431.58 | 504.98 | 646.33 | 74.06                 | 86.18 | 100.98 | 129.16 |
| C | Fresno (SJV) | Winter | 2010 | 319.21             | 367.78 | 438.09 | 550.22 | 73.33                 | 85.16 | 100.40 | 124.69 |
| C | Fresno (SJV) | Winter | 2011 | 319.43             | 368.35 | 437.74 | 550.95 | 73.36                 | 84.93 | 100.38 | 124.93 |
| C | Fresno (SJV) | Winter | 2012 | 319.71             | 368.92 | 437.59 | 551.79 | 73.39                 | 84.78 | 100.39 | 125.18 |
| C | Fresno (SJV) | Winter | 2013 | 320.09             | 369.54 | 437.61 | 552.79 | 73.44                 | 84.70 | 100.41 | 125.46 |
| C | Fresno (SJV) | Winter | 2014 | 320.29             | 369.93 | 437.44 | 553.49 | 73.49                 | 84.64 | 100.42 | 125.73 |
| C | Fresno (SJV) | Winter | 2015 | 321.02             | 370.92 | 438.04 | 555.11 | 73.55                 | 84.63 | 100.44 | 126.02 |
| C | Fresno (SJV) | Winter | 2016 | 321.20             | 371.25 | 437.94 | 555.75 | 73.62                 | 84.61 | 100.47 | 126.31 |
| C | Fresno (SJV) | Winter | 2017 | 321.32             | 371.53 | 437.86 | 556.36 | 73.64                 | 84.59 | 100.48 | 126.59 |
| C | Fresno (SJV) | Winter | 2018 | 322.45             | 372.96 | 439.21 | 558.66 | 73.67                 | 84.60 | 100.50 | 126.85 |
| C | Fresno (SJV) | Winter | 2019 | 322.55             | 373.22 | 439.16 | 559.12 | 73.72                 | 84.71 | 100.53 | 127.09 |
| C | Fresno (SJV) | Winter | 2020 | 322.63             | 373.45 | 439.13 | 559.54 | 73.81                 | 84.86 | 100.60 | 127.31 |
| C | Fresno (SJV) | Winter | 2021 | 322.69             | 373.69 | 439.11 | 559.90 | 73.87                 | 85.02 | 100.68 | 127.50 |
| C | Fresno (SJV) | Winter | 2022 | 322.71             | 373.88 | 439.08 | 560.19 | 73.92                 | 85.17 | 100.74 | 127.66 |
| C | Fresno (SJV) | Winter | 2023 | 322.72             | 374.03 | 439.05 | 560.43 | 73.95                 | 85.29 | 100.80 | 127.85 |
| C | Fresno (SJV) | Winter | 2024 | 322.58             | 374.02 | 438.86 | 560.40 | 73.97                 | 85.40 | 100.84 | 128.01 |
| C | Fresno (SJV) | Winter | 2025 | 322.58             | 374.13 | 438.84 | 560.57 | 73.99                 | 85.50 | 100.87 | 128.16 |
| C | Fresno (SJV) | Winter | 2026 | 324.46             | 376.42 | 441.35 | 563.99 | 74.01                 | 85.60 | 100.90 | 128.30 |
| C | Fresno (SJV) | Winter | 2027 | 324.47             | 376.54 | 441.33 | 564.15 | 74.02                 | 85.68 | 100.92 | 128.43 |
| C | Fresno (SJV) | Winter | 2028 | 324.47             | 376.66 | 441.30 | 564.31 | 74.03                 | 85.76 | 100.94 | 128.54 |
| C | Fresno (SJV) | Winter | 2029 | 324.47             | 376.77 | 441.27 | 564.47 | 74.04                 | 85.84 | 100.95 | 128.65 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |        |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|--------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1   | LDT2   | MDV    |
| C | Fresno (SVJ) | Winter | 2030 | 324.46             | 376.88 | 441.25 | 564.63 | 74.04                 | 85.91  | 100.96 | 128.75 |
| C | Fresno (SVJ) | Winter | 2031 | 324.47             | 376.99 | 441.24 | 564.79 | 74.05                 | 85.98  | 100.96 | 128.84 |
| C | Fresno (SVJ) | Winter | 2032 | 324.46             | 377.09 | 441.22 | 564.95 | 74.05                 | 86.04  | 100.97 | 128.93 |
| C | Fresno (SVJ) | Winter | 2033 | 324.46             | 377.18 | 441.21 | 565.09 | 74.05                 | 86.09  | 100.97 | 129.01 |
| C | Fresno (SVJ) | Winter | 2034 | 324.46             | 377.26 | 441.20 | 565.21 | 74.06                 | 86.14  | 100.98 | 129.09 |
| C | Fresno (SVJ) | Winter | 2035 | 324.46             | 377.33 | 441.18 | 565.32 | 74.06                 | 86.18  | 100.98 | 129.16 |
| C | Glenn (SV)   | Annual | 2010 | 347.61             | 407.24 | 479.18 | 597.47 | 73.80                 | 101.05 | 102.36 | 125.05 |
| C | Glenn (SV)   | Annual | 2011 | 347.94             | 406.83 | 478.46 | 597.84 | 73.70                 | 98.07  | 102.06 | 125.06 |
| C | Glenn (SV)   | Annual | 2012 | 348.25             | 406.57 | 477.93 | 598.43 | 73.59                 | 95.83  | 101.82 | 125.13 |
| C | Glenn (SV)   | Annual | 2013 | 348.56             | 406.34 | 477.52 | 599.20 | 73.54                 | 93.69  | 101.62 | 125.27 |
| C | Glenn (SV)   | Annual | 2014 | 348.81             | 406.16 | 477.20 | 600.00 | 73.43                 | 91.83  | 101.37 | 125.43 |
| C | Glenn (SV)   | Annual | 2015 | 349.05             | 406.03 | 476.95 | 600.89 | 73.38                 | 90.19  | 101.22 | 125.64 |
| C | Glenn (SV)   | Annual | 2016 | 349.27             | 405.92 | 476.74 | 601.81 | 73.41                 | 88.68  | 101.09 | 125.88 |
| C | Glenn (SV)   | Annual | 2017 | 349.44             | 405.85 | 476.57 | 602.68 | 73.41                 | 87.43  | 101.01 | 126.13 |
| C | Glenn (SV)   | Annual | 2018 | 349.58             | 405.77 | 476.41 | 603.43 | 73.43                 | 86.26  | 100.91 | 126.38 |
| C | Glenn (SV)   | Annual | 2019 | 349.68             | 405.76 | 476.29 | 604.10 | 73.46                 | 85.63  | 100.80 | 126.62 |
| C | Glenn (SV)   | Annual | 2020 | 349.77             | 405.79 | 476.19 | 604.70 | 73.56                 | 85.43  | 100.85 | 126.85 |
| C | Glenn (SV)   | Annual | 2021 | 349.82             | 405.88 | 476.10 | 605.14 | 73.62                 | 85.50  | 100.90 | 126.97 |
| C | Glenn (SV)   | Annual | 2022 | 349.86             | 405.97 | 476.01 | 605.47 | 73.68                 | 85.55  | 100.94 | 127.04 |
| C | Glenn (SV)   | Annual | 2023 | 349.88             | 406.04 | 475.94 | 605.72 | 73.71                 | 85.61  | 100.98 | 127.23 |
| C | Glenn (SV)   | Annual | 2024 | 349.89             | 406.11 | 475.87 | 605.91 | 73.71                 | 85.66  | 101.00 | 127.41 |
| C | Glenn (SV)   | Annual | 2025 | 349.89             | 406.19 | 475.82 | 606.12 | 73.72                 | 85.74  | 101.02 | 127.59 |
| C | Glenn (SV)   | Annual | 2026 | 349.91             | 406.27 | 475.76 | 606.32 | 73.75                 | 85.81  | 101.03 | 127.77 |
| C | Glenn (SV)   | Annual | 2027 | 349.93             | 406.34 | 475.71 | 606.53 | 73.76                 | 85.87  | 101.03 | 127.93 |
| C | Glenn (SV)   | Annual | 2028 | 349.94             | 406.42 | 475.66 | 606.74 | 73.77                 | 85.93  | 101.03 | 128.07 |
| C | Glenn (SV)   | Annual | 2029 | 349.94             | 406.49 | 475.61 | 606.94 | 73.78                 | 85.99  | 101.02 | 128.21 |
| C | Glenn (SV)   | Annual | 2030 | 349.94             | 406.57 | 475.56 | 607.16 | 73.78                 | 86.04  | 101.01 | 128.34 |
| C | Glenn (SV)   | Annual | 2031 | 349.94             | 406.64 | 475.55 | 607.42 | 73.79                 | 86.10  | 101.01 | 128.47 |
| C | Glenn (SV)   | Annual | 2032 | 349.94             | 406.69 | 475.53 | 607.68 | 73.79                 | 86.15  | 101.01 | 128.60 |
| C | Glenn (SV)   | Annual | 2033 | 349.94             | 406.75 | 475.52 | 607.92 | 73.80                 | 86.19  | 101.01 | 128.71 |
| C | Glenn (SV)   | Annual | 2034 | 349.94             | 406.79 | 475.50 | 608.14 | 73.80                 | 86.23  | 101.01 | 128.82 |
| C | Glenn (SV)   | Annual | 2035 | 349.93             | 406.82 | 475.49 | 608.33 | 73.81                 | 86.26  | 101.01 | 128.92 |
| C | Glenn (SV)   | Summer | 2010 | 384.83             | 445.81 | 527.20 | 657.56 | 73.80                 | 101.05 | 102.36 | 125.05 |
| C | Glenn (SV)   | Summer | 2011 | 385.51             | 446.50 | 527.25 | 657.84 | 73.70                 | 98.07  | 102.06 | 125.06 |
| C | Glenn (SV)   | Summer | 2012 | 386.08             | 446.98 | 527.28 | 658.52 | 73.59                 | 95.83  | 101.82 | 125.13 |
| C | Glenn (SV)   | Summer | 2013 | 386.56             | 447.34 | 527.28 | 659.58 | 73.54                 | 93.69  | 101.62 | 125.27 |
| C | Glenn (SV)   | Summer | 2014 | 386.94             | 447.60 | 527.29 | 660.69 | 73.43                 | 91.83  | 101.37 | 125.43 |
| C | Glenn (SV)   | Summer | 2015 | 387.27             | 447.83 | 527.25 | 661.99 | 73.38                 | 90.19  | 101.22 | 125.64 |
| C | Glenn (SV)   | Summer | 2016 | 387.55             | 448.01 | 527.19 | 663.37 | 73.41                 | 88.68  | 101.09 | 125.88 |
| C | Glenn (SV)   | Summer | 2017 | 387.74             | 448.13 | 527.06 | 664.65 | 73.41                 | 87.43  | 101.01 | 126.13 |
| C | Glenn (SV)   | Summer | 2018 | 387.86             | 448.22 | 526.91 | 665.76 | 73.43                 | 86.26  | 100.91 | 126.38 |
| C | Glenn (SV)   | Summer | 2019 | 387.96             | 448.30 | 526.79 | 666.74 | 73.46                 | 85.63  | 100.80 | 126.62 |
| C | Glenn (SV)   | Summer | 2020 | 388.02             | 448.37 | 526.65 | 667.59 | 73.56                 | 85.43  | 100.85 | 126.85 |
| C | Glenn (SV)   | Summer | 2021 | 388.06             | 448.51 | 526.53 | 668.25 | 73.62                 | 85.50  | 100.90 | 126.97 |
| C | Glenn (SV)   | Summer | 2022 | 388.09             | 448.64 | 526.43 | 668.76 | 73.68                 | 85.55  | 100.94 | 127.04 |
| C | Glenn (SV)   | Summer | 2023 | 388.10             | 448.75 | 526.35 | 669.12 | 73.71                 | 85.61  | 100.98 | 127.23 |
| C | Glenn (SV)   | Summer | 2024 | 388.12             | 448.88 | 526.29 | 669.37 | 73.71                 | 85.66  | 101.00 | 127.41 |
| C | Glenn (SV)   | Summer | 2025 | 388.13             | 449.00 | 526.24 | 669.61 | 73.72                 | 85.74  | 101.02 | 127.59 |
| C | Glenn (SV)   | Summer | 2026 | 388.17             | 449.13 | 526.19 | 669.78 | 73.75                 | 85.81  | 101.03 | 127.77 |
| C | Glenn (SV)   | Summer | 2027 | 388.21             | 449.21 | 526.15 | 669.97 | 73.76                 | 85.87  | 101.03 | 127.93 |
| C | Glenn (SV)   | Summer | 2028 | 388.24             | 449.33 | 526.12 | 670.17 | 73.77                 | 85.93  | 101.03 | 128.07 |
| C | Glenn (SV)   | Summer | 2029 | 388.26             | 449.45 | 526.10 | 670.39 | 73.78                 | 85.99  | 101.02 | 128.21 |
| C | Glenn (SV)   | Summer | 2030 | 388.28             | 449.57 | 526.08 | 670.64 | 73.78                 | 86.04  | 101.01 | 128.34 |
| C | Glenn (SV)   | Summer | 2031 | 388.27             | 449.67 | 526.12 | 670.94 | 73.79                 | 86.10  | 101.01 | 128.47 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |        |        |        |
|---|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|--------|--------|--------|
|   |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1   | LDT2   | MDV    |
| C | Glenn (SV)    | Summer | 2032 | 388.27             | 449.74 | 526.13 | 671.26 | 73.79                 | 86.15  | 101.01 | 128.60 |
| C | Glenn (SV)    | Summer | 2033 | 388.26             | 449.81 | 526.14 | 671.55 | 73.80                 | 86.19  | 101.01 | 128.71 |
| C | Glenn (SV)    | Summer | 2034 | 388.25             | 449.85 | 526.14 | 671.85 | 73.80                 | 86.23  | 101.01 | 128.82 |
| C | Glenn (SV)    | Summer | 2035 | 388.24             | 449.87 | 526.13 | 672.11 | 73.81                 | 86.26  | 101.01 | 128.92 |
| C | Glenn (SV)    | Winter | 2010 | 335.44             | 394.64 | 463.49 | 577.83 | 73.80                 | 101.05 | 102.36 | 125.05 |
| C | Glenn (SV)    | Winter | 2011 | 335.66             | 393.87 | 462.51 | 578.23 | 73.70                 | 98.07  | 102.06 | 125.06 |
| C | Glenn (SV)    | Winter | 2012 | 335.89             | 393.37 | 461.80 | 578.79 | 73.59                 | 95.83  | 101.82 | 125.13 |
| C | Glenn (SV)    | Winter | 2013 | 336.14             | 392.94 | 461.25 | 579.47 | 73.54                 | 93.69  | 101.62 | 125.27 |
| C | Glenn (SV)    | Winter | 2014 | 336.35             | 392.62 | 460.83 | 580.17 | 73.43                 | 91.83  | 101.37 | 125.43 |
| C | Glenn (SV)    | Winter | 2015 | 336.56             | 392.37 | 460.51 | 580.92 | 73.38                 | 90.19  | 101.22 | 125.64 |
| C | Glenn (SV)    | Winter | 2016 | 336.76             | 392.17 | 460.25 | 581.69 | 73.41                 | 88.68  | 101.09 | 125.88 |
| C | Glenn (SV)    | Winter | 2017 | 336.93             | 392.03 | 460.06 | 582.43 | 73.41                 | 87.43  | 101.01 | 126.13 |
| C | Glenn (SV)    | Winter | 2018 | 337.06             | 391.89 | 459.91 | 583.06 | 73.43                 | 86.26  | 100.91 | 126.38 |
| C | Glenn (SV)    | Winter | 2019 | 337.18             | 391.86 | 459.79 | 583.63 | 73.46                 | 85.63  | 100.80 | 126.62 |
| C | Glenn (SV)    | Winter | 2020 | 337.27             | 391.87 | 459.70 | 584.15 | 73.56                 | 85.43  | 100.85 | 126.85 |
| C | Glenn (SV)    | Winter | 2021 | 337.33             | 391.95 | 459.61 | 584.51 | 73.62                 | 85.50  | 100.90 | 126.97 |
| C | Glenn (SV)    | Winter | 2022 | 337.37             | 392.02 | 459.54 | 584.78 | 73.68                 | 85.55  | 100.94 | 127.04 |
| C | Glenn (SV)    | Winter | 2023 | 337.39             | 392.08 | 459.47 | 585.00 | 73.71                 | 85.61  | 100.98 | 127.23 |
| C | Glenn (SV)    | Winter | 2024 | 337.39             | 392.13 | 459.40 | 585.17 | 73.71                 | 85.66  | 101.00 | 127.41 |
| C | Glenn (SV)    | Winter | 2025 | 337.39             | 392.20 | 459.34 | 585.37 | 73.72                 | 85.74  | 101.02 | 127.59 |
| C | Glenn (SV)    | Winter | 2026 | 337.41             | 392.27 | 459.27 | 585.58 | 73.75                 | 85.81  | 101.03 | 127.77 |
| C | Glenn (SV)    | Winter | 2027 | 337.42             | 392.32 | 459.22 | 585.80 | 73.76                 | 85.87  | 101.03 | 127.93 |
| C | Glenn (SV)    | Winter | 2028 | 337.42             | 392.39 | 459.16 | 586.00 | 73.77                 | 85.93  | 101.03 | 128.07 |
| C | Glenn (SV)    | Winter | 2029 | 337.42             | 392.46 | 459.10 | 586.21 | 73.78                 | 85.99  | 101.02 | 128.21 |
| C | Glenn (SV)    | Winter | 2030 | 337.42             | 392.52 | 459.05 | 586.42 | 73.78                 | 86.04  | 101.01 | 128.34 |
| C | Glenn (SV)    | Winter | 2031 | 337.42             | 392.58 | 459.02 | 586.66 | 73.79                 | 86.10  | 101.01 | 128.47 |
| C | Glenn (SV)    | Winter | 2032 | 337.42             | 392.63 | 459.00 | 586.91 | 73.79                 | 86.15  | 101.01 | 128.60 |
| C | Glenn (SV)    | Winter | 2033 | 337.41             | 392.67 | 458.97 | 587.13 | 73.80                 | 86.19  | 101.01 | 128.71 |
| C | Glenn (SV)    | Winter | 2034 | 337.41             | 392.71 | 458.95 | 587.32 | 73.80                 | 86.23  | 101.01 | 128.82 |
| C | Glenn (SV)    | Winter | 2035 | 337.41             | 392.75 | 458.94 | 587.49 | 73.81                 | 86.26  | 101.01 | 128.92 |
| C | Humboldt (NC) | Annual | 2010 | 328.57             | 377.52 | 451.16 | 562.78 | 72.92                 | 85.59  | 100.40 | 123.74 |
| C | Humboldt (NC) | Annual | 2011 | 328.60             | 377.95 | 450.57 | 563.46 | 72.88                 | 85.26  | 100.35 | 123.95 |
| C | Humboldt (NC) | Annual | 2012 | 328.67             | 378.37 | 450.10 | 564.24 | 72.86                 | 85.04  | 100.37 | 124.22 |
| C | Humboldt (NC) | Annual | 2013 | 328.79             | 378.74 | 449.73 | 565.09 | 72.87                 | 84.87  | 100.40 | 124.52 |
| C | Humboldt (NC) | Annual | 2014 | 328.88             | 379.06 | 449.44 | 565.92 | 72.82                 | 84.72  | 100.41 | 124.81 |
| C | Humboldt (NC) | Annual | 2015 | 329.00             | 379.39 | 449.21 | 566.76 | 72.83                 | 84.63  | 100.44 | 125.14 |
| C | Humboldt (NC) | Annual | 2016 | 329.16             | 379.71 | 449.03 | 567.57 | 72.89                 | 84.61  | 100.49 | 125.48 |
| C | Humboldt (NC) | Annual | 2017 | 329.26             | 379.97 | 448.88 | 568.32 | 72.91                 | 84.54  | 100.52 | 125.81 |
| C | Humboldt (NC) | Annual | 2018 | 329.35             | 380.20 | 448.76 | 568.98 | 72.94                 | 84.52  | 100.55 | 126.12 |
| C | Humboldt (NC) | Annual | 2019 | 329.43             | 380.44 | 448.67 | 569.54 | 72.98                 | 84.60  | 100.61 | 126.42 |
| C | Humboldt (NC) | Annual | 2020 | 329.49             | 380.65 | 448.59 | 570.03 | 73.07                 | 84.71  | 100.67 | 126.69 |
| C | Humboldt (NC) | Annual | 2021 | 329.54             | 380.81 | 448.52 | 570.42 | 73.13                 | 84.84  | 100.74 | 126.93 |
| C | Humboldt (NC) | Annual | 2022 | 329.54             | 380.94 | 448.44 | 570.75 | 73.18                 | 84.95  | 100.79 | 127.13 |
| C | Humboldt (NC) | Annual | 2023 | 329.49             | 381.04 | 448.37 | 571.00 | 73.20                 | 85.06  | 100.83 | 127.34 |
| C | Humboldt (NC) | Annual | 2024 | 329.42             | 381.10 | 448.30 | 571.20 | 73.19                 | 85.15  | 100.87 | 127.53 |
| C | Humboldt (NC) | Annual | 2025 | 329.38             | 381.21 | 448.25 | 571.38 | 73.20                 | 85.25  | 100.90 | 127.70 |
| C | Humboldt (NC) | Annual | 2026 | 329.39             | 381.36 | 448.19 | 571.56 | 73.22                 | 85.36  | 100.92 | 127.86 |
| C | Humboldt (NC) | Annual | 2027 | 329.39             | 381.51 | 448.13 | 571.75 | 73.24                 | 85.47  | 100.94 | 128.01 |
| C | Humboldt (NC) | Annual | 2028 | 329.39             | 381.66 | 448.08 | 571.95 | 73.25                 | 85.56  | 100.95 | 128.15 |
| C | Humboldt (NC) | Annual | 2029 | 329.38             | 381.80 | 448.02 | 572.14 | 73.25                 | 85.65  | 100.96 | 128.28 |
| C | Humboldt (NC) | Annual | 2030 | 329.36             | 381.95 | 447.93 | 572.34 | 73.25                 | 85.74  | 100.95 | 128.41 |
| C | Humboldt (NC) | Annual | 2031 | 329.35             | 382.09 | 447.90 | 572.56 | 73.26                 | 85.82  | 100.95 | 128.53 |
| C | Humboldt (NC) | Annual | 2032 | 329.34             | 382.22 | 447.86 | 572.78 | 73.27                 | 85.90  | 100.96 | 128.65 |
| C | Humboldt (NC) | Annual | 2033 | 329.34             | 382.34 | 447.84 | 572.97 | 73.27                 | 85.97  | 100.96 | 128.76 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Humboldt (NC) | Annual | 2034 | 329.33             | 382.45 | 447.82 | 573.15 | 73.28                 | 86.03 | 100.97 | 128.86 |
| C | Humboldt (NC) | Annual | 2035 | 329.32             | 382.53 | 447.80 | 573.30 | 73.28                 | 86.09 | 100.97 | 128.95 |
| C | Humboldt (NC) | Summer | 2010 | 328.37             | 377.33 | 450.90 | 562.46 | 72.92                 | 85.59 | 100.40 | 123.74 |
| C | Humboldt (NC) | Summer | 2011 | 328.40             | 377.76 | 450.31 | 563.15 | 72.88                 | 85.26 | 100.35 | 123.95 |
| C | Humboldt (NC) | Summer | 2012 | 328.47             | 378.17 | 449.85 | 563.92 | 72.86                 | 85.04 | 100.37 | 124.22 |
| C | Humboldt (NC) | Summer | 2013 | 328.60             | 378.54 | 449.48 | 564.78 | 72.87                 | 84.87 | 100.40 | 124.52 |
| C | Humboldt (NC) | Summer | 2014 | 328.68             | 378.86 | 449.18 | 565.60 | 72.82                 | 84.72 | 100.41 | 124.81 |
| C | Humboldt (NC) | Summer | 2015 | 328.81             | 379.18 | 448.95 | 566.44 | 72.83                 | 84.63 | 100.44 | 125.14 |
| C | Humboldt (NC) | Summer | 2016 | 328.96             | 379.50 | 448.77 | 567.25 | 72.89                 | 84.61 | 100.49 | 125.48 |
| C | Humboldt (NC) | Summer | 2017 | 329.06             | 379.76 | 448.61 | 568.00 | 72.91                 | 84.54 | 100.52 | 125.81 |
| C | Humboldt (NC) | Summer | 2018 | 329.15             | 379.99 | 448.50 | 568.65 | 72.94                 | 84.52 | 100.55 | 126.12 |
| C | Humboldt (NC) | Summer | 2019 | 329.23             | 380.22 | 448.41 | 569.21 | 72.98                 | 84.60 | 100.61 | 126.42 |
| C | Humboldt (NC) | Summer | 2020 | 329.30             | 380.43 | 448.33 | 569.70 | 73.07                 | 84.71 | 100.67 | 126.69 |
| C | Humboldt (NC) | Summer | 2021 | 329.34             | 380.59 | 448.26 | 570.09 | 73.13                 | 84.84 | 100.74 | 126.93 |
| C | Humboldt (NC) | Summer | 2022 | 329.34             | 380.72 | 448.18 | 570.42 | 73.18                 | 84.95 | 100.79 | 127.13 |
| C | Humboldt (NC) | Summer | 2023 | 329.30             | 380.82 | 448.11 | 570.67 | 73.20                 | 85.06 | 100.83 | 127.34 |
| C | Humboldt (NC) | Summer | 2024 | 329.22             | 380.89 | 448.04 | 570.87 | 73.19                 | 85.15 | 100.87 | 127.53 |
| C | Humboldt (NC) | Summer | 2025 | 329.18             | 380.99 | 447.99 | 571.05 | 73.20                 | 85.25 | 100.90 | 127.70 |
| C | Humboldt (NC) | Summer | 2026 | 329.19             | 381.14 | 447.93 | 571.23 | 73.22                 | 85.36 | 100.92 | 127.86 |
| C | Humboldt (NC) | Summer | 2027 | 329.20             | 381.29 | 447.87 | 571.42 | 73.24                 | 85.47 | 100.94 | 128.01 |
| C | Humboldt (NC) | Summer | 2028 | 329.19             | 381.43 | 447.82 | 571.62 | 73.25                 | 85.56 | 100.95 | 128.15 |
| C | Humboldt (NC) | Summer | 2029 | 329.18             | 381.58 | 447.75 | 571.81 | 73.25                 | 85.65 | 100.96 | 128.28 |
| C | Humboldt (NC) | Summer | 2030 | 329.16             | 381.72 | 447.67 | 572.00 | 73.25                 | 85.74 | 100.95 | 128.41 |
| C | Humboldt (NC) | Summer | 2031 | 329.15             | 381.87 | 447.63 | 572.23 | 73.26                 | 85.82 | 100.95 | 128.53 |
| C | Humboldt (NC) | Summer | 2032 | 329.15             | 382.00 | 447.60 | 572.45 | 73.27                 | 85.90 | 100.96 | 128.65 |
| C | Humboldt (NC) | Summer | 2033 | 329.14             | 382.12 | 447.58 | 572.64 | 73.27                 | 85.97 | 100.96 | 128.76 |
| C | Humboldt (NC) | Summer | 2034 | 329.13             | 382.22 | 447.55 | 572.81 | 73.28                 | 86.03 | 100.97 | 128.86 |
| C | Humboldt (NC) | Summer | 2035 | 329.13             | 382.31 | 447.53 | 572.97 | 73.28                 | 86.09 | 100.97 | 128.95 |
| C | Humboldt (NC) | Winter | 2010 | 327.32             | 376.27 | 449.51 | 560.73 | 72.92                 | 85.59 | 100.40 | 123.74 |
| C | Humboldt (NC) | Winter | 2011 | 327.34             | 376.67 | 448.90 | 561.41 | 72.88                 | 85.26 | 100.35 | 123.95 |
| C | Humboldt (NC) | Winter | 2012 | 327.40             | 377.05 | 448.43 | 562.18 | 72.86                 | 85.04 | 100.37 | 124.22 |
| C | Humboldt (NC) | Winter | 2013 | 327.52             | 377.40 | 448.05 | 563.02 | 72.87                 | 84.87 | 100.40 | 124.52 |
| C | Humboldt (NC) | Winter | 2014 | 327.59             | 377.71 | 447.75 | 563.84 | 72.82                 | 84.72 | 100.41 | 124.81 |
| C | Humboldt (NC) | Winter | 2015 | 327.71             | 378.02 | 447.51 | 564.67 | 72.83                 | 84.63 | 100.44 | 125.14 |
| C | Humboldt (NC) | Winter | 2016 | 327.86             | 378.33 | 447.32 | 565.46 | 72.89                 | 84.61 | 100.49 | 125.48 |
| C | Humboldt (NC) | Winter | 2017 | 327.97             | 378.58 | 447.16 | 566.20 | 72.91                 | 84.54 | 100.52 | 125.81 |
| C | Humboldt (NC) | Winter | 2018 | 328.06             | 378.80 | 447.04 | 566.84 | 72.94                 | 84.52 | 100.55 | 126.12 |
| C | Humboldt (NC) | Winter | 2019 | 328.14             | 379.03 | 446.95 | 567.40 | 72.98                 | 84.60 | 100.61 | 126.42 |
| C | Humboldt (NC) | Winter | 2020 | 328.20             | 379.23 | 446.88 | 567.88 | 73.07                 | 84.71 | 100.67 | 126.69 |
| C | Humboldt (NC) | Winter | 2021 | 328.25             | 379.39 | 446.80 | 568.27 | 73.13                 | 84.84 | 100.74 | 126.93 |
| C | Humboldt (NC) | Winter | 2022 | 328.25             | 379.51 | 446.73 | 568.60 | 73.18                 | 84.95 | 100.79 | 127.13 |
| C | Humboldt (NC) | Winter | 2023 | 328.20             | 379.61 | 446.65 | 568.84 | 73.20                 | 85.06 | 100.83 | 127.34 |
| C | Humboldt (NC) | Winter | 2024 | 328.13             | 379.67 | 446.58 | 569.04 | 73.19                 | 85.15 | 100.87 | 127.53 |
| C | Humboldt (NC) | Winter | 2025 | 328.09             | 379.77 | 446.53 | 569.21 | 73.20                 | 85.25 | 100.90 | 127.70 |
| C | Humboldt (NC) | Winter | 2026 | 328.10             | 379.92 | 446.47 | 569.40 | 73.22                 | 85.36 | 100.92 | 127.86 |
| C | Humboldt (NC) | Winter | 2027 | 328.10             | 380.06 | 446.42 | 569.59 | 73.24                 | 85.47 | 100.94 | 128.01 |
| C | Humboldt (NC) | Winter | 2028 | 328.10             | 380.21 | 446.36 | 569.78 | 73.25                 | 85.56 | 100.95 | 128.15 |
| C | Humboldt (NC) | Winter | 2029 | 328.08             | 380.35 | 446.30 | 569.97 | 73.25                 | 85.65 | 100.96 | 128.28 |
| C | Humboldt (NC) | Winter | 2030 | 328.06             | 380.49 | 446.22 | 570.17 | 73.25                 | 85.74 | 100.95 | 128.41 |
| C | Humboldt (NC) | Winter | 2031 | 328.06             | 380.63 | 446.18 | 570.39 | 73.26                 | 85.82 | 100.95 | 128.53 |
| C | Humboldt (NC) | Winter | 2032 | 328.05             | 380.76 | 446.14 | 570.61 | 73.27                 | 85.90 | 100.96 | 128.65 |
| C | Humboldt (NC) | Winter | 2033 | 328.04             | 380.88 | 446.12 | 570.80 | 73.27                 | 85.97 | 100.96 | 128.76 |
| C | Humboldt (NC) | Winter | 2034 | 328.04             | 380.98 | 446.10 | 570.97 | 73.28                 | 86.03 | 100.97 | 128.86 |
| C | Humboldt (NC) | Winter | 2035 | 328.03             | 381.07 | 446.08 | 571.12 | 73.28                 | 86.09 | 100.97 | 128.95 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Imperial (SS) | Annual | 2010 | 333.06             | 382.51 | 456.21 | 575.78 | 72.99                 | 86.06 | 100.65 | 125.48 |
| C | Imperial (SS) | Annual | 2011 | 332.74             | 382.65 | 455.12 | 575.21 | 73.04                 | 85.73 | 100.60 | 125.71 |
| C | Imperial (SS) | Annual | 2012 | 333.03             | 383.36 | 454.93 | 575.79 | 73.14                 | 85.50 | 100.60 | 125.97 |
| C | Imperial (SS) | Annual | 2013 | 331.75             | 382.30 | 452.68 | 573.90 | 73.23                 | 85.37 | 100.58 | 126.29 |
| C | Imperial (SS) | Annual | 2014 | 331.98             | 382.91 | 452.61 | 574.66 | 73.31                 | 85.29 | 100.59 | 126.61 |
| C | Imperial (SS) | Annual | 2015 | 327.26             | 377.77 | 445.90 | 566.93 | 73.39                 | 85.24 | 100.62 | 126.91 |
| C | Imperial (SS) | Annual | 2016 | 327.36             | 378.16 | 445.86 | 567.56 | 73.41                 | 85.18 | 100.65 | 127.20 |
| C | Imperial (SS) | Annual | 2017 | 327.39             | 378.50 | 445.81 | 568.11 | 73.41                 | 85.15 | 100.65 | 127.47 |
| C | Imperial (SS) | Annual | 2018 | 327.40             | 378.76 | 445.76 | 568.55 | 73.39                 | 85.16 | 100.65 | 127.71 |
| C | Imperial (SS) | Annual | 2019 | 327.23             | 378.80 | 445.47 | 568.62 | 73.39                 | 85.24 | 100.69 | 127.93 |
| C | Imperial (SS) | Annual | 2020 | 327.21             | 379.01 | 445.41 | 568.92 | 73.41                 | 85.34 | 100.76 | 128.13 |
| C | Imperial (SS) | Annual | 2021 | 327.15             | 379.11 | 445.34 | 569.08 | 73.42                 | 85.44 | 100.80 | 128.28 |
| C | Imperial (SS) | Annual | 2022 | 327.03             | 379.19 | 445.26 | 569.20 | 73.39                 | 85.52 | 100.84 | 128.40 |
| C | Imperial (SS) | Annual | 2023 | 326.91             | 379.26 | 445.18 | 569.30 | 73.35                 | 85.60 | 100.87 | 128.53 |
| C | Imperial (SS) | Annual | 2024 | 329.56             | 382.51 | 448.87 | 574.16 | 73.32                 | 85.66 | 100.89 | 128.63 |
| C | Imperial (SS) | Annual | 2025 | 329.46             | 382.58 | 448.83 | 574.22 | 73.28                 | 85.73 | 100.92 | 128.73 |
| C | Imperial (SS) | Annual | 2026 | 329.42             | 382.67 | 448.77 | 574.27 | 73.26                 | 85.80 | 100.94 | 128.82 |
| C | Imperial (SS) | Annual | 2027 | 329.39             | 382.76 | 448.73 | 574.32 | 73.24                 | 85.86 | 100.95 | 128.90 |
| C | Imperial (SS) | Annual | 2028 | 329.37             | 382.86 | 448.71 | 574.39 | 73.23                 | 85.92 | 100.96 | 128.97 |
| C | Imperial (SS) | Annual | 2029 | 329.36             | 382.96 | 448.68 | 574.47 | 73.21                 | 85.97 | 100.96 | 129.04 |
| C | Imperial (SS) | Annual | 2030 | 329.34             | 383.07 | 448.66 | 574.55 | 73.20                 | 86.02 | 100.97 | 129.10 |
| C | Imperial (SS) | Annual | 2031 | 329.66             | 383.57 | 449.13 | 575.24 | 73.19                 | 86.07 | 100.97 | 129.15 |
| C | Imperial (SS) | Annual | 2032 | 329.64             | 383.67 | 449.12 | 575.31 | 73.18                 | 86.11 | 100.97 | 129.21 |
| C | Imperial (SS) | Annual | 2033 | 329.63             | 383.75 | 449.11 | 575.38 | 73.18                 | 86.15 | 100.98 | 129.26 |
| C | Imperial (SS) | Annual | 2034 | 329.63             | 383.82 | 449.11 | 575.45 | 73.18                 | 86.19 | 100.98 | 129.30 |
| C | Imperial (SS) | Annual | 2035 | 329.62             | 383.88 | 449.10 | 575.52 | 73.18                 | 86.22 | 100.98 | 129.34 |
| C | Imperial (SS) | Summer | 2010 | 341.49             | 391.06 | 467.38 | 590.08 | 72.99                 | 86.06 | 100.65 | 125.48 |
| C | Imperial (SS) | Summer | 2011 | 341.29             | 391.47 | 466.40 | 589.55 | 73.04                 | 85.73 | 100.60 | 125.71 |
| C | Imperial (SS) | Summer | 2012 | 341.64             | 392.37 | 466.28 | 590.14 | 73.14                 | 85.50 | 100.60 | 125.97 |
| C | Imperial (SS) | Summer | 2013 | 340.37             | 391.46 | 464.05 | 588.24 | 73.23                 | 85.37 | 100.58 | 126.29 |
| C | Imperial (SS) | Summer | 2014 | 340.64             | 392.20 | 464.05 | 589.07 | 73.31                 | 85.29 | 100.59 | 126.61 |
| C | Imperial (SS) | Summer | 2015 | 335.82             | 387.05 | 457.23 | 581.20 | 73.39                 | 85.24 | 100.62 | 126.91 |
| C | Imperial (SS) | Summer | 2016 | 335.93             | 387.53 | 457.23 | 581.90 | 73.41                 | 85.18 | 100.65 | 127.20 |
| C | Imperial (SS) | Summer | 2017 | 335.98             | 387.93 | 457.21 | 582.52 | 73.41                 | 85.15 | 100.65 | 127.47 |
| C | Imperial (SS) | Summer | 2018 | 335.99             | 388.23 | 457.17 | 583.00 | 73.39                 | 85.16 | 100.65 | 127.71 |
| C | Imperial (SS) | Summer | 2019 | 335.83             | 388.32 | 456.89 | 583.10 | 73.39                 | 85.24 | 100.69 | 127.93 |
| C | Imperial (SS) | Summer | 2020 | 335.80             | 388.55 | 456.83 | 583.42 | 73.41                 | 85.34 | 100.76 | 128.13 |
| C | Imperial (SS) | Summer | 2021 | 335.69             | 388.62 | 456.70 | 583.51 | 73.42                 | 85.44 | 100.80 | 128.28 |
| C | Imperial (SS) | Summer | 2022 | 335.56             | 388.70 | 456.60 | 583.62 | 73.39                 | 85.52 | 100.84 | 128.40 |
| C | Imperial (SS) | Summer | 2023 | 335.42             | 388.78 | 456.51 | 583.70 | 73.35                 | 85.60 | 100.87 | 128.53 |
| C | Imperial (SS) | Summer | 2024 | 338.10             | 392.07 | 460.23 | 588.61 | 73.32                 | 85.66 | 100.89 | 128.63 |
| C | Imperial (SS) | Summer | 2025 | 338.00             | 392.15 | 460.18 | 588.66 | 73.28                 | 85.73 | 100.92 | 128.73 |
| C | Imperial (SS) | Summer | 2026 | 337.95             | 392.24 | 460.11 | 588.69 | 73.26                 | 85.80 | 100.94 | 128.82 |
| C | Imperial (SS) | Summer | 2027 | 337.92             | 392.33 | 460.07 | 588.73 | 73.24                 | 85.86 | 100.95 | 128.90 |
| C | Imperial (SS) | Summer | 2028 | 337.91             | 392.44 | 460.04 | 588.80 | 73.23                 | 85.92 | 100.96 | 128.97 |
| C | Imperial (SS) | Summer | 2029 | 337.90             | 392.56 | 460.02 | 588.88 | 73.21                 | 85.97 | 100.96 | 129.04 |
| C | Imperial (SS) | Summer | 2030 | 337.89             | 392.68 | 460.00 | 588.96 | 73.20                 | 86.02 | 100.97 | 129.10 |
| C | Imperial (SS) | Summer | 2031 | 338.20             | 393.18 | 460.46 | 589.62 | 73.19                 | 86.07 | 100.97 | 129.15 |
| C | Imperial (SS) | Summer | 2032 | 338.17             | 393.28 | 460.45 | 589.69 | 73.18                 | 86.11 | 100.97 | 129.21 |
| C | Imperial (SS) | Summer | 2033 | 338.16             | 393.37 | 460.44 | 589.76 | 73.18                 | 86.15 | 100.98 | 129.26 |
| C | Imperial (SS) | Summer | 2034 | 338.16             | 393.45 | 460.44 | 589.84 | 73.18                 | 86.19 | 100.98 | 129.30 |
| C | Imperial (SS) | Summer | 2035 | 338.15             | 393.51 | 460.44 | 589.91 | 73.18                 | 86.22 | 100.98 | 129.34 |
| C | Imperial (SS) | Winter | 2010 | 314.45             | 363.62 | 431.53 | 544.19 | 72.99                 | 86.06 | 100.65 | 125.48 |
| C | Imperial (SS) | Winter | 2011 | 313.97             | 363.27 | 430.33 | 543.72 | 73.04                 | 85.73 | 100.60 | 125.71 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Imperial (SS) | Winter | 2012 | 314.13             | 363.55 | 430.01 | 544.27 | 73.14                 | 85.50 | 100.60 | 125.97 |
| C | Imperial (SS) | Winter | 2013 | 312.79             | 362.16 | 427.68 | 542.37 | 73.23                 | 85.37 | 100.58 | 126.29 |
| C | Imperial (SS) | Winter | 2014 | 312.93             | 362.45 | 427.46 | 542.97 | 73.31                 | 85.29 | 100.59 | 126.61 |
| C | Imperial (SS) | Winter | 2015 | 308.44             | 357.38 | 421.00 | 535.54 | 73.39                 | 85.24 | 100.62 | 126.91 |
| C | Imperial (SS) | Winter | 2016 | 308.50             | 357.58 | 420.87 | 536.02 | 73.41                 | 85.18 | 100.65 | 127.20 |
| C | Imperial (SS) | Winter | 2017 | 308.52             | 357.77 | 420.75 | 536.45 | 73.41                 | 85.15 | 100.65 | 127.47 |
| C | Imperial (SS) | Winter | 2018 | 308.53             | 357.93 | 420.67 | 536.81 | 73.39                 | 85.16 | 100.65 | 127.71 |
| C | Imperial (SS) | Winter | 2019 | 308.38             | 357.91 | 420.39 | 536.83 | 73.39                 | 85.24 | 100.69 | 127.93 |
| C | Imperial (SS) | Winter | 2020 | 308.36             | 358.06 | 420.34 | 537.09 | 73.41                 | 85.34 | 100.76 | 128.13 |
| C | Imperial (SS) | Winter | 2021 | 308.33             | 358.16 | 420.31 | 537.29 | 73.42                 | 85.44 | 100.80 | 128.28 |
| C | Imperial (SS) | Winter | 2022 | 308.24             | 358.22 | 420.27 | 537.43 | 73.39                 | 85.52 | 100.84 | 128.40 |
| C | Imperial (SS) | Winter | 2023 | 308.13             | 358.28 | 420.22 | 537.54 | 73.35                 | 85.60 | 100.87 | 128.53 |
| C | Imperial (SS) | Winter | 2024 | 310.65             | 361.33 | 423.72 | 542.17 | 73.32                 | 85.66 | 100.89 | 128.63 |
| C | Imperial (SS) | Winter | 2025 | 310.55             | 361.39 | 423.70 | 542.25 | 73.28                 | 85.73 | 100.92 | 128.73 |
| C | Imperial (SS) | Winter | 2026 | 310.52             | 361.47 | 423.66 | 542.33 | 73.26                 | 85.80 | 100.94 | 128.82 |
| C | Imperial (SS) | Winter | 2027 | 310.48             | 361.55 | 423.63 | 542.41 | 73.24                 | 85.86 | 100.95 | 128.90 |
| C | Imperial (SS) | Winter | 2028 | 310.46             | 361.64 | 423.61 | 542.49 | 73.23                 | 85.92 | 100.96 | 128.97 |
| C | Imperial (SS) | Winter | 2029 | 310.44             | 361.71 | 423.57 | 542.57 | 73.21                 | 85.97 | 100.96 | 129.04 |
| C | Imperial (SS) | Winter | 2030 | 310.42             | 361.79 | 423.54 | 542.64 | 73.20                 | 86.02 | 100.97 | 129.10 |
| C | Imperial (SS) | Winter | 2031 | 310.73             | 362.26 | 423.98 | 543.31 | 73.19                 | 86.07 | 100.97 | 129.15 |
| C | Imperial (SS) | Winter | 2032 | 310.71             | 362.33 | 423.97 | 543.39 | 73.18                 | 86.11 | 100.97 | 129.21 |
| C | Imperial (SS) | Winter | 2033 | 310.71             | 362.40 | 423.97 | 543.46 | 73.18                 | 86.15 | 100.98 | 129.26 |
| C | Imperial (SS) | Winter | 2034 | 310.70             | 362.46 | 423.96 | 543.52 | 73.18                 | 86.19 | 100.98 | 129.30 |
| C | Imperial (SS) | Winter | 2035 | 310.70             | 362.51 | 423.95 | 543.58 | 73.18                 | 86.22 | 100.98 | 129.34 |
| C | Inyo (GBV)    | Annual | 2010 | 356.66             | 415.27 | 486.92 | 609.08 | 74.86                 | 92.72 | 102.09 | 125.24 |
| C | Inyo (GBV)    | Annual | 2011 | 356.50             | 414.78 | 486.39 | 609.72 | 74.57                 | 91.41 | 101.86 | 125.33 |
| C | Inyo (GBV)    | Annual | 2012 | 356.50             | 414.32 | 485.97 | 610.47 | 74.43                 | 90.24 | 101.67 | 125.47 |
| C | Inyo (GBV)    | Annual | 2013 | 356.41             | 413.93 | 485.65 | 611.26 | 74.15                 | 89.28 | 101.48 | 125.65 |
| C | Inyo (GBV)    | Annual | 2014 | 356.31             | 413.56 | 485.39 | 612.03 | 73.85                 | 88.38 | 101.20 | 125.84 |
| C | Inyo (GBV)    | Annual | 2015 | 356.32             | 413.22 | 485.18 | 612.87 | 73.72                 | 87.54 | 101.16 | 126.06 |
| C | Inyo (GBV)    | Annual | 2016 | 356.43             | 413.02 | 485.02 | 613.71 | 73.74                 | 86.96 | 101.06 | 126.28 |
| C | Inyo (GBV)    | Annual | 2017 | 356.44             | 412.83 | 484.88 | 614.47 | 73.66                 | 86.43 | 100.99 | 126.51 |
| C | Inyo (GBV)    | Annual | 2018 | 356.41             | 412.64 | 484.77 | 615.10 | 73.56                 | 85.95 | 100.90 | 126.74 |
| C | Inyo (GBV)    | Annual | 2019 | 356.43             | 412.52 | 484.66 | 615.66 | 73.55                 | 85.62 | 100.82 | 126.95 |
| C | Inyo (GBV)    | Annual | 2020 | 356.41             | 412.45 | 484.57 | 616.15 | 73.60                 | 85.52 | 100.83 | 127.15 |
| C | Inyo (GBV)    | Annual | 2021 | 356.36             | 412.35 | 484.47 | 616.45 | 73.62                 | 85.52 | 100.87 | 127.29 |
| C | Inyo (GBV)    | Annual | 2022 | 356.25             | 412.28 | 484.37 | 616.71 | 73.62                 | 85.52 | 100.90 | 127.41 |
| C | Inyo (GBV)    | Annual | 2023 | 356.15             | 412.19 | 484.26 | 616.90 | 73.62                 | 85.53 | 100.92 | 127.57 |
| C | Inyo (GBV)    | Annual | 2024 | 356.06             | 412.13 | 484.17 | 617.04 | 73.61                 | 85.55 | 100.93 | 127.72 |
| C | Inyo (GBV)    | Annual | 2025 | 355.99             | 412.20 | 484.11 | 617.17 | 73.61                 | 85.62 | 100.96 | 127.86 |
| C | Inyo (GBV)    | Annual | 2026 | 356.00             | 412.34 | 484.04 | 617.36 | 73.63                 | 85.70 | 100.98 | 128.02 |
| C | Inyo (GBV)    | Annual | 2027 | 356.00             | 412.49 | 483.97 | 617.56 | 73.64                 | 85.78 | 101.00 | 128.16 |
| C | Inyo (GBV)    | Annual | 2028 | 355.99             | 412.64 | 483.91 | 617.74 | 73.64                 | 85.86 | 101.00 | 128.29 |
| C | Inyo (GBV)    | Annual | 2029 | 355.98             | 412.78 | 483.84 | 617.93 | 73.65                 | 85.93 | 101.01 | 128.40 |
| C | Inyo (GBV)    | Annual | 2030 | 355.96             | 412.92 | 483.77 | 618.12 | 73.65                 | 85.99 | 101.00 | 128.52 |
| C | Inyo (GBV)    | Annual | 2031 | 355.95             | 413.07 | 483.74 | 618.34 | 73.65                 | 86.06 | 101.01 | 128.63 |
| C | Inyo (GBV)    | Annual | 2032 | 355.94             | 413.20 | 483.70 | 618.56 | 73.66                 | 86.12 | 101.01 | 128.75 |
| C | Inyo (GBV)    | Annual | 2033 | 355.94             | 413.32 | 483.67 | 618.76 | 73.66                 | 86.17 | 101.01 | 128.85 |
| C | Inyo (GBV)    | Annual | 2034 | 355.93             | 413.42 | 483.64 | 618.94 | 73.67                 | 86.22 | 101.02 | 128.94 |
| C | Inyo (GBV)    | Annual | 2035 | 355.93             | 413.51 | 483.62 | 619.10 | 73.67                 | 86.27 | 101.02 | 129.02 |
| C | Inyo (GBV)    | Summer | 2010 | 381.10             | 438.56 | 518.79 | 649.11 | 74.86                 | 92.72 | 102.09 | 125.24 |
| C | Inyo (GBV)    | Summer | 2011 | 381.22             | 438.92 | 518.54 | 649.84 | 74.57                 | 91.41 | 101.86 | 125.33 |
| C | Inyo (GBV)    | Summer | 2012 | 381.40             | 439.18 | 518.36 | 650.75 | 74.43                 | 90.24 | 101.67 | 125.47 |
| C | Inyo (GBV)    | Summer | 2013 | 381.47             | 439.37 | 518.27 | 651.73 | 74.15                 | 89.28 | 101.48 | 125.65 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location   | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |            |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Inyo (GBV) | Summer | 2014 | 381.49             | 439.47 | 518.25 | 652.71 | 73.85                 | 88.38 | 101.20 | 125.84 |
| C | Inyo (GBV) | Summer | 2015 | 381.58             | 439.58 | 518.19 | 653.82 | 73.72                 | 87.54 | 101.16 | 126.06 |
| C | Inyo (GBV) | Summer | 2016 | 381.72             | 439.71 | 518.18 | 654.92 | 73.74                 | 86.96 | 101.06 | 126.28 |
| C | Inyo (GBV) | Summer | 2017 | 381.76             | 439.81 | 518.15 | 655.93 | 73.66                 | 86.43 | 100.99 | 126.51 |
| C | Inyo (GBV) | Summer | 2018 | 381.73             | 439.85 | 518.11 | 656.75 | 73.56                 | 85.95 | 100.90 | 126.74 |
| C | Inyo (GBV) | Summer | 2019 | 381.76             | 439.93 | 518.07 | 657.48 | 73.55                 | 85.62 | 100.82 | 126.95 |
| C | Inyo (GBV) | Summer | 2020 | 381.74             | 440.02 | 518.02 | 658.12 | 73.60                 | 85.52 | 100.83 | 127.15 |
| C | Inyo (GBV) | Summer | 2021 | 381.69             | 440.06 | 517.94 | 658.52 | 73.62                 | 85.52 | 100.87 | 127.29 |
| C | Inyo (GBV) | Summer | 2022 | 381.59             | 440.10 | 517.85 | 658.87 | 73.62                 | 85.52 | 100.90 | 127.41 |
| C | Inyo (GBV) | Summer | 2023 | 381.50             | 440.13 | 517.78 | 659.12 | 73.62                 | 85.53 | 100.92 | 127.57 |
| C | Inyo (GBV) | Summer | 2024 | 381.41             | 440.18 | 517.72 | 659.32 | 73.61                 | 85.55 | 100.93 | 127.72 |
| C | Inyo (GBV) | Summer | 2025 | 381.36             | 440.29 | 517.67 | 659.49 | 73.61                 | 85.62 | 100.96 | 127.86 |
| C | Inyo (GBV) | Summer | 2026 | 381.37             | 440.49 | 517.60 | 659.72 | 73.63                 | 85.70 | 100.98 | 128.02 |
| C | Inyo (GBV) | Summer | 2027 | 381.38             | 440.72 | 517.54 | 659.94 | 73.64                 | 85.78 | 101.00 | 128.16 |
| C | Inyo (GBV) | Summer | 2028 | 381.39             | 440.92 | 517.49 | 660.17 | 73.64                 | 85.86 | 101.00 | 128.29 |
| C | Inyo (GBV) | Summer | 2029 | 381.39             | 441.13 | 517.43 | 660.40 | 73.65                 | 85.93 | 101.01 | 128.40 |
| C | Inyo (GBV) | Summer | 2030 | 381.38             | 441.32 | 517.38 | 660.64 | 73.65                 | 85.99 | 101.00 | 128.52 |
| C | Inyo (GBV) | Summer | 2031 | 381.38             | 441.54 | 517.35 | 660.90 | 73.65                 | 86.06 | 101.01 | 128.63 |
| C | Inyo (GBV) | Summer | 2032 | 381.38             | 441.71 | 517.32 | 661.15 | 73.66                 | 86.12 | 101.01 | 128.75 |
| C | Inyo (GBV) | Summer | 2033 | 381.37             | 441.88 | 517.29 | 661.39 | 73.66                 | 86.17 | 101.01 | 128.85 |
| C | Inyo (GBV) | Summer | 2034 | 381.37             | 442.01 | 517.27 | 661.61 | 73.67                 | 86.22 | 101.02 | 128.94 |
| C | Inyo (GBV) | Summer | 2035 | 381.36             | 442.11 | 517.25 | 661.80 | 73.67                 | 86.27 | 101.02 | 129.02 |
| C | Inyo (GBV) | Winter | 2010 | 379.51             | 437.04 | 516.71 | 646.50 | 74.86                 | 92.72 | 102.09 | 125.24 |
| C | Inyo (GBV) | Winter | 2011 | 379.61             | 437.35 | 516.44 | 647.23 | 74.57                 | 91.41 | 101.86 | 125.33 |
| C | Inyo (GBV) | Winter | 2012 | 379.78             | 437.56 | 516.26 | 648.13 | 74.43                 | 90.24 | 101.67 | 125.47 |
| C | Inyo (GBV) | Winter | 2013 | 379.84             | 437.71 | 516.14 | 649.10 | 74.15                 | 89.28 | 101.48 | 125.65 |
| C | Inyo (GBV) | Winter | 2014 | 379.85             | 437.79 | 516.11 | 650.06 | 73.85                 | 88.38 | 101.20 | 125.84 |
| C | Inyo (GBV) | Winter | 2015 | 379.93             | 437.87 | 516.04 | 651.15 | 73.72                 | 87.54 | 101.16 | 126.06 |
| C | Inyo (GBV) | Winter | 2016 | 380.08             | 437.97 | 516.02 | 652.24 | 73.74                 | 86.96 | 101.06 | 126.28 |
| C | Inyo (GBV) | Winter | 2017 | 380.11             | 438.05 | 515.98 | 653.23 | 73.66                 | 86.43 | 100.99 | 126.51 |
| C | Inyo (GBV) | Winter | 2018 | 380.09             | 438.08 | 515.94 | 654.04 | 73.56                 | 85.95 | 100.90 | 126.74 |
| C | Inyo (GBV) | Winter | 2019 | 380.11             | 438.15 | 515.90 | 654.76 | 73.55                 | 85.62 | 100.82 | 126.95 |
| C | Inyo (GBV) | Winter | 2020 | 380.09             | 438.23 | 515.84 | 655.39 | 73.60                 | 85.52 | 100.83 | 127.15 |
| C | Inyo (GBV) | Winter | 2021 | 380.04             | 438.26 | 515.76 | 655.79 | 73.62                 | 85.52 | 100.87 | 127.29 |
| C | Inyo (GBV) | Winter | 2022 | 379.94             | 438.29 | 515.68 | 656.13 | 73.62                 | 85.52 | 100.90 | 127.41 |
| C | Inyo (GBV) | Winter | 2023 | 379.85             | 438.32 | 515.60 | 656.37 | 73.62                 | 85.53 | 100.92 | 127.57 |
| C | Inyo (GBV) | Winter | 2024 | 379.76             | 438.35 | 515.54 | 656.57 | 73.61                 | 85.55 | 100.93 | 127.72 |
| C | Inyo (GBV) | Winter | 2025 | 379.71             | 438.46 | 515.49 | 656.74 | 73.61                 | 85.62 | 100.96 | 127.86 |
| C | Inyo (GBV) | Winter | 2026 | 379.72             | 438.66 | 515.42 | 656.96 | 73.63                 | 85.70 | 100.98 | 128.02 |
| C | Inyo (GBV) | Winter | 2027 | 379.73             | 438.88 | 515.36 | 657.18 | 73.64                 | 85.78 | 101.00 | 128.16 |
| C | Inyo (GBV) | Winter | 2028 | 379.73             | 439.08 | 515.30 | 657.41 | 73.64                 | 85.86 | 101.00 | 128.29 |
| C | Inyo (GBV) | Winter | 2029 | 379.73             | 439.29 | 515.25 | 657.64 | 73.65                 | 85.93 | 101.01 | 128.40 |
| C | Inyo (GBV) | Winter | 2030 | 379.72             | 439.47 | 515.19 | 657.87 | 73.65                 | 85.99 | 101.00 | 128.52 |
| C | Inyo (GBV) | Winter | 2031 | 379.72             | 439.68 | 515.16 | 658.13 | 73.65                 | 86.06 | 101.01 | 128.63 |
| C | Inyo (GBV) | Winter | 2032 | 379.72             | 439.86 | 515.13 | 658.38 | 73.66                 | 86.12 | 101.01 | 128.75 |
| C | Inyo (GBV) | Winter | 2033 | 379.72             | 440.02 | 515.11 | 658.62 | 73.66                 | 86.17 | 101.01 | 128.85 |
| C | Inyo (GBV) | Winter | 2034 | 379.71             | 440.15 | 515.08 | 658.83 | 73.67                 | 86.22 | 101.02 | 128.94 |
| C | Inyo (GBV) | Winter | 2035 | 379.71             | 440.25 | 515.06 | 659.02 | 73.67                 | 86.27 | 101.02 | 129.02 |
| C | Kern (MD)  | Annual | 2010 | 336.08             | 392.10 | 460.74 | 577.53 | 74.06                 | 93.66 | 100.99 | 125.79 |
| C | Kern (MD)  | Annual | 2011 | 336.60             | 392.15 | 460.74 | 578.88 | 73.94                 | 91.90 | 100.87 | 125.91 |
| C | Kern (MD)  | Annual | 2012 | 336.72             | 391.78 | 460.32 | 579.53 | 73.83                 | 90.38 | 100.77 | 126.04 |
| C | Kern (MD)  | Annual | 2013 | 336.85             | 391.46 | 460.00 | 580.23 | 73.76                 | 89.06 | 100.75 | 126.20 |
| C | Kern (MD)  | Annual | 2014 | 336.97             | 391.23 | 459.75 | 580.93 | 73.68                 | 88.03 | 100.72 | 126.38 |
| C | Kern (MD)  | Annual | 2015 | 337.07             | 391.05 | 459.55 | 581.63 | 73.61                 | 87.19 | 100.70 | 126.58 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location  | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |           |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Kern (MD) | Annual | 2016 | 337.08             | 390.85 | 459.24 | 582.18 | 73.59                 | 86.61 | 100.72 | 126.80 |
| C | Kern (MD) | Annual | 2017 | 337.18             | 390.73 | 459.10 | 582.87 | 73.57                 | 85.95 | 100.70 | 127.03 |
| C | Kern (MD) | Annual | 2018 | 337.24             | 390.67 | 458.98 | 583.45 | 73.54                 | 85.51 | 100.67 | 127.24 |
| C | Kern (MD) | Annual | 2019 | 337.31             | 390.73 | 458.89 | 583.95 | 73.55                 | 85.38 | 100.69 | 127.44 |
| C | Kern (MD) | Annual | 2020 | 337.37             | 390.79 | 458.81 | 584.40 | 73.62                 | 85.36 | 100.74 | 127.63 |
| C | Kern (MD) | Annual | 2021 | 338.50             | 392.19 | 460.25 | 586.62 | 73.68                 | 85.47 | 100.80 | 127.74 |
| C | Kern (MD) | Annual | 2022 | 338.52             | 392.29 | 460.18 | 586.87 | 73.72                 | 85.56 | 100.85 | 127.82 |
| C | Kern (MD) | Annual | 2023 | 338.51             | 392.38 | 460.12 | 587.07 | 73.75                 | 85.64 | 100.89 | 127.98 |
| C | Kern (MD) | Annual | 2024 | 338.48             | 392.46 | 460.06 | 587.20 | 73.76                 | 85.71 | 100.92 | 128.12 |
| C | Kern (MD) | Annual | 2025 | 338.48             | 392.53 | 460.01 | 587.35 | 73.78                 | 85.78 | 100.95 | 128.26 |
| C | Kern (MD) | Annual | 2026 | 338.50             | 392.63 | 459.97 | 587.56 | 73.79                 | 85.84 | 100.97 | 128.40 |
| C | Kern (MD) | Annual | 2027 | 338.52             | 392.72 | 459.92 | 587.75 | 73.81                 | 85.90 | 100.98 | 128.53 |
| C | Kern (MD) | Annual | 2028 | 338.53             | 392.80 | 459.88 | 587.93 | 73.82                 | 85.95 | 100.99 | 128.65 |
| C | Kern (MD) | Annual | 2029 | 338.53             | 392.88 | 459.83 | 588.10 | 73.82                 | 86.00 | 100.99 | 128.75 |
| C | Kern (MD) | Annual | 2030 | 338.52             | 392.95 | 459.78 | 588.27 | 73.82                 | 86.04 | 100.98 | 128.85 |
| C | Kern (MD) | Annual | 2031 | 338.52             | 393.02 | 459.75 | 588.42 | 73.83                 | 86.08 | 100.99 | 128.94 |
| C | Kern (MD) | Annual | 2032 | 338.52             | 393.08 | 459.73 | 588.57 | 73.83                 | 86.12 | 100.99 | 129.02 |
| C | Kern (MD) | Annual | 2033 | 338.52             | 393.13 | 459.71 | 588.70 | 73.84                 | 86.16 | 100.99 | 129.09 |
| C | Kern (MD) | Annual | 2034 | 338.52             | 393.17 | 459.69 | 588.81 | 73.84                 | 86.19 | 101.00 | 129.16 |
| C | Kern (MD) | Annual | 2035 | 338.52             | 393.20 | 459.67 | 588.91 | 73.84                 | 86.21 | 101.00 | 129.22 |
| C | Kern (MD) | Summer | 2010 | 370.45             | 428.06 | 505.41 | 634.10 | 74.06                 | 93.66 | 100.99 | 125.79 |
| C | Kern (MD) | Summer | 2011 | 371.25             | 428.88 | 505.98 | 635.59 | 73.94                 | 91.90 | 100.87 | 125.91 |
| C | Kern (MD) | Summer | 2012 | 371.53             | 429.08 | 505.93 | 636.35 | 73.83                 | 90.38 | 100.77 | 126.04 |
| C | Kern (MD) | Summer | 2013 | 371.80             | 429.22 | 505.88 | 637.24 | 73.76                 | 89.06 | 100.75 | 126.20 |
| C | Kern (MD) | Summer | 2014 | 372.02             | 429.32 | 505.86 | 638.18 | 73.68                 | 88.03 | 100.72 | 126.38 |
| C | Kern (MD) | Summer | 2015 | 372.21             | 429.42 | 505.83 | 639.13 | 73.61                 | 87.19 | 100.70 | 126.58 |
| C | Kern (MD) | Summer | 2016 | 372.30             | 429.42 | 505.66 | 640.02 | 73.59                 | 86.61 | 100.72 | 126.80 |
| C | Kern (MD) | Summer | 2017 | 372.46             | 429.55 | 505.63 | 641.01 | 73.57                 | 85.95 | 100.70 | 127.03 |
| C | Kern (MD) | Summer | 2018 | 372.55             | 429.66 | 505.57 | 641.83 | 73.54                 | 85.51 | 100.67 | 127.24 |
| C | Kern (MD) | Summer | 2019 | 372.63             | 429.83 | 505.50 | 642.53 | 73.55                 | 85.38 | 100.69 | 127.44 |
| C | Kern (MD) | Summer | 2020 | 372.70             | 430.00 | 505.43 | 643.14 | 73.62                 | 85.36 | 100.74 | 127.63 |
| C | Kern (MD) | Summer | 2021 | 373.95             | 431.58 | 507.02 | 645.71 | 73.68                 | 85.47 | 100.80 | 127.74 |
| C | Kern (MD) | Summer | 2022 | 373.96             | 431.73 | 506.96 | 646.06 | 73.72                 | 85.56 | 100.85 | 127.82 |
| C | Kern (MD) | Summer | 2023 | 373.95             | 431.88 | 506.89 | 646.33 | 73.75                 | 85.64 | 100.89 | 127.98 |
| C | Kern (MD) | Summer | 2024 | 373.93             | 431.99 | 506.83 | 646.50 | 73.76                 | 85.71 | 100.92 | 128.12 |
| C | Kern (MD) | Summer | 2025 | 373.93             | 432.11 | 506.78 | 646.66 | 73.78                 | 85.78 | 100.95 | 128.26 |
| C | Kern (MD) | Summer | 2026 | 373.97             | 432.28 | 506.79 | 646.94 | 73.79                 | 85.84 | 100.97 | 128.40 |
| C | Kern (MD) | Summer | 2027 | 374.00             | 432.43 | 506.79 | 647.19 | 73.81                 | 85.90 | 100.98 | 128.53 |
| C | Kern (MD) | Summer | 2028 | 374.02             | 432.56 | 506.79 | 647.41 | 73.82                 | 85.95 | 100.99 | 128.65 |
| C | Kern (MD) | Summer | 2029 | 374.04             | 432.69 | 506.77 | 647.62 | 73.82                 | 86.00 | 100.99 | 128.75 |
| C | Kern (MD) | Summer | 2030 | 374.04             | 432.80 | 506.75 | 647.82 | 73.82                 | 86.04 | 100.98 | 128.85 |
| C | Kern (MD) | Summer | 2031 | 374.04             | 432.90 | 506.73 | 647.98 | 73.83                 | 86.08 | 100.99 | 128.94 |
| C | Kern (MD) | Summer | 2032 | 374.04             | 432.98 | 506.71 | 648.14 | 73.83                 | 86.12 | 100.99 | 129.02 |
| C | Kern (MD) | Summer | 2033 | 374.04             | 433.05 | 506.68 | 648.28 | 73.84                 | 86.16 | 100.99 | 129.09 |
| C | Kern (MD) | Summer | 2034 | 374.04             | 433.09 | 506.66 | 648.41 | 73.84                 | 86.19 | 101.00 | 129.16 |
| C | Kern (MD) | Summer | 2035 | 374.03             | 433.12 | 506.63 | 648.53 | 73.84                 | 86.21 | 101.00 | 129.22 |
| C | Kern (MD) | Winter | 2010 | 325.30             | 380.82 | 446.72 | 559.78 | 74.06                 | 93.66 | 100.99 | 125.79 |
| C | Kern (MD) | Winter | 2011 | 325.73             | 380.63 | 446.54 | 561.09 | 73.94                 | 91.90 | 100.87 | 125.91 |
| C | Kern (MD) | Winter | 2012 | 325.80             | 380.08 | 446.01 | 561.70 | 73.83                 | 90.38 | 100.77 | 126.04 |
| C | Kern (MD) | Winter | 2013 | 325.89             | 379.61 | 445.61 | 562.35 | 73.76                 | 89.06 | 100.75 | 126.20 |
| C | Kern (MD) | Winter | 2014 | 325.97             | 379.28 | 445.29 | 562.97 | 73.68                 | 88.03 | 100.72 | 126.38 |
| C | Kern (MD) | Winter | 2015 | 326.05             | 379.02 | 445.03 | 563.59 | 73.61                 | 87.19 | 100.70 | 126.58 |
| C | Kern (MD) | Winter | 2016 | 326.03             | 378.75 | 444.68 | 564.04 | 73.59                 | 86.61 | 100.72 | 126.80 |
| C | Kern (MD) | Winter | 2017 | 326.12             | 378.55 | 444.51 | 564.64 | 73.57                 | 85.95 | 100.70 | 127.03 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location   | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |            |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Kern (MD)  | Winter | 2018 | 326.17              | 378.44 | 444.37 | 565.14 | 73.54                 | 85.51 | 100.67 | 127.24 |
| C | Kern (MD)  | Winter | 2019 | 326.23              | 378.47 | 444.27 | 565.58 | 73.55                 | 85.38 | 100.69 | 127.44 |
| C | Kern (MD)  | Winter | 2020 | 326.29              | 378.49 | 444.19 | 565.97 | 73.62                 | 85.36 | 100.74 | 127.63 |
| C | Kern (MD)  | Winter | 2021 | 327.38              | 379.84 | 445.58 | 568.09 | 73.68                 | 85.47 | 100.80 | 127.74 |
| C | Kern (MD)  | Winter | 2022 | 327.40              | 379.92 | 445.51 | 568.30 | 73.72                 | 85.56 | 100.85 | 127.82 |
| C | Kern (MD)  | Winter | 2023 | 327.39              | 379.99 | 445.45 | 568.48 | 73.75                 | 85.64 | 100.89 | 127.98 |
| C | Kern (MD)  | Winter | 2024 | 327.36              | 380.05 | 445.39 | 568.60 | 73.76                 | 85.71 | 100.92 | 128.12 |
| C | Kern (MD)  | Winter | 2025 | 327.36              | 380.12 | 445.34 | 568.75 | 73.78                 | 85.78 | 100.95 | 128.26 |
| C | Kern (MD)  | Winter | 2026 | 327.38              | 380.19 | 445.29 | 568.94 | 73.79                 | 85.84 | 100.97 | 128.40 |
| C | Kern (MD)  | Winter | 2027 | 327.39              | 380.27 | 445.22 | 569.11 | 73.81                 | 85.90 | 100.98 | 128.53 |
| C | Kern (MD)  | Winter | 2028 | 327.39              | 380.33 | 445.17 | 569.28 | 73.82                 | 85.95 | 100.99 | 128.65 |
| C | Kern (MD)  | Winter | 2029 | 327.39              | 380.39 | 445.11 | 569.43 | 73.82                 | 86.00 | 100.99 | 128.75 |
| C | Kern (MD)  | Winter | 2030 | 327.38              | 380.45 | 445.05 | 569.59 | 73.82                 | 86.04 | 100.98 | 128.85 |
| C | Kern (MD)  | Winter | 2031 | 327.38              | 380.51 | 445.02 | 569.73 | 73.83                 | 86.08 | 100.99 | 128.94 |
| C | Kern (MD)  | Winter | 2032 | 327.38              | 380.56 | 445.00 | 569.88 | 73.83                 | 86.12 | 100.99 | 129.02 |
| C | Kern (MD)  | Winter | 2033 | 327.38              | 380.61 | 444.98 | 570.01 | 73.84                 | 86.16 | 100.99 | 129.09 |
| C | Kern (MD)  | Winter | 2034 | 327.38              | 380.65 | 444.96 | 570.12 | 73.84                 | 86.19 | 101.00 | 129.16 |
| C | Kern (MD)  | Winter | 2035 | 327.38              | 380.68 | 444.94 | 570.22 | 73.84                 | 86.21 | 101.00 | 129.22 |
| C | Kern (SJV) | Annual | 2010 | 372.18              | 426.19 | 509.12 | 641.67 | 73.42                 | 84.89 | 100.24 | 125.09 |
| C | Kern (SJV) | Annual | 2011 | 372.44              | 427.30 | 508.94 | 642.35 | 73.43                 | 84.72 | 100.24 | 125.33 |
| C | Kern (SJV) | Annual | 2012 | 372.69              | 428.18 | 508.79 | 643.02 | 73.45                 | 84.62 | 100.27 | 125.57 |
| C | Kern (SJV) | Annual | 2013 | 372.35              | 428.23 | 507.88 | 642.72 | 73.49                 | 84.53 | 100.30 | 125.82 |
| C | Kern (SJV) | Annual | 2014 | 372.56              | 428.86 | 507.81 | 643.44 | 73.51                 | 84.49 | 100.33 | 126.07 |
| C | Kern (SJV) | Annual | 2015 | 373.51              | 430.29 | 508.76 | 645.47 | 73.56                 | 84.48 | 100.37 | 126.34 |
| C | Kern (SJV) | Annual | 2016 | 373.71              | 430.80 | 508.73 | 646.20 | 73.62                 | 84.50 | 100.43 | 126.61 |
| C | Kern (SJV) | Annual | 2017 | 373.86              | 431.24 | 508.70 | 646.89 | 73.66                 | 84.50 | 100.45 | 126.87 |
| C | Kern (SJV) | Annual | 2018 | 373.04              | 430.53 | 507.39 | 645.86 | 73.69                 | 84.54 | 100.48 | 127.12 |
| C | Kern (SJV) | Annual | 2019 | 373.15              | 430.90 | 507.37 | 646.40 | 73.74                 | 84.68 | 100.53 | 127.34 |
| C | Kern (SJV) | Annual | 2020 | 373.24              | 431.23 | 507.35 | 646.87 | 73.83                 | 84.85 | 100.60 | 127.55 |
| C | Kern (SJV) | Annual | 2021 | 373.14              | 431.29 | 507.08 | 646.94 | 73.89                 | 85.01 | 100.67 | 127.72 |
| C | Kern (SJV) | Annual | 2022 | 373.18              | 431.51 | 507.05 | 647.25 | 73.94                 | 85.15 | 100.74 | 127.87 |
| C | Kern (SJV) | Annual | 2023 | 373.19              | 431.70 | 507.02 | 647.49 | 73.97                 | 85.27 | 100.79 | 128.04 |
| C | Kern (SJV) | Annual | 2024 | 373.41              | 432.15 | 507.32 | 648.08 | 73.99                 | 85.38 | 100.83 | 128.18 |
| C | Kern (SJV) | Annual | 2025 | 373.41              | 432.31 | 507.30 | 648.26 | 74.01                 | 85.48 | 100.87 | 128.32 |
| C | Kern (SJV) | Annual | 2026 | 371.83              | 430.65 | 505.11 | 645.67 | 74.03                 | 85.58 | 100.89 | 128.45 |
| C | Kern (SJV) | Annual | 2027 | 371.84              | 430.82 | 505.09 | 645.83 | 74.04                 | 85.67 | 100.92 | 128.57 |
| C | Kern (SJV) | Annual | 2028 | 371.85              | 430.99 | 505.08 | 645.99 | 74.05                 | 85.75 | 100.93 | 128.67 |
| C | Kern (SJV) | Annual | 2029 | 371.85              | 431.15 | 505.06 | 646.15 | 74.05                 | 85.83 | 100.94 | 128.77 |
| C | Kern (SJV) | Annual | 2030 | 371.85              | 431.30 | 505.04 | 646.31 | 74.06                 | 85.90 | 100.95 | 128.86 |
| C | Kern (SJV) | Annual | 2031 | 371.85              | 431.44 | 505.03 | 646.46 | 74.06                 | 85.96 | 100.96 | 128.95 |
| C | Kern (SJV) | Annual | 2032 | 371.85              | 431.57 | 505.02 | 646.61 | 74.07                 | 86.03 | 100.96 | 129.03 |
| C | Kern (SJV) | Annual | 2033 | 371.85              | 431.68 | 505.01 | 646.74 | 74.07                 | 86.08 | 100.97 | 129.10 |
| C | Kern (SJV) | Annual | 2034 | 371.85              | 431.78 | 505.00 | 646.87 | 74.07                 | 86.13 | 100.97 | 129.16 |
| C | Kern (SJV) | Annual | 2035 | 371.84              | 431.85 | 504.99 | 646.98 | 74.07                 | 86.18 | 100.98 | 129.22 |
| C | Kern (SJV) | Summer | 2010 | 412.69              | 467.79 | 562.40 | 709.14 | 73.42                 | 84.89 | 100.24 | 125.09 |
| C | Kern (SJV) | Summer | 2011 | 413.18              | 469.85 | 562.48 | 709.74 | 73.43                 | 84.72 | 100.24 | 125.33 |
| C | Kern (SJV) | Summer | 2012 | 413.59              | 471.41 | 562.52 | 710.40 | 73.45                 | 84.62 | 100.27 | 125.57 |
| C | Kern (SJV) | Summer | 2013 | 413.29              | 471.91 | 561.69 | 710.05 | 73.49                 | 84.53 | 100.30 | 125.82 |
| C | Kern (SJV) | Summer | 2014 | 413.60              | 472.94 | 561.79 | 710.92 | 73.51                 | 84.49 | 100.33 | 126.07 |
| C | Kern (SJV) | Summer | 2015 | 414.72              | 474.79 | 563.00 | 713.30 | 73.56                 | 84.48 | 100.37 | 126.34 |
| C | Kern (SJV) | Summer | 2016 | 414.99              | 475.56 | 563.10 | 714.28 | 73.62                 | 84.50 | 100.43 | 126.61 |
| C | Kern (SJV) | Summer | 2017 | 415.18              | 476.21 | 563.17 | 715.20 | 73.66                 | 84.50 | 100.45 | 126.87 |
| C | Kern (SJV) | Summer | 2018 | 414.27              | 475.56 | 561.78 | 714.21 | 73.69                 | 84.54 | 100.48 | 127.12 |
| C | Kern (SJV) | Summer | 2019 | 414.39              | 476.05 | 561.78 | 714.92 | 73.74                 | 84.68 | 100.53 | 127.34 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Kern (SJV)  | Summer | 2020 | 414.49             | 476.49 | 561.77 | 715.54 | 73.83                 | 84.85 | 100.60 | 127.55 |
| C | Kern (SJV)  | Summer | 2021 | 414.38             | 476.59 | 561.45 | 715.68 | 73.89                 | 85.01 | 100.67 | 127.72 |
| C | Kern (SJV)  | Summer | 2022 | 414.42             | 476.88 | 561.40 | 716.07 | 73.94                 | 85.15 | 100.74 | 127.87 |
| C | Kern (SJV)  | Summer | 2023 | 414.43             | 477.14 | 561.35 | 716.37 | 73.97                 | 85.27 | 100.79 | 128.04 |
| C | Kern (SJV)  | Summer | 2024 | 414.68             | 477.72 | 561.68 | 717.04 | 73.99                 | 85.38 | 100.83 | 128.18 |
| C | Kern (SJV)  | Summer | 2025 | 414.69             | 477.97 | 561.66 | 717.23 | 74.01                 | 85.48 | 100.87 | 128.32 |
| C | Kern (SJV)  | Summer | 2026 | 412.93             | 476.21 | 559.25 | 714.34 | 74.03                 | 85.58 | 100.89 | 128.45 |
| C | Kern (SJV)  | Summer | 2027 | 412.94             | 476.48 | 559.24 | 714.51 | 74.04                 | 85.67 | 100.92 | 128.57 |
| C | Kern (SJV)  | Summer | 2028 | 412.95             | 476.73 | 559.24 | 714.67 | 74.05                 | 85.75 | 100.93 | 128.67 |
| C | Kern (SJV)  | Summer | 2029 | 412.96             | 476.98 | 559.23 | 714.83 | 74.05                 | 85.83 | 100.94 | 128.77 |
| C | Kern (SJV)  | Summer | 2030 | 412.96             | 477.21 | 559.23 | 715.00 | 74.06                 | 85.90 | 100.95 | 128.86 |
| C | Kern (SJV)  | Summer | 2031 | 412.96             | 477.42 | 559.21 | 715.15 | 74.06                 | 85.96 | 100.96 | 128.95 |
| C | Kern (SJV)  | Summer | 2032 | 412.95             | 477.60 | 559.19 | 715.31 | 74.07                 | 86.03 | 100.96 | 129.03 |
| C | Kern (SJV)  | Summer | 2033 | 412.95             | 477.75 | 559.18 | 715.46 | 74.07                 | 86.08 | 100.97 | 129.10 |
| C | Kern (SJV)  | Summer | 2034 | 412.95             | 477.86 | 559.17 | 715.61 | 74.07                 | 86.13 | 100.97 | 129.16 |
| C | Kern (SJV)  | Summer | 2035 | 412.95             | 477.95 | 559.16 | 715.75 | 74.07                 | 86.18 | 100.98 | 129.22 |
| C | Kern (SJV)  | Winter | 2010 | 356.46             | 410.05 | 488.44 | 615.49 | 73.42                 | 84.89 | 100.24 | 125.09 |
| C | Kern (SJV)  | Winter | 2011 | 356.63             | 410.79 | 488.16 | 616.20 | 73.43                 | 84.72 | 100.24 | 125.33 |
| C | Kern (SJV)  | Winter | 2012 | 356.82             | 411.41 | 487.95 | 616.88 | 73.45                 | 84.62 | 100.27 | 125.57 |
| C | Kern (SJV)  | Winter | 2013 | 356.46             | 411.28 | 487.00 | 616.59 | 73.49                 | 84.53 | 100.30 | 125.82 |
| C | Kern (SJV)  | Winter | 2014 | 356.64             | 411.75 | 486.87 | 617.26 | 73.51                 | 84.49 | 100.33 | 126.07 |
| C | Kern (SJV)  | Winter | 2015 | 357.52             | 413.02 | 487.71 | 619.15 | 73.56                 | 84.48 | 100.37 | 126.34 |
| C | Kern (SJV)  | Winter | 2016 | 357.70             | 413.43 | 487.64 | 619.79 | 73.62                 | 84.50 | 100.43 | 126.61 |
| C | Kern (SJV)  | Winter | 2017 | 357.83             | 413.79 | 487.57 | 620.38 | 73.66                 | 84.50 | 100.45 | 126.87 |
| C | Kern (SJV)  | Winter | 2018 | 357.04             | 413.06 | 486.29 | 619.34 | 73.69                 | 84.54 | 100.48 | 127.12 |
| C | Kern (SJV)  | Winter | 2019 | 357.14             | 413.38 | 486.26 | 619.81 | 73.74                 | 84.68 | 100.53 | 127.34 |
| C | Kern (SJV)  | Winter | 2020 | 357.23             | 413.67 | 486.23 | 620.23 | 73.83                 | 84.85 | 100.60 | 127.55 |
| C | Kern (SJV)  | Winter | 2021 | 357.14             | 413.71 | 485.99 | 620.27 | 73.89                 | 85.01 | 100.67 | 127.72 |
| C | Kern (SJV)  | Winter | 2022 | 357.17             | 413.91 | 485.97 | 620.54 | 73.94                 | 85.15 | 100.74 | 127.87 |
| C | Kern (SJV)  | Winter | 2023 | 357.18             | 414.07 | 485.95 | 620.76 | 73.97                 | 85.27 | 100.79 | 128.04 |
| C | Kern (SJV)  | Winter | 2024 | 357.39             | 414.47 | 486.23 | 621.33 | 73.99                 | 85.38 | 100.83 | 128.18 |
| C | Kern (SJV)  | Winter | 2025 | 357.39             | 414.59 | 486.21 | 621.50 | 74.01                 | 85.48 | 100.87 | 128.32 |
| C | Kern (SJV)  | Winter | 2026 | 355.88             | 412.97 | 484.11 | 619.02 | 74.03                 | 85.58 | 100.89 | 128.45 |
| C | Kern (SJV)  | Winter | 2027 | 355.89             | 413.11 | 484.08 | 619.19 | 74.04                 | 85.67 | 100.92 | 128.57 |
| C | Kern (SJV)  | Winter | 2028 | 355.90             | 413.24 | 484.06 | 619.35 | 74.05                 | 85.75 | 100.93 | 128.67 |
| C | Kern (SJV)  | Winter | 2029 | 355.90             | 413.37 | 484.04 | 619.50 | 74.05                 | 85.83 | 100.94 | 128.77 |
| C | Kern (SJV)  | Winter | 2030 | 355.90             | 413.49 | 484.02 | 619.65 | 74.06                 | 85.90 | 100.95 | 128.86 |
| C | Kern (SJV)  | Winter | 2031 | 355.90             | 413.60 | 484.01 | 619.80 | 74.06                 | 85.96 | 100.96 | 128.95 |
| C | Kern (SJV)  | Winter | 2032 | 355.90             | 413.71 | 484.00 | 619.95 | 74.07                 | 86.03 | 100.96 | 129.03 |
| C | Kern (SJV)  | Winter | 2033 | 355.90             | 413.81 | 483.99 | 620.08 | 74.07                 | 86.08 | 100.97 | 129.10 |
| C | Kern (SJV)  | Winter | 2034 | 355.90             | 413.89 | 483.98 | 620.20 | 74.07                 | 86.13 | 100.97 | 129.16 |
| C | Kern (SJV)  | Winter | 2035 | 355.89             | 413.96 | 483.97 | 620.30 | 74.07                 | 86.18 | 100.98 | 129.22 |
| C | Kings (SJV) | Annual | 2010 | 334.26             | 384.18 | 458.54 | 576.15 | 73.37                 | 85.91 | 100.56 | 124.91 |
| C | Kings (SJV) | Annual | 2011 | 334.55             | 384.83 | 458.24 | 576.82 | 73.38                 | 85.51 | 100.52 | 125.14 |
| C | Kings (SJV) | Annual | 2012 | 335.48             | 386.17 | 458.92 | 578.63 | 73.41                 | 85.28 | 100.50 | 125.38 |
| C | Kings (SJV) | Annual | 2013 | 335.97             | 386.90 | 459.08 | 579.74 | 73.44                 | 85.03 | 100.49 | 125.62 |
| C | Kings (SJV) | Annual | 2014 | 336.19             | 387.33 | 458.94 | 580.41 | 73.47                 | 84.93 | 100.47 | 125.88 |
| C | Kings (SJV) | Annual | 2015 | 335.98             | 387.22 | 458.26 | 580.38 | 73.53                 | 84.82 | 100.48 | 126.14 |
| C | Kings (SJV) | Annual | 2016 | 336.16             | 387.56 | 458.18 | 581.05 | 73.58                 | 84.77 | 100.51 | 126.40 |
| C | Kings (SJV) | Annual | 2017 | 336.30             | 387.85 | 458.10 | 581.67 | 73.62                 | 84.69 | 100.52 | 126.66 |
| C | Kings (SJV) | Annual | 2018 | 332.59             | 383.72 | 452.87 | 575.68 | 73.63                 | 84.63 | 100.54 | 126.91 |
| C | Kings (SJV) | Annual | 2019 | 332.68             | 384.00 | 452.82 | 576.19 | 73.68                 | 84.71 | 100.55 | 127.14 |
| C | Kings (SJV) | Annual | 2020 | 332.75             | 384.27 | 452.78 | 576.64 | 73.76                 | 84.84 | 100.62 | 127.35 |
| C | Kings (SJV) | Annual | 2021 | 334.26             | 386.18 | 454.72 | 579.52 | 73.83                 | 84.98 | 100.69 | 127.52 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Kings (SJV) | Annual | 2022 | 334.29              | 386.41 | 454.68 | 579.81 | 73.88                 | 85.12 | 100.75 | 127.67 |
| C | Kings (SJV) | Annual | 2023 | 334.30              | 386.59 | 454.64 | 580.04 | 73.91                 | 85.24 | 100.80 | 127.84 |
| C | Kings (SJV) | Annual | 2024 | 334.92              | 387.49 | 455.46 | 581.31 | 73.93                 | 85.35 | 100.84 | 127.99 |
| C | Kings (SJV) | Annual | 2025 | 334.93              | 387.63 | 455.43 | 581.48 | 73.95                 | 85.45 | 100.87 | 128.14 |
| C | Kings (SJV) | Annual | 2026 | 337.32              | 390.57 | 458.64 | 585.81 | 73.97                 | 85.55 | 100.90 | 128.28 |
| C | Kings (SJV) | Annual | 2027 | 337.33              | 390.73 | 458.61 | 585.98 | 73.98                 | 85.64 | 100.92 | 128.41 |
| C | Kings (SJV) | Annual | 2028 | 337.33              | 390.90 | 458.57 | 586.15 | 73.99                 | 85.73 | 100.94 | 128.53 |
| C | Kings (SJV) | Annual | 2029 | 337.33              | 391.07 | 458.54 | 586.31 | 74.00                 | 85.80 | 100.95 | 128.63 |
| C | Kings (SJV) | Annual | 2030 | 337.33              | 391.23 | 458.51 | 586.48 | 74.01                 | 85.88 | 100.95 | 128.74 |
| C | Kings (SJV) | Annual | 2031 | 337.33              | 391.39 | 458.49 | 586.65 | 74.01                 | 85.95 | 100.96 | 128.83 |
| C | Kings (SJV) | Annual | 2032 | 337.33              | 391.54 | 458.47 | 586.81 | 74.01                 | 86.02 | 100.97 | 128.92 |
| C | Kings (SJV) | Annual | 2033 | 337.33              | 391.67 | 458.45 | 586.96 | 74.02                 | 86.08 | 100.97 | 129.01 |
| C | Kings (SJV) | Annual | 2034 | 337.33              | 391.78 | 458.43 | 587.10 | 74.02                 | 86.13 | 100.98 | 129.08 |
| C | Kings (SJV) | Annual | 2035 | 337.33              | 391.87 | 458.41 | 587.22 | 74.02                 | 86.17 | 100.98 | 129.15 |
| C | Kings (SJV) | Summer | 2010 | 367.72              | 417.56 | 501.93 | 631.65 | 73.37                 | 85.91 | 100.56 | 124.91 |
| C | Kings (SJV) | Summer | 2011 | 368.24              | 419.09 | 501.96 | 632.31 | 73.38                 | 85.51 | 100.52 | 125.14 |
| C | Kings (SJV) | Summer | 2012 | 369.40              | 421.14 | 502.98 | 634.26 | 73.41                 | 85.28 | 100.50 | 125.38 |
| C | Kings (SJV) | Summer | 2013 | 370.02              | 422.41 | 503.38 | 635.49 | 73.44                 | 85.03 | 100.49 | 125.62 |
| C | Kings (SJV) | Summer | 2014 | 370.32              | 423.21 | 503.44 | 636.29 | 73.47                 | 84.93 | 100.47 | 125.88 |
| C | Kings (SJV) | Summer | 2015 | 370.13              | 423.37 | 502.86 | 636.36 | 73.53                 | 84.82 | 100.48 | 126.14 |
| C | Kings (SJV) | Summer | 2016 | 370.35              | 423.95 | 502.90 | 637.22 | 73.58                 | 84.77 | 100.51 | 126.40 |
| C | Kings (SJV) | Summer | 2017 | 370.51              | 424.45 | 502.92 | 638.03 | 73.62                 | 84.69 | 100.52 | 126.66 |
| C | Kings (SJV) | Summer | 2018 | 366.42              | 420.10 | 497.24 | 631.57 | 73.63                 | 84.63 | 100.54 | 126.91 |
| C | Kings (SJV) | Summer | 2019 | 366.52              | 420.52 | 497.24 | 632.24 | 73.68                 | 84.71 | 100.55 | 127.14 |
| C | Kings (SJV) | Summer | 2020 | 366.59              | 420.92 | 497.21 | 632.82 | 73.76                 | 84.84 | 100.62 | 127.35 |
| C | Kings (SJV) | Summer | 2021 | 368.26              | 423.12 | 499.35 | 636.05 | 73.83                 | 84.98 | 100.69 | 127.52 |
| C | Kings (SJV) | Summer | 2022 | 368.30              | 423.46 | 499.31 | 636.43 | 73.88                 | 85.12 | 100.75 | 127.67 |
| C | Kings (SJV) | Summer | 2023 | 368.32              | 423.74 | 499.27 | 636.71 | 73.91                 | 85.24 | 100.80 | 127.84 |
| C | Kings (SJV) | Summer | 2024 | 369.01              | 424.82 | 500.17 | 638.12 | 73.93                 | 85.35 | 100.84 | 127.99 |
| C | Kings (SJV) | Summer | 2025 | 369.02              | 425.07 | 500.14 | 638.31 | 73.95                 | 85.45 | 100.87 | 128.14 |
| C | Kings (SJV) | Summer | 2026 | 371.65              | 428.36 | 503.68 | 643.07 | 73.97                 | 85.55 | 100.90 | 128.28 |
| C | Kings (SJV) | Summer | 2027 | 371.66              | 428.60 | 503.66 | 643.25 | 73.98                 | 85.64 | 100.92 | 128.41 |
| C | Kings (SJV) | Summer | 2028 | 371.66              | 428.85 | 503.63 | 643.43 | 73.99                 | 85.73 | 100.94 | 128.53 |
| C | Kings (SJV) | Summer | 2029 | 371.66              | 429.09 | 503.61 | 643.61 | 74.00                 | 85.80 | 100.95 | 128.63 |
| C | Kings (SJV) | Summer | 2030 | 371.67              | 429.33 | 503.59 | 643.80 | 74.01                 | 85.88 | 100.95 | 128.74 |
| C | Kings (SJV) | Summer | 2031 | 371.67              | 429.58 | 503.58 | 643.97 | 74.01                 | 85.95 | 100.96 | 128.83 |
| C | Kings (SJV) | Summer | 2032 | 371.67              | 429.79 | 503.57 | 644.15 | 74.01                 | 86.02 | 100.97 | 128.92 |
| C | Kings (SJV) | Summer | 2033 | 371.67              | 429.97 | 503.55 | 644.32 | 74.02                 | 86.08 | 100.97 | 129.01 |
| C | Kings (SJV) | Summer | 2034 | 371.67              | 430.11 | 503.54 | 644.49 | 74.02                 | 86.13 | 100.98 | 129.08 |
| C | Kings (SJV) | Summer | 2035 | 371.67              | 430.22 | 503.52 | 644.64 | 74.02                 | 86.17 | 100.98 | 129.15 |
| C | Kings (SJV) | Winter | 2010 | 320.60              | 370.56 | 440.84 | 553.50 | 73.37                 | 85.91 | 100.56 | 124.91 |
| C | Kings (SJV) | Winter | 2011 | 320.80              | 370.85 | 440.40 | 554.17 | 73.38                 | 85.51 | 100.52 | 125.14 |
| C | Kings (SJV) | Winter | 2012 | 321.64              | 371.90 | 440.94 | 555.92 | 73.41                 | 85.28 | 100.50 | 125.38 |
| C | Kings (SJV) | Winter | 2013 | 322.08              | 372.41 | 441.00 | 556.98 | 73.44                 | 85.03 | 100.49 | 125.62 |
| C | Kings (SJV) | Winter | 2014 | 322.26              | 372.69 | 440.78 | 557.60 | 73.47                 | 84.93 | 100.47 | 125.88 |
| C | Kings (SJV) | Winter | 2015 | 322.05              | 372.46 | 440.06 | 557.54 | 73.53                 | 84.82 | 100.48 | 126.14 |
| C | Kings (SJV) | Winter | 2016 | 322.20              | 372.71 | 439.92 | 558.12 | 73.58                 | 84.77 | 100.51 | 126.40 |
| C | Kings (SJV) | Winter | 2017 | 322.34              | 372.91 | 439.81 | 558.67 | 73.62                 | 84.69 | 100.52 | 126.66 |
| C | Kings (SJV) | Winter | 2018 | 318.78              | 368.87 | 434.77 | 552.87 | 73.63                 | 84.63 | 100.54 | 126.91 |
| C | Kings (SJV) | Winter | 2019 | 318.87              | 369.09 | 434.70 | 553.31 | 73.68                 | 84.71 | 100.55 | 127.14 |
| C | Kings (SJV) | Winter | 2020 | 318.94              | 369.31 | 434.65 | 553.71 | 73.76                 | 84.84 | 100.62 | 127.35 |
| C | Kings (SJV) | Winter | 2021 | 320.39              | 371.11 | 436.51 | 556.44 | 73.83                 | 84.98 | 100.69 | 127.52 |
| C | Kings (SJV) | Winter | 2022 | 320.42              | 371.30 | 436.47 | 556.70 | 73.88                 | 85.12 | 100.75 | 127.67 |
| C | Kings (SJV) | Winter | 2023 | 320.42              | 371.43 | 436.43 | 556.91 | 73.91                 | 85.24 | 100.80 | 127.84 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Kings (SJV) | Winter | 2024 | 321.01              | 372.25 | 437.21 | 558.12 | 73.93                 | 85.35 | 100.84 | 127.99 |
| C | Kings (SJV) | Winter | 2025 | 321.02              | 372.35 | 437.18 | 558.28 | 73.95                 | 85.45 | 100.87 | 128.14 |
| C | Kings (SJV) | Winter | 2026 | 323.31              | 375.15 | 440.26 | 562.45 | 73.97                 | 85.55 | 100.90 | 128.28 |
| C | Kings (SJV) | Winter | 2027 | 323.32              | 375.28 | 440.22 | 562.61 | 73.98                 | 85.64 | 100.92 | 128.41 |
| C | Kings (SJV) | Winter | 2028 | 323.32              | 375.41 | 440.18 | 562.78 | 73.99                 | 85.73 | 100.94 | 128.53 |
| C | Kings (SJV) | Winter | 2029 | 323.32              | 375.55 | 440.15 | 562.93 | 74.00                 | 85.80 | 100.95 | 128.63 |
| C | Kings (SJV) | Winter | 2030 | 323.32              | 375.68 | 440.11 | 563.09 | 74.01                 | 85.88 | 100.95 | 128.74 |
| C | Kings (SJV) | Winter | 2031 | 323.32              | 375.81 | 440.09 | 563.25 | 74.01                 | 85.95 | 100.96 | 128.83 |
| C | Kings (SJV) | Winter | 2032 | 323.32              | 375.94 | 440.07 | 563.41 | 74.01                 | 86.02 | 100.97 | 128.92 |
| C | Kings (SJV) | Winter | 2033 | 323.32              | 376.05 | 440.04 | 563.56 | 74.02                 | 86.08 | 100.97 | 129.01 |
| C | Kings (SJV) | Winter | 2034 | 323.32              | 376.14 | 440.02 | 563.68 | 74.02                 | 86.13 | 100.98 | 129.08 |
| C | Kings (SJV) | Winter | 2035 | 323.32              | 376.23 | 440.00 | 563.79 | 74.02                 | 86.17 | 100.98 | 129.15 |
| C | Lake (LC)   | Annual | 2010 | 342.07              | 393.50 | 467.77 | 584.22 | 74.77                 | 89.34 | 101.91 | 124.46 |
| C | Lake (LC)   | Annual | 2011 | 342.02              | 394.05 | 467.30 | 584.79 | 74.52                 | 88.47 | 101.71 | 124.54 |
| C | Lake (LC)   | Annual | 2012 | 342.06              | 394.51 | 466.93 | 585.54 | 74.36                 | 87.81 | 101.56 | 124.69 |
| C | Lake (LC)   | Annual | 2013 | 342.12              | 394.89 | 466.63 | 586.41 | 74.20                 | 87.25 | 101.40 | 124.90 |
| C | Lake (LC)   | Annual | 2014 | 342.14              | 395.21 | 466.41 | 587.25 | 73.98                 | 86.77 | 101.22 | 125.12 |
| C | Lake (LC)   | Annual | 2015 | 342.23              | 395.51 | 466.24 | 588.17 | 73.90                 | 86.33 | 101.09 | 125.37 |
| C | Lake (LC)   | Annual | 2016 | 342.33              | 395.78 | 466.10 | 589.06 | 73.88                 | 85.99 | 101.00 | 125.66 |
| C | Lake (LC)   | Annual | 2017 | 342.36              | 396.00 | 465.97 | 589.89 | 73.79                 | 85.60 | 100.88 | 125.95 |
| C | Lake (LC)   | Annual | 2018 | 342.39              | 396.17 | 465.87 | 590.62 | 73.73                 | 85.27 | 100.83 | 126.22 |
| C | Lake (LC)   | Annual | 2019 | 342.41              | 396.35 | 465.79 | 591.26 | 73.69                 | 85.13 | 100.79 | 126.48 |
| C | Lake (LC)   | Annual | 2020 | 342.44              | 396.52 | 465.72 | 591.82 | 73.77                 | 85.14 | 100.79 | 126.73 |
| C | Lake (LC)   | Annual | 2021 | 342.39              | 396.64 | 465.65 | 592.21 | 73.79                 | 85.21 | 100.84 | 126.90 |
| C | Lake (LC)   | Annual | 2022 | 342.31              | 396.75 | 465.57 | 592.55 | 73.78                 | 85.27 | 100.85 | 127.07 |
| C | Lake (LC)   | Annual | 2023 | 342.19              | 396.83 | 465.51 | 592.77 | 73.76                 | 85.32 | 100.87 | 127.26 |
| C | Lake (LC)   | Annual | 2024 | 342.07              | 396.89 | 465.44 | 592.97 | 73.71                 | 85.36 | 100.88 | 127.45 |
| C | Lake (LC)   | Annual | 2025 | 342.01              | 396.99 | 465.40 | 593.14 | 73.71                 | 85.45 | 100.91 | 127.61 |
| C | Lake (LC)   | Annual | 2026 | 342.02              | 397.10 | 465.36 | 593.32 | 73.73                 | 85.55 | 100.93 | 127.78 |
| C | Lake (LC)   | Annual | 2027 | 342.03              | 397.21 | 465.31 | 593.53 | 73.74                 | 85.64 | 100.94 | 127.94 |
| C | Lake (LC)   | Annual | 2028 | 342.03              | 397.32 | 465.27 | 593.73 | 73.75                 | 85.72 | 100.95 | 128.09 |
| C | Lake (LC)   | Annual | 2029 | 342.02              | 397.43 | 465.24 | 593.93 | 73.75                 | 85.80 | 100.96 | 128.22 |
| C | Lake (LC)   | Annual | 2030 | 342.00              | 397.54 | 465.21 | 594.14 | 73.75                 | 85.88 | 100.95 | 128.35 |
| C | Lake (LC)   | Annual | 2031 | 342.00              | 397.66 | 465.19 | 594.38 | 73.76                 | 85.96 | 100.95 | 128.48 |
| C | Lake (LC)   | Annual | 2032 | 341.99              | 397.76 | 465.18 | 594.62 | 73.76                 | 86.03 | 100.96 | 128.61 |
| C | Lake (LC)   | Annual | 2033 | 341.99              | 397.84 | 465.18 | 594.84 | 73.77                 | 86.09 | 100.96 | 128.72 |
| C | Lake (LC)   | Annual | 2034 | 341.98              | 397.92 | 465.17 | 595.03 | 73.77                 | 86.15 | 100.97 | 128.82 |
| C | Lake (LC)   | Annual | 2035 | 341.97              | 397.97 | 465.16 | 595.21 | 73.78                 | 86.20 | 100.97 | 128.92 |
| C | Lake (LC)   | Summer | 2010 | 365.54              | 417.38 | 498.77 | 621.97 | 74.77                 | 89.34 | 101.91 | 124.46 |
| C | Lake (LC)   | Summer | 2011 | 365.78              | 418.72 | 498.60 | 622.61 | 74.52                 | 88.47 | 101.71 | 124.54 |
| C | Lake (LC)   | Summer | 2012 | 366.03              | 419.77 | 498.49 | 623.54 | 74.36                 | 87.81 | 101.56 | 124.69 |
| C | Lake (LC)   | Summer | 2013 | 366.25              | 420.60 | 498.41 | 624.68 | 74.20                 | 87.25 | 101.40 | 124.90 |
| C | Lake (LC)   | Summer | 2014 | 366.39              | 421.26 | 498.37 | 625.78 | 73.98                 | 86.77 | 101.22 | 125.12 |
| C | Lake (LC)   | Summer | 2015 | 366.55              | 421.85 | 498.36 | 627.02 | 73.90                 | 86.33 | 101.09 | 125.37 |
| C | Lake (LC)   | Summer | 2016 | 366.69              | 422.33 | 498.33 | 628.23 | 73.88                 | 85.99 | 101.00 | 125.66 |
| C | Lake (LC)   | Summer | 2017 | 366.75              | 422.72 | 498.28 | 629.33 | 73.79                 | 85.60 | 100.88 | 125.95 |
| C | Lake (LC)   | Summer | 2018 | 366.77              | 423.03 | 498.21 | 630.31 | 73.73                 | 85.27 | 100.83 | 126.22 |
| C | Lake (LC)   | Summer | 2019 | 366.79              | 423.31 | 498.14 | 631.16 | 73.69                 | 85.13 | 100.79 | 126.48 |
| C | Lake (LC)   | Summer | 2020 | 366.81              | 423.55 | 498.08 | 631.89 | 73.77                 | 85.14 | 100.79 | 126.73 |
| C | Lake (LC)   | Summer | 2021 | 366.76              | 423.74 | 498.00 | 632.43 | 73.79                 | 85.21 | 100.84 | 126.90 |
| C | Lake (LC)   | Summer | 2022 | 366.67              | 423.91 | 497.93 | 632.88 | 73.78                 | 85.27 | 100.85 | 127.07 |
| C | Lake (LC)   | Summer | 2023 | 366.57              | 424.04 | 497.87 | 633.19 | 73.76                 | 85.32 | 100.87 | 127.26 |
| C | Lake (LC)   | Summer | 2024 | 366.46              | 424.16 | 497.81 | 633.47 | 73.71                 | 85.36 | 100.88 | 127.45 |
| C | Lake (LC)   | Summer | 2025 | 366.41              | 424.28 | 497.76 | 633.69 | 73.71                 | 85.45 | 100.91 | 127.61 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Lake (LC)    | Summer | 2026 | 366.43             | 424.42 | 497.70 | 633.89 | 73.73                 | 85.55 | 100.93 | 127.78 |
| C | Lake (LC)    | Summer | 2027 | 366.46             | 424.56 | 497.65 | 634.10 | 73.74                 | 85.64 | 100.94 | 127.94 |
| C | Lake (LC)    | Summer | 2028 | 366.47             | 424.70 | 497.62 | 634.32 | 73.75                 | 85.72 | 100.95 | 128.09 |
| C | Lake (LC)    | Summer | 2029 | 366.48             | 424.86 | 497.59 | 634.55 | 73.75                 | 85.80 | 100.96 | 128.22 |
| C | Lake (LC)    | Summer | 2030 | 366.48             | 425.00 | 497.56 | 634.80 | 73.75                 | 85.88 | 100.95 | 128.35 |
| C | Lake (LC)    | Summer | 2031 | 366.48             | 425.18 | 497.58 | 635.06 | 73.76                 | 85.96 | 100.95 | 128.48 |
| C | Lake (LC)    | Summer | 2032 | 366.47             | 425.33 | 497.59 | 635.34 | 73.76                 | 86.03 | 100.96 | 128.61 |
| C | Lake (LC)    | Summer | 2033 | 366.46             | 425.44 | 497.60 | 635.60 | 73.77                 | 86.09 | 100.96 | 128.72 |
| C | Lake (LC)    | Summer | 2034 | 366.45             | 425.54 | 497.60 | 635.84 | 73.77                 | 86.15 | 100.97 | 128.82 |
| C | Lake (LC)    | Summer | 2035 | 366.44             | 425.60 | 497.60 | 636.06 | 73.78                 | 86.20 | 100.97 | 128.92 |
| C | Lake (LC)    | Winter | 2010 | 355.28             | 406.94 | 485.21 | 605.47 | 74.77                 | 89.34 | 101.91 | 124.46 |
| C | Lake (LC)    | Winter | 2011 | 355.39             | 407.93 | 484.91 | 606.07 | 74.52                 | 88.47 | 101.71 | 124.54 |
| C | Lake (LC)    | Winter | 2012 | 355.55             | 408.73 | 484.69 | 606.93 | 74.36                 | 87.81 | 101.56 | 124.69 |
| C | Lake (LC)    | Winter | 2013 | 355.70             | 409.36 | 484.52 | 607.95 | 74.20                 | 87.25 | 101.40 | 124.90 |
| C | Lake (LC)    | Winter | 2014 | 355.79             | 409.87 | 484.39 | 608.93 | 73.98                 | 86.77 | 101.22 | 125.12 |
| C | Lake (LC)    | Winter | 2015 | 355.91             | 410.33 | 484.31 | 610.03 | 73.90                 | 86.33 | 101.09 | 125.37 |
| C | Lake (LC)    | Winter | 2016 | 356.04             | 410.72 | 484.24 | 611.10 | 73.88                 | 85.99 | 101.00 | 125.66 |
| C | Lake (LC)    | Winter | 2017 | 356.08             | 411.04 | 484.15 | 612.08 | 73.79                 | 85.60 | 100.88 | 125.95 |
| C | Lake (LC)    | Winter | 2018 | 356.11             | 411.29 | 484.07 | 612.96 | 73.73                 | 85.27 | 100.83 | 126.22 |
| C | Lake (LC)    | Winter | 2019 | 356.13             | 411.52 | 484.00 | 613.71 | 73.69                 | 85.13 | 100.79 | 126.48 |
| C | Lake (LC)    | Winter | 2020 | 356.15             | 411.73 | 483.93 | 614.36 | 73.77                 | 85.14 | 100.79 | 126.73 |
| C | Lake (LC)    | Winter | 2021 | 356.11             | 411.89 | 483.85 | 614.84 | 73.79                 | 85.21 | 100.84 | 126.90 |
| C | Lake (LC)    | Winter | 2022 | 356.02             | 412.03 | 483.78 | 615.25 | 73.78                 | 85.27 | 100.85 | 127.07 |
| C | Lake (LC)    | Winter | 2023 | 355.91             | 412.15 | 483.72 | 615.52 | 73.76                 | 85.32 | 100.87 | 127.26 |
| C | Lake (LC)    | Winter | 2024 | 355.79             | 412.24 | 483.66 | 615.76 | 73.71                 | 85.36 | 100.88 | 127.45 |
| C | Lake (LC)    | Winter | 2025 | 355.74             | 412.35 | 483.61 | 615.96 | 73.71                 | 85.45 | 100.91 | 127.61 |
| C | Lake (LC)    | Winter | 2026 | 355.76             | 412.47 | 483.56 | 616.15 | 73.73                 | 85.55 | 100.93 | 127.78 |
| C | Lake (LC)    | Winter | 2027 | 355.78             | 412.60 | 483.51 | 616.36 | 73.74                 | 85.64 | 100.94 | 127.94 |
| C | Lake (LC)    | Winter | 2028 | 355.78             | 412.73 | 483.47 | 616.58 | 73.75                 | 85.72 | 100.95 | 128.09 |
| C | Lake (LC)    | Winter | 2029 | 355.78             | 412.87 | 483.44 | 616.79 | 73.75                 | 85.80 | 100.96 | 128.22 |
| C | Lake (LC)    | Winter | 2030 | 355.78             | 412.99 | 483.41 | 617.02 | 73.75                 | 85.88 | 100.95 | 128.35 |
| C | Lake (LC)    | Winter | 2031 | 355.77             | 413.15 | 483.42 | 617.27 | 73.76                 | 85.96 | 100.95 | 128.48 |
| C | Lake (LC)    | Winter | 2032 | 355.77             | 413.27 | 483.42 | 617.53 | 73.76                 | 86.03 | 100.96 | 128.61 |
| C | Lake (LC)    | Winter | 2033 | 355.76             | 413.37 | 483.42 | 617.77 | 73.77                 | 86.09 | 100.96 | 128.72 |
| C | Lake (LC)    | Winter | 2034 | 355.75             | 413.46 | 483.42 | 618.00 | 73.77                 | 86.15 | 100.97 | 128.82 |
| C | Lake (LC)    | Winter | 2035 | 355.74             | 413.52 | 483.42 | 618.20 | 73.78                 | 86.20 | 100.97 | 128.92 |
| C | Lassen (NEP) | Annual | 2010 | 366.63             | 428.55 | 501.21 | 626.78 | 75.03                 | 93.49 | 101.72 | 124.85 |
| C | Lassen (NEP) | Annual | 2011 | 366.52             | 427.89 | 500.66 | 627.52 | 74.78                 | 92.04 | 101.44 | 124.99 |
| C | Lassen (NEP) | Annual | 2012 | 366.51             | 427.37 | 500.23 | 628.37 | 74.62                 | 90.87 | 101.30 | 125.17 |
| C | Lassen (NEP) | Annual | 2013 | 366.45             | 426.93 | 499.88 | 629.27 | 74.35                 | 89.90 | 101.18 | 125.38 |
| C | Lassen (NEP) | Annual | 2014 | 366.47             | 426.50 | 499.61 | 630.13 | 74.18                 | 88.91 | 101.02 | 125.60 |
| C | Lassen (NEP) | Annual | 2015 | 366.54             | 426.15 | 499.39 | 631.03 | 74.11                 | 88.06 | 100.90 | 125.84 |
| C | Lassen (NEP) | Annual | 2016 | 366.63             | 425.82 | 499.23 | 631.85 | 74.09                 | 87.24 | 100.87 | 126.11 |
| C | Lassen (NEP) | Annual | 2017 | 366.62             | 425.58 | 499.09 | 632.62 | 73.95                 | 86.60 | 100.80 | 126.37 |
| C | Lassen (NEP) | Annual | 2018 | 366.60             | 425.38 | 498.97 | 633.29 | 73.84                 | 86.10 | 100.79 | 126.62 |
| C | Lassen (NEP) | Annual | 2019 | 366.62             | 425.22 | 498.88 | 633.88 | 73.81                 | 85.71 | 100.76 | 126.84 |
| C | Lassen (NEP) | Annual | 2020 | 366.64             | 425.15 | 498.80 | 634.35 | 73.88                 | 85.60 | 100.80 | 127.07 |
| C | Lassen (NEP) | Annual | 2021 | 366.58             | 425.05 | 498.73 | 634.71 | 73.90                 | 85.58 | 100.85 | 127.25 |
| C | Lassen (NEP) | Annual | 2022 | 366.46             | 424.97 | 498.64 | 635.00 | 73.88                 | 85.58 | 100.88 | 127.38 |
| C | Lassen (NEP) | Annual | 2023 | 366.37             | 424.91 | 498.56 | 635.19 | 73.88                 | 85.59 | 100.91 | 127.55 |
| C | Lassen (NEP) | Annual | 2024 | 366.23             | 424.85 | 498.49 | 635.34 | 73.85                 | 85.60 | 100.93 | 127.70 |
| C | Lassen (NEP) | Annual | 2025 | 366.17             | 424.91 | 498.44 | 635.47 | 73.85                 | 85.67 | 100.96 | 127.84 |
| C | Lassen (NEP) | Annual | 2026 | 366.19             | 425.03 | 498.40 | 635.65 | 73.87                 | 85.75 | 100.99 | 127.99 |
| C | Lassen (NEP) | Annual | 2027 | 366.19             | 425.15 | 498.34 | 635.84 | 73.88                 | 85.83 | 101.00 | 128.13 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Lassen (NEP) | Annual | 2028 | 366.19              | 425.28 | 498.29 | 636.04 | 73.89                 | 85.91 | 101.01 | 128.26 |
| C | Lassen (NEP) | Annual | 2029 | 366.17              | 425.41 | 498.23 | 636.23 | 73.89                 | 85.98 | 101.01 | 128.38 |
| C | Lassen (NEP) | Annual | 2030 | 366.16              | 425.52 | 498.17 | 636.41 | 73.89                 | 86.04 | 101.01 | 128.49 |
| C | Lassen (NEP) | Annual | 2031 | 366.15              | 425.65 | 498.14 | 636.65 | 73.90                 | 86.10 | 101.01 | 128.61 |
| C | Lassen (NEP) | Annual | 2032 | 366.15              | 425.76 | 498.12 | 636.90 | 73.90                 | 86.16 | 101.01 | 128.73 |
| C | Lassen (NEP) | Annual | 2033 | 366.15              | 425.86 | 498.09 | 637.12 | 73.91                 | 86.22 | 101.02 | 128.83 |
| C | Lassen (NEP) | Annual | 2034 | 366.14              | 425.94 | 498.07 | 637.31 | 73.91                 | 86.26 | 101.02 | 128.92 |
| C | Lassen (NEP) | Annual | 2035 | 366.13              | 426.00 | 498.05 | 637.48 | 73.92                 | 86.30 | 101.02 | 129.01 |
| C | Lassen (NEP) | Summer | 2010 | 385.95              | 446.82 | 526.65 | 657.83 | 75.03                 | 93.49 | 101.72 | 124.85 |
| C | Lassen (NEP) | Summer | 2011 | 386.07              | 446.99 | 526.29 | 658.69 | 74.78                 | 92.04 | 101.44 | 124.99 |
| C | Lassen (NEP) | Summer | 2012 | 386.23              | 447.10 | 526.01 | 659.72 | 74.62                 | 90.87 | 101.30 | 125.17 |
| C | Lassen (NEP) | Summer | 2013 | 386.31              | 447.13 | 525.80 | 660.84 | 74.35                 | 89.90 | 101.18 | 125.38 |
| C | Lassen (NEP) | Summer | 2014 | 386.41              | 447.10 | 525.66 | 661.92 | 74.18                 | 88.91 | 101.02 | 125.60 |
| C | Lassen (NEP) | Summer | 2015 | 386.54              | 447.07 | 525.57 | 663.05 | 74.11                 | 88.06 | 100.90 | 125.84 |
| C | Lassen (NEP) | Summer | 2016 | 386.67              | 447.02 | 525.50 | 664.09 | 74.09                 | 87.24 | 100.87 | 126.11 |
| C | Lassen (NEP) | Summer | 2017 | 386.67              | 446.98 | 525.44 | 665.06 | 73.95                 | 86.60 | 100.80 | 126.37 |
| C | Lassen (NEP) | Summer | 2018 | 386.66              | 446.94 | 525.37 | 665.90 | 73.84                 | 86.10 | 100.79 | 126.62 |
| C | Lassen (NEP) | Summer | 2019 | 386.67              | 446.92 | 525.31 | 666.64 | 73.81                 | 85.71 | 100.76 | 126.84 |
| C | Lassen (NEP) | Summer | 2020 | 386.68              | 446.95 | 525.25 | 667.23 | 73.88                 | 85.60 | 100.80 | 127.07 |
| C | Lassen (NEP) | Summer | 2021 | 386.62              | 446.96 | 525.18 | 667.70 | 73.90                 | 85.58 | 100.85 | 127.25 |
| C | Lassen (NEP) | Summer | 2022 | 386.49              | 446.97 | 525.10 | 668.07 | 73.88                 | 85.58 | 100.88 | 127.38 |
| C | Lassen (NEP) | Summer | 2023 | 386.41              | 446.99 | 525.03 | 668.33 | 73.88                 | 85.59 | 100.91 | 127.55 |
| C | Lassen (NEP) | Summer | 2024 | 386.28              | 447.01 | 524.97 | 668.54 | 73.85                 | 85.60 | 100.93 | 127.70 |
| C | Lassen (NEP) | Summer | 2025 | 386.22              | 447.11 | 524.92 | 668.73 | 73.85                 | 85.67 | 100.96 | 127.84 |
| C | Lassen (NEP) | Summer | 2026 | 386.24              | 447.28 | 524.88 | 668.93 | 73.87                 | 85.75 | 100.99 | 127.99 |
| C | Lassen (NEP) | Summer | 2027 | 386.26              | 447.44 | 524.83 | 669.14 | 73.88                 | 85.83 | 101.00 | 128.13 |
| C | Lassen (NEP) | Summer | 2028 | 386.27              | 447.61 | 524.79 | 669.37 | 73.89                 | 85.91 | 101.01 | 128.26 |
| C | Lassen (NEP) | Summer | 2029 | 386.27              | 447.79 | 524.74 | 669.59 | 73.89                 | 85.98 | 101.01 | 128.38 |
| C | Lassen (NEP) | Summer | 2030 | 386.26              | 447.96 | 524.69 | 669.81 | 73.89                 | 86.04 | 101.01 | 128.49 |
| C | Lassen (NEP) | Summer | 2031 | 386.26              | 448.12 | 524.66 | 670.10 | 73.90                 | 86.10 | 101.01 | 128.61 |
| C | Lassen (NEP) | Summer | 2032 | 386.26              | 448.27 | 524.64 | 670.38 | 73.90                 | 86.16 | 101.01 | 128.73 |
| C | Lassen (NEP) | Summer | 2033 | 386.25              | 448.40 | 524.62 | 670.64 | 73.91                 | 86.22 | 101.02 | 128.83 |
| C | Lassen (NEP) | Summer | 2034 | 386.25              | 448.50 | 524.60 | 670.87 | 73.91                 | 86.26 | 101.02 | 128.92 |
| C | Lassen (NEP) | Summer | 2035 | 386.24              | 448.57 | 524.58 | 671.07 | 73.92                 | 86.30 | 101.02 | 129.01 |
| C | Lassen (NEP) | Winter | 2010 | 359.88              | 422.17 | 492.33 | 615.94 | 75.03                 | 93.49 | 101.72 | 124.85 |
| C | Lassen (NEP) | Winter | 2011 | 359.69              | 421.22 | 491.71 | 616.64 | 74.78                 | 92.04 | 101.44 | 124.99 |
| C | Lassen (NEP) | Winter | 2012 | 359.63              | 420.48 | 491.23 | 617.43 | 74.62                 | 90.87 | 101.30 | 125.17 |
| C | Lassen (NEP) | Winter | 2013 | 359.52              | 419.89 | 490.84 | 618.25 | 74.35                 | 89.90 | 101.18 | 125.38 |
| C | Lassen (NEP) | Winter | 2014 | 359.51              | 419.32 | 490.52 | 619.04 | 74.18                 | 88.91 | 101.02 | 125.60 |
| C | Lassen (NEP) | Winter | 2015 | 359.57              | 418.85 | 490.26 | 619.85 | 74.11                 | 88.06 | 100.90 | 125.84 |
| C | Lassen (NEP) | Winter | 2016 | 359.64              | 418.43 | 490.06 | 620.60 | 74.09                 | 87.24 | 100.87 | 126.11 |
| C | Lassen (NEP) | Winter | 2017 | 359.62              | 418.11 | 489.89 | 621.30 | 73.95                 | 86.60 | 100.80 | 126.37 |
| C | Lassen (NEP) | Winter | 2018 | 359.60              | 417.85 | 489.77 | 621.91 | 73.84                 | 86.10 | 100.79 | 126.62 |
| C | Lassen (NEP) | Winter | 2019 | 359.62              | 417.65 | 489.66 | 622.44 | 73.81                 | 85.71 | 100.76 | 126.84 |
| C | Lassen (NEP) | Winter | 2020 | 359.65              | 417.54 | 489.58 | 622.88 | 73.88                 | 85.60 | 100.80 | 127.07 |
| C | Lassen (NEP) | Winter | 2021 | 359.59              | 417.41 | 489.50 | 623.21 | 73.90                 | 85.58 | 100.85 | 127.25 |
| C | Lassen (NEP) | Winter | 2022 | 359.47              | 417.29 | 489.40 | 623.46 | 73.88                 | 85.58 | 100.88 | 127.38 |
| C | Lassen (NEP) | Winter | 2023 | 359.38              | 417.21 | 489.33 | 623.63 | 73.88                 | 85.59 | 100.91 | 127.55 |
| C | Lassen (NEP) | Winter | 2024 | 359.24              | 417.11 | 489.25 | 623.75 | 73.85                 | 85.60 | 100.93 | 127.70 |
| C | Lassen (NEP) | Winter | 2025 | 359.18              | 417.16 | 489.20 | 623.86 | 73.85                 | 85.67 | 100.96 | 127.84 |
| C | Lassen (NEP) | Winter | 2026 | 359.19              | 417.27 | 489.16 | 624.04 | 73.87                 | 85.75 | 100.99 | 127.99 |
| C | Lassen (NEP) | Winter | 2027 | 359.18              | 417.38 | 489.10 | 624.22 | 73.88                 | 85.83 | 101.00 | 128.13 |
| C | Lassen (NEP) | Winter | 2028 | 359.18              | 417.49 | 489.05 | 624.41 | 73.89                 | 85.91 | 101.01 | 128.26 |
| C | Lassen (NEP) | Winter | 2029 | 359.16              | 417.59 | 488.98 | 624.59 | 73.89                 | 85.98 | 101.01 | 128.38 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Lassen (NEP)     | Winter | 2030 | 359.14              | 417.70 | 488.92 | 624.75 | 73.89                 | 86.04 | 101.01 | 128.49 |
| C | Lassen (NEP)     | Winter | 2031 | 359.14              | 417.80 | 488.89 | 624.98 | 73.90                 | 86.10 | 101.01 | 128.61 |
| C | Lassen (NEP)     | Winter | 2032 | 359.14              | 417.90 | 488.86 | 625.22 | 73.90                 | 86.16 | 101.01 | 128.73 |
| C | Lassen (NEP)     | Winter | 2033 | 359.13              | 417.99 | 488.84 | 625.43 | 73.91                 | 86.22 | 101.02 | 128.83 |
| C | Lassen (NEP)     | Winter | 2034 | 359.13              | 418.06 | 488.82 | 625.61 | 73.91                 | 86.26 | 101.02 | 128.92 |
| C | Lassen (NEP)     | Winter | 2035 | 359.12              | 418.13 | 488.80 | 625.76 | 73.92                 | 86.30 | 101.02 | 129.01 |
| C | Los Angeles (MD) | Annual | 2010 | 345.89              | 395.46 | 472.51 | 595.78 | 73.36                 | 84.38 | 99.72  | 125.11 |
| C | Los Angeles (MD) | Annual | 2011 | 348.87              | 399.45 | 476.26 | 601.40 | 73.38                 | 84.28 | 99.78  | 125.35 |
| C | Los Angeles (MD) | Annual | 2012 | 349.04              | 400.17 | 476.18 | 602.17 | 73.40                 | 84.27 | 99.87  | 125.60 |
| C | Los Angeles (MD) | Annual | 2013 | 350.49              | 402.29 | 477.89 | 605.21 | 73.42                 | 84.25 | 99.97  | 125.87 |
| C | Los Angeles (MD) | Annual | 2014 | 350.66              | 402.85 | 477.86 | 605.99 | 73.46                 | 84.24 | 100.05 | 126.14 |
| C | Los Angeles (MD) | Annual | 2015 | 355.63              | 408.92 | 484.44 | 615.13 | 73.50                 | 84.26 | 100.16 | 126.42 |
| C | Los Angeles (MD) | Annual | 2016 | 355.79              | 409.41 | 484.43 | 615.82 | 73.56                 | 84.33 | 100.25 | 126.69 |
| C | Los Angeles (MD) | Annual | 2017 | 355.91              | 409.84 | 484.42 | 616.46 | 73.60                 | 84.36 | 100.32 | 126.95 |
| C | Los Angeles (MD) | Annual | 2018 | 356.00              | 410.20 | 484.40 | 617.00 | 73.63                 | 84.42 | 100.38 | 127.20 |
| C | Los Angeles (MD) | Annual | 2019 | 357.84              | 412.61 | 486.79 | 620.54 | 73.67                 | 84.58 | 100.46 | 127.42 |
| C | Los Angeles (MD) | Annual | 2020 | 357.92              | 412.97 | 486.78 | 620.97 | 73.75                 | 84.76 | 100.55 | 127.62 |
| C | Los Angeles (MD) | Annual | 2021 | 360.97              | 416.79 | 490.85 | 626.51 | 73.82                 | 84.94 | 100.64 | 127.79 |
| C | Los Angeles (MD) | Annual | 2022 | 361.00              | 417.09 | 490.84 | 626.80 | 73.87                 | 85.10 | 100.71 | 127.92 |
| C | Los Angeles (MD) | Annual | 2023 | 361.00              | 417.34 | 490.82 | 627.02 | 73.90                 | 85.24 | 100.77 | 128.08 |
| C | Los Angeles (MD) | Annual | 2024 | 361.28              | 417.87 | 491.15 | 627.65 | 73.91                 | 85.37 | 100.81 | 128.23 |
| C | Los Angeles (MD) | Annual | 2025 | 361.29              | 418.06 | 491.14 | 627.84 | 73.93                 | 85.48 | 100.86 | 128.37 |
| C | Los Angeles (MD) | Annual | 2026 | 361.30              | 418.26 | 491.12 | 628.01 | 73.95                 | 85.58 | 100.89 | 128.50 |
| C | Los Angeles (MD) | Annual | 2027 | 361.31              | 418.44 | 491.10 | 628.17 | 73.97                 | 85.67 | 100.91 | 128.62 |
| C | Los Angeles (MD) | Annual | 2028 | 361.32              | 418.63 | 491.09 | 628.32 | 73.97                 | 85.76 | 100.93 | 128.72 |
| C | Los Angeles (MD) | Annual | 2029 | 361.32              | 418.81 | 491.07 | 628.47 | 73.98                 | 85.84 | 100.94 | 128.81 |
| C | Los Angeles (MD) | Annual | 2030 | 361.31              | 418.99 | 491.06 | 628.62 | 73.98                 | 85.91 | 100.95 | 128.90 |
| C | Los Angeles (MD) | Annual | 2031 | 366.94              | 425.72 | 498.73 | 638.58 | 73.99                 | 85.98 | 100.96 | 128.98 |
| C | Los Angeles (MD) | Annual | 2032 | 366.93              | 425.88 | 498.72 | 638.71 | 73.99                 | 86.05 | 100.97 | 129.05 |
| C | Los Angeles (MD) | Annual | 2033 | 366.93              | 426.03 | 498.71 | 638.83 | 74.00                 | 86.10 | 100.98 | 129.12 |
| C | Los Angeles (MD) | Annual | 2034 | 366.92              | 426.15 | 498.70 | 638.94 | 74.00                 | 86.15 | 100.98 | 129.18 |
| C | Los Angeles (MD) | Annual | 2035 | 366.92              | 426.26 | 498.69 | 639.04 | 74.00                 | 86.20 | 100.99 | 129.24 |
| C | Los Angeles (MD) | Summer | 2010 | 381.87              | 431.89 | 519.76 | 655.58 | 73.36                 | 84.38 | 99.72  | 125.11 |
| C | Los Angeles (MD) | Summer | 2011 | 385.34              | 436.89 | 524.09 | 661.69 | 73.38                 | 84.28 | 99.78  | 125.35 |
| C | Los Angeles (MD) | Summer | 2012 | 385.66              | 438.19 | 524.18 | 662.56 | 73.40                 | 84.27 | 99.87  | 125.60 |
| C | Los Angeles (MD) | Summer | 2013 | 387.37              | 440.97 | 526.26 | 666.03 | 73.42                 | 84.25 | 99.97  | 125.87 |
| C | Los Angeles (MD) | Summer | 2014 | 387.63              | 441.94 | 526.42 | 667.04 | 73.46                 | 84.24 | 100.05 | 126.14 |
| C | Los Angeles (MD) | Summer | 2015 | 393.20              | 448.92 | 533.87 | 677.32 | 73.50                 | 84.26 | 100.16 | 126.42 |
| C | Los Angeles (MD) | Summer | 2016 | 393.41              | 449.67 | 534.00 | 678.24 | 73.56                 | 84.33 | 100.25 | 126.69 |
| C | Los Angeles (MD) | Summer | 2017 | 393.56              | 450.33 | 534.08 | 679.07 | 73.60                 | 84.36 | 100.32 | 126.95 |
| C | Los Angeles (MD) | Summer | 2018 | 393.65              | 450.86 | 534.11 | 679.75 | 73.63                 | 84.42 | 100.38 | 127.20 |
| C | Los Angeles (MD) | Summer | 2019 | 395.68              | 453.61 | 536.75 | 683.71 | 73.67                 | 84.58 | 100.46 | 127.42 |
| C | Los Angeles (MD) | Summer | 2020 | 395.75              | 454.07 | 536.73 | 684.25 | 73.75                 | 84.76 | 100.55 | 127.62 |
| C | Los Angeles (MD) | Summer | 2021 | 399.16              | 458.42 | 541.24 | 690.46 | 73.82                 | 84.94 | 100.64 | 127.79 |
| C | Los Angeles (MD) | Summer | 2022 | 399.20              | 458.86 | 541.22 | 690.83 | 73.87                 | 85.10 | 100.71 | 127.92 |
| C | Los Angeles (MD) | Summer | 2023 | 399.21              | 459.24 | 541.20 | 691.10 | 73.90                 | 85.24 | 100.77 | 128.08 |
| C | Los Angeles (MD) | Summer | 2024 | 399.46              | 459.85 | 541.48 | 691.72 | 73.91                 | 85.37 | 100.81 | 128.23 |
| C | Los Angeles (MD) | Summer | 2025 | 399.48              | 460.16 | 541.47 | 691.93 | 73.93                 | 85.48 | 100.86 | 128.37 |
| C | Los Angeles (MD) | Summer | 2026 | 399.50              | 460.45 | 541.44 | 692.11 | 73.95                 | 85.58 | 100.89 | 128.50 |
| C | Los Angeles (MD) | Summer | 2027 | 399.52              | 460.73 | 541.42 | 692.27 | 73.97                 | 85.67 | 100.91 | 128.62 |
| C | Los Angeles (MD) | Summer | 2028 | 399.53              | 461.00 | 541.41 | 692.44 | 73.97                 | 85.76 | 100.93 | 128.72 |
| C | Los Angeles (MD) | Summer | 2029 | 399.53              | 461.26 | 541.39 | 692.59 | 73.98                 | 85.84 | 100.94 | 128.81 |
| C | Los Angeles (MD) | Summer | 2030 | 399.53              | 461.50 | 541.38 | 692.75 | 73.98                 | 85.91 | 100.95 | 128.90 |
| C | Los Angeles (MD) | Summer | 2031 | 405.74              | 468.99 | 549.84 | 703.69 | 73.99                 | 85.98 | 100.96 | 128.98 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Los Angeles (MD) | Summer | 2032 | 405.72              | 469.23 | 549.82 | 703.80 | 73.99                 | 86.05 | 100.97 | 129.05 |
| C | Los Angeles (MD) | Summer | 2033 | 405.71              | 469.41 | 549.81 | 703.92 | 74.00                 | 86.10 | 100.98 | 129.12 |
| C | Los Angeles (MD) | Summer | 2034 | 405.70              | 469.58 | 549.80 | 704.05 | 74.00                 | 86.15 | 100.98 | 129.18 |
| C | Los Angeles (MD) | Summer | 2035 | 405.69              | 469.70 | 549.79 | 704.16 | 74.00                 | 86.20 | 100.99 | 129.24 |
| C | Los Angeles (MD) | Winter | 2010 | 335.14              | 384.58 | 458.40 | 577.92 | 73.36                 | 84.38 | 99.72  | 125.11 |
| C | Los Angeles (MD) | Winter | 2011 | 337.98              | 388.27 | 461.98 | 583.39 | 73.38                 | 84.28 | 99.78  | 125.35 |
| C | Los Angeles (MD) | Winter | 2012 | 338.10              | 388.82 | 461.84 | 584.13 | 73.40                 | 84.27 | 99.87  | 125.60 |
| C | Los Angeles (MD) | Winter | 2013 | 339.47              | 390.73 | 463.43 | 587.03 | 73.42                 | 84.25 | 99.97  | 125.87 |
| C | Los Angeles (MD) | Winter | 2014 | 339.61              | 391.17 | 463.35 | 587.75 | 73.46                 | 84.24 | 100.05 | 126.14 |
| C | Los Angeles (MD) | Winter | 2015 | 344.39              | 396.95 | 469.65 | 596.52 | 73.50                 | 84.26 | 100.16 | 126.42 |
| C | Los Angeles (MD) | Winter | 2016 | 344.53              | 397.37 | 469.60 | 597.15 | 73.56                 | 84.33 | 100.25 | 126.69 |
| C | Los Angeles (MD) | Winter | 2017 | 344.65              | 397.72 | 469.56 | 597.73 | 73.60                 | 84.36 | 100.32 | 126.95 |
| C | Los Angeles (MD) | Winter | 2018 | 344.74              | 398.03 | 469.53 | 598.23 | 73.63                 | 84.42 | 100.38 | 127.20 |
| C | Los Angeles (MD) | Winter | 2019 | 346.52              | 400.35 | 471.84 | 601.64 | 73.67                 | 84.58 | 100.46 | 127.42 |
| C | Los Angeles (MD) | Winter | 2020 | 346.60              | 400.67 | 471.84 | 602.04 | 73.75                 | 84.76 | 100.55 | 127.62 |
| C | Los Angeles (MD) | Winter | 2021 | 349.54              | 404.32 | 475.76 | 607.37 | 73.82                 | 84.94 | 100.64 | 127.79 |
| C | Los Angeles (MD) | Winter | 2022 | 349.57              | 404.59 | 475.75 | 607.63 | 73.87                 | 85.10 | 100.71 | 127.92 |
| C | Los Angeles (MD) | Winter | 2023 | 349.56              | 404.80 | 475.74 | 607.83 | 73.90                 | 85.24 | 100.77 | 128.08 |
| C | Los Angeles (MD) | Winter | 2024 | 349.86              | 405.31 | 476.10 | 608.49 | 73.91                 | 85.37 | 100.81 | 128.23 |
| C | Los Angeles (MD) | Winter | 2025 | 349.87              | 405.47 | 476.09 | 608.67 | 73.93                 | 85.48 | 100.86 | 128.37 |
| C | Los Angeles (MD) | Winter | 2026 | 349.88              | 405.64 | 476.07 | 608.84 | 73.95                 | 85.58 | 100.89 | 128.50 |
| C | Los Angeles (MD) | Winter | 2027 | 349.89              | 405.80 | 476.06 | 609.00 | 73.97                 | 85.67 | 100.91 | 128.62 |
| C | Los Angeles (MD) | Winter | 2028 | 349.89              | 405.96 | 476.04 | 609.15 | 73.97                 | 85.76 | 100.93 | 128.72 |
| C | Los Angeles (MD) | Winter | 2029 | 349.89              | 406.12 | 476.02 | 609.30 | 73.98                 | 85.84 | 100.94 | 128.81 |
| C | Los Angeles (MD) | Winter | 2030 | 349.88              | 406.27 | 476.01 | 609.44 | 73.98                 | 85.91 | 100.95 | 128.90 |
| C | Los Angeles (MD) | Winter | 2031 | 355.33              | 412.77 | 483.44 | 619.10 | 73.99                 | 85.98 | 100.96 | 128.98 |
| C | Los Angeles (MD) | Winter | 2032 | 355.33              | 412.92 | 483.43 | 619.24 | 73.99                 | 86.05 | 100.97 | 129.05 |
| C | Los Angeles (MD) | Winter | 2033 | 355.33              | 413.05 | 483.42 | 619.36 | 74.00                 | 86.10 | 100.98 | 129.12 |
| C | Los Angeles (MD) | Winter | 2034 | 355.32              | 413.16 | 483.41 | 619.46 | 74.00                 | 86.15 | 100.98 | 129.18 |
| C | Los Angeles (MD) | Winter | 2035 | 355.32              | 413.26 | 483.40 | 619.56 | 74.00                 | 86.20 | 100.99 | 129.24 |
| C | Los Angeles (SC) | Annual | 2010 | 368.81              | 423.35 | 504.31 | 636.79 | 73.23                 | 84.17 | 99.44  | 125.24 |
| C | Los Angeles (SC) | Annual | 2011 | 369.19              | 424.14 | 504.55 | 637.78 | 73.25                 | 84.09 | 99.54  | 125.41 |
| C | Los Angeles (SC) | Annual | 2012 | 369.32              | 424.57 | 504.44 | 638.29 | 73.29                 | 84.06 | 99.65  | 125.59 |
| C | Los Angeles (SC) | Annual | 2013 | 369.90              | 425.46 | 504.92 | 639.56 | 73.35                 | 84.06 | 99.77  | 125.78 |
| C | Los Angeles (SC) | Annual | 2014 | 370.06              | 425.83 | 504.86 | 640.12 | 73.40                 | 84.06 | 99.88  | 125.98 |
| C | Los Angeles (SC) | Annual | 2015 | 371.03              | 427.14 | 505.91 | 642.13 | 73.46                 | 84.09 | 99.99  | 126.20 |
| C | Los Angeles (SC) | Annual | 2016 | 371.20              | 427.50 | 505.88 | 642.73 | 73.53                 | 84.14 | 100.10 | 126.42 |
| C | Los Angeles (SC) | Annual | 2017 | 371.33              | 427.85 | 505.86 | 643.32 | 73.57                 | 84.19 | 100.20 | 126.66 |
| C | Los Angeles (SC) | Annual | 2018 | 371.43              | 428.15 | 505.85 | 643.83 | 73.60                 | 84.26 | 100.28 | 126.87 |
| C | Los Angeles (SC) | Annual | 2019 | 370.16              | 426.91 | 503.97 | 641.92 | 73.64                 | 84.41 | 100.37 | 127.07 |
| C | Los Angeles (SC) | Annual | 2020 | 370.25              | 427.21 | 503.98 | 642.35 | 73.73                 | 84.57 | 100.47 | 127.26 |
| C | Los Angeles (SC) | Annual | 2021 | 371.05              | 428.35 | 504.98 | 643.97 | 73.79                 | 84.73 | 100.56 | 127.42 |
| C | Los Angeles (SC) | Annual | 2022 | 371.07              | 428.59 | 504.97 | 644.26 | 73.84                 | 84.87 | 100.64 | 127.56 |
| C | Los Angeles (SC) | Annual | 2023 | 371.07              | 428.78 | 504.96 | 644.47 | 73.87                 | 84.99 | 100.70 | 127.72 |
| C | Los Angeles (SC) | Annual | 2024 | 373.71              | 432.03 | 508.59 | 649.29 | 73.88                 | 85.10 | 100.76 | 127.86 |
| C | Los Angeles (SC) | Annual | 2025 | 373.69              | 432.17 | 508.58 | 649.46 | 73.90                 | 85.21 | 100.80 | 128.00 |
| C | Los Angeles (SC) | Annual | 2026 | 373.71              | 432.36 | 508.56 | 649.64 | 73.92                 | 85.31 | 100.84 | 128.14 |
| C | Los Angeles (SC) | Annual | 2027 | 373.72              | 432.53 | 508.54 | 649.80 | 73.93                 | 85.40 | 100.87 | 128.26 |
| C | Los Angeles (SC) | Annual | 2028 | 373.72              | 432.70 | 508.51 | 649.97 | 73.94                 | 85.49 | 100.89 | 128.37 |
| C | Los Angeles (SC) | Annual | 2029 | 373.72              | 432.89 | 508.49 | 650.13 | 73.95                 | 85.57 | 100.91 | 128.48 |
| C | Los Angeles (SC) | Annual | 2030 | 373.71              | 433.07 | 508.47 | 650.30 | 73.95                 | 85.65 | 100.92 | 128.58 |
| C | Los Angeles (SC) | Annual | 2031 | 374.43              | 434.12 | 509.44 | 651.74 | 73.96                 | 85.73 | 100.93 | 128.68 |
| C | Los Angeles (SC) | Annual | 2032 | 374.42              | 434.31 | 509.43 | 651.93 | 73.96                 | 85.81 | 100.94 | 128.77 |
| C | Los Angeles (SC) | Annual | 2033 | 374.42              | 434.47 | 509.42 | 652.10 | 73.97                 | 85.88 | 100.95 | 128.86 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Los Angeles (SC) | Annual | 2034 | 374.42             | 434.62 | 509.41 | 652.26 | 73.97                 | 85.94 | 100.96 | 128.94 |
| C | Los Angeles (SC) | Annual | 2035 | 374.41             | 434.74 | 509.40 | 652.40 | 73.97                 | 85.99 | 100.96 | 129.01 |
| C | Los Angeles (SC) | Summer | 2010 | 385.28             | 440.09 | 525.98 | 664.19 | 73.23                 | 84.17 | 99.44  | 125.24 |
| C | Los Angeles (SC) | Summer | 2011 | 385.73             | 441.13 | 526.29 | 665.13 | 73.25                 | 84.09 | 99.54  | 125.41 |
| C | Los Angeles (SC) | Summer | 2012 | 385.91             | 441.75 | 526.21 | 665.60 | 73.29                 | 84.06 | 99.65  | 125.59 |
| C | Los Angeles (SC) | Summer | 2013 | 386.55             | 442.81 | 526.76 | 666.89 | 73.35                 | 84.06 | 99.77  | 125.78 |
| C | Los Angeles (SC) | Summer | 2014 | 386.73             | 443.32 | 526.74 | 667.48 | 73.40                 | 84.06 | 99.88  | 125.98 |
| C | Los Angeles (SC) | Summer | 2015 | 387.76             | 444.78 | 527.89 | 669.62 | 73.46                 | 84.09 | 99.99  | 126.20 |
| C | Los Angeles (SC) | Summer | 2016 | 387.94             | 445.24 | 527.91 | 670.32 | 73.53                 | 84.14 | 100.10 | 126.42 |
| C | Los Angeles (SC) | Summer | 2017 | 388.08             | 445.68 | 527.93 | 671.01 | 73.57                 | 84.19 | 100.20 | 126.66 |
| C | Los Angeles (SC) | Summer | 2018 | 388.19             | 446.07 | 527.94 | 671.60 | 73.60                 | 84.26 | 100.28 | 126.87 |
| C | Los Angeles (SC) | Summer | 2019 | 386.86             | 444.82 | 526.01 | 669.67 | 73.64                 | 84.41 | 100.37 | 127.07 |
| C | Los Angeles (SC) | Summer | 2020 | 386.96             | 445.19 | 526.01 | 670.16 | 73.73                 | 84.57 | 100.47 | 127.26 |
| C | Los Angeles (SC) | Summer | 2021 | 387.79             | 446.44 | 527.07 | 671.91 | 73.79                 | 84.73 | 100.56 | 127.42 |
| C | Los Angeles (SC) | Summer | 2022 | 387.82             | 446.75 | 527.06 | 672.25 | 73.84                 | 84.87 | 100.64 | 127.56 |
| C | Los Angeles (SC) | Summer | 2023 | 387.81             | 447.00 | 527.05 | 672.49 | 73.87                 | 84.99 | 100.70 | 127.72 |
| C | Los Angeles (SC) | Summer | 2024 | 390.60             | 450.47 | 530.86 | 677.57 | 73.88                 | 85.10 | 100.76 | 127.86 |
| C | Los Angeles (SC) | Summer | 2025 | 390.59             | 450.66 | 530.84 | 677.76 | 73.90                 | 85.21 | 100.80 | 128.00 |
| C | Los Angeles (SC) | Summer | 2026 | 390.61             | 450.90 | 530.82 | 677.94 | 73.92                 | 85.31 | 100.84 | 128.14 |
| C | Los Angeles (SC) | Summer | 2027 | 390.62             | 451.11 | 530.79 | 678.11 | 73.93                 | 85.40 | 100.87 | 128.26 |
| C | Los Angeles (SC) | Summer | 2028 | 390.63             | 451.34 | 530.77 | 678.27 | 73.94                 | 85.49 | 100.89 | 128.37 |
| C | Los Angeles (SC) | Summer | 2029 | 390.63             | 451.57 | 530.74 | 678.44 | 73.95                 | 85.57 | 100.91 | 128.48 |
| C | Los Angeles (SC) | Summer | 2030 | 390.62             | 451.80 | 530.72 | 678.61 | 73.95                 | 85.65 | 100.92 | 128.58 |
| C | Los Angeles (SC) | Summer | 2031 | 391.38             | 452.94 | 531.76 | 680.13 | 73.96                 | 85.73 | 100.93 | 128.68 |
| C | Los Angeles (SC) | Summer | 2032 | 391.37             | 453.18 | 531.75 | 680.32 | 73.96                 | 85.81 | 100.94 | 128.77 |
| C | Los Angeles (SC) | Summer | 2033 | 391.37             | 453.37 | 531.74 | 680.50 | 73.97                 | 85.88 | 100.95 | 128.86 |
| C | Los Angeles (SC) | Summer | 2034 | 391.37             | 453.55 | 531.73 | 680.67 | 73.97                 | 85.94 | 100.96 | 128.94 |
| C | Los Angeles (SC) | Summer | 2035 | 391.36             | 453.68 | 531.72 | 680.83 | 73.97                 | 85.99 | 100.96 | 129.01 |
| C | Los Angeles (SC) | Winter | 2010 | 362.71             | 417.15 | 496.28 | 626.64 | 73.23                 | 84.17 | 99.44  | 125.24 |
| C | Los Angeles (SC) | Winter | 2011 | 363.06             | 417.84 | 496.50 | 627.65 | 73.25                 | 84.09 | 99.54  | 125.41 |
| C | Los Angeles (SC) | Winter | 2012 | 363.18             | 418.21 | 496.38 | 628.18 | 73.29                 | 84.06 | 99.65  | 125.59 |
| C | Los Angeles (SC) | Winter | 2013 | 363.74             | 419.03 | 496.84 | 629.44 | 73.35                 | 84.06 | 99.77  | 125.78 |
| C | Los Angeles (SC) | Winter | 2014 | 363.89             | 419.36 | 496.75 | 629.99 | 73.40                 | 84.06 | 99.88  | 125.98 |
| C | Los Angeles (SC) | Winter | 2015 | 364.84             | 420.60 | 497.77 | 631.94 | 73.46                 | 84.09 | 99.99  | 126.20 |
| C | Los Angeles (SC) | Winter | 2016 | 365.00             | 420.93 | 497.72 | 632.51 | 73.53                 | 84.14 | 100.10 | 126.42 |
| C | Los Angeles (SC) | Winter | 2017 | 365.12             | 421.25 | 497.69 | 633.06 | 73.57                 | 84.19 | 100.20 | 126.66 |
| C | Los Angeles (SC) | Winter | 2018 | 365.22             | 421.52 | 497.66 | 633.55 | 73.60                 | 84.26 | 100.28 | 126.87 |
| C | Los Angeles (SC) | Winter | 2019 | 363.97             | 420.27 | 495.81 | 631.65 | 73.64                 | 84.41 | 100.37 | 127.07 |
| C | Los Angeles (SC) | Winter | 2020 | 364.06             | 420.56 | 495.81 | 632.05 | 73.73                 | 84.57 | 100.47 | 127.26 |
| C | Los Angeles (SC) | Winter | 2021 | 364.85             | 421.65 | 496.80 | 633.62 | 73.79                 | 84.73 | 100.56 | 127.42 |
| C | Los Angeles (SC) | Winter | 2022 | 364.87             | 421.87 | 496.79 | 633.89 | 73.84                 | 84.87 | 100.64 | 127.56 |
| C | Los Angeles (SC) | Winter | 2023 | 364.86             | 422.03 | 496.78 | 634.09 | 73.87                 | 84.99 | 100.70 | 127.72 |
| C | Los Angeles (SC) | Winter | 2024 | 367.45             | 425.20 | 500.34 | 638.81 | 73.88                 | 85.10 | 100.76 | 127.86 |
| C | Los Angeles (SC) | Winter | 2025 | 367.44             | 425.32 | 500.33 | 638.98 | 73.90                 | 85.21 | 100.80 | 128.00 |
| C | Los Angeles (SC) | Winter | 2026 | 367.45             | 425.49 | 500.31 | 639.15 | 73.92                 | 85.31 | 100.84 | 128.14 |
| C | Los Angeles (SC) | Winter | 2027 | 367.46             | 425.64 | 500.29 | 639.32 | 73.93                 | 85.40 | 100.87 | 128.26 |
| C | Los Angeles (SC) | Winter | 2028 | 367.46             | 425.80 | 500.27 | 639.48 | 73.94                 | 85.49 | 100.89 | 128.37 |
| C | Los Angeles (SC) | Winter | 2029 | 367.45             | 425.97 | 500.24 | 639.64 | 73.95                 | 85.57 | 100.91 | 128.48 |
| C | Los Angeles (SC) | Winter | 2030 | 367.44             | 426.13 | 500.22 | 639.81 | 73.95                 | 85.65 | 100.92 | 128.58 |
| C | Los Angeles (SC) | Winter | 2031 | 368.15             | 427.14 | 501.18 | 641.22 | 73.96                 | 85.73 | 100.93 | 128.68 |
| C | Los Angeles (SC) | Winter | 2032 | 368.14             | 427.31 | 501.17 | 641.41 | 73.96                 | 85.81 | 100.94 | 128.77 |
| C | Los Angeles (SC) | Winter | 2033 | 368.14             | 427.47 | 501.15 | 641.57 | 73.97                 | 85.88 | 100.95 | 128.86 |
| C | Los Angeles (SC) | Winter | 2034 | 368.14             | 427.61 | 501.14 | 641.73 | 73.97                 | 85.94 | 100.96 | 128.94 |
| C | Los Angeles (SC) | Winter | 2035 | 368.13             | 427.73 | 501.13 | 641.86 | 73.97                 | 85.99 | 100.96 | 129.01 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Madera (SJV) | Annual | 2010 | 344.30             | 396.00 | 471.44 | 591.13 | 73.51                 | 87.22 | 100.74 | 124.58 |
| C | Madera (SJV) | Annual | 2011 | 344.51             | 396.95 | 471.16 | 592.07 | 73.49                 | 86.59 | 100.69 | 124.83 |
| C | Madera (SJV) | Annual | 2012 | 344.50             | 397.37 | 470.74 | 592.52 | 73.45                 | 86.21 | 100.68 | 125.06 |
| C | Madera (SJV) | Annual | 2013 | 348.08             | 401.83 | 475.18 | 599.25 | 73.49                 | 85.88 | 100.68 | 125.34 |
| C | Madera (SJV) | Annual | 2014 | 348.25             | 402.31 | 475.06 | 600.13 | 73.49                 | 85.60 | 100.63 | 125.63 |
| C | Madera (SJV) | Annual | 2015 | 354.35             | 409.56 | 483.11 | 611.24 | 73.50                 | 85.34 | 100.61 | 125.91 |
| C | Madera (SJV) | Annual | 2016 | 354.51             | 409.87 | 483.03 | 612.02 | 73.54                 | 85.14 | 100.62 | 126.19 |
| C | Madera (SJV) | Annual | 2017 | 354.59             | 410.14 | 482.95 | 612.76 | 73.53                 | 84.97 | 100.56 | 126.47 |
| C | Madera (SJV) | Annual | 2018 | 362.06             | 419.14 | 493.00 | 626.51 | 73.54                 | 84.94 | 100.58 | 126.81 |
| C | Madera (SJV) | Annual | 2019 | 362.17             | 419.50 | 492.97 | 627.30 | 73.58                 | 84.99 | 100.61 | 127.12 |
| C | Madera (SJV) | Annual | 2020 | 362.26             | 419.80 | 492.94 | 627.97 | 73.67                 | 85.10 | 100.68 | 127.40 |
| C | Madera (SJV) | Annual | 2021 | 357.55             | 414.48 | 486.41 | 620.11 | 73.74                 | 85.25 | 100.75 | 127.59 |
| C | Madera (SJV) | Annual | 2022 | 357.57             | 414.65 | 486.37 | 620.44 | 73.79                 | 85.37 | 100.81 | 127.75 |
| C | Madera (SJV) | Annual | 2023 | 357.55             | 414.78 | 486.33 | 620.71 | 73.81                 | 85.48 | 100.86 | 127.94 |
| C | Madera (SJV) | Annual | 2024 | 364.97             | 423.58 | 496.48 | 633.93 | 73.82                 | 85.58 | 100.89 | 128.11 |
| C | Madera (SJV) | Annual | 2025 | 364.97             | 423.69 | 496.44 | 634.14 | 73.84                 | 85.67 | 100.92 | 128.28 |
| C | Madera (SJV) | Annual | 2026 | 374.82             | 435.22 | 509.83 | 651.42 | 73.86                 | 85.75 | 100.94 | 128.40 |
| C | Madera (SJV) | Annual | 2027 | 374.81             | 435.26 | 509.77 | 651.51 | 73.87                 | 85.81 | 100.96 | 128.52 |
| C | Madera (SJV) | Annual | 2028 | 374.80             | 435.33 | 509.72 | 651.63 | 73.88                 | 85.88 | 100.97 | 128.62 |
| C | Madera (SJV) | Annual | 2029 | 374.79             | 435.42 | 509.68 | 651.76 | 73.89                 | 85.94 | 100.97 | 128.71 |
| C | Madera (SJV) | Annual | 2030 | 374.78             | 435.50 | 509.65 | 651.90 | 73.89                 | 85.99 | 100.98 | 128.81 |
| C | Madera (SJV) | Annual | 2031 | 374.77             | 435.59 | 509.63 | 652.06 | 73.89                 | 86.05 | 100.98 | 128.89 |
| C | Madera (SJV) | Annual | 2032 | 374.77             | 435.67 | 509.62 | 652.22 | 73.90                 | 86.10 | 100.99 | 128.97 |
| C | Madera (SJV) | Annual | 2033 | 374.77             | 435.74 | 509.61 | 652.38 | 73.90                 | 86.14 | 100.99 | 129.05 |
| C | Madera (SJV) | Annual | 2034 | 374.77             | 435.81 | 509.62 | 652.54 | 73.90                 | 86.18 | 100.99 | 129.12 |
| C | Madera (SJV) | Annual | 2035 | 374.77             | 435.86 | 509.62 | 652.67 | 73.91                 | 86.22 | 101.00 | 129.18 |
| C | Madera (SJV) | Summer | 2010 | 377.25             | 430.41 | 514.94 | 645.71 | 73.51                 | 87.22 | 100.74 | 124.58 |
| C | Madera (SJV) | Summer | 2011 | 377.78             | 432.35 | 515.17 | 646.80 | 73.49                 | 86.59 | 100.69 | 124.83 |
| C | Madera (SJV) | Summer | 2012 | 377.94             | 433.28 | 514.98 | 647.29 | 73.45                 | 86.21 | 100.68 | 125.06 |
| C | Madera (SJV) | Summer | 2013 | 382.01             | 438.58 | 520.11 | 654.78 | 73.49                 | 85.88 | 100.68 | 125.34 |
| C | Madera (SJV) | Summer | 2014 | 382.31             | 439.41 | 520.20 | 655.90 | 73.49                 | 85.60 | 100.63 | 125.63 |
| C | Madera (SJV) | Summer | 2015 | 389.06             | 447.53 | 529.15 | 668.18 | 73.50                 | 85.34 | 100.61 | 125.91 |
| C | Madera (SJV) | Summer | 2016 | 389.25             | 447.99 | 529.13 | 669.19 | 73.54                 | 85.14 | 100.62 | 126.19 |
| C | Madera (SJV) | Summer | 2017 | 389.36             | 448.39 | 529.09 | 670.12 | 73.53                 | 84.97 | 100.56 | 126.47 |
| C | Madera (SJV) | Summer | 2018 | 397.65             | 458.50 | 540.25 | 685.49 | 73.54                 | 84.94 | 100.58 | 126.81 |
| C | Madera (SJV) | Summer | 2019 | 397.83             | 459.10 | 540.32 | 686.62 | 73.58                 | 84.99 | 100.61 | 127.12 |
| C | Madera (SJV) | Summer | 2020 | 397.96             | 459.58 | 540.34 | 687.54 | 73.67                 | 85.10 | 100.68 | 127.40 |
| C | Madera (SJV) | Summer | 2021 | 392.77             | 453.78 | 533.14 | 678.99 | 73.74                 | 85.25 | 100.75 | 127.59 |
| C | Madera (SJV) | Summer | 2022 | 392.78             | 454.00 | 533.07 | 679.41 | 73.79                 | 85.37 | 100.81 | 127.75 |
| C | Madera (SJV) | Summer | 2023 | 392.75             | 454.19 | 533.01 | 679.71 | 73.81                 | 85.48 | 100.86 | 127.94 |
| C | Madera (SJV) | Summer | 2024 | 400.91             | 463.86 | 544.13 | 694.20 | 73.82                 | 85.58 | 100.89 | 128.11 |
| C | Madera (SJV) | Summer | 2025 | 400.90             | 464.00 | 544.08 | 694.41 | 73.84                 | 85.67 | 100.92 | 128.28 |
| C | Madera (SJV) | Summer | 2026 | 411.64             | 476.53 | 558.60 | 713.13 | 73.86                 | 85.75 | 100.94 | 128.40 |
| C | Madera (SJV) | Summer | 2027 | 411.58             | 476.53 | 558.44 | 713.08 | 73.87                 | 85.81 | 100.96 | 128.52 |
| C | Madera (SJV) | Summer | 2028 | 411.54             | 476.57 | 558.32 | 713.10 | 73.88                 | 85.88 | 100.97 | 128.62 |
| C | Madera (SJV) | Summer | 2029 | 411.52             | 476.66 | 558.26 | 713.17 | 73.89                 | 85.94 | 100.97 | 128.71 |
| C | Madera (SJV) | Summer | 2030 | 411.52             | 476.77 | 558.22 | 713.28 | 73.89                 | 85.99 | 100.98 | 128.81 |
| C | Madera (SJV) | Summer | 2031 | 411.48             | 476.87 | 558.17 | 713.41 | 73.89                 | 86.05 | 100.98 | 128.89 |
| C | Madera (SJV) | Summer | 2032 | 411.47             | 476.97 | 558.15 | 713.58 | 73.90                 | 86.10 | 100.99 | 128.97 |
| C | Madera (SJV) | Summer | 2033 | 411.47             | 477.07 | 558.17 | 713.77 | 73.90                 | 86.14 | 100.99 | 129.05 |
| C | Madera (SJV) | Summer | 2034 | 411.48             | 477.17 | 558.20 | 713.98 | 73.90                 | 86.18 | 100.99 | 129.12 |
| C | Madera (SJV) | Summer | 2035 | 411.50             | 477.24 | 558.23 | 714.17 | 73.91                 | 86.22 | 101.00 | 129.18 |
| C | Madera (SJV) | Winter | 2010 | 331.74             | 382.88 | 454.86 | 570.33 | 73.51                 | 87.22 | 100.74 | 124.58 |
| C | Madera (SJV) | Winter | 2011 | 331.82             | 383.46 | 454.38 | 571.21 | 73.49                 | 86.59 | 100.69 | 124.83 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Madera (SJV) | Winter | 2012 | 331.75             | 383.68 | 453.87 | 571.65 | 73.45                 | 86.21 | 100.68 | 125.06 |
| C | Madera (SJV) | Winter | 2013 | 335.14             | 387.83 | 458.06 | 578.08 | 73.49                 | 85.88 | 100.68 | 125.34 |
| C | Madera (SJV) | Winter | 2014 | 335.27             | 388.17 | 457.85 | 578.87 | 73.49                 | 85.60 | 100.63 | 125.63 |
| C | Madera (SJV) | Winter | 2015 | 341.12             | 395.09 | 465.56 | 589.53 | 73.50                 | 85.34 | 100.61 | 125.91 |
| C | Madera (SJV) | Winter | 2016 | 341.26             | 395.33 | 465.45 | 590.23 | 73.54                 | 85.14 | 100.62 | 126.19 |
| C | Madera (SJV) | Winter | 2017 | 341.34             | 395.55 | 465.36 | 590.89 | 73.53                 | 84.97 | 100.56 | 126.47 |
| C | Madera (SJV) | Winter | 2018 | 348.50             | 404.13 | 474.98 | 604.03 | 73.54                 | 84.94 | 100.58 | 126.81 |
| C | Madera (SJV) | Winter | 2019 | 348.58             | 404.41 | 474.92 | 604.69 | 73.58                 | 84.99 | 100.61 | 127.12 |
| C | Madera (SJV) | Winter | 2020 | 348.65             | 404.64 | 474.88 | 605.26 | 73.67                 | 85.10 | 100.68 | 127.40 |
| C | Madera (SJV) | Winter | 2021 | 344.13             | 399.50 | 468.60 | 597.66 | 73.74                 | 85.25 | 100.75 | 127.59 |
| C | Madera (SJV) | Winter | 2022 | 344.15             | 399.65 | 468.56 | 597.97 | 73.79                 | 85.37 | 100.81 | 127.75 |
| C | Madera (SJV) | Winter | 2023 | 344.14             | 399.77 | 468.53 | 598.22 | 73.81                 | 85.48 | 100.86 | 127.94 |
| C | Madera (SJV) | Winter | 2024 | 351.28             | 408.23 | 478.31 | 610.95 | 73.82                 | 85.58 | 100.89 | 128.11 |
| C | Madera (SJV) | Winter | 2025 | 351.28             | 408.32 | 478.29 | 611.17 | 73.84                 | 85.67 | 100.92 | 128.28 |
| C | Madera (SJV) | Winter | 2026 | 360.78             | 419.47 | 491.24 | 627.89 | 73.86                 | 85.75 | 100.94 | 128.40 |
| C | Madera (SJV) | Winter | 2027 | 360.79             | 419.54 | 491.22 | 628.04 | 73.87                 | 85.81 | 100.96 | 128.52 |
| C | Madera (SJV) | Winter | 2028 | 360.79             | 419.61 | 491.19 | 628.20 | 73.88                 | 85.88 | 100.97 | 128.62 |
| C | Madera (SJV) | Winter | 2029 | 360.79             | 419.69 | 491.17 | 628.35 | 73.89                 | 85.94 | 100.97 | 128.71 |
| C | Madera (SJV) | Winter | 2030 | 360.78             | 419.77 | 491.14 | 628.51 | 73.89                 | 85.99 | 100.98 | 128.81 |
| C | Madera (SJV) | Winter | 2031 | 360.78             | 419.85 | 491.13 | 628.67 | 73.89                 | 86.05 | 100.98 | 128.89 |
| C | Madera (SJV) | Winter | 2032 | 360.78             | 419.92 | 491.12 | 628.84 | 73.90                 | 86.10 | 100.99 | 128.97 |
| C | Madera (SJV) | Winter | 2033 | 360.78             | 419.98 | 491.11 | 628.98 | 73.90                 | 86.14 | 100.99 | 129.05 |
| C | Madera (SJV) | Winter | 2034 | 360.77             | 420.04 | 491.10 | 629.12 | 73.90                 | 86.18 | 100.99 | 129.12 |
| C | Madera (SJV) | Winter | 2035 | 360.77             | 420.08 | 491.09 | 629.23 | 73.91                 | 86.22 | 101.00 | 129.18 |
| C | Marin (SF)   | Annual | 2010 | 342.06             | 393.30 | 467.93 | 590.43 | 73.01                 | 84.53 | 99.43  | 125.07 |
| C | Marin (SF)   | Annual | 2011 | 342.19             | 393.69 | 467.77 | 590.87 | 73.00                 | 84.35 | 99.51  | 125.23 |
| C | Marin (SF)   | Annual | 2012 | 342.32             | 394.10 | 467.65 | 591.38 | 72.98                 | 84.26 | 99.63  | 125.42 |
| C | Marin (SF)   | Annual | 2013 | 342.52             | 394.50 | 467.56 | 591.92 | 73.04                 | 84.24 | 99.74  | 125.62 |
| C | Marin (SF)   | Annual | 2014 | 342.70             | 394.88 | 467.49 | 592.49 | 73.06                 | 84.22 | 99.85  | 125.83 |
| C | Marin (SF)   | Annual | 2015 | 342.90             | 395.23 | 467.44 | 593.06 | 73.12                 | 84.21 | 99.96  | 126.06 |
| C | Marin (SF)   | Annual | 2016 | 343.09             | 395.61 | 467.41 | 593.61 | 73.20                 | 84.24 | 100.07 | 126.29 |
| C | Marin (SF)   | Annual | 2017 | 343.23             | 395.96 | 467.38 | 594.14 | 73.23                 | 84.30 | 100.16 | 126.53 |
| C | Marin (SF)   | Annual | 2018 | 343.35             | 396.28 | 467.37 | 594.61 | 73.26                 | 84.37 | 100.27 | 126.75 |
| C | Marin (SF)   | Annual | 2019 | 343.45             | 396.57 | 467.36 | 595.01 | 73.29                 | 84.48 | 100.36 | 126.95 |
| C | Marin (SF)   | Annual | 2020 | 343.56             | 396.84 | 467.35 | 595.38 | 73.40                 | 84.63 | 100.46 | 127.14 |
| C | Marin (SF)   | Annual | 2021 | 343.62             | 397.07 | 467.35 | 595.68 | 73.47                 | 84.79 | 100.55 | 127.29 |
| C | Marin (SF)   | Annual | 2022 | 343.67             | 397.28 | 467.34 | 595.93 | 73.53                 | 84.93 | 100.63 | 127.41 |
| C | Marin (SF)   | Annual | 2023 | 343.68             | 397.44 | 467.33 | 596.13 | 73.56                 | 85.05 | 100.70 | 127.57 |
| C | Marin (SF)   | Annual | 2024 | 343.65             | 397.57 | 467.32 | 596.28 | 73.58                 | 85.16 | 100.76 | 127.71 |
| C | Marin (SF)   | Annual | 2025 | 343.63             | 397.68 | 467.31 | 596.44 | 73.60                 | 85.26 | 100.80 | 127.85 |
| C | Marin (SF)   | Annual | 2026 | 343.66             | 397.83 | 467.29 | 596.62 | 73.62                 | 85.36 | 100.84 | 127.99 |
| C | Marin (SF)   | Annual | 2027 | 343.67             | 397.97 | 467.27 | 596.79 | 73.64                 | 85.45 | 100.87 | 128.12 |
| C | Marin (SF)   | Annual | 2028 | 343.67             | 398.11 | 467.25 | 596.97 | 73.65                 | 85.53 | 100.89 | 128.24 |
| C | Marin (SF)   | Annual | 2029 | 343.67             | 398.26 | 467.22 | 597.14 | 73.66                 | 85.62 | 100.91 | 128.35 |
| C | Marin (SF)   | Annual | 2030 | 343.66             | 398.41 | 467.19 | 597.32 | 73.66                 | 85.69 | 100.92 | 128.46 |
| C | Marin (SF)   | Annual | 2031 | 343.65             | 398.57 | 467.18 | 597.51 | 73.67                 | 85.77 | 100.93 | 128.56 |
| C | Marin (SF)   | Annual | 2032 | 343.65             | 398.71 | 467.17 | 597.70 | 73.67                 | 85.85 | 100.94 | 128.66 |
| C | Marin (SF)   | Annual | 2033 | 343.65             | 398.85 | 467.16 | 597.87 | 73.68                 | 85.91 | 100.95 | 128.75 |
| C | Marin (SF)   | Annual | 2034 | 343.65             | 398.97 | 467.15 | 598.03 | 73.68                 | 85.98 | 100.95 | 128.84 |
| C | Marin (SF)   | Annual | 2035 | 343.64             | 399.07 | 467.13 | 598.17 | 73.69                 | 86.03 | 100.96 | 128.92 |
| C | Marin (SF)   | Summer | 2010 | 368.58             | 421.04 | 503.41 | 635.07 | 73.01                 | 84.53 | 99.43  | 125.07 |
| C | Marin (SF)   | Summer | 2011 | 368.87             | 421.79 | 503.29 | 635.34 | 73.00                 | 84.35 | 99.51  | 125.23 |
| C | Marin (SF)   | Summer | 2012 | 369.13             | 422.49 | 503.22 | 635.76 | 72.98                 | 84.26 | 99.63  | 125.42 |
| C | Marin (SF)   | Summer | 2013 | 369.44             | 423.14 | 503.19 | 636.29 | 73.04                 | 84.24 | 99.74  | 125.62 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Marin (SF)    | Summer | 2014 | 369.69             | 423.73 | 503.20 | 636.91 | 73.06                 | 84.22 | 99.85  | 125.83 |
| C | Marin (SF)    | Summer | 2015 | 369.95             | 424.26 | 503.22 | 637.60 | 73.12                 | 84.21 | 99.96  | 126.06 |
| C | Marin (SF)    | Summer | 2016 | 370.19             | 424.82 | 503.26 | 638.30 | 73.20                 | 84.24 | 100.07 | 126.29 |
| C | Marin (SF)    | Summer | 2017 | 370.35             | 425.34 | 503.30 | 638.99 | 73.23                 | 84.30 | 100.16 | 126.53 |
| C | Marin (SF)    | Summer | 2018 | 370.48             | 425.80 | 503.31 | 639.59 | 73.26                 | 84.37 | 100.27 | 126.75 |
| C | Marin (SF)    | Summer | 2019 | 370.59             | 426.19 | 503.33 | 640.09 | 73.29                 | 84.48 | 100.36 | 126.95 |
| C | Marin (SF)    | Summer | 2020 | 370.71             | 426.55 | 503.34 | 640.55 | 73.40                 | 84.63 | 100.46 | 127.14 |
| C | Marin (SF)    | Summer | 2021 | 370.77             | 426.87 | 503.34 | 640.93 | 73.47                 | 84.79 | 100.55 | 127.29 |
| C | Marin (SF)    | Summer | 2022 | 370.82             | 427.15 | 503.33 | 641.26 | 73.53                 | 84.93 | 100.63 | 127.41 |
| C | Marin (SF)    | Summer | 2023 | 370.83             | 427.37 | 503.31 | 641.51 | 73.56                 | 85.05 | 100.70 | 127.57 |
| C | Marin (SF)    | Summer | 2024 | 370.80             | 427.56 | 503.29 | 641.70 | 73.58                 | 85.16 | 100.76 | 127.71 |
| C | Marin (SF)    | Summer | 2025 | 370.79             | 427.73 | 503.27 | 641.88 | 73.60                 | 85.26 | 100.80 | 127.85 |
| C | Marin (SF)    | Summer | 2026 | 370.81             | 427.93 | 503.25 | 642.10 | 73.62                 | 85.36 | 100.84 | 127.99 |
| C | Marin (SF)    | Summer | 2027 | 370.83             | 428.12 | 503.22 | 642.29 | 73.64                 | 85.45 | 100.87 | 128.12 |
| C | Marin (SF)    | Summer | 2028 | 370.84             | 428.32 | 503.19 | 642.48 | 73.65                 | 85.53 | 100.89 | 128.24 |
| C | Marin (SF)    | Summer | 2029 | 370.84             | 428.53 | 503.16 | 642.68 | 73.66                 | 85.62 | 100.91 | 128.35 |
| C | Marin (SF)    | Summer | 2030 | 370.84             | 428.74 | 503.14 | 642.87 | 73.66                 | 85.69 | 100.92 | 128.46 |
| C | Marin (SF)    | Summer | 2031 | 370.84             | 428.96 | 503.13 | 643.08 | 73.67                 | 85.77 | 100.93 | 128.56 |
| C | Marin (SF)    | Summer | 2032 | 370.84             | 429.15 | 503.12 | 643.29 | 73.67                 | 85.85 | 100.94 | 128.66 |
| C | Marin (SF)    | Summer | 2033 | 370.85             | 429.32 | 503.11 | 643.48 | 73.68                 | 85.91 | 100.95 | 128.75 |
| C | Marin (SF)    | Summer | 2034 | 370.85             | 429.47 | 503.10 | 643.67 | 73.68                 | 85.98 | 100.95 | 128.84 |
| C | Marin (SF)    | Summer | 2035 | 370.85             | 429.59 | 503.09 | 643.84 | 73.69                 | 86.03 | 100.96 | 128.92 |
| C | Marin (SF)    | Winter | 2010 | 340.33             | 391.50 | 465.62 | 587.52 | 73.01                 | 84.53 | 99.43  | 125.07 |
| C | Marin (SF)    | Winter | 2011 | 340.45             | 391.86 | 465.46 | 587.97 | 73.00                 | 84.35 | 99.51  | 125.23 |
| C | Marin (SF)    | Winter | 2012 | 340.57             | 392.25 | 465.34 | 588.49 | 72.98                 | 84.26 | 99.63  | 125.42 |
| C | Marin (SF)    | Winter | 2013 | 340.77             | 392.64 | 465.24 | 589.03 | 73.04                 | 84.24 | 99.74  | 125.62 |
| C | Marin (SF)    | Winter | 2014 | 340.94             | 393.00 | 465.17 | 589.60 | 73.06                 | 84.22 | 99.85  | 125.83 |
| C | Marin (SF)    | Winter | 2015 | 341.14             | 393.34 | 465.11 | 590.16 | 73.12                 | 84.21 | 99.96  | 126.06 |
| C | Marin (SF)    | Winter | 2016 | 341.33             | 393.70 | 465.07 | 590.70 | 73.20                 | 84.24 | 100.07 | 126.29 |
| C | Marin (SF)    | Winter | 2017 | 341.47             | 394.05 | 465.04 | 591.22 | 73.23                 | 84.30 | 100.16 | 126.53 |
| C | Marin (SF)    | Winter | 2018 | 341.58             | 394.36 | 465.03 | 591.68 | 73.26                 | 84.37 | 100.27 | 126.75 |
| C | Marin (SF)    | Winter | 2019 | 341.68             | 394.64 | 465.02 | 592.08 | 73.29                 | 84.48 | 100.36 | 126.95 |
| C | Marin (SF)    | Winter | 2020 | 341.80             | 394.90 | 465.01 | 592.44 | 73.40                 | 84.63 | 100.46 | 127.14 |
| C | Marin (SF)    | Winter | 2021 | 341.86             | 395.13 | 465.01 | 592.73 | 73.47                 | 84.79 | 100.55 | 127.29 |
| C | Marin (SF)    | Winter | 2022 | 341.91             | 395.34 | 465.00 | 592.98 | 73.53                 | 84.93 | 100.63 | 127.41 |
| C | Marin (SF)    | Winter | 2023 | 341.91             | 395.49 | 464.99 | 593.17 | 73.56                 | 85.05 | 100.70 | 127.57 |
| C | Marin (SF)    | Winter | 2024 | 341.88             | 395.61 | 464.98 | 593.32 | 73.58                 | 85.16 | 100.76 | 127.71 |
| C | Marin (SF)    | Winter | 2025 | 341.87             | 395.73 | 464.97 | 593.48 | 73.60                 | 85.26 | 100.80 | 127.85 |
| C | Marin (SF)    | Winter | 2026 | 341.89             | 395.87 | 464.95 | 593.66 | 73.62                 | 85.36 | 100.84 | 127.99 |
| C | Marin (SF)    | Winter | 2027 | 341.90             | 396.01 | 464.93 | 593.83 | 73.64                 | 85.45 | 100.87 | 128.12 |
| C | Marin (SF)    | Winter | 2028 | 341.90             | 396.15 | 464.91 | 594.00 | 73.65                 | 85.53 | 100.89 | 128.24 |
| C | Marin (SF)    | Winter | 2029 | 341.90             | 396.29 | 464.88 | 594.18 | 73.66                 | 85.62 | 100.91 | 128.35 |
| C | Marin (SF)    | Winter | 2030 | 341.89             | 396.44 | 464.85 | 594.35 | 73.66                 | 85.69 | 100.92 | 128.46 |
| C | Marin (SF)    | Winter | 2031 | 341.88             | 396.59 | 464.84 | 594.54 | 73.67                 | 85.77 | 100.93 | 128.56 |
| C | Marin (SF)    | Winter | 2032 | 341.88             | 396.73 | 464.83 | 594.73 | 73.67                 | 85.85 | 100.94 | 128.66 |
| C | Marin (SF)    | Winter | 2033 | 341.88             | 396.86 | 464.82 | 594.90 | 73.68                 | 85.91 | 100.95 | 128.75 |
| C | Marin (SF)    | Winter | 2034 | 341.88             | 396.98 | 464.80 | 595.06 | 73.68                 | 85.98 | 100.95 | 128.84 |
| C | Marin (SF)    | Winter | 2035 | 341.87             | 397.09 | 464.79 | 595.20 | 73.69                 | 86.03 | 100.96 | 128.92 |
| C | Mariposa (MC) | Annual | 2010 | 354.50             | 410.51 | 485.83 | 607.63 | 74.37                 | 89.51 | 102.09 | 125.68 |
| C | Mariposa (MC) | Annual | 2011 | 354.40             | 410.55 | 485.11 | 608.19 | 74.22                 | 88.77 | 101.86 | 125.71 |
| C | Mariposa (MC) | Annual | 2012 | 354.31             | 410.56 | 484.54 | 608.86 | 74.03                 | 88.15 | 101.71 | 125.79 |
| C | Mariposa (MC) | Annual | 2013 | 354.36             | 410.52 | 484.09 | 609.60 | 73.97                 | 87.50 | 101.57 | 125.92 |
| C | Mariposa (MC) | Annual | 2014 | 354.33             | 410.46 | 483.72 | 610.33 | 73.82                 | 86.87 | 101.30 | 126.07 |
| C | Mariposa (MC) | Annual | 2015 | 354.43             | 410.47 | 483.42 | 611.09 | 73.83                 | 86.45 | 101.16 | 126.26 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mariposa (MC) | Annual | 2016 | 354.48              | 410.49 | 483.19 | 611.81 | 73.80                 | 86.11 | 101.08 | 126.48 |
| C | Mariposa (MC) | Annual | 2017 | 354.51              | 410.47 | 483.00 | 612.49 | 73.77                 | 85.68 | 101.00 | 126.70 |
| C | Mariposa (MC) | Annual | 2018 | 354.51              | 410.48 | 482.83 | 613.06 | 73.71                 | 85.43 | 100.90 | 126.90 |
| C | Mariposa (MC) | Annual | 2019 | 354.47              | 410.55 | 482.70 | 613.53 | 73.61                 | 85.35 | 100.87 | 127.11 |
| C | Mariposa (MC) | Annual | 2020 | 354.41              | 410.60 | 482.59 | 613.96 | 73.65                 | 85.32 | 100.89 | 127.30 |
| C | Mariposa (MC) | Annual | 2021 | 354.35              | 410.60 | 482.48 | 614.20 | 73.67                 | 85.35 | 100.93 | 127.34 |
| C | Mariposa (MC) | Annual | 2022 | 354.26              | 410.63 | 482.35 | 614.40 | 73.67                 | 85.40 | 100.94 | 127.39 |
| C | Mariposa (MC) | Annual | 2023 | 354.08              | 410.62 | 482.24 | 614.56 | 73.64                 | 85.42 | 100.94 | 127.56 |
| C | Mariposa (MC) | Annual | 2024 | 353.92              | 410.60 | 482.16 | 614.67 | 73.60                 | 85.46 | 100.96 | 127.71 |
| C | Mariposa (MC) | Annual | 2025 | 353.86              | 410.66 | 482.10 | 614.79 | 73.60                 | 85.52 | 100.99 | 127.87 |
| C | Mariposa (MC) | Annual | 2026 | 353.86              | 410.81 | 482.03 | 614.95 | 73.62                 | 85.62 | 101.00 | 128.02 |
| C | Mariposa (MC) | Annual | 2027 | 353.86              | 410.93 | 481.97 | 615.12 | 73.63                 | 85.71 | 101.01 | 128.16 |
| C | Mariposa (MC) | Annual | 2028 | 353.85              | 411.06 | 481.91 | 615.29 | 73.64                 | 85.79 | 101.02 | 128.29 |
| C | Mariposa (MC) | Annual | 2029 | 353.83              | 411.19 | 481.84 | 615.47 | 73.64                 | 85.87 | 101.02 | 128.41 |
| C | Mariposa (MC) | Annual | 2030 | 353.81              | 411.31 | 481.77 | 615.62 | 73.64                 | 85.94 | 101.01 | 128.52 |
| C | Mariposa (MC) | Annual | 2031 | 353.81              | 411.44 | 481.74 | 615.85 | 73.65                 | 86.01 | 101.01 | 128.65 |
| C | Mariposa (MC) | Annual | 2032 | 353.80              | 411.54 | 481.71 | 616.07 | 73.65                 | 86.08 | 101.02 | 128.76 |
| C | Mariposa (MC) | Annual | 2033 | 353.80              | 411.63 | 481.68 | 616.27 | 73.66                 | 86.13 | 101.02 | 128.86 |
| C | Mariposa (MC) | Annual | 2034 | 353.79              | 411.70 | 481.65 | 616.45 | 73.66                 | 86.19 | 101.02 | 128.96 |
| C | Mariposa (MC) | Annual | 2035 | 353.78              | 411.77 | 481.63 | 616.61 | 73.67                 | 86.23 | 101.02 | 129.05 |
| C | Mariposa (MC) | Summer | 2010 | 383.75              | 439.08 | 524.10 | 654.73 | 74.37                 | 89.51 | 102.09 | 125.68 |
| C | Mariposa (MC) | Summer | 2011 | 383.98              | 440.10 | 523.79 | 655.48 | 74.22                 | 88.77 | 101.86 | 125.71 |
| C | Mariposa (MC) | Summer | 2012 | 384.14              | 440.90 | 523.54 | 656.41 | 74.03                 | 88.15 | 101.71 | 125.79 |
| C | Mariposa (MC) | Summer | 2013 | 384.37              | 441.53 | 523.38 | 657.50 | 73.97                 | 87.50 | 101.57 | 125.92 |
| C | Mariposa (MC) | Summer | 2014 | 384.48              | 442.00 | 523.29 | 658.57 | 73.82                 | 86.87 | 101.30 | 126.07 |
| C | Mariposa (MC) | Summer | 2015 | 384.66              | 442.44 | 523.21 | 659.71 | 73.83                 | 86.45 | 101.16 | 126.26 |
| C | Mariposa (MC) | Summer | 2016 | 384.77              | 442.80 | 523.13 | 660.80 | 73.80                 | 86.11 | 101.08 | 126.48 |
| C | Mariposa (MC) | Summer | 2017 | 384.83              | 443.08 | 523.05 | 661.80 | 73.77                 | 85.68 | 101.00 | 126.70 |
| C | Mariposa (MC) | Summer | 2018 | 384.83              | 443.32 | 522.95 | 662.65 | 73.71                 | 85.43 | 100.90 | 126.90 |
| C | Mariposa (MC) | Summer | 2019 | 384.80              | 443.56 | 522.85 | 663.34 | 73.61                 | 85.35 | 100.87 | 127.11 |
| C | Mariposa (MC) | Summer | 2020 | 384.74              | 443.78 | 522.76 | 663.97 | 73.65                 | 85.32 | 100.89 | 127.30 |
| C | Mariposa (MC) | Summer | 2021 | 384.68              | 443.93 | 522.65 | 664.40 | 73.67                 | 85.35 | 100.93 | 127.34 |
| C | Mariposa (MC) | Summer | 2022 | 384.58              | 444.09 | 522.56 | 664.75 | 73.67                 | 85.40 | 100.94 | 127.39 |
| C | Mariposa (MC) | Summer | 2023 | 384.42              | 444.21 | 522.47 | 665.02 | 73.64                 | 85.42 | 100.94 | 127.56 |
| C | Mariposa (MC) | Summer | 2024 | 384.29              | 444.31 | 522.40 | 665.20 | 73.60                 | 85.46 | 100.96 | 127.71 |
| C | Mariposa (MC) | Summer | 2025 | 384.24              | 444.44 | 522.34 | 665.37 | 73.60                 | 85.52 | 100.99 | 127.87 |
| C | Mariposa (MC) | Summer | 2026 | 384.25              | 444.68 | 522.29 | 665.56 | 73.62                 | 85.62 | 101.00 | 128.02 |
| C | Mariposa (MC) | Summer | 2027 | 384.26              | 444.88 | 522.24 | 665.76 | 73.63                 | 85.71 | 101.01 | 128.16 |
| C | Mariposa (MC) | Summer | 2028 | 384.26              | 445.08 | 522.20 | 665.98 | 73.64                 | 85.79 | 101.02 | 128.29 |
| C | Mariposa (MC) | Summer | 2029 | 384.26              | 445.29 | 522.15 | 666.20 | 73.64                 | 85.87 | 101.02 | 128.41 |
| C | Mariposa (MC) | Summer | 2030 | 384.25              | 445.48 | 522.11 | 666.42 | 73.64                 | 85.94 | 101.01 | 128.52 |
| C | Mariposa (MC) | Summer | 2031 | 384.25              | 445.67 | 522.08 | 666.71 | 73.65                 | 86.01 | 101.01 | 128.65 |
| C | Mariposa (MC) | Summer | 2032 | 384.25              | 445.81 | 522.06 | 667.00 | 73.65                 | 86.08 | 101.02 | 128.76 |
| C | Mariposa (MC) | Summer | 2033 | 384.25              | 445.93 | 522.04 | 667.26 | 73.66                 | 86.13 | 101.02 | 128.86 |
| C | Mariposa (MC) | Summer | 2034 | 384.24              | 446.03 | 522.02 | 667.49 | 73.66                 | 86.19 | 101.02 | 128.96 |
| C | Mariposa (MC) | Summer | 2035 | 384.23              | 446.10 | 521.99 | 667.70 | 73.67                 | 86.23 | 101.02 | 129.05 |
| C | Mariposa (MC) | Winter | 2010 | 347.30              | 403.48 | 476.41 | 596.03 | 74.37                 | 89.51 | 102.09 | 125.68 |
| C | Mariposa (MC) | Winter | 2011 | 347.12              | 403.27 | 475.59 | 596.55 | 74.22                 | 88.77 | 101.86 | 125.71 |
| C | Mariposa (MC) | Winter | 2012 | 346.97              | 403.10 | 474.94 | 597.15 | 74.03                 | 88.15 | 101.71 | 125.79 |
| C | Mariposa (MC) | Winter | 2013 | 346.97              | 402.89 | 474.42 | 597.81 | 73.97                 | 87.50 | 101.57 | 125.92 |
| C | Mariposa (MC) | Winter | 2014 | 346.91              | 402.69 | 473.97 | 598.45 | 73.82                 | 86.87 | 101.30 | 126.07 |
| C | Mariposa (MC) | Winter | 2015 | 346.99              | 402.60 | 473.63 | 599.12 | 73.83                 | 86.45 | 101.16 | 126.26 |
| C | Mariposa (MC) | Winter | 2016 | 347.02              | 402.54 | 473.35 | 599.75 | 73.80                 | 86.11 | 101.08 | 126.48 |
| C | Mariposa (MC) | Winter | 2017 | 347.05              | 402.44 | 473.14 | 600.35 | 73.77                 | 85.68 | 101.00 | 126.70 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location          | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mariposa (MC)     | Winter | 2018 | 347.05             | 402.40 | 472.95 | 600.86 | 73.71                 | 85.43 | 100.90 | 126.90 |
| C | Mariposa (MC)     | Winter | 2019 | 347.00             | 402.43 | 472.82 | 601.27 | 73.61                 | 85.35 | 100.87 | 127.11 |
| C | Mariposa (MC)     | Winter | 2020 | 346.95             | 402.43 | 472.71 | 601.65 | 73.65                 | 85.32 | 100.89 | 127.30 |
| C | Mariposa (MC)     | Winter | 2021 | 346.89             | 402.39 | 472.58 | 601.84 | 73.67                 | 85.35 | 100.93 | 127.34 |
| C | Mariposa (MC)     | Winter | 2022 | 346.79             | 402.39 | 472.45 | 602.00 | 73.67                 | 85.40 | 100.94 | 127.39 |
| C | Mariposa (MC)     | Winter | 2023 | 346.62             | 402.35 | 472.34 | 602.13 | 73.64                 | 85.42 | 100.94 | 127.56 |
| C | Mariposa (MC)     | Winter | 2024 | 346.44             | 402.31 | 472.26 | 602.23 | 73.60                 | 85.46 | 100.96 | 127.71 |
| C | Mariposa (MC)     | Winter | 2025 | 346.39             | 402.35 | 472.20 | 602.34 | 73.60                 | 85.52 | 100.99 | 127.87 |
| C | Mariposa (MC)     | Winter | 2026 | 346.39             | 402.47 | 472.12 | 602.49 | 73.62                 | 85.62 | 101.00 | 128.02 |
| C | Mariposa (MC)     | Winter | 2027 | 346.37             | 402.58 | 472.05 | 602.65 | 73.63                 | 85.71 | 101.01 | 128.16 |
| C | Mariposa (MC)     | Winter | 2028 | 346.37             | 402.69 | 472.00 | 602.81 | 73.64                 | 85.79 | 101.02 | 128.29 |
| C | Mariposa (MC)     | Winter | 2029 | 346.35             | 402.80 | 471.92 | 602.98 | 73.64                 | 85.87 | 101.02 | 128.41 |
| C | Mariposa (MC)     | Winter | 2030 | 346.32             | 402.90 | 471.85 | 603.12 | 73.64                 | 85.94 | 101.01 | 128.52 |
| C | Mariposa (MC)     | Winter | 2031 | 346.31             | 403.01 | 471.81 | 603.33 | 73.65                 | 86.01 | 101.01 | 128.65 |
| C | Mariposa (MC)     | Winter | 2032 | 346.31             | 403.10 | 471.78 | 603.54 | 73.65                 | 86.08 | 101.02 | 128.76 |
| C | Mariposa (MC)     | Winter | 2033 | 346.30             | 403.18 | 471.75 | 603.72 | 73.66                 | 86.13 | 101.02 | 128.86 |
| C | Mariposa (MC)     | Winter | 2034 | 346.29             | 403.25 | 471.72 | 603.89 | 73.66                 | 86.19 | 101.02 | 128.96 |
| C | Mariposa (MC)     | Winter | 2035 | 346.28             | 403.31 | 471.70 | 604.03 | 73.67                 | 86.23 | 101.02 | 129.05 |
| C | Mendocino-Coastal | Annual | 2010 | 328.61             | 379.07 | 451.10 | 562.37 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Coastal | Annual | 2011 | 328.64             | 379.33 | 450.55 | 563.04 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Coastal | Annual | 2012 | 328.71             | 379.62 | 450.13 | 563.82 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Coastal | Annual | 2013 | 328.81             | 379.86 | 449.78 | 564.69 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Coastal | Annual | 2014 | 328.91             | 380.10 | 449.50 | 565.53 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Coastal | Annual | 2015 | 329.05             | 380.33 | 449.28 | 566.42 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Coastal | Annual | 2016 | 329.20             | 380.54 | 449.10 | 567.26 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Coastal | Annual | 2017 | 329.29             | 380.71 | 448.96 | 568.05 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Coastal | Annual | 2018 | 329.36             | 380.86 | 448.84 | 568.75 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Coastal | Annual | 2019 | 329.41             | 381.04 | 448.75 | 569.35 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Coastal | Annual | 2020 | 329.46             | 381.20 | 448.68 | 569.87 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Coastal | Annual | 2021 | 329.47             | 381.32 | 448.60 | 570.28 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Coastal | Annual | 2022 | 329.44             | 381.41 | 448.52 | 570.63 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Coastal | Annual | 2023 | 329.37             | 381.48 | 448.45 | 570.90 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Coastal | Annual | 2024 | 329.30             | 381.52 | 448.37 | 571.09 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Coastal | Annual | 2025 | 329.26             | 381.61 | 448.33 | 571.27 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Coastal | Annual | 2026 | 329.27             | 381.77 | 448.27 | 571.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Coastal | Annual | 2027 | 329.27             | 381.91 | 448.22 | 571.68 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Coastal | Annual | 2028 | 329.27             | 382.05 | 448.17 | 571.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Coastal | Annual | 2029 | 329.25             | 382.19 | 448.10 | 572.09 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Coastal | Annual | 2030 | 329.24             | 382.33 | 448.03 | 572.30 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Coastal | Annual | 2031 | 329.23             | 382.47 | 448.00 | 572.53 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Coastal | Annual | 2032 | 329.23             | 382.60 | 447.97 | 572.77 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Coastal | Annual | 2033 | 329.22             | 382.71 | 447.95 | 572.98 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Coastal | Annual | 2034 | 329.22             | 382.81 | 447.93 | 573.17 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Coastal | Annual | 2035 | 329.21             | 382.89 | 447.91 | 573.33 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Coastal | Summer | 2010 | 335.50             | 385.93 | 460.22 | 573.75 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Coastal | Summer | 2011 | 335.60             | 386.40 | 459.76 | 574.44 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Coastal | Summer | 2012 | 335.73             | 386.85 | 459.39 | 575.26 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Coastal | Summer | 2013 | 335.88             | 387.22 | 459.11 | 576.18 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Coastal | Summer | 2014 | 336.01             | 387.57 | 458.87 | 577.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Coastal | Summer | 2015 | 336.17             | 387.90 | 458.70 | 578.04 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Coastal | Summer | 2016 | 336.34             | 388.18 | 458.56 | 578.96 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Coastal | Summer | 2017 | 336.43             | 388.42 | 458.43 | 579.82 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Coastal | Summer | 2018 | 336.49             | 388.62 | 458.33 | 580.57 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Coastal | Summer | 2019 | 336.54             | 388.83 | 458.25 | 581.22 | 72.81                 | 84.81 | 100.66 | 126.39 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location          | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mendocino-Coastal | Summer | 2020 | 336.59             | 389.03 | 458.18 | 581.78 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Coastal | Summer | 2021 | 336.60             | 389.18 | 458.11 | 582.21 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Coastal | Summer | 2022 | 336.57             | 389.31 | 458.03 | 582.59 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Coastal | Summer | 2023 | 336.50             | 389.40 | 457.96 | 582.88 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Coastal | Summer | 2024 | 336.43             | 389.46 | 457.89 | 583.08 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Coastal | Summer | 2025 | 336.39             | 389.57 | 457.85 | 583.26 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Coastal | Summer | 2026 | 336.40             | 389.75 | 457.79 | 583.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Coastal | Summer | 2027 | 336.41             | 389.91 | 457.74 | 583.68 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Coastal | Summer | 2028 | 336.41             | 390.07 | 457.70 | 583.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Coastal | Summer | 2029 | 336.40             | 390.24 | 457.63 | 584.11 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Coastal | Summer | 2030 | 336.39             | 390.39 | 457.57 | 584.32 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Coastal | Summer | 2031 | 336.39             | 390.55 | 457.53 | 584.57 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Coastal | Summer | 2032 | 336.38             | 390.69 | 457.51 | 584.82 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Coastal | Summer | 2033 | 336.38             | 390.81 | 457.48 | 585.05 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Coastal | Summer | 2034 | 336.37             | 390.92 | 457.46 | 585.25 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Coastal | Summer | 2035 | 336.36             | 391.01 | 457.44 | 585.42 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Coastal | Winter | 2010 | 325.36             | 375.84 | 446.80 | 556.99 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Coastal | Winter | 2011 | 325.35             | 375.99 | 446.21 | 557.66 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Coastal | Winter | 2012 | 325.39             | 376.21 | 445.75 | 558.43 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Coastal | Winter | 2013 | 325.47             | 376.38 | 445.38 | 559.27 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Coastal | Winter | 2014 | 325.56             | 376.57 | 445.08 | 560.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Coastal | Winter | 2015 | 325.69             | 376.77 | 444.84 | 560.93 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Coastal | Winter | 2016 | 325.84             | 376.93 | 444.64 | 561.74 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Coastal | Winter | 2017 | 325.92             | 377.08 | 444.49 | 562.50 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Coastal | Winter | 2018 | 325.99             | 377.20 | 444.36 | 563.17 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Coastal | Winter | 2019 | 326.04             | 377.36 | 444.27 | 563.75 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Coastal | Winter | 2020 | 326.10             | 377.51 | 444.20 | 564.26 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Coastal | Winter | 2021 | 326.10             | 377.61 | 444.12 | 564.65 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Coastal | Winter | 2022 | 326.08             | 377.69 | 444.04 | 564.99 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Coastal | Winter | 2023 | 326.01             | 377.75 | 443.96 | 565.25 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Coastal | Winter | 2024 | 325.93             | 377.77 | 443.88 | 565.44 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Coastal | Winter | 2025 | 325.89             | 377.86 | 443.83 | 565.61 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Coastal | Winter | 2026 | 325.90             | 378.00 | 443.78 | 565.81 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Coastal | Winter | 2027 | 325.90             | 378.13 | 443.72 | 566.01 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Coastal | Winter | 2028 | 325.90             | 378.27 | 443.68 | 566.22 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Coastal | Winter | 2029 | 325.88             | 378.40 | 443.60 | 566.42 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Coastal | Winter | 2030 | 325.86             | 378.53 | 443.54 | 566.62 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Coastal | Winter | 2031 | 325.86             | 378.66 | 443.50 | 566.86 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Coastal | Winter | 2032 | 325.85             | 378.78 | 443.47 | 567.09 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Coastal | Winter | 2033 | 325.85             | 378.89 | 443.45 | 567.29 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Coastal | Winter | 2034 | 325.84             | 378.99 | 443.43 | 567.47 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Coastal | Winter | 2035 | 325.83             | 379.07 | 443.41 | 567.63 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Inland  | Annual | 2010 | 328.61             | 379.07 | 451.10 | 562.37 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Inland  | Annual | 2011 | 328.64             | 379.33 | 450.55 | 563.04 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Inland  | Annual | 2012 | 328.71             | 379.62 | 450.13 | 563.82 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Inland  | Annual | 2013 | 328.81             | 379.86 | 449.78 | 564.69 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Inland  | Annual | 2014 | 328.91             | 380.10 | 449.50 | 565.53 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Inland  | Annual | 2015 | 329.05             | 380.33 | 449.28 | 566.42 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Inland  | Annual | 2016 | 329.20             | 380.54 | 449.10 | 567.26 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Inland  | Annual | 2017 | 329.29             | 380.71 | 448.96 | 568.05 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Inland  | Annual | 2018 | 329.36             | 380.86 | 448.84 | 568.75 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Inland  | Annual | 2019 | 329.41             | 381.04 | 448.75 | 569.35 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Inland  | Annual | 2020 | 329.46             | 381.20 | 448.68 | 569.87 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Inland  | Annual | 2021 | 329.47             | 381.32 | 448.60 | 570.28 | 72.95                 | 85.00 | 100.77 | 126.88 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mendocino-Inland | Annual | 2022 | 329.44             | 381.41 | 448.52 | 570.63 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Inland | Annual | 2023 | 329.37             | 381.48 | 448.45 | 570.90 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Inland | Annual | 2024 | 329.30             | 381.52 | 448.37 | 571.09 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Inland | Annual | 2025 | 329.26             | 381.61 | 448.33 | 571.27 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Inland | Annual | 2026 | 329.27             | 381.77 | 448.27 | 571.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Inland | Annual | 2027 | 329.27             | 381.91 | 448.22 | 571.68 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Inland | Annual | 2028 | 329.27             | 382.05 | 448.17 | 571.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Inland | Annual | 2029 | 329.25             | 382.19 | 448.10 | 572.09 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Inland | Annual | 2030 | 329.24             | 382.33 | 448.03 | 572.30 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Inland | Annual | 2031 | 329.23             | 382.47 | 448.00 | 572.53 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Inland | Annual | 2032 | 329.23             | 382.60 | 447.97 | 572.77 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Inland | Annual | 2033 | 329.22             | 382.71 | 447.95 | 572.98 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Inland | Annual | 2034 | 329.22             | 382.81 | 447.93 | 573.17 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Inland | Annual | 2035 | 329.21             | 382.89 | 447.91 | 573.33 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Inland | Summer | 2010 | 335.50             | 385.93 | 460.22 | 573.75 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Inland | Summer | 2011 | 335.60             | 386.40 | 459.76 | 574.44 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Inland | Summer | 2012 | 335.73             | 386.85 | 459.39 | 575.26 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Inland | Summer | 2013 | 335.88             | 387.22 | 459.11 | 576.18 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Inland | Summer | 2014 | 336.01             | 387.57 | 458.87 | 577.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Inland | Summer | 2015 | 336.17             | 387.90 | 458.70 | 578.04 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Inland | Summer | 2016 | 336.34             | 388.18 | 458.56 | 578.96 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Inland | Summer | 2017 | 336.43             | 388.42 | 458.43 | 579.82 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Inland | Summer | 2018 | 336.49             | 388.62 | 458.33 | 580.57 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Inland | Summer | 2019 | 336.54             | 388.83 | 458.25 | 581.22 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Inland | Summer | 2020 | 336.59             | 389.03 | 458.18 | 581.78 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Inland | Summer | 2021 | 336.60             | 389.18 | 458.11 | 582.21 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Inland | Summer | 2022 | 336.57             | 389.31 | 458.03 | 582.59 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Inland | Summer | 2023 | 336.50             | 389.40 | 457.96 | 582.88 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Inland | Summer | 2024 | 336.43             | 389.46 | 457.89 | 583.08 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Inland | Summer | 2025 | 336.39             | 389.57 | 457.85 | 583.26 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Inland | Summer | 2026 | 336.40             | 389.75 | 457.79 | 583.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Inland | Summer | 2027 | 336.41             | 389.91 | 457.74 | 583.68 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Inland | Summer | 2028 | 336.41             | 390.07 | 457.70 | 583.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Inland | Summer | 2029 | 336.40             | 390.24 | 457.63 | 584.11 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Inland | Summer | 2030 | 336.39             | 390.39 | 457.57 | 584.32 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Inland | Summer | 2031 | 336.39             | 390.55 | 457.53 | 584.57 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Inland | Summer | 2032 | 336.38             | 390.69 | 457.51 | 584.82 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Inland | Summer | 2033 | 336.38             | 390.81 | 457.48 | 585.05 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Inland | Summer | 2034 | 336.37             | 390.92 | 457.46 | 585.25 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Inland | Summer | 2035 | 336.36             | 391.01 | 457.44 | 585.42 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Inland | Winter | 2010 | 325.36             | 375.84 | 446.80 | 556.99 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Inland | Winter | 2011 | 325.35             | 375.99 | 446.21 | 557.66 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Inland | Winter | 2012 | 325.39             | 376.21 | 445.75 | 558.43 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Inland | Winter | 2013 | 325.47             | 376.38 | 445.38 | 559.27 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Inland | Winter | 2014 | 325.56             | 376.57 | 445.08 | 560.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Inland | Winter | 2015 | 325.69             | 376.77 | 444.84 | 560.93 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Inland | Winter | 2016 | 325.84             | 376.93 | 444.64 | 561.74 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Inland | Winter | 2017 | 325.92             | 377.08 | 444.49 | 562.50 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Inland | Winter | 2018 | 325.99             | 377.20 | 444.36 | 563.17 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Inland | Winter | 2019 | 326.04             | 377.36 | 444.27 | 563.75 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Inland | Winter | 2020 | 326.10             | 377.51 | 444.20 | 564.26 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Inland | Winter | 2021 | 326.10             | 377.61 | 444.12 | 564.65 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Inland | Winter | 2022 | 326.08             | 377.69 | 444.04 | 564.99 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Inland | Winter | 2023 | 326.01             | 377.75 | 443.96 | 565.25 | 72.99                 | 85.18 | 100.85 | 127.29 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location                     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mendocino-Inland             | Winter | 2024 | 325.93             | 377.77 | 443.88 | 565.44 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Inland             | Winter | 2025 | 325.89             | 377.86 | 443.83 | 565.61 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Inland             | Winter | 2026 | 325.90             | 378.00 | 443.78 | 565.81 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Inland             | Winter | 2027 | 325.90             | 378.13 | 443.72 | 566.01 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Inland             | Winter | 2028 | 325.90             | 378.27 | 443.68 | 566.22 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Inland             | Winter | 2029 | 325.88             | 378.40 | 443.60 | 566.42 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Inland             | Winter | 2030 | 325.86             | 378.53 | 443.54 | 566.62 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Inland             | Winter | 2031 | 325.86             | 378.66 | 443.50 | 566.86 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Inland             | Winter | 2032 | 325.85             | 378.78 | 443.47 | 567.09 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Inland             | Winter | 2033 | 325.85             | 378.89 | 443.45 | 567.29 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Inland             | Winter | 2034 | 325.84             | 378.99 | 443.43 | 567.47 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Inland             | Winter | 2035 | 325.83             | 379.07 | 443.41 | 567.63 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Rural Inland North | Annual | 2010 | 328.61             | 379.07 | 451.10 | 562.37 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Rural Inland North | Annual | 2011 | 328.64             | 379.33 | 450.55 | 563.04 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Rural Inland North | Annual | 2012 | 328.71             | 379.62 | 450.13 | 563.82 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Rural Inland North | Annual | 2013 | 328.81             | 379.86 | 449.78 | 564.69 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Rural Inland North | Annual | 2014 | 328.91             | 380.10 | 449.50 | 565.53 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Rural Inland North | Annual | 2015 | 329.05             | 380.33 | 449.28 | 566.42 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Rural Inland North | Annual | 2016 | 329.20             | 380.54 | 449.10 | 567.26 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Rural Inland North | Annual | 2017 | 329.29             | 380.71 | 448.96 | 568.05 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Rural Inland North | Annual | 2018 | 329.36             | 380.86 | 448.84 | 568.75 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Rural Inland North | Annual | 2019 | 329.41             | 381.04 | 448.75 | 569.35 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Rural Inland North | Annual | 2020 | 329.46             | 381.20 | 448.68 | 569.87 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Rural Inland North | Annual | 2021 | 329.47             | 381.32 | 448.60 | 570.28 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Rural Inland North | Annual | 2022 | 329.44             | 381.41 | 448.52 | 570.63 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Rural Inland North | Annual | 2023 | 329.37             | 381.48 | 448.45 | 570.90 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Rural Inland North | Annual | 2024 | 329.30             | 381.52 | 448.37 | 571.09 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Rural Inland North | Annual | 2025 | 329.26             | 381.61 | 448.33 | 571.27 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Rural Inland North | Annual | 2026 | 329.27             | 381.77 | 448.27 | 571.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Rural Inland North | Annual | 2027 | 329.27             | 381.91 | 448.22 | 571.68 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Rural Inland North | Annual | 2028 | 329.27             | 382.05 | 448.17 | 571.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Rural Inland North | Annual | 2029 | 329.25             | 382.19 | 448.10 | 572.09 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Rural Inland North | Annual | 2030 | 329.24             | 382.33 | 448.03 | 572.30 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Rural Inland North | Annual | 2031 | 329.23             | 382.47 | 448.00 | 572.53 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Rural Inland North | Annual | 2032 | 329.23             | 382.60 | 447.97 | 572.77 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Rural Inland North | Annual | 2033 | 329.22             | 382.71 | 447.95 | 572.98 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Rural Inland North | Annual | 2034 | 329.22             | 382.81 | 447.93 | 573.17 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Rural Inland North | Annual | 2035 | 329.21             | 382.89 | 447.91 | 573.33 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Rural Inland North | Summer | 2010 | 335.50             | 385.93 | 460.22 | 573.75 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Rural Inland North | Summer | 2011 | 335.60             | 386.40 | 459.76 | 574.44 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Rural Inland North | Summer | 2012 | 335.73             | 386.85 | 459.39 | 575.26 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Rural Inland North | Summer | 2013 | 335.88             | 387.22 | 459.11 | 576.18 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Rural Inland North | Summer | 2014 | 336.01             | 387.57 | 458.87 | 577.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Rural Inland North | Summer | 2015 | 336.17             | 387.90 | 458.70 | 578.04 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Rural Inland North | Summer | 2016 | 336.34             | 388.18 | 458.56 | 578.96 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Rural Inland North | Summer | 2017 | 336.43             | 388.42 | 458.43 | 579.82 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Rural Inland North | Summer | 2018 | 336.49             | 388.62 | 458.33 | 580.57 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Rural Inland North | Summer | 2019 | 336.54             | 388.83 | 458.25 | 581.22 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Rural Inland North | Summer | 2020 | 336.59             | 389.03 | 458.18 | 581.78 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Rural Inland North | Summer | 2021 | 336.60             | 389.18 | 458.11 | 582.21 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Rural Inland North | Summer | 2022 | 336.57             | 389.31 | 458.03 | 582.59 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Rural Inland North | Summer | 2023 | 336.50             | 389.40 | 457.96 | 582.88 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Rural Inland North | Summer | 2024 | 336.43             | 389.46 | 457.89 | 583.08 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Rural Inland North | Summer | 2025 | 336.39             | 389.57 | 457.85 | 583.26 | 72.99                 | 85.36 | 100.90 | 127.65 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location                     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mendocino-Rural Inland North | Summer | 2026 | 336.40             | 389.75 | 457.79 | 583.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Rural Inland North | Summer | 2027 | 336.41             | 389.91 | 457.74 | 583.68 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Rural Inland North | Summer | 2028 | 336.41             | 390.07 | 457.70 | 583.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Rural Inland North | Summer | 2029 | 336.40             | 390.24 | 457.63 | 584.11 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Rural Inland North | Summer | 2030 | 336.39             | 390.39 | 457.57 | 584.32 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Rural Inland North | Summer | 2031 | 336.39             | 390.55 | 457.53 | 584.57 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Rural Inland North | Summer | 2032 | 336.38             | 390.69 | 457.51 | 584.82 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Rural Inland North | Summer | 2033 | 336.38             | 390.81 | 457.48 | 585.05 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Rural Inland North | Summer | 2034 | 336.37             | 390.92 | 457.46 | 585.25 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Rural Inland North | Summer | 2035 | 336.36             | 391.01 | 457.44 | 585.42 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Rural Inland North | Winter | 2010 | 325.36             | 375.84 | 446.80 | 556.99 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Rural Inland North | Winter | 2011 | 325.35             | 375.99 | 446.21 | 557.66 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Rural Inland North | Winter | 2012 | 325.39             | 376.21 | 445.75 | 558.43 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Rural Inland North | Winter | 2013 | 325.47             | 376.38 | 445.38 | 559.27 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Rural Inland North | Winter | 2014 | 325.56             | 376.57 | 445.08 | 560.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Rural Inland North | Winter | 2015 | 325.69             | 376.77 | 444.84 | 560.93 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Rural Inland North | Winter | 2016 | 325.84             | 376.93 | 444.64 | 561.74 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Rural Inland North | Winter | 2017 | 325.92             | 377.08 | 444.49 | 562.50 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Rural Inland North | Winter | 2018 | 325.99             | 377.20 | 444.36 | 563.17 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Rural Inland North | Winter | 2019 | 326.04             | 377.36 | 444.27 | 563.75 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Rural Inland North | Winter | 2020 | 326.10             | 377.51 | 444.20 | 564.26 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Rural Inland North | Winter | 2021 | 326.10             | 377.61 | 444.12 | 564.65 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Rural Inland North | Winter | 2022 | 326.08             | 377.69 | 444.04 | 564.99 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Rural Inland North | Winter | 2023 | 326.01             | 377.75 | 443.96 | 565.25 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Rural Inland North | Winter | 2024 | 325.93             | 377.77 | 443.88 | 565.44 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Rural Inland North | Winter | 2025 | 325.89             | 377.86 | 443.83 | 565.61 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Rural Inland North | Winter | 2026 | 325.90             | 378.00 | 443.78 | 565.81 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Rural Inland North | Winter | 2027 | 325.90             | 378.13 | 443.72 | 566.01 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Rural Inland North | Winter | 2028 | 325.90             | 378.27 | 443.68 | 566.22 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Rural Inland North | Winter | 2029 | 325.88             | 378.40 | 443.60 | 566.42 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Rural Inland North | Winter | 2030 | 325.86             | 378.53 | 443.54 | 566.62 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Rural Inland North | Winter | 2031 | 325.86             | 378.66 | 443.50 | 566.86 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Rural Inland North | Winter | 2032 | 325.85             | 378.78 | 443.47 | 567.09 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Rural Inland North | Winter | 2033 | 325.85             | 378.89 | 443.45 | 567.29 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Rural Inland North | Winter | 2034 | 325.84             | 378.99 | 443.43 | 567.47 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Rural Inland North | Winter | 2035 | 325.83             | 379.07 | 443.41 | 567.63 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Rural Inland South | Annual | 2010 | 328.61             | 379.07 | 451.10 | 562.37 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Rural Inland South | Annual | 2011 | 328.64             | 379.33 | 450.55 | 563.04 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Rural Inland South | Annual | 2012 | 328.71             | 379.62 | 450.13 | 563.82 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Rural Inland South | Annual | 2013 | 328.81             | 379.86 | 449.78 | 564.69 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Rural Inland South | Annual | 2014 | 328.91             | 380.10 | 449.50 | 565.53 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Rural Inland South | Annual | 2015 | 329.05             | 380.33 | 449.28 | 566.42 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Rural Inland South | Annual | 2016 | 329.20             | 380.54 | 449.10 | 567.26 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Rural Inland South | Annual | 2017 | 329.29             | 380.71 | 448.96 | 568.05 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Rural Inland South | Annual | 2018 | 329.36             | 380.86 | 448.84 | 568.75 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Rural Inland South | Annual | 2019 | 329.41             | 381.04 | 448.75 | 569.35 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Rural Inland South | Annual | 2020 | 329.46             | 381.20 | 448.68 | 569.87 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Rural Inland South | Annual | 2021 | 329.47             | 381.32 | 448.60 | 570.28 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Rural Inland South | Annual | 2022 | 329.44             | 381.41 | 448.52 | 570.63 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Rural Inland South | Annual | 2023 | 329.37             | 381.48 | 448.45 | 570.90 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Rural Inland South | Annual | 2024 | 329.30             | 381.52 | 448.37 | 571.09 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Rural Inland South | Annual | 2025 | 329.26             | 381.61 | 448.33 | 571.27 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Rural Inland South | Annual | 2026 | 329.27             | 381.77 | 448.27 | 571.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Rural Inland South | Annual | 2027 | 329.27             | 381.91 | 448.22 | 571.68 | 73.03                 | 85.57 | 100.94 | 127.97 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location                     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mendocino-Rural Inland South | Annual | 2028 | 329.27             | 382.05 | 448.17 | 571.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Rural Inland South | Annual | 2029 | 329.25             | 382.19 | 448.10 | 572.09 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Rural Inland South | Annual | 2030 | 329.24             | 382.33 | 448.03 | 572.30 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Rural Inland South | Annual | 2031 | 329.23             | 382.47 | 448.00 | 572.53 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Rural Inland South | Annual | 2032 | 329.23             | 382.60 | 447.97 | 572.77 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Rural Inland South | Annual | 2033 | 329.22             | 382.71 | 447.95 | 572.98 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Rural Inland South | Annual | 2034 | 329.22             | 382.81 | 447.93 | 573.17 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Rural Inland South | Annual | 2035 | 329.21             | 382.89 | 447.91 | 573.33 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Rural Inland South | Summer | 2010 | 335.50             | 385.93 | 460.22 | 573.75 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Rural Inland South | Summer | 2011 | 335.60             | 386.40 | 459.76 | 574.44 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Rural Inland South | Summer | 2012 | 335.73             | 386.85 | 459.39 | 575.26 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Rural Inland South | Summer | 2013 | 335.88             | 387.22 | 459.11 | 576.18 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Rural Inland South | Summer | 2014 | 336.01             | 387.57 | 458.87 | 577.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Rural Inland South | Summer | 2015 | 336.17             | 387.90 | 458.70 | 578.04 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Rural Inland South | Summer | 2016 | 336.34             | 388.18 | 458.56 | 578.96 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Rural Inland South | Summer | 2017 | 336.43             | 388.42 | 458.43 | 579.82 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Rural Inland South | Summer | 2018 | 336.49             | 388.62 | 458.33 | 580.57 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Rural Inland South | Summer | 2019 | 336.54             | 388.83 | 458.25 | 581.22 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Rural Inland South | Summer | 2020 | 336.59             | 389.03 | 458.18 | 581.78 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Rural Inland South | Summer | 2021 | 336.60             | 389.18 | 458.11 | 582.21 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Rural Inland South | Summer | 2022 | 336.57             | 389.31 | 458.03 | 582.59 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Rural Inland South | Summer | 2023 | 336.50             | 389.40 | 457.96 | 582.88 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Rural Inland South | Summer | 2024 | 336.43             | 389.46 | 457.89 | 583.08 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Rural Inland South | Summer | 2025 | 336.39             | 389.57 | 457.85 | 583.26 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Rural Inland South | Summer | 2026 | 336.40             | 389.75 | 457.79 | 583.47 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Rural Inland South | Summer | 2027 | 336.41             | 389.91 | 457.74 | 583.68 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Rural Inland South | Summer | 2028 | 336.41             | 390.07 | 457.70 | 583.89 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Rural Inland South | Summer | 2029 | 336.40             | 390.24 | 457.63 | 584.11 | 73.04                 | 85.75 | 100.95 | 128.24 |
| C | Mendocino-Rural Inland South | Summer | 2030 | 336.39             | 390.39 | 457.57 | 584.32 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Rural Inland South | Summer | 2031 | 336.39             | 390.55 | 457.53 | 584.57 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Rural Inland South | Summer | 2032 | 336.38             | 390.69 | 457.51 | 584.82 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Rural Inland South | Summer | 2033 | 336.38             | 390.81 | 457.48 | 585.05 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Rural Inland South | Summer | 2034 | 336.37             | 390.92 | 457.46 | 585.25 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Rural Inland South | Summer | 2035 | 336.36             | 391.01 | 457.44 | 585.42 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Mendocino-Rural Inland South | Winter | 2010 | 325.36             | 375.84 | 446.80 | 556.99 | 72.79                 | 86.74 | 100.94 | 123.79 |
| C | Mendocino-Rural Inland South | Winter | 2011 | 325.35             | 375.99 | 446.21 | 557.66 | 72.74                 | 86.20 | 100.83 | 123.99 |
| C | Mendocino-Rural Inland South | Winter | 2012 | 325.39             | 376.21 | 445.75 | 558.43 | 72.71                 | 85.88 | 100.79 | 124.25 |
| C | Mendocino-Rural Inland South | Winter | 2013 | 325.47             | 376.38 | 445.38 | 559.27 | 72.69                 | 85.57 | 100.77 | 124.53 |
| C | Mendocino-Rural Inland South | Winter | 2014 | 325.56             | 376.57 | 445.08 | 560.08 | 72.66                 | 85.38 | 100.70 | 124.83 |
| C | Mendocino-Rural Inland South | Winter | 2015 | 325.69             | 376.77 | 444.84 | 560.93 | 72.71                 | 85.22 | 100.68 | 125.15 |
| C | Mendocino-Rural Inland South | Winter | 2016 | 325.84             | 376.93 | 444.64 | 561.74 | 72.78                 | 85.05 | 100.67 | 125.47 |
| C | Mendocino-Rural Inland South | Winter | 2017 | 325.92             | 377.08 | 444.49 | 562.50 | 72.79                 | 84.90 | 100.65 | 125.80 |
| C | Mendocino-Rural Inland South | Winter | 2018 | 325.99             | 377.20 | 444.36 | 563.17 | 72.80                 | 84.79 | 100.64 | 126.10 |
| C | Mendocino-Rural Inland South | Winter | 2019 | 326.04             | 377.36 | 444.27 | 563.75 | 72.81                 | 84.81 | 100.66 | 126.39 |
| C | Mendocino-Rural Inland South | Winter | 2020 | 326.10             | 377.51 | 444.20 | 564.26 | 72.90                 | 84.89 | 100.71 | 126.66 |
| C | Mendocino-Rural Inland South | Winter | 2021 | 326.10             | 377.61 | 444.12 | 564.65 | 72.95                 | 85.00 | 100.77 | 126.88 |
| C | Mendocino-Rural Inland South | Winter | 2022 | 326.08             | 377.69 | 444.04 | 564.99 | 72.98                 | 85.10 | 100.81 | 127.08 |
| C | Mendocino-Rural Inland South | Winter | 2023 | 326.01             | 377.75 | 443.96 | 565.25 | 72.99                 | 85.18 | 100.85 | 127.29 |
| C | Mendocino-Rural Inland South | Winter | 2024 | 325.93             | 377.77 | 443.88 | 565.44 | 72.98                 | 85.26 | 100.87 | 127.48 |
| C | Mendocino-Rural Inland South | Winter | 2025 | 325.89             | 377.86 | 443.83 | 565.61 | 72.99                 | 85.36 | 100.90 | 127.65 |
| C | Mendocino-Rural Inland South | Winter | 2026 | 325.90             | 378.00 | 443.78 | 565.81 | 73.01                 | 85.47 | 100.93 | 127.81 |
| C | Mendocino-Rural Inland South | Winter | 2027 | 325.90             | 378.13 | 443.72 | 566.01 | 73.03                 | 85.57 | 100.94 | 127.97 |
| C | Mendocino-Rural Inland South | Winter | 2028 | 325.90             | 378.27 | 443.68 | 566.22 | 73.03                 | 85.66 | 100.96 | 128.11 |
| C | Mendocino-Rural Inland South | Winter | 2029 | 325.88             | 378.40 | 443.60 | 566.42 | 73.04                 | 85.75 | 100.95 | 128.24 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location                     | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                              |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mendocino-Rural Inland South | Winter | 2030 | 325.86              | 378.53 | 443.54 | 566.62 | 73.04                 | 85.83 | 100.95 | 128.37 |
| C | Mendocino-Rural Inland South | Winter | 2031 | 325.86              | 378.66 | 443.50 | 566.86 | 73.05                 | 85.91 | 100.96 | 128.50 |
| C | Mendocino-Rural Inland South | Winter | 2032 | 325.85              | 378.78 | 443.47 | 567.09 | 73.06                 | 85.98 | 100.96 | 128.62 |
| C | Mendocino-Rural Inland South | Winter | 2033 | 325.85              | 378.89 | 443.45 | 567.29 | 73.06                 | 86.05 | 100.96 | 128.73 |
| C | Mendocino-Rural Inland South | Winter | 2034 | 325.84              | 378.99 | 443.43 | 567.47 | 73.07                 | 86.11 | 100.97 | 128.83 |
| C | Mendocino-Rural Inland South | Winter | 2035 | 325.83              | 379.07 | 443.41 | 567.63 | 73.07                 | 86.16 | 100.97 | 128.93 |
| C | Merced (SJV)                 | Annual | 2010 | 340.87              | 390.90 | 467.36 | 584.95 | 73.16                 | 85.59 | 100.55 | 123.92 |
| C | Merced (SJV)                 | Annual | 2011 | 341.18              | 391.95 | 467.11 | 585.80 | 73.17                 | 85.25 | 100.50 | 124.18 |
| C | Merced (SJV)                 | Annual | 2012 | 342.08              | 393.49 | 467.75 | 587.72 | 73.22                 | 85.08 | 100.47 | 124.45 |
| C | Merced (SJV)                 | Annual | 2013 | 343.97              | 396.08 | 469.80 | 591.52 | 73.28                 | 84.93 | 100.46 | 124.78 |
| C | Merced (SJV)                 | Annual | 2014 | 344.21              | 396.70 | 469.70 | 592.50 | 73.32                 | 84.82 | 100.47 | 125.10 |
| C | Merced (SJV)                 | Annual | 2015 | 346.14              | 399.22 | 471.93 | 596.45 | 73.40                 | 84.76 | 100.47 | 125.45 |
| C | Merced (SJV)                 | Annual | 2016 | 346.35              | 399.69 | 471.87 | 597.40 | 73.48                 | 84.69 | 100.48 | 125.80 |
| C | Merced (SJV)                 | Annual | 2017 | 346.49              | 400.09 | 471.80 | 598.27 | 73.51                 | 84.64 | 100.48 | 126.15 |
| C | Merced (SJV)                 | Annual | 2018 | 349.13              | 403.34 | 475.20 | 603.39 | 73.57                 | 84.61 | 100.50 | 126.47 |
| C | Merced (SJV)                 | Annual | 2019 | 349.23              | 403.65 | 475.15 | 604.02 | 73.62                 | 84.72 | 100.53 | 126.76 |
| C | Merced (SJV)                 | Annual | 2020 | 349.30              | 403.93 | 475.11 | 604.59 | 73.71                 | 84.85 | 100.61 | 127.03 |
| C | Merced (SJV)                 | Annual | 2021 | 351.18              | 406.32 | 477.56 | 608.27 | 73.78                 | 85.02 | 100.69 | 127.27 |
| C | Merced (SJV)                 | Annual | 2022 | 351.21              | 406.57 | 477.54 | 608.69 | 73.83                 | 85.17 | 100.76 | 127.46 |
| C | Merced (SJV)                 | Annual | 2023 | 351.21              | 406.77 | 477.51 | 609.02 | 73.86                 | 85.30 | 100.81 | 127.68 |
| C | Merced (SJV)                 | Annual | 2024 | 352.65              | 408.63 | 479.46 | 611.80 | 73.88                 | 85.42 | 100.85 | 127.88 |
| C | Merced (SJV)                 | Annual | 2025 | 352.66              | 408.77 | 479.44 | 612.05 | 73.90                 | 85.52 | 100.89 | 128.06 |
| C | Merced (SJV)                 | Annual | 2026 | 355.16              | 411.82 | 482.81 | 616.64 | 73.92                 | 85.62 | 100.91 | 128.23 |
| C | Merced (SJV)                 | Annual | 2027 | 355.17              | 411.96 | 482.79 | 616.85 | 73.93                 | 85.71 | 100.93 | 128.38 |
| C | Merced (SJV)                 | Annual | 2028 | 355.18              | 412.10 | 482.76 | 617.06 | 73.94                 | 85.80 | 100.95 | 128.51 |
| C | Merced (SJV)                 | Annual | 2029 | 355.18              | 412.22 | 482.73 | 617.26 | 73.95                 | 85.87 | 100.95 | 128.63 |
| C | Merced (SJV)                 | Annual | 2030 | 355.17              | 412.35 | 482.71 | 617.45 | 73.95                 | 85.94 | 100.96 | 128.75 |
| C | Merced (SJV)                 | Annual | 2031 | 355.17              | 412.47 | 482.69 | 617.62 | 73.96                 | 86.01 | 100.97 | 128.85 |
| C | Merced (SJV)                 | Annual | 2032 | 355.17              | 412.57 | 482.67 | 617.79 | 73.96                 | 86.07 | 100.97 | 128.94 |
| C | Merced (SJV)                 | Annual | 2033 | 355.17              | 412.66 | 482.65 | 617.95 | 73.97                 | 86.12 | 100.98 | 129.03 |
| C | Merced (SJV)                 | Annual | 2034 | 355.17              | 412.73 | 482.64 | 618.09 | 73.97                 | 86.17 | 100.98 | 129.10 |
| C | Merced (SJV)                 | Annual | 2035 | 355.17              | 412.79 | 482.63 | 618.21 | 73.97                 | 86.21 | 100.99 | 129.17 |
| C | Merced (SJV)                 | Summer | 2010 | 373.91              | 424.50 | 510.75 | 639.39 | 73.16                 | 85.59 | 100.55 | 123.92 |
| C | Merced (SJV)                 | Summer | 2011 | 374.54              | 426.53 | 510.92 | 640.32 | 73.17                 | 85.25 | 100.50 | 124.18 |
| C | Merced (SJV)                 | Summer | 2012 | 375.72              | 428.80 | 511.95 | 642.49 | 73.22                 | 85.08 | 100.47 | 124.45 |
| C | Merced (SJV)                 | Summer | 2013 | 377.96              | 432.14 | 514.48 | 646.83 | 73.28                 | 84.93 | 100.46 | 124.78 |
| C | Merced (SJV)                 | Summer | 2014 | 378.33              | 433.19 | 514.60 | 648.11 | 73.32                 | 84.82 | 100.47 | 125.10 |
| C | Merced (SJV)                 | Summer | 2015 | 380.53              | 436.25 | 517.25 | 652.67 | 73.40                 | 84.76 | 100.47 | 125.45 |
| C | Merced (SJV)                 | Summer | 2016 | 380.80              | 437.00 | 517.32 | 653.93 | 73.48                 | 84.69 | 100.48 | 125.80 |
| C | Merced (SJV)                 | Summer | 2017 | 380.97              | 437.61 | 517.33 | 655.06 | 73.51                 | 84.64 | 100.48 | 126.15 |
| C | Merced (SJV)                 | Summer | 2018 | 383.85              | 441.28 | 521.08 | 660.79 | 73.57                 | 84.61 | 100.50 | 126.47 |
| C | Merced (SJV)                 | Summer | 2019 | 383.93              | 441.70 | 521.02 | 661.58 | 73.62                 | 84.72 | 100.53 | 126.76 |
| C | Merced (SJV)                 | Summer | 2020 | 383.99              | 442.07 | 520.96 | 662.27 | 73.71                 | 84.85 | 100.61 | 127.03 |
| C | Merced (SJV)                 | Summer | 2021 | 386.07              | 444.82 | 523.67 | 666.43 | 73.78                 | 85.02 | 100.69 | 127.27 |
| C | Merced (SJV)                 | Summer | 2022 | 386.11              | 445.19 | 523.65 | 666.97 | 73.83                 | 85.17 | 100.76 | 127.46 |
| C | Merced (SJV)                 | Summer | 2023 | 386.12              | 445.49 | 523.63 | 667.38 | 73.86                 | 85.30 | 100.81 | 127.68 |
| C | Merced (SJV)                 | Summer | 2024 | 387.72              | 447.60 | 525.78 | 670.47 | 73.88                 | 85.42 | 100.85 | 127.88 |
| C | Merced (SJV)                 | Summer | 2025 | 387.74              | 447.82 | 525.78 | 670.75 | 73.90                 | 85.52 | 100.89 | 128.06 |
| C | Merced (SJV)                 | Summer | 2026 | 390.50              | 451.22 | 529.48 | 675.75 | 73.92                 | 85.62 | 100.91 | 128.23 |
| C | Merced (SJV)                 | Summer | 2027 | 390.51              | 451.41 | 529.46 | 675.97 | 73.93                 | 85.71 | 100.93 | 128.38 |
| C | Merced (SJV)                 | Summer | 2028 | 390.52              | 451.60 | 529.44 | 676.18 | 73.94                 | 85.80 | 100.95 | 128.51 |
| C | Merced (SJV)                 | Summer | 2029 | 390.53              | 451.78 | 529.41 | 676.38 | 73.95                 | 85.87 | 100.95 | 128.63 |
| C | Merced (SJV)                 | Summer | 2030 | 390.53              | 451.95 | 529.39 | 676.58 | 73.95                 | 85.94 | 100.96 | 128.75 |
| C | Merced (SJV)                 | Summer | 2031 | 390.53              | 452.12 | 529.34 | 676.72 | 73.96                 | 86.01 | 100.97 | 128.85 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |        |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|--------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1   | LDT2   | MDV    |
| C | Merced (SJV) | Summer | 2032 | 390.53             | 452.26 | 529.30 | 676.87 | 73.96                 | 86.07  | 100.97 | 128.94 |
| C | Merced (SJV) | Summer | 2033 | 390.53             | 452.37 | 529.27 | 677.03 | 73.97                 | 86.12  | 100.98 | 129.03 |
| C | Merced (SJV) | Summer | 2034 | 390.53             | 452.46 | 529.26 | 677.19 | 73.97                 | 86.17  | 100.98 | 129.10 |
| C | Merced (SJV) | Summer | 2035 | 390.53             | 452.53 | 529.24 | 677.34 | 73.97                 | 86.21  | 100.99 | 129.17 |
| C | Merced (SJV) | Winter | 2010 | 329.03             | 378.86 | 451.81 | 565.43 | 73.16                 | 85.59  | 100.55 | 123.92 |
| C | Merced (SJV) | Winter | 2011 | 329.22             | 379.55 | 451.41 | 566.25 | 73.17                 | 85.25  | 100.50 | 124.18 |
| C | Merced (SJV) | Winter | 2012 | 330.02             | 380.82 | 451.91 | 568.09 | 73.22                 | 85.08  | 100.47 | 124.45 |
| C | Merced (SJV) | Winter | 2013 | 331.78             | 383.15 | 453.79 | 571.69 | 73.28                 | 84.93  | 100.46 | 124.78 |
| C | Merced (SJV) | Winter | 2014 | 331.98             | 383.62 | 453.60 | 572.57 | 73.32                 | 84.82  | 100.47 | 125.10 |
| C | Merced (SJV) | Winter | 2015 | 333.81             | 385.94 | 455.69 | 576.30 | 73.40                 | 84.76  | 100.47 | 125.45 |
| C | Merced (SJV) | Winter | 2016 | 334.00             | 386.31 | 455.57 | 577.14 | 73.48                 | 84.69  | 100.48 | 125.80 |
| C | Merced (SJV) | Winter | 2017 | 334.13             | 386.64 | 455.48 | 577.91 | 73.51                 | 84.64  | 100.48 | 126.15 |
| C | Merced (SJV) | Winter | 2018 | 336.69             | 389.74 | 458.76 | 582.81 | 73.57                 | 84.61  | 100.50 | 126.47 |
| C | Merced (SJV) | Winter | 2019 | 336.79             | 390.02 | 458.71 | 583.39 | 73.62                 | 84.72  | 100.53 | 126.76 |
| C | Merced (SJV) | Winter | 2020 | 336.87             | 390.25 | 458.68 | 583.91 | 73.71                 | 84.85  | 100.61 | 127.03 |
| C | Merced (SJV) | Winter | 2021 | 338.67             | 392.52 | 461.04 | 587.42 | 73.78                 | 85.02  | 100.69 | 127.27 |
| C | Merced (SJV) | Winter | 2022 | 338.70             | 392.73 | 461.01 | 587.80 | 73.83                 | 85.17  | 100.76 | 127.46 |
| C | Merced (SJV) | Winter | 2023 | 338.70             | 392.89 | 460.97 | 588.09 | 73.86                 | 85.30  | 100.81 | 127.68 |
| C | Merced (SJV) | Winter | 2024 | 340.08             | 394.65 | 462.85 | 590.78 | 73.88                 | 85.42  | 100.85 | 127.88 |
| C | Merced (SJV) | Winter | 2025 | 340.08             | 394.77 | 462.82 | 591.01 | 73.90                 | 85.52  | 100.89 | 128.06 |
| C | Merced (SJV) | Winter | 2026 | 342.49             | 397.70 | 466.08 | 595.45 | 73.92                 | 85.62  | 100.91 | 128.23 |
| C | Merced (SJV) | Winter | 2027 | 342.50             | 397.82 | 466.06 | 595.66 | 73.93                 | 85.71  | 100.93 | 128.38 |
| C | Merced (SJV) | Winter | 2028 | 342.50             | 397.93 | 466.03 | 595.87 | 73.94                 | 85.80  | 100.95 | 128.51 |
| C | Merced (SJV) | Winter | 2029 | 342.50             | 398.05 | 466.00 | 596.07 | 73.95                 | 85.87  | 100.95 | 128.63 |
| C | Merced (SJV) | Winter | 2030 | 342.50             | 398.15 | 465.98 | 596.26 | 73.95                 | 85.94  | 100.96 | 128.75 |
| C | Merced (SJV) | Winter | 2031 | 342.50             | 398.25 | 465.97 | 596.43 | 73.96                 | 86.01  | 100.97 | 128.85 |
| C | Merced (SJV) | Winter | 2032 | 342.50             | 398.34 | 465.96 | 596.61 | 73.96                 | 86.07  | 100.97 | 128.94 |
| C | Merced (SJV) | Winter | 2033 | 342.50             | 398.42 | 465.94 | 596.76 | 73.97                 | 86.12  | 100.98 | 129.03 |
| C | Merced (SJV) | Winter | 2034 | 342.49             | 398.49 | 465.93 | 596.90 | 73.97                 | 86.17  | 100.98 | 129.10 |
| C | Merced (SJV) | Winter | 2035 | 342.49             | 398.55 | 465.92 | 597.02 | 73.97                 | 86.21  | 100.99 | 129.17 |
| C | Modoc (NEP)  | Annual | 2010 | 408.79             | 488.59 | 560.53 | 697.57 | 74.87                 | 100.48 | 102.62 | 125.01 |
| C | Modoc (NEP)  | Annual | 2011 | 408.63             | 485.64 | 559.72 | 698.46 | 74.72                 | 97.48  | 102.30 | 125.08 |
| C | Modoc (NEP)  | Annual | 2012 | 408.43             | 483.59 | 559.09 | 699.50 | 74.39                 | 95.30  | 102.13 | 125.22 |
| C | Modoc (NEP)  | Annual | 2013 | 408.39             | 482.13 | 558.57 | 700.69 | 74.23                 | 93.74  | 101.93 | 125.38 |
| C | Modoc (NEP)  | Annual | 2014 | 408.30             | 480.62 | 558.13 | 701.74 | 73.97                 | 91.96  | 101.58 | 125.59 |
| C | Modoc (NEP)  | Annual | 2015 | 408.25             | 479.23 | 557.81 | 702.85 | 73.76                 | 90.19  | 101.45 | 125.82 |
| C | Modoc (NEP)  | Annual | 2016 | 408.36             | 478.26 | 557.54 | 703.92 | 73.79                 | 88.96  | 101.31 | 126.08 |
| C | Modoc (NEP)  | Annual | 2017 | 408.32             | 477.36 | 557.31 | 704.96 | 73.64                 | 87.77  | 101.05 | 126.34 |
| C | Modoc (NEP)  | Annual | 2018 | 408.22             | 476.76 | 557.13 | 705.82 | 73.43                 | 87.03  | 100.91 | 126.59 |
| C | Modoc (NEP)  | Annual | 2019 | 408.20             | 476.34 | 556.98 | 706.60 | 73.35                 | 86.56  | 100.78 | 126.79 |
| C | Modoc (NEP)  | Annual | 2020 | 408.15             | 475.96 | 556.87 | 707.25 | 73.39                 | 86.27  | 100.81 | 127.00 |
| C | Modoc (NEP)  | Annual | 2021 | 408.10             | 475.54 | 556.77 | 707.69 | 73.42                 | 86.13  | 100.87 | 127.13 |
| C | Modoc (NEP)  | Annual | 2022 | 408.00             | 475.17 | 556.62 | 708.03 | 73.42                 | 86.00  | 100.88 | 127.20 |
| C | Modoc (NEP)  | Annual | 2023 | 407.93             | 474.79 | 556.52 | 708.27 | 73.44                 | 85.87  | 100.91 | 127.38 |
| C | Modoc (NEP)  | Annual | 2024 | 407.79             | 474.58 | 556.39 | 708.49 | 73.41                 | 85.82  | 100.92 | 127.55 |
| C | Modoc (NEP)  | Annual | 2025 | 407.72             | 474.59 | 556.34 | 708.71 | 73.41                 | 85.87  | 100.96 | 127.72 |
| C | Modoc (NEP)  | Annual | 2026 | 407.73             | 474.69 | 556.26 | 709.00 | 73.43                 | 85.94  | 100.98 | 127.90 |
| C | Modoc (NEP)  | Annual | 2027 | 407.73             | 474.80 | 556.20 | 709.30 | 73.44                 | 86.00  | 100.99 | 128.07 |
| C | Modoc (NEP)  | Annual | 2028 | 407.71             | 474.90 | 556.15 | 709.60 | 73.44                 | 86.06  | 101.01 | 128.22 |
| C | Modoc (NEP)  | Annual | 2029 | 407.70             | 475.01 | 556.08 | 709.88 | 73.45                 | 86.12  | 101.01 | 128.36 |
| C | Modoc (NEP)  | Annual | 2030 | 407.68             | 475.10 | 556.00 | 710.15 | 73.45                 | 86.17  | 101.01 | 128.50 |
| C | Modoc (NEP)  | Annual | 2031 | 407.69             | 475.22 | 555.95 | 710.46 | 73.45                 | 86.22  | 101.01 | 128.63 |
| C | Modoc (NEP)  | Annual | 2032 | 407.68             | 475.32 | 555.91 | 710.77 | 73.46                 | 86.27  | 101.01 | 128.76 |
| C | Modoc (NEP)  | Annual | 2033 | 407.68             | 475.40 | 555.88 | 711.04 | 73.47                 | 86.31  | 101.01 | 128.87 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |        |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|--------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1   | LDT2   | MDV    |
| C | Modoc (NEP) | Annual | 2034 | 407.67             | 475.47 | 555.85 | 711.29 | 73.47                 | 86.35  | 101.01 | 128.97 |
| C | Modoc (NEP) | Annual | 2035 | 407.66             | 475.53 | 555.81 | 711.49 | 73.48                 | 86.38  | 101.02 | 129.07 |
| C | Modoc (NEP) | Summer | 2010 | 425.39             | 503.36 | 582.23 | 724.10 | 74.87                 | 100.48 | 102.62 | 125.01 |
| C | Modoc (NEP) | Summer | 2011 | 425.44             | 501.48 | 581.68 | 725.15 | 74.72                 | 97.48  | 102.30 | 125.08 |
| C | Modoc (NEP) | Summer | 2012 | 425.41             | 500.15 | 581.24 | 726.37 | 74.39                 | 95.30  | 102.13 | 125.22 |
| C | Modoc (NEP) | Summer | 2013 | 425.50             | 499.17 | 580.90 | 727.80 | 74.23                 | 93.74  | 101.93 | 125.38 |
| C | Modoc (NEP) | Summer | 2014 | 425.50             | 498.13 | 580.66 | 729.05 | 73.97                 | 91.96  | 101.58 | 125.59 |
| C | Modoc (NEP) | Summer | 2015 | 425.50             | 497.14 | 580.45 | 730.41 | 73.76                 | 90.19  | 101.45 | 125.82 |
| C | Modoc (NEP) | Summer | 2016 | 425.64             | 496.45 | 580.30 | 731.70 | 73.79                 | 88.96  | 101.31 | 126.08 |
| C | Modoc (NEP) | Summer | 2017 | 425.62             | 495.80 | 580.16 | 732.94 | 73.64                 | 87.77  | 101.05 | 126.34 |
| C | Modoc (NEP) | Summer | 2018 | 425.52             | 495.35 | 580.02 | 733.96 | 73.43                 | 87.03  | 100.91 | 126.59 |
| C | Modoc (NEP) | Summer | 2019 | 425.50             | 495.06 | 579.91 | 734.91 | 73.35                 | 86.56  | 100.78 | 126.79 |
| C | Modoc (NEP) | Summer | 2020 | 425.44             | 494.80 | 579.80 | 735.68 | 73.39                 | 86.27  | 100.81 | 127.00 |
| C | Modoc (NEP) | Summer | 2021 | 425.39             | 494.51 | 579.70 | 736.23 | 73.42                 | 86.13  | 100.87 | 127.13 |
| C | Modoc (NEP) | Summer | 2022 | 425.28             | 494.26 | 579.57 | 736.66 | 73.42                 | 86.00  | 100.88 | 127.20 |
| C | Modoc (NEP) | Summer | 2023 | 425.21             | 493.99 | 579.47 | 736.98 | 73.44                 | 85.87  | 100.91 | 127.38 |
| C | Modoc (NEP) | Summer | 2024 | 425.08             | 493.85 | 579.37 | 737.26 | 73.41                 | 85.82  | 100.92 | 127.55 |
| C | Modoc (NEP) | Summer | 2025 | 425.02             | 493.90 | 579.31 | 737.53 | 73.41                 | 85.87  | 100.96 | 127.72 |
| C | Modoc (NEP) | Summer | 2026 | 425.03             | 494.03 | 579.22 | 737.87 | 73.43                 | 85.94  | 100.98 | 127.90 |
| C | Modoc (NEP) | Summer | 2027 | 425.04             | 494.17 | 579.16 | 738.21 | 73.44                 | 86.00  | 100.99 | 128.07 |
| C | Modoc (NEP) | Summer | 2028 | 425.05             | 494.30 | 579.11 | 738.56 | 73.44                 | 86.06  | 101.01 | 128.22 |
| C | Modoc (NEP) | Summer | 2029 | 425.05             | 494.46 | 579.05 | 738.88 | 73.45                 | 86.12  | 101.01 | 128.36 |
| C | Modoc (NEP) | Summer | 2030 | 425.04             | 494.57 | 578.98 | 739.20 | 73.45                 | 86.17  | 101.01 | 128.50 |
| C | Modoc (NEP) | Summer | 2031 | 425.05             | 494.75 | 578.95 | 739.54 | 73.45                 | 86.22  | 101.01 | 128.63 |
| C | Modoc (NEP) | Summer | 2032 | 425.05             | 494.88 | 578.93 | 739.88 | 73.46                 | 86.27  | 101.01 | 128.76 |
| C | Modoc (NEP) | Summer | 2033 | 425.05             | 494.99 | 578.91 | 740.18 | 73.47                 | 86.31  | 101.01 | 128.87 |
| C | Modoc (NEP) | Summer | 2034 | 425.04             | 495.08 | 578.89 | 740.44 | 73.47                 | 86.35  | 101.01 | 128.97 |
| C | Modoc (NEP) | Summer | 2035 | 425.03             | 495.14 | 578.86 | 740.68 | 73.48                 | 86.38  | 101.02 | 129.07 |
| C | Modoc (NEP) | Winter | 2010 | 403.43             | 483.82 | 553.52 | 689.00 | 74.87                 | 100.48 | 102.62 | 125.01 |
| C | Modoc (NEP) | Winter | 2011 | 403.20             | 480.53 | 552.63 | 689.84 | 74.72                 | 97.48  | 102.30 | 125.08 |
| C | Modoc (NEP) | Winter | 2012 | 402.94             | 478.25 | 551.93 | 690.82 | 74.39                 | 95.30  | 102.13 | 125.22 |
| C | Modoc (NEP) | Winter | 2013 | 402.86             | 476.62 | 551.35 | 691.93 | 74.23                 | 93.74  | 101.93 | 125.38 |
| C | Modoc (NEP) | Winter | 2014 | 402.75             | 474.97 | 550.86 | 692.91 | 73.97                 | 91.96  | 101.58 | 125.59 |
| C | Modoc (NEP) | Winter | 2015 | 402.67             | 473.44 | 550.49 | 693.96 | 73.76                 | 90.19  | 101.45 | 125.82 |
| C | Modoc (NEP) | Winter | 2016 | 402.78             | 472.38 | 550.19 | 694.95 | 73.79                 | 88.96  | 101.31 | 126.08 |
| C | Modoc (NEP) | Winter | 2017 | 402.74             | 471.40 | 549.93 | 695.92 | 73.64                 | 87.77  | 101.05 | 126.34 |
| C | Modoc (NEP) | Winter | 2018 | 402.64             | 470.75 | 549.73 | 696.72 | 73.43                 | 87.03  | 100.91 | 126.59 |
| C | Modoc (NEP) | Winter | 2019 | 402.61             | 470.29 | 549.57 | 697.46 | 73.35                 | 86.56  | 100.78 | 126.79 |
| C | Modoc (NEP) | Winter | 2020 | 402.56             | 469.87 | 549.46 | 698.07 | 73.39                 | 86.27  | 100.81 | 127.00 |
| C | Modoc (NEP) | Winter | 2021 | 402.52             | 469.41 | 549.36 | 698.48 | 73.42                 | 86.13  | 100.87 | 127.13 |
| C | Modoc (NEP) | Winter | 2022 | 402.41             | 469.01 | 549.21 | 698.78 | 73.42                 | 86.00  | 100.88 | 127.20 |
| C | Modoc (NEP) | Winter | 2023 | 402.35             | 468.59 | 549.10 | 699.00 | 73.44                 | 85.87  | 100.91 | 127.38 |
| C | Modoc (NEP) | Winter | 2024 | 402.21             | 468.35 | 548.97 | 699.20 | 73.41                 | 85.82  | 100.92 | 127.55 |
| C | Modoc (NEP) | Winter | 2025 | 402.14             | 468.36 | 548.91 | 699.40 | 73.41                 | 85.87  | 100.96 | 127.72 |
| C | Modoc (NEP) | Winter | 2026 | 402.14             | 468.45 | 548.84 | 699.67 | 73.43                 | 85.94  | 100.98 | 127.90 |
| C | Modoc (NEP) | Winter | 2027 | 402.13             | 468.54 | 548.78 | 699.96 | 73.44                 | 86.00  | 100.99 | 128.07 |
| C | Modoc (NEP) | Winter | 2028 | 402.11             | 468.63 | 548.73 | 700.25 | 73.44                 | 86.06  | 101.01 | 128.22 |
| C | Modoc (NEP) | Winter | 2029 | 402.10             | 468.72 | 548.66 | 700.50 | 73.45                 | 86.12  | 101.01 | 128.36 |
| C | Modoc (NEP) | Winter | 2030 | 402.08             | 468.81 | 548.57 | 700.77 | 73.45                 | 86.17  | 101.01 | 128.50 |
| C | Modoc (NEP) | Winter | 2031 | 402.08             | 468.91 | 548.52 | 701.07 | 73.45                 | 86.22  | 101.01 | 128.63 |
| C | Modoc (NEP) | Winter | 2032 | 402.08             | 469.00 | 548.47 | 701.37 | 73.46                 | 86.27  | 101.01 | 128.76 |
| C | Modoc (NEP) | Winter | 2033 | 402.07             | 469.08 | 548.44 | 701.63 | 73.47                 | 86.31  | 101.01 | 128.87 |
| C | Modoc (NEP) | Winter | 2034 | 402.06             | 469.14 | 548.40 | 701.87 | 73.47                 | 86.35  | 101.01 | 128.97 |
| C | Modoc (NEP) | Winter | 2035 | 402.05             | 469.20 | 548.37 | 702.06 | 73.48                 | 86.38  | 101.02 | 129.07 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location   | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |            |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mono (GBV) | Annual | 2010 | 343.29             | 401.90 | 471.21 | 588.85 | 73.49                 | 90.48 | 100.46 | 124.33 |
| C | Mono (GBV) | Annual | 2011 | 343.38             | 401.41 | 470.63 | 589.51 | 73.45                 | 89.54 | 100.40 | 124.54 |
| C | Mono (GBV) | Annual | 2012 | 343.46             | 401.01 | 470.17 | 590.24 | 73.30                 | 88.81 | 100.41 | 124.77 |
| C | Mono (GBV) | Annual | 2013 | 343.56             | 400.60 | 469.80 | 591.01 | 73.12                 | 88.06 | 100.44 | 125.04 |
| C | Mono (GBV) | Annual | 2014 | 343.63             | 400.25 | 469.51 | 591.80 | 72.91                 | 87.42 | 100.46 | 125.29 |
| C | Mono (GBV) | Annual | 2015 | 343.76             | 400.00 | 469.27 | 592.59 | 72.85                 | 86.92 | 100.51 | 125.58 |
| C | Mono (GBV) | Annual | 2016 | 343.89             | 399.78 | 469.09 | 593.36 | 72.82                 | 86.46 | 100.57 | 125.87 |
| C | Mono (GBV) | Annual | 2017 | 343.97             | 399.52 | 468.93 | 594.07 | 72.77                 | 85.93 | 100.62 | 126.17 |
| C | Mono (GBV) | Annual | 2018 | 344.06             | 399.38 | 468.81 | 594.73 | 72.79                 | 85.63 | 100.65 | 126.43 |
| C | Mono (GBV) | Annual | 2019 | 344.09             | 399.35 | 468.71 | 595.27 | 72.69                 | 85.53 | 100.67 | 126.69 |
| C | Mono (GBV) | Annual | 2020 | 344.16             | 399.27 | 468.63 | 595.75 | 72.78                 | 85.46 | 100.75 | 126.94 |
| C | Mono (GBV) | Annual | 2021 | 344.10             | 399.20 | 468.56 | 596.09 | 72.76                 | 85.49 | 100.81 | 127.11 |
| C | Mono (GBV) | Annual | 2022 | 344.02             | 399.16 | 468.47 | 596.42 | 72.72                 | 85.53 | 100.85 | 127.32 |
| C | Mono (GBV) | Annual | 2023 | 343.91             | 399.06 | 468.40 | 596.65 | 72.65                 | 85.55 | 100.89 | 127.50 |
| C | Mono (GBV) | Annual | 2024 | 343.88             | 398.93 | 468.31 | 596.81 | 72.64                 | 85.56 | 100.91 | 127.66 |
| C | Mono (GBV) | Annual | 2025 | 343.85             | 399.01 | 468.26 | 597.00 | 72.64                 | 85.64 | 100.94 | 127.83 |
| C | Mono (GBV) | Annual | 2026 | 343.87             | 399.12 | 468.20 | 597.21 | 72.66                 | 85.73 | 100.97 | 127.98 |
| C | Mono (GBV) | Annual | 2027 | 343.88             | 399.24 | 468.15 | 597.42 | 72.67                 | 85.81 | 100.99 | 128.13 |
| C | Mono (GBV) | Annual | 2028 | 343.89             | 399.35 | 468.10 | 597.63 | 72.68                 | 85.89 | 101.00 | 128.27 |
| C | Mono (GBV) | Annual | 2029 | 343.88             | 399.47 | 468.01 | 597.85 | 72.68                 | 85.96 | 101.00 | 128.40 |
| C | Mono (GBV) | Annual | 2030 | 343.87             | 399.58 | 467.93 | 598.05 | 72.68                 | 86.03 | 101.00 | 128.52 |
| C | Mono (GBV) | Annual | 2031 | 343.87             | 399.69 | 467.90 | 598.28 | 72.69                 | 86.09 | 101.00 | 128.64 |
| C | Mono (GBV) | Annual | 2032 | 343.87             | 399.80 | 467.87 | 598.50 | 72.69                 | 86.15 | 101.01 | 128.75 |
| C | Mono (GBV) | Annual | 2033 | 343.87             | 399.90 | 467.84 | 598.69 | 72.70                 | 86.20 | 101.01 | 128.85 |
| C | Mono (GBV) | Annual | 2034 | 343.87             | 399.99 | 467.82 | 598.87 | 72.70                 | 86.25 | 101.01 | 128.95 |
| C | Mono (GBV) | Annual | 2035 | 343.86             | 400.07 | 467.79 | 599.02 | 72.70                 | 86.30 | 101.02 | 129.03 |
| C | Mono (GBV) | Summer | 2010 | 344.62             | 403.20 | 472.98 | 591.06 | 73.49                 | 90.48 | 100.46 | 124.33 |
| C | Mono (GBV) | Summer | 2011 | 344.72             | 402.75 | 472.40 | 591.72 | 73.45                 | 89.54 | 100.40 | 124.54 |
| C | Mono (GBV) | Summer | 2012 | 344.82             | 402.39 | 471.95 | 592.45 | 73.30                 | 88.81 | 100.41 | 124.77 |
| C | Mono (GBV) | Summer | 2013 | 344.91             | 402.00 | 471.59 | 593.23 | 73.12                 | 88.06 | 100.44 | 125.04 |
| C | Mono (GBV) | Summer | 2014 | 345.00             | 401.67 | 471.31 | 594.02 | 72.91                 | 87.42 | 100.46 | 125.29 |
| C | Mono (GBV) | Summer | 2015 | 345.13             | 401.44 | 471.08 | 594.83 | 72.85                 | 86.92 | 100.51 | 125.58 |
| C | Mono (GBV) | Summer | 2016 | 345.25             | 401.24 | 470.89 | 595.61 | 72.82                 | 86.46 | 100.57 | 125.87 |
| C | Mono (GBV) | Summer | 2017 | 345.34             | 400.99 | 470.75 | 596.33 | 72.77                 | 85.93 | 100.62 | 126.17 |
| C | Mono (GBV) | Summer | 2018 | 345.43             | 400.86 | 470.62 | 597.00 | 72.79                 | 85.63 | 100.65 | 126.43 |
| C | Mono (GBV) | Summer | 2019 | 345.45             | 400.84 | 470.53 | 597.55 | 72.69                 | 85.53 | 100.67 | 126.69 |
| C | Mono (GBV) | Summer | 2020 | 345.53             | 400.77 | 470.45 | 598.03 | 72.78                 | 85.46 | 100.75 | 126.94 |
| C | Mono (GBV) | Summer | 2021 | 345.47             | 400.71 | 470.37 | 598.38 | 72.76                 | 85.49 | 100.81 | 127.11 |
| C | Mono (GBV) | Summer | 2022 | 345.39             | 400.67 | 470.29 | 598.71 | 72.72                 | 85.53 | 100.85 | 127.32 |
| C | Mono (GBV) | Summer | 2023 | 345.28             | 400.59 | 470.22 | 598.94 | 72.65                 | 85.55 | 100.89 | 127.50 |
| C | Mono (GBV) | Summer | 2024 | 345.25             | 400.46 | 470.13 | 599.11 | 72.64                 | 85.56 | 100.91 | 127.66 |
| C | Mono (GBV) | Summer | 2025 | 345.22             | 400.54 | 470.08 | 599.30 | 72.64                 | 85.64 | 100.94 | 127.83 |
| C | Mono (GBV) | Summer | 2026 | 345.23             | 400.65 | 470.02 | 599.51 | 72.66                 | 85.73 | 100.97 | 127.98 |
| C | Mono (GBV) | Summer | 2027 | 345.25             | 400.77 | 469.98 | 599.72 | 72.67                 | 85.81 | 100.99 | 128.13 |
| C | Mono (GBV) | Summer | 2028 | 345.26             | 400.89 | 469.92 | 599.94 | 72.68                 | 85.89 | 101.00 | 128.27 |
| C | Mono (GBV) | Summer | 2029 | 345.25             | 401.01 | 469.84 | 600.15 | 72.68                 | 85.96 | 101.00 | 128.40 |
| C | Mono (GBV) | Summer | 2030 | 345.24             | 401.12 | 469.76 | 600.36 | 72.68                 | 86.03 | 101.00 | 128.52 |
| C | Mono (GBV) | Summer | 2031 | 345.24             | 401.24 | 469.72 | 600.58 | 72.69                 | 86.09 | 101.00 | 128.64 |
| C | Mono (GBV) | Summer | 2032 | 345.24             | 401.35 | 469.69 | 600.81 | 72.69                 | 86.15 | 101.01 | 128.75 |
| C | Mono (GBV) | Summer | 2033 | 345.24             | 401.45 | 469.67 | 601.01 | 72.70                 | 86.20 | 101.01 | 128.85 |
| C | Mono (GBV) | Summer | 2034 | 345.24             | 401.54 | 469.64 | 601.18 | 72.70                 | 86.25 | 101.01 | 128.95 |
| C | Mono (GBV) | Summer | 2035 | 345.23             | 401.62 | 469.62 | 601.34 | 72.70                 | 86.30 | 101.02 | 129.03 |
| C | Mono (GBV) | Winter | 2010 | 344.72             | 403.30 | 473.10 | 591.22 | 73.49                 | 90.48 | 100.46 | 124.33 |
| C | Mono (GBV) | Winter | 2011 | 344.82             | 402.85 | 472.53 | 591.88 | 73.45                 | 89.54 | 100.40 | 124.54 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Mono (GBV)     | Winter | 2012 | 344.91             | 402.49 | 472.08 | 592.61 | 73.30                 | 88.81 | 100.41 | 124.77 |
| C | Mono (GBV)     | Winter | 2013 | 345.01             | 402.10 | 471.72 | 593.39 | 73.12                 | 88.06 | 100.44 | 125.04 |
| C | Mono (GBV)     | Winter | 2014 | 345.10             | 401.78 | 471.44 | 594.19 | 72.91                 | 87.42 | 100.46 | 125.29 |
| C | Mono (GBV)     | Winter | 2015 | 345.23             | 401.55 | 471.21 | 594.99 | 72.85                 | 86.92 | 100.51 | 125.58 |
| C | Mono (GBV)     | Winter | 2016 | 345.35             | 401.35 | 471.03 | 595.77 | 72.82                 | 86.46 | 100.57 | 125.87 |
| C | Mono (GBV)     | Winter | 2017 | 345.44             | 401.10 | 470.88 | 596.50 | 72.77                 | 85.93 | 100.62 | 126.17 |
| C | Mono (GBV)     | Winter | 2018 | 345.53             | 400.97 | 470.76 | 597.17 | 72.79                 | 85.63 | 100.65 | 126.43 |
| C | Mono (GBV)     | Winter | 2019 | 345.55             | 400.95 | 470.66 | 597.72 | 72.69                 | 85.53 | 100.67 | 126.69 |
| C | Mono (GBV)     | Winter | 2020 | 345.63             | 400.88 | 470.59 | 598.20 | 72.78                 | 85.46 | 100.75 | 126.94 |
| C | Mono (GBV)     | Winter | 2021 | 345.57             | 400.82 | 470.51 | 598.55 | 72.76                 | 85.49 | 100.81 | 127.11 |
| C | Mono (GBV)     | Winter | 2022 | 345.49             | 400.78 | 470.42 | 598.88 | 72.72                 | 85.53 | 100.85 | 127.32 |
| C | Mono (GBV)     | Winter | 2023 | 345.38             | 400.70 | 470.35 | 599.11 | 72.65                 | 85.55 | 100.89 | 127.50 |
| C | Mono (GBV)     | Winter | 2024 | 345.35             | 400.57 | 470.26 | 599.28 | 72.64                 | 85.56 | 100.91 | 127.66 |
| C | Mono (GBV)     | Winter | 2025 | 345.32             | 400.65 | 470.21 | 599.47 | 72.64                 | 85.64 | 100.94 | 127.83 |
| C | Mono (GBV)     | Winter | 2026 | 345.33             | 400.77 | 470.16 | 599.68 | 72.66                 | 85.73 | 100.97 | 127.98 |
| C | Mono (GBV)     | Winter | 2027 | 345.35             | 400.89 | 470.11 | 599.89 | 72.67                 | 85.81 | 100.99 | 128.13 |
| C | Mono (GBV)     | Winter | 2028 | 345.35             | 401.00 | 470.06 | 600.11 | 72.68                 | 85.89 | 101.00 | 128.27 |
| C | Mono (GBV)     | Winter | 2029 | 345.35             | 401.12 | 469.97 | 600.32 | 72.68                 | 85.96 | 101.00 | 128.40 |
| C | Mono (GBV)     | Winter | 2030 | 345.34             | 401.24 | 469.89 | 600.53 | 72.68                 | 86.03 | 101.00 | 128.52 |
| C | Mono (GBV)     | Winter | 2031 | 345.34             | 401.35 | 469.86 | 600.75 | 72.69                 | 86.09 | 101.00 | 128.64 |
| C | Mono (GBV)     | Winter | 2032 | 345.34             | 401.47 | 469.83 | 600.98 | 72.69                 | 86.15 | 101.01 | 128.75 |
| C | Mono (GBV)     | Winter | 2033 | 345.34             | 401.57 | 469.80 | 601.18 | 72.70                 | 86.20 | 101.01 | 128.85 |
| C | Mono (GBV)     | Winter | 2034 | 345.34             | 401.66 | 469.77 | 601.35 | 72.70                 | 86.25 | 101.01 | 128.95 |
| C | Mono (GBV)     | Winter | 2035 | 345.33             | 401.73 | 469.75 | 601.50 | 72.70                 | 86.30 | 101.02 | 129.03 |
| C | Monterey (NCC) | Annual | 2010 | 361.69             | 420.90 | 498.72 | 622.94 | 72.97                 | 87.15 | 99.70  | 123.80 |
| C | Monterey (NCC) | Annual | 2011 | 360.10             | 418.76 | 495.80 | 620.71 | 72.95                 | 86.58 | 99.75  | 124.04 |
| C | Monterey (NCC) | Annual | 2012 | 360.24             | 418.68 | 495.36 | 621.52 | 72.94                 | 86.11 | 99.83  | 124.31 |
| C | Monterey (NCC) | Annual | 2013 | 360.44             | 418.67 | 495.00 | 622.39 | 72.98                 | 85.75 | 99.92  | 124.61 |
| C | Monterey (NCC) | Annual | 2014 | 360.60             | 418.67 | 494.72 | 623.24 | 73.00                 | 85.44 | 100.02 | 124.91 |
| C | Monterey (NCC) | Annual | 2015 | 360.80             | 418.74 | 494.50 | 624.11 | 73.07                 | 85.23 | 100.12 | 125.24 |
| C | Monterey (NCC) | Annual | 2016 | 360.99             | 418.78 | 494.33 | 624.94 | 73.15                 | 85.01 | 100.23 | 125.56 |
| C | Monterey (NCC) | Annual | 2017 | 361.13             | 418.83 | 494.19 | 625.72 | 73.19                 | 84.83 | 100.31 | 125.87 |
| C | Monterey (NCC) | Annual | 2018 | 361.23             | 418.90 | 494.08 | 626.40 | 73.21                 | 84.71 | 100.39 | 126.18 |
| C | Monterey (NCC) | Annual | 2019 | 361.32             | 419.04 | 494.00 | 627.00 | 73.25                 | 84.71 | 100.47 | 126.46 |
| C | Monterey (NCC) | Annual | 2020 | 361.40             | 419.20 | 493.94 | 627.55 | 73.34                 | 84.80 | 100.56 | 126.73 |
| C | Monterey (NCC) | Annual | 2021 | 361.41             | 419.37 | 493.82 | 627.95 | 73.42                 | 84.94 | 100.65 | 126.97 |
| C | Monterey (NCC) | Annual | 2022 | 361.43             | 419.55 | 493.76 | 628.35 | 73.47                 | 85.07 | 100.72 | 127.17 |
| C | Monterey (NCC) | Annual | 2023 | 361.40             | 419.69 | 493.69 | 628.65 | 73.50                 | 85.18 | 100.78 | 127.38 |
| C | Monterey (NCC) | Annual | 2024 | 361.35             | 419.79 | 493.63 | 628.89 | 73.51                 | 85.28 | 100.83 | 127.56 |
| C | Monterey (NCC) | Annual | 2025 | 361.32             | 419.90 | 493.58 | 629.12 | 73.53                 | 85.37 | 100.87 | 127.74 |
| C | Monterey (NCC) | Annual | 2026 | 359.63             | 418.04 | 491.16 | 626.37 | 73.55                 | 85.47 | 100.90 | 127.91 |
| C | Monterey (NCC) | Annual | 2027 | 359.64             | 418.17 | 491.09 | 626.59 | 73.57                 | 85.55 | 100.92 | 128.06 |
| C | Monterey (NCC) | Annual | 2028 | 359.64             | 418.30 | 491.03 | 626.81 | 73.58                 | 85.62 | 100.93 | 128.19 |
| C | Monterey (NCC) | Annual | 2029 | 359.64             | 418.44 | 490.95 | 627.03 | 73.58                 | 85.69 | 100.94 | 128.32 |
| C | Monterey (NCC) | Annual | 2030 | 359.63             | 418.59 | 490.87 | 627.25 | 73.59                 | 85.76 | 100.94 | 128.45 |
| C | Monterey (NCC) | Annual | 2031 | 359.63             | 418.74 | 490.82 | 627.49 | 73.59                 | 85.83 | 100.95 | 128.56 |
| C | Monterey (NCC) | Annual | 2032 | 359.64             | 418.88 | 490.78 | 627.72 | 73.60                 | 85.89 | 100.96 | 128.68 |
| C | Monterey (NCC) | Annual | 2033 | 359.64             | 419.01 | 490.75 | 627.94 | 73.60                 | 85.95 | 100.96 | 128.78 |
| C | Monterey (NCC) | Annual | 2034 | 359.64             | 419.12 | 490.71 | 628.13 | 73.61                 | 86.00 | 100.97 | 128.88 |
| C | Monterey (NCC) | Annual | 2035 | 359.64             | 419.22 | 490.68 | 628.30 | 73.61                 | 86.04 | 100.97 | 128.97 |
| C | Monterey (NCC) | Summer | 2010 | 384.62             | 444.54 | 528.69 | 661.39 | 72.97                 | 87.15 | 99.70  | 123.80 |
| C | Monterey (NCC) | Summer | 2011 | 383.13             | 442.63 | 525.88 | 658.94 | 72.95                 | 86.58 | 99.75  | 124.04 |
| C | Monterey (NCC) | Summer | 2012 | 383.43             | 442.87 | 525.66 | 659.77 | 72.94                 | 86.11 | 99.83  | 124.31 |
| C | Monterey (NCC) | Summer | 2013 | 383.74             | 443.13 | 525.49 | 660.73 | 72.98                 | 85.75 | 99.92  | 124.61 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Monterey (NCC) | Summer | 2014 | 384.00             | 443.36 | 525.37 | 661.71 | 73.00                 | 85.44 | 100.02 | 124.91 |
| C | Monterey (NCC) | Summer | 2015 | 384.25             | 443.63 | 525.27 | 662.75 | 73.07                 | 85.23 | 100.12 | 125.24 |
| C | Monterey (NCC) | Summer | 2016 | 384.48             | 443.85 | 525.19 | 663.74 | 73.15                 | 85.01 | 100.23 | 125.56 |
| C | Monterey (NCC) | Summer | 2017 | 384.63             | 444.07 | 525.11 | 664.67 | 73.19                 | 84.83 | 100.31 | 125.87 |
| C | Monterey (NCC) | Summer | 2018 | 384.73             | 444.29 | 525.03 | 665.48 | 73.21                 | 84.71 | 100.39 | 126.18 |
| C | Monterey (NCC) | Summer | 2019 | 384.81             | 444.55 | 524.96 | 666.19 | 73.25                 | 84.71 | 100.47 | 126.46 |
| C | Monterey (NCC) | Summer | 2020 | 384.89             | 444.81 | 524.90 | 666.82 | 73.34                 | 84.80 | 100.56 | 126.73 |
| C | Monterey (NCC) | Summer | 2021 | 384.89             | 445.06 | 524.78 | 667.28 | 73.42                 | 84.94 | 100.65 | 126.97 |
| C | Monterey (NCC) | Summer | 2022 | 384.92             | 445.33 | 524.72 | 667.75 | 73.47                 | 85.07 | 100.72 | 127.17 |
| C | Monterey (NCC) | Summer | 2023 | 384.89             | 445.54 | 524.67 | 668.09 | 73.50                 | 85.18 | 100.78 | 127.38 |
| C | Monterey (NCC) | Summer | 2024 | 384.85             | 445.71 | 524.61 | 668.34 | 73.51                 | 85.28 | 100.83 | 127.56 |
| C | Monterey (NCC) | Summer | 2025 | 384.84             | 445.87 | 524.56 | 668.58 | 73.53                 | 85.37 | 100.87 | 127.74 |
| C | Monterey (NCC) | Summer | 2026 | 383.04             | 443.94 | 522.01 | 665.65 | 73.55                 | 85.47 | 100.90 | 127.91 |
| C | Monterey (NCC) | Summer | 2027 | 383.05             | 444.11 | 521.95 | 665.88 | 73.57                 | 85.55 | 100.92 | 128.06 |
| C | Monterey (NCC) | Summer | 2028 | 383.06             | 444.28 | 521.90 | 666.11 | 73.58                 | 85.62 | 100.93 | 128.19 |
| C | Monterey (NCC) | Summer | 2029 | 383.07             | 444.47 | 521.83 | 666.33 | 73.58                 | 85.69 | 100.94 | 128.32 |
| C | Monterey (NCC) | Summer | 2030 | 383.07             | 444.66 | 521.77 | 666.57 | 73.59                 | 85.76 | 100.94 | 128.45 |
| C | Monterey (NCC) | Summer | 2031 | 383.07             | 444.86 | 521.73 | 666.82 | 73.59                 | 85.83 | 100.95 | 128.56 |
| C | Monterey (NCC) | Summer | 2032 | 383.08             | 445.04 | 521.70 | 667.08 | 73.60                 | 85.89 | 100.96 | 128.68 |
| C | Monterey (NCC) | Summer | 2033 | 383.09             | 445.20 | 521.67 | 667.32 | 73.60                 | 85.95 | 100.96 | 128.78 |
| C | Monterey (NCC) | Summer | 2034 | 383.09             | 445.34 | 521.64 | 667.54 | 73.61                 | 86.00 | 100.97 | 128.88 |
| C | Monterey (NCC) | Summer | 2035 | 383.09             | 445.45 | 521.62 | 667.73 | 73.61                 | 86.04 | 100.97 | 128.97 |
| C | Monterey (NCC) | Winter | 2010 | 359.53             | 418.68 | 495.91 | 619.33 | 72.97                 | 87.15 | 99.70  | 123.80 |
| C | Monterey (NCC) | Winter | 2011 | 357.94             | 416.52 | 492.98 | 617.12 | 72.95                 | 86.58 | 99.75  | 124.04 |
| C | Monterey (NCC) | Winter | 2012 | 358.06             | 416.41 | 492.51 | 617.92 | 72.94                 | 86.11 | 99.83  | 124.31 |
| C | Monterey (NCC) | Winter | 2013 | 358.25             | 416.38 | 492.14 | 618.78 | 72.98                 | 85.75 | 99.92  | 124.61 |
| C | Monterey (NCC) | Winter | 2014 | 358.40             | 416.35 | 491.84 | 619.62 | 73.00                 | 85.44 | 100.02 | 124.91 |
| C | Monterey (NCC) | Winter | 2015 | 358.60             | 416.40 | 491.61 | 620.48 | 73.07                 | 85.23 | 100.12 | 125.24 |
| C | Monterey (NCC) | Winter | 2016 | 358.78             | 416.42 | 491.43 | 621.29 | 73.15                 | 85.01 | 100.23 | 125.56 |
| C | Monterey (NCC) | Winter | 2017 | 358.92             | 416.46 | 491.28 | 622.06 | 73.19                 | 84.83 | 100.31 | 125.87 |
| C | Monterey (NCC) | Winter | 2018 | 359.02             | 416.51 | 491.17 | 622.73 | 73.21                 | 84.71 | 100.39 | 126.18 |
| C | Monterey (NCC) | Winter | 2019 | 359.11             | 416.65 | 491.09 | 623.32 | 73.25                 | 84.71 | 100.47 | 126.46 |
| C | Monterey (NCC) | Winter | 2020 | 359.20             | 416.80 | 491.03 | 623.86 | 73.34                 | 84.80 | 100.56 | 126.73 |
| C | Monterey (NCC) | Winter | 2021 | 359.20             | 416.95 | 490.91 | 624.25 | 73.42                 | 84.94 | 100.65 | 126.97 |
| C | Monterey (NCC) | Winter | 2022 | 359.22             | 417.13 | 490.85 | 624.65 | 73.47                 | 85.07 | 100.72 | 127.17 |
| C | Monterey (NCC) | Winter | 2023 | 359.19             | 417.26 | 490.78 | 624.95 | 73.50                 | 85.18 | 100.78 | 127.38 |
| C | Monterey (NCC) | Winter | 2024 | 359.14             | 417.36 | 490.72 | 625.18 | 73.51                 | 85.28 | 100.83 | 127.56 |
| C | Monterey (NCC) | Winter | 2025 | 359.11             | 417.45 | 490.67 | 625.41 | 73.53                 | 85.37 | 100.87 | 127.74 |
| C | Monterey (NCC) | Winter | 2026 | 357.43             | 415.61 | 488.26 | 622.68 | 73.55                 | 85.47 | 100.90 | 127.91 |
| C | Monterey (NCC) | Winter | 2027 | 357.44             | 415.73 | 488.19 | 622.90 | 73.57                 | 85.55 | 100.92 | 128.06 |
| C | Monterey (NCC) | Winter | 2028 | 357.44             | 415.86 | 488.13 | 623.12 | 73.58                 | 85.62 | 100.93 | 128.19 |
| C | Monterey (NCC) | Winter | 2029 | 357.44             | 416.00 | 488.04 | 623.34 | 73.58                 | 85.69 | 100.94 | 128.32 |
| C | Monterey (NCC) | Winter | 2030 | 357.43             | 416.14 | 487.97 | 623.56 | 73.59                 | 85.76 | 100.94 | 128.45 |
| C | Monterey (NCC) | Winter | 2031 | 357.43             | 416.28 | 487.92 | 623.79 | 73.59                 | 85.83 | 100.95 | 128.56 |
| C | Monterey (NCC) | Winter | 2032 | 357.43             | 416.42 | 487.88 | 624.03 | 73.60                 | 85.89 | 100.96 | 128.68 |
| C | Monterey (NCC) | Winter | 2033 | 357.44             | 416.54 | 487.84 | 624.24 | 73.60                 | 85.95 | 100.96 | 128.78 |
| C | Monterey (NCC) | Winter | 2034 | 357.44             | 416.66 | 487.80 | 624.43 | 73.61                 | 86.00 | 100.97 | 128.88 |
| C | Monterey (NCC) | Winter | 2035 | 357.43             | 416.75 | 487.77 | 624.59 | 73.61                 | 86.04 | 100.97 | 128.97 |
| C | Napa (SF)      | Annual | 2010 | 329.10             | 378.96 | 450.01 | 565.84 | 73.43                 | 86.05 | 99.91  | 124.74 |
| C | Napa (SF)      | Annual | 2011 | 329.06             | 378.97 | 449.74 | 566.36 | 73.36                 | 85.65 | 99.95  | 124.92 |
| C | Napa (SF)      | Annual | 2012 | 329.05             | 379.03 | 449.53 | 566.94 | 73.30                 | 85.32 | 99.99  | 125.12 |
| C | Napa (SF)      | Annual | 2013 | 329.13             | 379.15 | 449.36 | 567.56 | 73.30                 | 85.09 | 100.06 | 125.34 |
| C | Napa (SF)      | Annual | 2014 | 329.21             | 379.25 | 449.22 | 568.19 | 73.28                 | 84.89 | 100.11 | 125.57 |
| C | Napa (SF)      | Annual | 2015 | 329.32             | 379.37 | 449.11 | 568.83 | 73.31                 | 84.71 | 100.14 | 125.82 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location  | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |           |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Napa (SF) | Annual | 2016 | 329.46             | 379.53 | 449.03 | 569.44 | 73.38                 | 84.61 | 100.21 | 126.08 |
| C | Napa (SF) | Annual | 2017 | 329.52             | 379.63 | 448.96 | 570.02 | 73.36                 | 84.47 | 100.26 | 126.33 |
| C | Napa (SF) | Annual | 2018 | 329.58             | 379.77 | 448.91 | 570.54 | 73.37                 | 84.41 | 100.30 | 126.57 |
| C | Napa (SF) | Annual | 2019 | 329.63             | 379.97 | 448.87 | 570.99 | 73.38                 | 84.45 | 100.37 | 126.80 |
| C | Napa (SF) | Annual | 2020 | 329.69             | 380.19 | 448.85 | 571.40 | 73.47                 | 84.58 | 100.46 | 127.02 |
| C | Napa (SF) | Annual | 2021 | 329.76             | 380.44 | 448.83 | 571.71 | 73.55                 | 84.74 | 100.55 | 127.19 |
| C | Napa (SF) | Annual | 2022 | 329.80             | 380.64 | 448.80 | 571.97 | 73.61                 | 84.89 | 100.63 | 127.33 |
| C | Napa (SF) | Annual | 2023 | 329.77             | 380.79 | 448.77 | 572.17 | 73.64                 | 85.01 | 100.69 | 127.50 |
| C | Napa (SF) | Annual | 2024 | 329.73             | 380.92 | 448.74 | 572.31 | 73.66                 | 85.13 | 100.75 | 127.65 |
| C | Napa (SF) | Annual | 2025 | 329.72             | 381.02 | 448.71 | 572.48 | 73.68                 | 85.23 | 100.80 | 127.80 |
| C | Napa (SF) | Annual | 2026 | 329.74             | 381.19 | 448.67 | 572.65 | 73.70                 | 85.33 | 100.83 | 127.95 |
| C | Napa (SF) | Annual | 2027 | 329.75             | 381.36 | 448.64 | 572.81 | 73.72                 | 85.43 | 100.86 | 128.09 |
| C | Napa (SF) | Annual | 2028 | 329.75             | 381.54 | 448.61 | 572.98 | 73.73                 | 85.52 | 100.89 | 128.21 |
| C | Napa (SF) | Annual | 2029 | 329.74             | 381.72 | 448.56 | 573.14 | 73.74                 | 85.61 | 100.90 | 128.33 |
| C | Napa (SF) | Annual | 2030 | 329.73             | 381.90 | 448.51 | 573.32 | 73.74                 | 85.69 | 100.91 | 128.44 |
| C | Napa (SF) | Annual | 2031 | 329.73             | 382.10 | 448.49 | 573.52 | 73.75                 | 85.77 | 100.92 | 128.55 |
| C | Napa (SF) | Annual | 2032 | 329.72             | 382.29 | 448.47 | 573.73 | 73.75                 | 85.85 | 100.93 | 128.66 |
| C | Napa (SF) | Annual | 2033 | 329.72             | 382.46 | 448.45 | 573.91 | 73.76                 | 85.92 | 100.94 | 128.76 |
| C | Napa (SF) | Annual | 2034 | 329.71             | 382.61 | 448.42 | 574.08 | 73.76                 | 85.98 | 100.94 | 128.86 |
| C | Napa (SF) | Annual | 2035 | 329.70             | 382.75 | 448.40 | 574.22 | 73.77                 | 86.04 | 100.95 | 128.94 |
| C | Napa (SF) | Summer | 2010 | 352.37             | 401.97 | 480.67 | 604.93 | 73.43                 | 86.05 | 99.91  | 124.74 |
| C | Napa (SF) | Summer | 2011 | 352.52             | 402.44 | 480.51 | 605.37 | 73.36                 | 85.65 | 99.95  | 124.92 |
| C | Napa (SF) | Summer | 2012 | 352.67             | 402.91 | 480.41 | 605.97 | 73.30                 | 85.32 | 99.99  | 125.12 |
| C | Napa (SF) | Summer | 2013 | 352.86             | 403.37 | 480.36 | 606.65 | 73.30                 | 85.09 | 100.06 | 125.34 |
| C | Napa (SF) | Summer | 2014 | 353.02             | 403.79 | 480.35 | 607.39 | 73.28                 | 84.89 | 100.11 | 125.57 |
| C | Napa (SF) | Summer | 2015 | 353.20             | 404.17 | 480.37 | 608.18 | 73.31                 | 84.71 | 100.14 | 125.82 |
| C | Napa (SF) | Summer | 2016 | 353.38             | 404.56 | 480.39 | 608.94 | 73.38                 | 84.61 | 100.21 | 126.08 |
| C | Napa (SF) | Summer | 2017 | 353.47             | 404.88 | 480.42 | 609.68 | 73.36                 | 84.47 | 100.26 | 126.33 |
| C | Napa (SF) | Summer | 2018 | 353.53             | 405.19 | 480.43 | 610.32 | 73.37                 | 84.41 | 100.30 | 126.57 |
| C | Napa (SF) | Summer | 2019 | 353.59             | 405.53 | 480.43 | 610.87 | 73.38                 | 84.45 | 100.37 | 126.80 |
| C | Napa (SF) | Summer | 2020 | 353.65             | 405.87 | 480.42 | 611.37 | 73.47                 | 84.58 | 100.46 | 127.02 |
| C | Napa (SF) | Summer | 2021 | 353.72             | 406.21 | 480.39 | 611.75 | 73.55                 | 84.74 | 100.55 | 127.19 |
| C | Napa (SF) | Summer | 2022 | 353.75             | 406.51 | 480.36 | 612.08 | 73.61                 | 84.89 | 100.63 | 127.33 |
| C | Napa (SF) | Summer | 2023 | 353.73             | 406.75 | 480.32 | 612.31 | 73.64                 | 85.01 | 100.69 | 127.50 |
| C | Napa (SF) | Summer | 2024 | 353.70             | 406.96 | 480.28 | 612.48 | 73.66                 | 85.13 | 100.75 | 127.65 |
| C | Napa (SF) | Summer | 2025 | 353.69             | 407.15 | 480.25 | 612.65 | 73.68                 | 85.23 | 100.80 | 127.80 |
| C | Napa (SF) | Summer | 2026 | 353.71             | 407.39 | 480.21 | 612.82 | 73.70                 | 85.33 | 100.83 | 127.95 |
| C | Napa (SF) | Summer | 2027 | 353.72             | 407.64 | 480.17 | 612.99 | 73.72                 | 85.43 | 100.86 | 128.09 |
| C | Napa (SF) | Summer | 2028 | 353.73             | 407.89 | 480.14 | 613.16 | 73.73                 | 85.52 | 100.89 | 128.21 |
| C | Napa (SF) | Summer | 2029 | 353.74             | 408.15 | 480.10 | 613.34 | 73.74                 | 85.61 | 100.90 | 128.33 |
| C | Napa (SF) | Summer | 2030 | 353.73             | 408.41 | 480.06 | 613.52 | 73.74                 | 85.69 | 100.91 | 128.44 |
| C | Napa (SF) | Summer | 2031 | 353.73             | 408.69 | 480.04 | 613.77 | 73.75                 | 85.77 | 100.92 | 128.55 |
| C | Napa (SF) | Summer | 2032 | 353.73             | 408.94 | 480.03 | 614.01 | 73.75                 | 85.85 | 100.93 | 128.66 |
| C | Napa (SF) | Summer | 2033 | 353.73             | 409.15 | 480.01 | 614.23 | 73.76                 | 85.92 | 100.94 | 128.76 |
| C | Napa (SF) | Summer | 2034 | 353.73             | 409.35 | 479.99 | 614.43 | 73.76                 | 85.98 | 100.94 | 128.86 |
| C | Napa (SF) | Summer | 2035 | 353.72             | 409.51 | 479.97 | 614.62 | 73.77                 | 86.04 | 100.95 | 128.94 |
| C | Napa (SF) | Winter | 2010 | 325.46             | 375.37 | 445.22 | 559.74 | 73.43                 | 86.05 | 99.91  | 124.74 |
| C | Napa (SF) | Winter | 2011 | 325.40             | 375.31 | 444.93 | 560.26 | 73.36                 | 85.65 | 99.95  | 124.92 |
| C | Napa (SF) | Winter | 2012 | 325.37             | 375.30 | 444.70 | 560.85 | 73.30                 | 85.32 | 99.99  | 125.12 |
| C | Napa (SF) | Winter | 2013 | 325.43             | 375.36 | 444.52 | 561.45 | 73.30                 | 85.09 | 100.06 | 125.34 |
| C | Napa (SF) | Winter | 2014 | 325.49             | 375.42 | 444.36 | 562.07 | 73.28                 | 84.89 | 100.11 | 125.57 |
| C | Napa (SF) | Winter | 2015 | 325.59             | 375.49 | 444.23 | 562.69 | 73.31                 | 84.71 | 100.14 | 125.82 |
| C | Napa (SF) | Winter | 2016 | 325.73             | 375.62 | 444.13 | 563.27 | 73.38                 | 84.61 | 100.21 | 126.08 |
| C | Napa (SF) | Winter | 2017 | 325.78             | 375.69 | 444.05 | 563.83 | 73.36                 | 84.47 | 100.26 | 126.33 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Napa (SF)   | Winter | 2018 | 325.84             | 375.80 | 443.99 | 564.33 | 73.37                 | 84.41 | 100.30 | 126.57 |
| C | Napa (SF)   | Winter | 2019 | 325.89             | 375.97 | 443.95 | 564.76 | 73.38                 | 84.45 | 100.37 | 126.80 |
| C | Napa (SF)   | Winter | 2020 | 325.95             | 376.18 | 443.92 | 565.16 | 73.47                 | 84.58 | 100.46 | 127.02 |
| C | Napa (SF)   | Winter | 2021 | 326.02             | 376.41 | 443.90 | 565.46 | 73.55                 | 84.74 | 100.55 | 127.19 |
| C | Napa (SF)   | Winter | 2022 | 326.06             | 376.60 | 443.87 | 565.71 | 73.61                 | 84.89 | 100.63 | 127.33 |
| C | Napa (SF)   | Winter | 2023 | 326.03             | 376.74 | 443.84 | 565.90 | 73.64                 | 85.01 | 100.69 | 127.50 |
| C | Napa (SF)   | Winter | 2024 | 325.99             | 376.85 | 443.81 | 566.04 | 73.66                 | 85.13 | 100.75 | 127.65 |
| C | Napa (SF)   | Winter | 2025 | 325.98             | 376.94 | 443.79 | 566.20 | 73.68                 | 85.23 | 100.80 | 127.80 |
| C | Napa (SF)   | Winter | 2026 | 325.99             | 377.10 | 443.75 | 566.37 | 73.70                 | 85.33 | 100.83 | 127.95 |
| C | Napa (SF)   | Winter | 2027 | 326.00             | 377.26 | 443.72 | 566.54 | 73.72                 | 85.43 | 100.86 | 128.09 |
| C | Napa (SF)   | Winter | 2028 | 326.00             | 377.42 | 443.68 | 566.71 | 73.73                 | 85.52 | 100.89 | 128.21 |
| C | Napa (SF)   | Winter | 2029 | 325.99             | 377.59 | 443.63 | 566.87 | 73.74                 | 85.61 | 100.90 | 128.33 |
| C | Napa (SF)   | Winter | 2030 | 325.98             | 377.76 | 443.59 | 567.04 | 73.74                 | 85.69 | 100.91 | 128.44 |
| C | Napa (SF)   | Winter | 2031 | 325.98             | 377.95 | 443.57 | 567.24 | 73.75                 | 85.77 | 100.92 | 128.55 |
| C | Napa (SF)   | Winter | 2032 | 325.97             | 378.13 | 443.55 | 567.44 | 73.75                 | 85.85 | 100.93 | 128.66 |
| C | Napa (SF)   | Winter | 2033 | 325.97             | 378.29 | 443.52 | 567.61 | 73.76                 | 85.92 | 100.94 | 128.76 |
| C | Napa (SF)   | Winter | 2034 | 325.96             | 378.44 | 443.49 | 567.77 | 73.76                 | 85.98 | 100.94 | 128.86 |
| C | Napa (SF)   | Winter | 2035 | 325.95             | 378.57 | 443.47 | 567.91 | 73.77                 | 86.04 | 100.95 | 128.94 |
| C | Nevada (MC) | Annual | 2010 | 326.07             | 380.22 | 447.10 | 559.78 | 73.67                 | 93.42 | 100.30 | 125.42 |
| C | Nevada (MC) | Annual | 2011 | 326.05             | 379.91 | 446.56 | 560.31 | 73.51                 | 91.91 | 100.28 | 125.49 |
| C | Nevada (MC) | Annual | 2012 | 326.08             | 379.65 | 446.15 | 560.94 | 73.39                 | 90.54 | 100.30 | 125.59 |
| C | Nevada (MC) | Annual | 2013 | 326.14             | 379.46 | 445.84 | 561.62 | 73.28                 | 89.44 | 100.33 | 125.74 |
| C | Nevada (MC) | Annual | 2014 | 326.17             | 379.29 | 445.60 | 562.31 | 73.14                 | 88.45 | 100.37 | 125.90 |
| C | Nevada (MC) | Annual | 2015 | 326.25             | 379.17 | 445.41 | 563.05 | 73.08                 | 87.59 | 100.41 | 126.09 |
| C | Nevada (MC) | Annual | 2016 | 326.37             | 379.06 | 445.26 | 563.75 | 73.08                 | 86.81 | 100.48 | 126.31 |
| C | Nevada (MC) | Annual | 2017 | 326.42             | 378.96 | 445.14 | 564.41 | 73.04                 | 86.10 | 100.50 | 126.53 |
| C | Nevada (MC) | Annual | 2018 | 326.47             | 378.87 | 445.04 | 564.98 | 73.01                 | 85.49 | 100.54 | 126.75 |
| C | Nevada (MC) | Annual | 2019 | 326.52             | 378.90 | 444.96 | 565.48 | 73.00                 | 85.26 | 100.59 | 126.96 |
| C | Nevada (MC) | Annual | 2020 | 326.58             | 378.94 | 444.89 | 565.93 | 73.10                 | 85.21 | 100.66 | 127.16 |
| C | Nevada (MC) | Annual | 2021 | 326.64             | 379.04 | 444.84 | 566.23 | 73.18                 | 85.31 | 100.74 | 127.27 |
| C | Nevada (MC) | Annual | 2022 | 326.65             | 379.14 | 444.78 | 566.45 | 73.23                 | 85.40 | 100.80 | 127.30 |
| C | Nevada (MC) | Annual | 2023 | 326.63             | 379.22 | 444.73 | 566.61 | 73.26                 | 85.48 | 100.85 | 127.47 |
| C | Nevada (MC) | Annual | 2024 | 326.58             | 379.28 | 444.68 | 566.75 | 73.28                 | 85.56 | 100.89 | 127.62 |
| C | Nevada (MC) | Annual | 2025 | 326.58             | 379.35 | 444.63 | 566.93 | 73.30                 | 85.63 | 100.92 | 127.79 |
| C | Nevada (MC) | Annual | 2026 | 326.59             | 379.43 | 444.58 | 567.11 | 73.32                 | 85.70 | 100.95 | 127.95 |
| C | Nevada (MC) | Annual | 2027 | 326.60             | 379.49 | 444.53 | 567.28 | 73.34                 | 85.77 | 100.96 | 128.09 |
| C | Nevada (MC) | Annual | 2028 | 326.60             | 379.56 | 444.49 | 567.46 | 73.35                 | 85.83 | 100.97 | 128.22 |
| C | Nevada (MC) | Annual | 2029 | 326.60             | 379.64 | 444.43 | 567.65 | 73.36                 | 85.88 | 100.97 | 128.35 |
| C | Nevada (MC) | Annual | 2030 | 326.59             | 379.71 | 444.37 | 567.83 | 73.36                 | 85.93 | 100.97 | 128.47 |
| C | Nevada (MC) | Annual | 2031 | 326.58             | 379.78 | 444.34 | 568.04 | 73.37                 | 85.99 | 100.97 | 128.58 |
| C | Nevada (MC) | Annual | 2032 | 326.58             | 379.84 | 444.32 | 568.25 | 73.37                 | 86.03 | 100.97 | 128.70 |
| C | Nevada (MC) | Annual | 2033 | 326.58             | 379.90 | 444.30 | 568.44 | 73.38                 | 86.08 | 100.98 | 128.80 |
| C | Nevada (MC) | Annual | 2034 | 326.57             | 379.95 | 444.28 | 568.61 | 73.38                 | 86.12 | 100.98 | 128.89 |
| C | Nevada (MC) | Annual | 2035 | 326.57             | 379.99 | 444.26 | 568.76 | 73.39                 | 86.15 | 100.98 | 128.98 |
| C | Nevada (MC) | Summer | 2010 | 349.54             | 405.49 | 478.37 | 598.65 | 73.67                 | 93.42 | 100.30 | 125.42 |
| C | Nevada (MC) | Summer | 2011 | 349.74             | 405.57 | 478.16 | 599.23 | 73.51                 | 91.91 | 100.28 | 125.49 |
| C | Nevada (MC) | Summer | 2012 | 349.96             | 405.65 | 478.01 | 599.97 | 73.39                 | 90.54 | 100.30 | 125.59 |
| C | Nevada (MC) | Summer | 2013 | 350.16             | 405.73 | 477.90 | 600.85 | 73.28                 | 89.44 | 100.33 | 125.74 |
| C | Nevada (MC) | Summer | 2014 | 350.32             | 405.78 | 477.81 | 601.73 | 73.14                 | 88.45 | 100.37 | 125.90 |
| C | Nevada (MC) | Summer | 2015 | 350.49             | 405.86 | 477.75 | 602.72 | 73.08                 | 87.59 | 100.41 | 126.09 |
| C | Nevada (MC) | Summer | 2016 | 350.67             | 405.92 | 477.68 | 603.66 | 73.08                 | 86.81 | 100.48 | 126.31 |
| C | Nevada (MC) | Summer | 2017 | 350.76             | 405.97 | 477.60 | 604.55 | 73.04                 | 86.10 | 100.50 | 126.53 |
| C | Nevada (MC) | Summer | 2018 | 350.82             | 406.02 | 477.50 | 605.29 | 73.01                 | 85.49 | 100.54 | 126.75 |
| C | Nevada (MC) | Summer | 2019 | 350.87             | 406.12 | 477.42 | 605.95 | 73.00                 | 85.26 | 100.59 | 126.96 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Nevada (MC) | Summer | 2020 | 350.93             | 406.22 | 477.35 | 606.52 | 73.10                 | 85.21 | 100.66 | 127.16 |
| C | Nevada (MC) | Summer | 2021 | 350.98             | 406.36 | 477.27 | 606.93 | 73.18                 | 85.31 | 100.74 | 127.27 |
| C | Nevada (MC) | Summer | 2022 | 350.98             | 406.49 | 477.21 | 607.24 | 73.23                 | 85.40 | 100.80 | 127.30 |
| C | Nevada (MC) | Summer | 2023 | 350.96             | 406.60 | 477.15 | 607.48 | 73.26                 | 85.48 | 100.85 | 127.47 |
| C | Nevada (MC) | Summer | 2024 | 350.91             | 406.70 | 477.10 | 607.66 | 73.28                 | 85.56 | 100.89 | 127.62 |
| C | Nevada (MC) | Summer | 2025 | 350.91             | 406.81 | 477.06 | 607.85 | 73.30                 | 85.63 | 100.92 | 127.79 |
| C | Nevada (MC) | Summer | 2026 | 350.93             | 406.90 | 477.02 | 608.02 | 73.32                 | 85.70 | 100.95 | 127.95 |
| C | Nevada (MC) | Summer | 2027 | 350.95             | 406.99 | 476.99 | 608.19 | 73.34                 | 85.77 | 100.96 | 128.09 |
| C | Nevada (MC) | Summer | 2028 | 350.96             | 407.08 | 476.96 | 608.37 | 73.35                 | 85.83 | 100.97 | 128.22 |
| C | Nevada (MC) | Summer | 2029 | 350.96             | 407.18 | 476.92 | 608.57 | 73.36                 | 85.88 | 100.97 | 128.35 |
| C | Nevada (MC) | Summer | 2030 | 350.96             | 407.28 | 476.88 | 608.77 | 73.36                 | 85.93 | 100.97 | 128.47 |
| C | Nevada (MC) | Summer | 2031 | 350.97             | 407.37 | 476.86 | 609.02 | 73.37                 | 85.99 | 100.97 | 128.58 |
| C | Nevada (MC) | Summer | 2032 | 350.97             | 407.44 | 476.85 | 609.26 | 73.37                 | 86.03 | 100.97 | 128.70 |
| C | Nevada (MC) | Summer | 2033 | 350.97             | 407.51 | 476.83 | 609.49 | 73.38                 | 86.08 | 100.98 | 128.80 |
| C | Nevada (MC) | Summer | 2034 | 350.97             | 407.57 | 476.81 | 609.70 | 73.38                 | 86.12 | 100.98 | 128.89 |
| C | Nevada (MC) | Summer | 2035 | 350.96             | 407.62 | 476.80 | 609.90 | 73.39                 | 86.15 | 100.98 | 128.98 |
| C | Nevada (MC) | Winter | 2010 | 320.89             | 374.64 | 440.20 | 551.20 | 73.67                 | 93.42 | 100.30 | 125.42 |
| C | Nevada (MC) | Winter | 2011 | 320.82             | 374.25 | 439.58 | 551.72 | 73.51                 | 91.91 | 100.28 | 125.49 |
| C | Nevada (MC) | Winter | 2012 | 320.81             | 373.90 | 439.12 | 552.32 | 73.39                 | 90.54 | 100.30 | 125.59 |
| C | Nevada (MC) | Winter | 2013 | 320.83             | 373.65 | 438.76 | 552.96 | 73.28                 | 89.44 | 100.33 | 125.74 |
| C | Nevada (MC) | Winter | 2014 | 320.84             | 373.44 | 438.48 | 553.60 | 73.14                 | 88.45 | 100.37 | 125.90 |
| C | Nevada (MC) | Winter | 2015 | 320.90             | 373.27 | 438.27 | 554.29 | 73.08                 | 87.59 | 100.41 | 126.09 |
| C | Nevada (MC) | Winter | 2016 | 321.00             | 373.13 | 438.10 | 554.93 | 73.08                 | 86.81 | 100.48 | 126.31 |
| C | Nevada (MC) | Winter | 2017 | 321.05             | 372.99 | 437.97 | 555.55 | 73.04                 | 86.10 | 100.50 | 126.53 |
| C | Nevada (MC) | Winter | 2018 | 321.09             | 372.88 | 437.87 | 556.08 | 73.01                 | 85.49 | 100.54 | 126.75 |
| C | Nevada (MC) | Winter | 2019 | 321.14             | 372.89 | 437.79 | 556.55 | 73.00                 | 85.26 | 100.59 | 126.96 |
| C | Nevada (MC) | Winter | 2020 | 321.21             | 372.92 | 437.73 | 556.97 | 73.10                 | 85.21 | 100.66 | 127.16 |
| C | Nevada (MC) | Winter | 2021 | 321.26             | 373.01 | 437.67 | 557.24 | 73.18                 | 85.31 | 100.74 | 127.27 |
| C | Nevada (MC) | Winter | 2022 | 321.28             | 373.10 | 437.62 | 557.44 | 73.23                 | 85.40 | 100.80 | 127.30 |
| C | Nevada (MC) | Winter | 2023 | 321.26             | 373.17 | 437.57 | 557.59 | 73.26                 | 85.48 | 100.85 | 127.47 |
| C | Nevada (MC) | Winter | 2024 | 321.21             | 373.23 | 437.52 | 557.72 | 73.28                 | 85.56 | 100.89 | 127.62 |
| C | Nevada (MC) | Winter | 2025 | 321.21             | 373.29 | 437.48 | 557.90 | 73.30                 | 85.63 | 100.92 | 127.79 |
| C | Nevada (MC) | Winter | 2026 | 321.22             | 373.36 | 437.42 | 558.07 | 73.32                 | 85.70 | 100.95 | 127.95 |
| C | Nevada (MC) | Winter | 2027 | 321.23             | 373.42 | 437.37 | 558.25 | 73.34                 | 85.77 | 100.96 | 128.09 |
| C | Nevada (MC) | Winter | 2028 | 321.23             | 373.49 | 437.32 | 558.43 | 73.35                 | 85.83 | 100.97 | 128.22 |
| C | Nevada (MC) | Winter | 2029 | 321.22             | 373.56 | 437.26 | 558.61 | 73.36                 | 85.88 | 100.97 | 128.35 |
| C | Nevada (MC) | Winter | 2030 | 321.20             | 373.62 | 437.19 | 558.79 | 73.36                 | 85.93 | 100.97 | 128.47 |
| C | Nevada (MC) | Winter | 2031 | 321.20             | 373.69 | 437.16 | 558.99 | 73.37                 | 85.99 | 100.97 | 128.58 |
| C | Nevada (MC) | Winter | 2032 | 321.20             | 373.75 | 437.14 | 559.20 | 73.37                 | 86.03 | 100.97 | 128.70 |
| C | Nevada (MC) | Winter | 2033 | 321.19             | 373.80 | 437.12 | 559.38 | 73.38                 | 86.08 | 100.98 | 128.80 |
| C | Nevada (MC) | Winter | 2034 | 321.19             | 373.85 | 437.10 | 559.54 | 73.38                 | 86.12 | 100.98 | 128.89 |
| C | Nevada (MC) | Winter | 2035 | 321.18             | 373.89 | 437.08 | 559.68 | 73.39                 | 86.15 | 100.98 | 128.98 |
| C | Orange (SC) | Annual | 2010 | 347.87             | 400.01 | 475.99 | 602.85 | 73.07                 | 83.78 | 99.29  | 125.36 |
| C | Orange (SC) | Annual | 2011 | 348.42             | 401.06 | 476.42 | 603.92 | 73.09                 | 83.78 | 99.41  | 125.57 |
| C | Orange (SC) | Annual | 2012 | 348.63             | 401.63 | 476.37 | 604.39 | 73.13                 | 83.82 | 99.55  | 125.78 |
| C | Orange (SC) | Annual | 2013 | 347.19             | 400.22 | 474.06 | 601.99 | 73.21                 | 83.88 | 99.69  | 126.00 |
| C | Orange (SC) | Annual | 2014 | 347.40             | 400.69 | 474.04 | 602.49 | 73.26                 | 83.95 | 99.83  | 126.23 |
| C | Orange (SC) | Annual | 2015 | 346.99             | 400.42 | 473.19 | 601.91 | 73.34                 | 84.04 | 99.96  | 126.46 |
| C | Orange (SC) | Annual | 2016 | 347.18             | 400.82 | 473.19 | 602.39 | 73.43                 | 84.13 | 100.08 | 126.69 |
| C | Orange (SC) | Annual | 2017 | 347.34             | 401.21 | 473.19 | 602.86 | 73.49                 | 84.25 | 100.19 | 126.92 |
| C | Orange (SC) | Annual | 2018 | 347.48             | 401.54 | 473.20 | 603.27 | 73.54                 | 84.36 | 100.29 | 127.13 |
| C | Orange (SC) | Annual | 2019 | 349.20             | 403.69 | 475.40 | 606.40 | 73.60                 | 84.51 | 100.39 | 127.32 |
| C | Orange (SC) | Annual | 2020 | 349.30             | 403.97 | 475.41 | 606.72 | 73.70                 | 84.67 | 100.49 | 127.50 |
| C | Orange (SC) | Annual | 2021 | 349.75             | 404.66 | 475.92 | 607.64 | 73.77                 | 84.83 | 100.58 | 127.66 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Orange (SC) | Annual | 2022 | 349.80             | 404.88 | 475.93 | 607.87 | 73.82                 | 84.97 | 100.65 | 127.80 |
| C | Orange (SC) | Annual | 2023 | 349.82             | 405.05 | 475.92 | 608.05 | 73.86                 | 85.10 | 100.72 | 127.95 |
| C | Orange (SC) | Annual | 2024 | 349.76             | 405.12 | 475.84 | 608.09 | 73.88                 | 85.21 | 100.77 | 128.09 |
| C | Orange (SC) | Annual | 2025 | 349.77             | 405.26 | 475.83 | 608.24 | 73.90                 | 85.31 | 100.82 | 128.22 |
| C | Orange (SC) | Annual | 2026 | 349.79             | 405.40 | 475.82 | 608.38 | 73.92                 | 85.41 | 100.85 | 128.34 |
| C | Orange (SC) | Annual | 2027 | 349.80             | 405.53 | 475.81 | 608.51 | 73.94                 | 85.50 | 100.88 | 128.45 |
| C | Orange (SC) | Annual | 2028 | 349.81             | 405.67 | 475.80 | 608.64 | 73.95                 | 85.58 | 100.90 | 128.55 |
| C | Orange (SC) | Annual | 2029 | 349.81             | 405.80 | 475.79 | 608.77 | 73.96                 | 85.66 | 100.92 | 128.64 |
| C | Orange (SC) | Annual | 2030 | 349.81             | 405.94 | 475.78 | 608.90 | 73.96                 | 85.73 | 100.93 | 128.73 |
| C | Orange (SC) | Annual | 2031 | 348.96             | 405.11 | 474.63 | 607.56 | 73.97                 | 85.80 | 100.95 | 128.81 |
| C | Orange (SC) | Annual | 2032 | 348.96             | 405.24 | 474.63 | 607.70 | 73.97                 | 85.87 | 100.95 | 128.89 |
| C | Orange (SC) | Annual | 2033 | 348.96             | 405.36 | 474.62 | 607.83 | 73.97                 | 85.94 | 100.96 | 128.97 |
| C | Orange (SC) | Annual | 2034 | 348.95             | 405.47 | 474.62 | 607.95 | 73.98                 | 86.00 | 100.97 | 129.04 |
| C | Orange (SC) | Annual | 2035 | 348.95             | 405.55 | 474.61 | 608.05 | 73.98                 | 86.05 | 100.97 | 129.10 |
| C | Orange (SC) | Summer | 2010 | 362.44             | 415.36 | 495.33 | 627.26 | 73.07                 | 83.78 | 99.29  | 125.36 |
| C | Orange (SC) | Summer | 2011 | 363.04             | 416.58 | 495.78 | 628.25 | 73.09                 | 83.78 | 99.41  | 125.57 |
| C | Orange (SC) | Summer | 2012 | 363.28             | 417.29 | 495.73 | 628.67 | 73.13                 | 83.82 | 99.55  | 125.78 |
| C | Orange (SC) | Summer | 2013 | 361.81             | 415.93 | 493.36 | 626.17 | 73.21                 | 83.88 | 99.69  | 126.00 |
| C | Orange (SC) | Summer | 2014 | 362.04             | 416.49 | 493.37 | 626.68 | 73.26                 | 83.95 | 99.83  | 126.23 |
| C | Orange (SC) | Summer | 2015 | 361.62             | 416.27 | 492.50 | 626.09 | 73.34                 | 84.04 | 99.96  | 126.46 |
| C | Orange (SC) | Summer | 2016 | 361.83             | 416.72 | 492.53 | 626.63 | 73.43                 | 84.13 | 100.08 | 126.69 |
| C | Orange (SC) | Summer | 2017 | 362.01             | 417.16 | 492.56 | 627.16 | 73.49                 | 84.25 | 100.19 | 126.92 |
| C | Orange (SC) | Summer | 2018 | 362.15             | 417.54 | 492.59 | 627.63 | 73.54                 | 84.36 | 100.29 | 127.13 |
| C | Orange (SC) | Summer | 2019 | 363.96             | 419.82 | 494.91 | 630.94 | 73.60                 | 84.51 | 100.39 | 127.32 |
| C | Orange (SC) | Summer | 2020 | 364.07             | 420.12 | 494.92 | 631.29 | 73.70                 | 84.67 | 100.49 | 127.50 |
| C | Orange (SC) | Summer | 2021 | 364.53             | 420.87 | 495.46 | 632.27 | 73.77                 | 84.83 | 100.58 | 127.66 |
| C | Orange (SC) | Summer | 2022 | 364.57             | 421.13 | 495.46 | 632.54 | 73.82                 | 84.97 | 100.65 | 127.80 |
| C | Orange (SC) | Summer | 2023 | 364.59             | 421.33 | 495.45 | 632.74 | 73.86                 | 85.10 | 100.72 | 127.95 |
| C | Orange (SC) | Summer | 2024 | 364.55             | 421.45 | 495.37 | 632.81 | 73.88                 | 85.21 | 100.77 | 128.09 |
| C | Orange (SC) | Summer | 2025 | 364.56             | 421.62 | 495.36 | 632.96 | 73.90                 | 85.31 | 100.82 | 128.22 |
| C | Orange (SC) | Summer | 2026 | 364.58             | 421.79 | 495.35 | 633.12 | 73.92                 | 85.41 | 100.85 | 128.34 |
| C | Orange (SC) | Summer | 2027 | 364.59             | 421.94 | 495.34 | 633.26 | 73.94                 | 85.50 | 100.88 | 128.45 |
| C | Orange (SC) | Summer | 2028 | 364.60             | 422.10 | 495.33 | 633.39 | 73.95                 | 85.58 | 100.90 | 128.55 |
| C | Orange (SC) | Summer | 2029 | 364.60             | 422.27 | 495.31 | 633.51 | 73.96                 | 85.66 | 100.92 | 128.64 |
| C | Orange (SC) | Summer | 2030 | 364.60             | 422.43 | 495.31 | 633.65 | 73.96                 | 85.73 | 100.93 | 128.73 |
| C | Orange (SC) | Summer | 2031 | 363.73             | 421.60 | 494.12 | 632.27 | 73.97                 | 85.80 | 100.95 | 128.81 |
| C | Orange (SC) | Summer | 2032 | 363.72             | 421.76 | 494.11 | 632.41 | 73.97                 | 85.87 | 100.95 | 128.89 |
| C | Orange (SC) | Summer | 2033 | 363.72             | 421.90 | 494.11 | 632.54 | 73.97                 | 85.94 | 100.96 | 128.97 |
| C | Orange (SC) | Summer | 2034 | 363.72             | 422.02 | 494.10 | 632.66 | 73.98                 | 86.00 | 100.97 | 129.04 |
| C | Orange (SC) | Summer | 2035 | 363.71             | 422.11 | 494.10 | 632.78 | 73.98                 | 86.05 | 100.97 | 129.10 |
| C | Orange (SC) | Winter | 2010 | 342.49             | 394.35 | 468.85 | 593.85 | 73.07                 | 83.78 | 99.29  | 125.36 |
| C | Orange (SC) | Winter | 2011 | 343.03             | 395.32 | 469.28 | 594.94 | 73.09                 | 83.78 | 99.41  | 125.57 |
| C | Orange (SC) | Winter | 2012 | 343.22             | 395.85 | 469.23 | 595.43 | 73.13                 | 83.82 | 99.55  | 125.78 |
| C | Orange (SC) | Winter | 2013 | 341.80             | 394.42 | 466.94 | 593.07 | 73.21                 | 83.88 | 99.69  | 126.00 |
| C | Orange (SC) | Winter | 2014 | 341.99             | 394.86 | 466.91 | 593.56 | 73.26                 | 83.95 | 99.83  | 126.23 |
| C | Orange (SC) | Winter | 2015 | 341.59             | 394.58 | 466.06 | 592.99 | 73.34                 | 84.04 | 99.96  | 126.46 |
| C | Orange (SC) | Winter | 2016 | 341.78             | 394.95 | 466.05 | 593.44 | 73.43                 | 84.13 | 100.08 | 126.69 |
| C | Orange (SC) | Winter | 2017 | 341.93             | 395.32 | 466.04 | 593.89 | 73.49                 | 84.25 | 100.19 | 126.92 |
| C | Orange (SC) | Winter | 2018 | 342.06             | 395.63 | 466.04 | 594.28 | 73.54                 | 84.36 | 100.29 | 127.13 |
| C | Orange (SC) | Winter | 2019 | 343.75             | 397.74 | 468.20 | 597.34 | 73.60                 | 84.51 | 100.39 | 127.32 |
| C | Orange (SC) | Winter | 2020 | 343.85             | 398.00 | 468.21 | 597.65 | 73.70                 | 84.67 | 100.49 | 127.50 |
| C | Orange (SC) | Winter | 2021 | 344.29             | 398.67 | 468.71 | 598.54 | 73.77                 | 84.83 | 100.58 | 127.66 |
| C | Orange (SC) | Winter | 2022 | 344.34             | 398.88 | 468.72 | 598.77 | 73.82                 | 84.97 | 100.65 | 127.80 |
| C | Orange (SC) | Winter | 2023 | 344.36             | 399.04 | 468.72 | 598.94 | 73.86                 | 85.10 | 100.72 | 127.95 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Orange (SC) | Winter | 2024 | 344.30              | 399.10 | 468.63 | 598.97 | 73.88                 | 85.21 | 100.77 | 128.09 |
| C | Orange (SC) | Winter | 2025 | 344.31              | 399.22 | 468.62 | 599.11 | 73.90                 | 85.31 | 100.82 | 128.22 |
| C | Orange (SC) | Winter | 2026 | 344.33              | 399.35 | 468.62 | 599.25 | 73.92                 | 85.41 | 100.85 | 128.34 |
| C | Orange (SC) | Winter | 2027 | 344.34              | 399.47 | 468.61 | 599.38 | 73.94                 | 85.50 | 100.88 | 128.45 |
| C | Orange (SC) | Winter | 2028 | 344.35              | 399.60 | 468.60 | 599.51 | 73.95                 | 85.58 | 100.90 | 128.55 |
| C | Orange (SC) | Winter | 2029 | 344.35              | 399.72 | 468.59 | 599.64 | 73.96                 | 85.66 | 100.92 | 128.64 |
| C | Orange (SC) | Winter | 2030 | 344.34              | 399.85 | 468.58 | 599.77 | 73.96                 | 85.73 | 100.93 | 128.73 |
| C | Orange (SC) | Winter | 2031 | 343.51              | 399.02 | 467.44 | 598.45 | 73.97                 | 85.80 | 100.95 | 128.81 |
| C | Orange (SC) | Winter | 2032 | 343.51              | 399.15 | 467.43 | 598.59 | 73.97                 | 85.87 | 100.95 | 128.89 |
| C | Orange (SC) | Winter | 2033 | 343.51              | 399.26 | 467.43 | 598.71 | 73.97                 | 85.94 | 100.96 | 128.97 |
| C | Orange (SC) | Winter | 2034 | 343.50              | 399.36 | 467.42 | 598.82 | 73.98                 | 86.00 | 100.97 | 129.04 |
| C | Orange (SC) | Winter | 2035 | 343.50              | 399.44 | 467.42 | 598.92 | 73.98                 | 86.05 | 100.97 | 129.10 |
| C | Placer (LT) | Annual | 2010 | 340.23              | 392.41 | 463.45 | 577.11 | 74.90                 | 88.03 | 99.95  | 123.15 |
| C | Placer (LT) | Annual | 2011 | 339.97              | 392.42 | 463.05 | 578.12 | 74.69                 | 87.25 | 99.98  | 123.39 |
| C | Placer (LT) | Annual | 2012 | 339.74              | 392.55 | 462.73 | 579.12 | 74.40                 | 86.88 | 100.02 | 123.70 |
| C | Placer (LT) | Annual | 2013 | 339.68              | 392.64 | 462.48 | 580.23 | 74.28                 | 86.50 | 100.11 | 124.04 |
| C | Placer (LT) | Annual | 2014 | 339.55              | 392.72 | 462.29 | 581.26 | 74.02                 | 86.17 | 100.18 | 124.39 |
| C | Placer (LT) | Annual | 2015 | 339.51              | 392.81 | 462.13 | 582.31 | 73.88                 | 85.86 | 100.25 | 124.76 |
| C | Placer (LT) | Annual | 2016 | 339.57              | 392.94 | 462.02 | 583.33 | 73.88                 | 85.70 | 100.34 | 125.12 |
| C | Placer (LT) | Annual | 2017 | 339.55              | 392.98 | 461.93 | 584.26 | 73.79                 | 85.38 | 100.40 | 125.48 |
| C | Placer (LT) | Annual | 2018 | 339.54              | 393.05 | 461.86 | 585.08 | 73.72                 | 85.22 | 100.48 | 125.82 |
| C | Placer (LT) | Annual | 2019 | 339.49              | 393.16 | 461.81 | 585.79 | 73.61                 | 85.17 | 100.54 | 126.14 |
| C | Placer (LT) | Annual | 2020 | 339.51              | 393.28 | 461.78 | 586.39 | 73.69                 | 85.23 | 100.64 | 126.46 |
| C | Placer (LT) | Annual | 2021 | 339.39              | 393.37 | 461.75 | 586.89 | 73.69                 | 85.32 | 100.72 | 126.73 |
| C | Placer (LT) | Annual | 2022 | 339.32              | 393.46 | 461.71 | 587.33 | 73.71                 | 85.41 | 100.78 | 126.98 |
| C | Placer (LT) | Annual | 2023 | 339.19              | 393.47 | 461.67 | 587.65 | 73.70                 | 85.46 | 100.83 | 127.20 |
| C | Placer (LT) | Annual | 2024 | 338.99              | 393.46 | 461.63 | 587.89 | 73.66                 | 85.51 | 100.87 | 127.40 |
| C | Placer (LT) | Annual | 2025 | 338.92              | 393.53 | 461.61 | 588.13 | 73.66                 | 85.59 | 100.91 | 127.59 |
| C | Placer (LT) | Annual | 2026 | 338.92              | 393.66 | 461.58 | 588.38 | 73.68                 | 85.69 | 100.94 | 127.78 |
| C | Placer (LT) | Annual | 2027 | 338.92              | 393.78 | 461.56 | 588.62 | 73.70                 | 85.78 | 100.96 | 127.94 |
| C | Placer (LT) | Annual | 2028 | 338.91              | 393.89 | 461.53 | 588.87 | 73.71                 | 85.86 | 100.98 | 128.10 |
| C | Placer (LT) | Annual | 2029 | 338.88              | 394.01 | 461.50 | 589.12 | 73.71                 | 85.93 | 100.99 | 128.24 |
| C | Placer (LT) | Annual | 2030 | 338.87              | 394.12 | 461.45 | 589.36 | 73.71                 | 86.00 | 100.99 | 128.38 |
| C | Placer (LT) | Annual | 2031 | 338.87              | 394.23 | 461.43 | 589.62 | 73.72                 | 86.07 | 101.00 | 128.51 |
| C | Placer (LT) | Annual | 2032 | 338.86              | 394.34 | 461.40 | 589.88 | 73.73                 | 86.13 | 101.01 | 128.64 |
| C | Placer (LT) | Annual | 2033 | 338.86              | 394.44 | 461.38 | 590.11 | 73.73                 | 86.19 | 101.01 | 128.75 |
| C | Placer (LT) | Annual | 2034 | 338.85              | 394.52 | 461.36 | 590.32 | 73.74                 | 86.25 | 101.01 | 128.86 |
| C | Placer (LT) | Annual | 2035 | 338.84              | 394.59 | 461.34 | 590.51 | 73.74                 | 86.29 | 101.02 | 128.96 |
| C | Placer (LT) | Summer | 2010 | 338.84              | 391.00 | 461.59 | 574.82 | 74.90                 | 88.03 | 99.95  | 123.15 |
| C | Placer (LT) | Summer | 2011 | 338.57              | 390.97 | 461.17 | 575.82 | 74.69                 | 87.25 | 99.98  | 123.39 |
| C | Placer (LT) | Summer | 2012 | 338.32              | 391.08 | 460.84 | 576.82 | 74.40                 | 86.88 | 100.02 | 123.70 |
| C | Placer (LT) | Summer | 2013 | 338.25              | 391.14 | 460.59 | 577.91 | 74.28                 | 86.50 | 100.11 | 124.04 |
| C | Placer (LT) | Summer | 2014 | 338.11              | 391.20 | 460.39 | 578.92 | 74.02                 | 86.17 | 100.18 | 124.39 |
| C | Placer (LT) | Summer | 2015 | 338.07              | 391.27 | 460.22 | 579.97 | 73.88                 | 85.86 | 100.25 | 124.76 |
| C | Placer (LT) | Summer | 2016 | 338.13              | 391.39 | 460.11 | 580.97 | 73.88                 | 85.70 | 100.34 | 125.12 |
| C | Placer (LT) | Summer | 2017 | 338.10              | 391.41 | 460.01 | 581.88 | 73.79                 | 85.38 | 100.40 | 125.48 |
| C | Placer (LT) | Summer | 2018 | 338.10              | 391.48 | 459.94 | 582.69 | 73.72                 | 85.22 | 100.48 | 125.82 |
| C | Placer (LT) | Summer | 2019 | 338.04              | 391.58 | 459.89 | 583.40 | 73.61                 | 85.17 | 100.54 | 126.14 |
| C | Placer (LT) | Summer | 2020 | 338.06              | 391.69 | 459.86 | 583.98 | 73.69                 | 85.23 | 100.64 | 126.46 |
| C | Placer (LT) | Summer | 2021 | 337.95              | 391.78 | 459.84 | 584.48 | 73.69                 | 85.32 | 100.72 | 126.73 |
| C | Placer (LT) | Summer | 2022 | 337.87              | 391.86 | 459.79 | 584.92 | 73.71                 | 85.41 | 100.78 | 126.98 |
| C | Placer (LT) | Summer | 2023 | 337.74              | 391.87 | 459.76 | 585.24 | 73.70                 | 85.46 | 100.83 | 127.20 |
| C | Placer (LT) | Summer | 2024 | 337.54              | 391.85 | 459.72 | 585.48 | 73.66                 | 85.51 | 100.87 | 127.40 |
| C | Placer (LT) | Summer | 2025 | 337.47              | 391.92 | 459.69 | 585.72 | 73.66                 | 85.59 | 100.91 | 127.59 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Placer (LT) | Summer | 2026 | 337.47             | 392.04 | 459.66 | 585.97 | 73.68                 | 85.69 | 100.94 | 127.78 |
| C | Placer (LT) | Summer | 2027 | 337.47             | 392.16 | 459.64 | 586.21 | 73.70                 | 85.78 | 100.96 | 127.94 |
| C | Placer (LT) | Summer | 2028 | 337.46             | 392.27 | 459.61 | 586.46 | 73.71                 | 85.86 | 100.98 | 128.10 |
| C | Placer (LT) | Summer | 2029 | 337.44             | 392.39 | 459.58 | 586.70 | 73.71                 | 85.93 | 100.99 | 128.24 |
| C | Placer (LT) | Summer | 2030 | 337.42             | 392.50 | 459.53 | 586.94 | 73.71                 | 86.00 | 100.99 | 128.38 |
| C | Placer (LT) | Summer | 2031 | 337.42             | 392.60 | 459.50 | 587.19 | 73.72                 | 86.07 | 101.00 | 128.51 |
| C | Placer (LT) | Summer | 2032 | 337.41             | 392.71 | 459.48 | 587.45 | 73.73                 | 86.13 | 101.01 | 128.64 |
| C | Placer (LT) | Summer | 2033 | 337.40             | 392.80 | 459.46 | 587.68 | 73.73                 | 86.19 | 101.01 | 128.75 |
| C | Placer (LT) | Summer | 2034 | 337.40             | 392.88 | 459.44 | 587.89 | 73.74                 | 86.25 | 101.01 | 128.86 |
| C | Placer (LT) | Summer | 2035 | 337.39             | 392.96 | 459.42 | 588.07 | 73.74                 | 86.29 | 101.02 | 128.96 |
| C | Placer (LT) | Winter | 2010 | 338.69             | 390.84 | 461.38 | 574.56 | 74.90                 | 88.03 | 99.95  | 123.15 |
| C | Placer (LT) | Winter | 2011 | 338.41             | 390.80 | 460.96 | 575.56 | 74.69                 | 87.25 | 99.98  | 123.39 |
| C | Placer (LT) | Winter | 2012 | 338.16             | 390.91 | 460.63 | 576.55 | 74.40                 | 86.88 | 100.02 | 123.70 |
| C | Placer (LT) | Winter | 2013 | 338.09             | 390.97 | 460.37 | 577.65 | 74.28                 | 86.50 | 100.11 | 124.04 |
| C | Placer (LT) | Winter | 2014 | 337.95             | 391.03 | 460.17 | 578.66 | 74.02                 | 86.17 | 100.18 | 124.39 |
| C | Placer (LT) | Winter | 2015 | 337.90             | 391.10 | 460.01 | 579.70 | 73.88                 | 85.86 | 100.25 | 124.76 |
| C | Placer (LT) | Winter | 2016 | 337.96             | 391.21 | 459.89 | 580.70 | 73.88                 | 85.70 | 100.34 | 125.12 |
| C | Placer (LT) | Winter | 2017 | 337.94             | 391.23 | 459.79 | 581.61 | 73.79                 | 85.38 | 100.40 | 125.48 |
| C | Placer (LT) | Winter | 2018 | 337.93             | 391.30 | 459.73 | 582.42 | 73.72                 | 85.22 | 100.48 | 125.82 |
| C | Placer (LT) | Winter | 2019 | 337.88             | 391.40 | 459.67 | 583.12 | 73.61                 | 85.17 | 100.54 | 126.14 |
| C | Placer (LT) | Winter | 2020 | 337.90             | 391.51 | 459.64 | 583.71 | 73.69                 | 85.23 | 100.64 | 126.46 |
| C | Placer (LT) | Winter | 2021 | 337.78             | 391.60 | 459.62 | 584.21 | 73.69                 | 85.32 | 100.72 | 126.73 |
| C | Placer (LT) | Winter | 2022 | 337.71             | 391.68 | 459.57 | 584.64 | 73.71                 | 85.41 | 100.78 | 126.98 |
| C | Placer (LT) | Winter | 2023 | 337.58             | 391.69 | 459.54 | 584.96 | 73.70                 | 85.46 | 100.83 | 127.20 |
| C | Placer (LT) | Winter | 2024 | 337.38             | 391.66 | 459.50 | 585.21 | 73.66                 | 85.51 | 100.87 | 127.40 |
| C | Placer (LT) | Winter | 2025 | 337.31             | 391.74 | 459.47 | 585.44 | 73.66                 | 85.59 | 100.91 | 127.59 |
| C | Placer (LT) | Winter | 2026 | 337.31             | 391.86 | 459.44 | 585.69 | 73.68                 | 85.69 | 100.94 | 127.78 |
| C | Placer (LT) | Winter | 2027 | 337.31             | 391.98 | 459.42 | 585.93 | 73.70                 | 85.78 | 100.96 | 127.94 |
| C | Placer (LT) | Winter | 2028 | 337.30             | 392.09 | 459.39 | 586.18 | 73.71                 | 85.86 | 100.98 | 128.10 |
| C | Placer (LT) | Winter | 2029 | 337.27             | 392.20 | 459.36 | 586.42 | 73.71                 | 85.93 | 100.99 | 128.24 |
| C | Placer (LT) | Winter | 2030 | 337.25             | 392.31 | 459.31 | 586.66 | 73.71                 | 86.00 | 100.99 | 128.38 |
| C | Placer (LT) | Winter | 2031 | 337.25             | 392.42 | 459.29 | 586.92 | 73.72                 | 86.07 | 101.00 | 128.51 |
| C | Placer (LT) | Winter | 2032 | 337.24             | 392.52 | 459.26 | 587.18 | 73.73                 | 86.13 | 101.01 | 128.64 |
| C | Placer (LT) | Winter | 2033 | 337.24             | 392.62 | 459.24 | 587.41 | 73.73                 | 86.19 | 101.01 | 128.75 |
| C | Placer (LT) | Winter | 2034 | 337.23             | 392.70 | 459.22 | 587.62 | 73.74                 | 86.25 | 101.01 | 128.86 |
| C | Placer (LT) | Winter | 2035 | 337.23             | 392.77 | 459.20 | 587.80 | 73.74                 | 86.29 | 101.02 | 128.96 |
| C | Placer (MC) | Annual | 2010 | 329.36             | 386.40 | 451.66 | 564.92 | 74.80                 | 97.65 | 101.10 | 126.15 |
| C | Placer (MC) | Annual | 2011 | 329.15             | 385.52 | 450.95 | 565.40 | 74.33                 | 95.41 | 100.91 | 126.13 |
| C | Placer (MC) | Annual | 2012 | 329.07             | 384.69 | 450.42 | 566.02 | 74.02                 | 93.26 | 100.87 | 126.12 |
| C | Placer (MC) | Annual | 2013 | 329.11             | 384.15 | 450.00 | 566.65 | 73.83                 | 91.74 | 100.80 | 126.20 |
| C | Placer (MC) | Annual | 2014 | 329.16             | 383.61 | 449.69 | 567.30 | 73.68                 | 90.22 | 100.75 | 126.29 |
| C | Placer (MC) | Annual | 2015 | 329.24             | 383.22 | 449.43 | 567.96 | 73.57                 | 89.07 | 100.72 | 126.43 |
| C | Placer (MC) | Annual | 2016 | 329.36             | 382.88 | 449.24 | 568.58 | 73.54                 | 88.05 | 100.72 | 126.60 |
| C | Placer (MC) | Annual | 2017 | 329.40             | 382.34 | 449.07 | 569.24 | 73.43                 | 86.60 | 100.66 | 126.74 |
| C | Placer (MC) | Annual | 2018 | 329.36             | 382.09 | 448.94 | 569.80 | 73.26                 | 85.85 | 100.69 | 126.90 |
| C | Placer (MC) | Annual | 2019 | 332.02             | 385.00 | 452.39 | 574.73 | 73.29                 | 85.50 | 100.67 | 127.04 |
| C | Placer (MC) | Annual | 2020 | 332.07             | 384.86 | 452.31 | 575.12 | 73.38                 | 85.28 | 100.73 | 127.19 |
| C | Placer (MC) | Annual | 2021 | 332.12             | 384.99 | 452.23 | 575.34 | 73.44                 | 85.38 | 100.80 | 127.25 |
| C | Placer (MC) | Annual | 2022 | 332.17             | 385.09 | 452.15 | 575.43 | 73.51                 | 85.47 | 100.85 | 127.16 |
| C | Placer (MC) | Annual | 2023 | 332.19             | 385.15 | 452.08 | 575.52 | 73.55                 | 85.54 | 100.90 | 127.30 |
| C | Placer (MC) | Annual | 2024 | 332.17             | 385.17 | 452.02 | 575.58 | 73.57                 | 85.59 | 100.94 | 127.43 |
| C | Placer (MC) | Annual | 2025 | 332.15             | 385.21 | 451.97 | 575.68 | 73.59                 | 85.65 | 100.97 | 127.57 |
| C | Placer (MC) | Annual | 2026 | 332.17             | 385.30 | 451.90 | 575.81 | 73.61                 | 85.72 | 100.99 | 127.72 |
| C | Placer (MC) | Annual | 2027 | 332.18             | 385.38 | 451.84 | 575.95 | 73.62                 | 85.78 | 101.01 | 127.85 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Placer (MC) | Annual | 2028 | 332.18              | 385.47 | 451.76 | 576.09 | 73.63                 | 85.85 | 101.01 | 127.97 |
| C | Placer (MC) | Annual | 2029 | 332.18              | 385.56 | 451.67 | 576.26 | 73.64                 | 85.91 | 101.01 | 128.09 |
| C | Placer (MC) | Annual | 2030 | 332.17              | 385.66 | 451.55 | 576.44 | 73.64                 | 85.96 | 100.98 | 128.21 |
| C | Placer (MC) | Annual | 2031 | 332.17              | 385.75 | 451.50 | 576.67 | 73.65                 | 86.02 | 100.99 | 128.33 |
| C | Placer (MC) | Annual | 2032 | 332.16              | 385.83 | 451.46 | 576.90 | 73.66                 | 86.07 | 100.99 | 128.45 |
| C | Placer (MC) | Annual | 2033 | 332.16              | 385.91 | 451.43 | 577.12 | 73.66                 | 86.12 | 100.99 | 128.57 |
| C | Placer (MC) | Annual | 2034 | 332.16              | 385.97 | 451.40 | 577.32 | 73.67                 | 86.17 | 100.99 | 128.67 |
| C | Placer (MC) | Annual | 2035 | 332.15              | 386.03 | 451.37 | 577.50 | 73.67                 | 86.20 | 101.00 | 128.78 |
| C | Placer (MC) | Summer | 2010 | 352.60              | 410.10 | 482.16 | 602.93 | 74.80                 | 97.65 | 101.10 | 126.15 |
| C | Placer (MC) | Summer | 2011 | 352.62              | 409.82 | 481.81 | 603.49 | 74.33                 | 95.41 | 100.91 | 126.13 |
| C | Placer (MC) | Summer | 2012 | 352.73              | 409.55 | 481.54 | 604.28 | 74.02                 | 93.26 | 100.87 | 126.12 |
| C | Placer (MC) | Summer | 2013 | 352.90              | 409.38 | 481.34 | 605.11 | 73.83                 | 91.74 | 100.80 | 126.20 |
| C | Placer (MC) | Summer | 2014 | 353.06              | 409.18 | 481.21 | 605.99 | 73.68                 | 90.22 | 100.75 | 126.29 |
| C | Placer (MC) | Summer | 2015 | 353.22              | 409.05 | 481.09 | 606.90 | 73.57                 | 89.07 | 100.72 | 126.43 |
| C | Placer (MC) | Summer | 2016 | 353.39              | 408.90 | 480.99 | 607.75 | 73.54                 | 88.05 | 100.72 | 126.60 |
| C | Placer (MC) | Summer | 2017 | 353.47              | 408.64 | 480.89 | 608.64 | 73.43                 | 86.60 | 100.66 | 126.74 |
| C | Placer (MC) | Summer | 2018 | 353.45              | 408.51 | 480.77 | 609.39 | 73.26                 | 85.85 | 100.69 | 126.90 |
| C | Placer (MC) | Summer | 2019 | 356.31              | 411.72 | 484.51 | 614.80 | 73.29                 | 85.50 | 100.67 | 127.04 |
| C | Placer (MC) | Summer | 2020 | 356.34              | 411.66 | 484.39 | 615.29 | 73.38                 | 85.28 | 100.73 | 127.19 |
| C | Placer (MC) | Summer | 2021 | 356.36              | 411.82 | 484.28 | 615.58 | 73.44                 | 85.38 | 100.80 | 127.25 |
| C | Placer (MC) | Summer | 2022 | 356.40              | 411.97 | 484.18 | 615.77 | 73.51                 | 85.47 | 100.85 | 127.16 |
| C | Placer (MC) | Summer | 2023 | 356.40              | 412.10 | 484.10 | 615.91 | 73.55                 | 85.54 | 100.90 | 127.30 |
| C | Placer (MC) | Summer | 2024 | 356.40              | 412.17 | 484.02 | 615.97 | 73.57                 | 85.59 | 100.94 | 127.43 |
| C | Placer (MC) | Summer | 2025 | 356.38              | 412.27 | 483.96 | 616.07 | 73.59                 | 85.65 | 100.97 | 127.57 |
| C | Placer (MC) | Summer | 2026 | 356.41              | 412.39 | 483.91 | 616.17 | 73.61                 | 85.72 | 100.99 | 127.72 |
| C | Placer (MC) | Summer | 2027 | 356.43              | 412.50 | 483.87 | 616.28 | 73.62                 | 85.78 | 101.01 | 127.85 |
| C | Placer (MC) | Summer | 2028 | 356.44              | 412.63 | 483.82 | 616.43 | 73.63                 | 85.85 | 101.01 | 127.97 |
| C | Placer (MC) | Summer | 2029 | 356.46              | 412.75 | 483.76 | 616.60 | 73.64                 | 85.91 | 101.01 | 128.09 |
| C | Placer (MC) | Summer | 2030 | 356.46              | 412.90 | 483.67 | 616.81 | 73.64                 | 85.96 | 100.98 | 128.21 |
| C | Placer (MC) | Summer | 2031 | 356.46              | 413.02 | 483.66 | 617.09 | 73.65                 | 86.02 | 100.99 | 128.33 |
| C | Placer (MC) | Summer | 2032 | 356.46              | 413.12 | 483.65 | 617.39 | 73.66                 | 86.07 | 100.99 | 128.45 |
| C | Placer (MC) | Summer | 2033 | 356.45              | 413.21 | 483.63 | 617.66 | 73.66                 | 86.12 | 100.99 | 128.57 |
| C | Placer (MC) | Summer | 2034 | 356.45              | 413.29 | 483.61 | 617.93 | 73.67                 | 86.17 | 100.99 | 128.67 |
| C | Placer (MC) | Summer | 2035 | 356.44              | 413.35 | 483.58 | 618.17 | 73.67                 | 86.20 | 101.00 | 128.78 |
| C | Placer (MC) | Winter | 2010 | 324.91              | 381.86 | 445.82 | 557.64 | 74.80                 | 97.65 | 101.10 | 126.15 |
| C | Placer (MC) | Winter | 2011 | 324.66              | 380.86 | 445.04 | 558.11 | 74.33                 | 95.41 | 100.91 | 126.13 |
| C | Placer (MC) | Winter | 2012 | 324.54              | 379.93 | 444.46 | 558.70 | 74.02                 | 93.26 | 100.87 | 126.12 |
| C | Placer (MC) | Winter | 2013 | 324.55              | 379.32 | 444.00 | 559.29 | 73.83                 | 91.74 | 100.80 | 126.20 |
| C | Placer (MC) | Winter | 2014 | 324.58              | 378.71 | 443.65 | 559.89 | 73.68                 | 90.22 | 100.75 | 126.29 |
| C | Placer (MC) | Winter | 2015 | 324.65              | 378.28 | 443.37 | 560.51 | 73.57                 | 89.07 | 100.72 | 126.43 |
| C | Placer (MC) | Winter | 2016 | 324.76              | 377.90 | 443.16 | 561.08 | 73.54                 | 88.05 | 100.72 | 126.60 |
| C | Placer (MC) | Winter | 2017 | 324.79              | 377.30 | 442.98 | 561.69 | 73.43                 | 86.60 | 100.66 | 126.74 |
| C | Placer (MC) | Winter | 2018 | 324.75              | 377.03 | 442.84 | 562.22 | 73.26                 | 85.85 | 100.69 | 126.90 |
| C | Placer (MC) | Winter | 2019 | 327.37              | 379.88 | 446.24 | 567.05 | 73.29                 | 85.50 | 100.67 | 127.04 |
| C | Placer (MC) | Winter | 2020 | 327.42              | 379.73 | 446.16 | 567.42 | 73.38                 | 85.28 | 100.73 | 127.19 |
| C | Placer (MC) | Winter | 2021 | 327.47              | 379.84 | 446.08 | 567.62 | 73.44                 | 85.38 | 100.80 | 127.25 |
| C | Placer (MC) | Winter | 2022 | 327.53              | 379.93 | 446.02 | 567.70 | 73.51                 | 85.47 | 100.85 | 127.16 |
| C | Placer (MC) | Winter | 2023 | 327.55              | 379.99 | 445.95 | 567.78 | 73.55                 | 85.54 | 100.90 | 127.30 |
| C | Placer (MC) | Winter | 2024 | 327.53              | 379.99 | 445.89 | 567.83 | 73.57                 | 85.59 | 100.94 | 127.43 |
| C | Placer (MC) | Winter | 2025 | 327.51              | 380.02 | 445.84 | 567.94 | 73.59                 | 85.65 | 100.97 | 127.57 |
| C | Placer (MC) | Winter | 2026 | 327.52              | 380.10 | 445.77 | 568.08 | 73.61                 | 85.72 | 100.99 | 127.72 |
| C | Placer (MC) | Winter | 2027 | 327.53              | 380.18 | 445.70 | 568.22 | 73.62                 | 85.78 | 101.01 | 127.85 |
| C | Placer (MC) | Winter | 2028 | 327.53              | 380.27 | 445.62 | 568.36 | 73.63                 | 85.85 | 101.01 | 127.97 |
| C | Placer (MC) | Winter | 2029 | 327.53              | 380.35 | 445.52 | 568.53 | 73.64                 | 85.91 | 101.01 | 128.09 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Placer (MC) | Winter | 2030 | 327.52             | 380.43 | 445.39 | 568.71 | 73.64                 | 85.96 | 100.98 | 128.21 |
| C | Placer (MC) | Winter | 2031 | 327.52             | 380.52 | 445.34 | 568.92 | 73.65                 | 86.02 | 100.99 | 128.33 |
| C | Placer (MC) | Winter | 2032 | 327.51             | 380.60 | 445.29 | 569.15 | 73.66                 | 86.07 | 100.99 | 128.45 |
| C | Placer (MC) | Winter | 2033 | 327.51             | 380.67 | 445.26 | 569.35 | 73.66                 | 86.12 | 100.99 | 128.57 |
| C | Placer (MC) | Winter | 2034 | 327.50             | 380.74 | 445.22 | 569.54 | 73.67                 | 86.17 | 100.99 | 128.67 |
| C | Placer (MC) | Winter | 2035 | 327.50             | 380.79 | 445.19 | 569.71 | 73.67                 | 86.20 | 101.00 | 128.78 |
| C | Placer (SV) | Annual | 2010 | 330.73             | 381.91 | 453.82 | 574.66 | 73.02                 | 85.63 | 99.77  | 125.72 |
| C | Placer (SV) | Annual | 2011 | 330.94             | 382.54 | 453.73 | 575.15 | 73.00                 | 85.31 | 99.84  | 125.93 |
| C | Placer (SV) | Annual | 2012 | 331.14             | 383.12 | 453.66 | 575.67 | 72.98                 | 85.12 | 99.94  | 126.16 |
| C | Placer (SV) | Annual | 2013 | 331.36             | 383.59 | 453.61 | 576.19 | 73.02                 | 84.98 | 100.04 | 126.39 |
| C | Placer (SV) | Annual | 2014 | 331.54             | 384.02 | 453.59 | 576.71 | 73.02                 | 84.89 | 100.12 | 126.62 |
| C | Placer (SV) | Annual | 2015 | 331.72             | 384.39 | 453.58 | 577.22 | 73.07                 | 84.82 | 100.20 | 126.84 |
| C | Placer (SV) | Annual | 2016 | 331.89             | 384.74 | 453.58 | 577.72 | 73.15                 | 84.80 | 100.28 | 127.07 |
| C | Placer (SV) | Annual | 2017 | 332.02             | 385.03 | 453.57 | 578.18 | 73.21                 | 84.75 | 100.34 | 127.30 |
| C | Placer (SV) | Annual | 2018 | 332.13             | 385.29 | 453.57 | 578.57 | 73.26                 | 84.74 | 100.42 | 127.51 |
| C | Placer (SV) | Annual | 2019 | 331.61             | 384.84 | 452.75 | 577.85 | 73.32                 | 84.86 | 100.50 | 127.69 |
| C | Placer (SV) | Annual | 2020 | 331.69             | 385.06 | 452.74 | 578.14 | 73.41                 | 84.99 | 100.58 | 127.86 |
| C | Placer (SV) | Annual | 2021 | 331.75             | 385.26 | 452.73 | 578.36 | 73.48                 | 85.13 | 100.66 | 127.99 |
| C | Placer (SV) | Annual | 2022 | 331.79             | 385.43 | 452.72 | 578.54 | 73.53                 | 85.25 | 100.72 | 128.10 |
| C | Placer (SV) | Annual | 2023 | 331.81             | 385.56 | 452.70 | 578.69 | 73.57                 | 85.36 | 100.78 | 128.24 |
| C | Placer (SV) | Annual | 2024 | 331.82             | 385.67 | 452.69 | 578.81 | 73.59                 | 85.45 | 100.82 | 128.36 |
| C | Placer (SV) | Annual | 2025 | 331.83             | 385.78 | 452.68 | 578.93 | 73.61                 | 85.53 | 100.86 | 128.48 |
| C | Placer (SV) | Annual | 2026 | 331.85             | 385.89 | 452.67 | 579.04 | 73.63                 | 85.62 | 100.89 | 128.59 |
| C | Placer (SV) | Annual | 2027 | 331.87             | 385.99 | 452.65 | 579.14 | 73.64                 | 85.69 | 100.92 | 128.68 |
| C | Placer (SV) | Annual | 2028 | 331.88             | 386.10 | 452.64 | 579.25 | 73.65                 | 85.75 | 100.94 | 128.77 |
| C | Placer (SV) | Annual | 2029 | 331.89             | 386.21 | 452.63 | 579.35 | 73.66                 | 85.82 | 100.95 | 128.85 |
| C | Placer (SV) | Annual | 2030 | 331.89             | 386.32 | 452.63 | 579.46 | 73.67                 | 85.88 | 100.96 | 128.92 |
| C | Placer (SV) | Annual | 2031 | 331.90             | 386.42 | 452.62 | 579.56 | 73.67                 | 85.94 | 100.97 | 128.99 |
| C | Placer (SV) | Annual | 2032 | 331.90             | 386.52 | 452.61 | 579.67 | 73.67                 | 85.99 | 100.97 | 129.06 |
| C | Placer (SV) | Annual | 2033 | 331.90             | 386.60 | 452.61 | 579.77 | 73.68                 | 86.04 | 100.98 | 129.12 |
| C | Placer (SV) | Annual | 2034 | 331.90             | 386.68 | 452.60 | 579.86 | 73.68                 | 86.08 | 100.99 | 129.18 |
| C | Placer (SV) | Annual | 2035 | 331.90             | 386.73 | 452.60 | 579.94 | 73.68                 | 86.12 | 100.99 | 129.23 |
| C | Placer (SV) | Summer | 2010 | 369.31             | 422.83 | 505.21 | 639.49 | 73.02                 | 85.63 | 99.77  | 125.72 |
| C | Placer (SV) | Summer | 2011 | 369.67             | 424.09 | 505.18 | 639.85 | 73.00                 | 85.31 | 99.84  | 125.93 |
| C | Placer (SV) | Summer | 2012 | 369.99             | 425.15 | 505.19 | 640.33 | 72.98                 | 85.12 | 99.94  | 126.16 |
| C | Placer (SV) | Summer | 2013 | 370.30             | 425.98 | 505.22 | 640.88 | 73.02                 | 84.98 | 100.04 | 126.39 |
| C | Placer (SV) | Summer | 2014 | 370.56             | 426.69 | 505.30 | 641.49 | 73.02                 | 84.89 | 100.12 | 126.62 |
| C | Placer (SV) | Summer | 2015 | 370.79             | 427.26 | 505.37 | 642.12 | 73.07                 | 84.82 | 100.20 | 126.84 |
| C | Placer (SV) | Summer | 2016 | 370.99             | 427.77 | 505.47 | 642.78 | 73.15                 | 84.80 | 100.28 | 127.07 |
| C | Placer (SV) | Summer | 2017 | 371.13             | 428.22 | 505.53 | 643.41 | 73.21                 | 84.75 | 100.34 | 127.30 |
| C | Placer (SV) | Summer | 2018 | 371.24             | 428.59 | 505.55 | 643.93 | 73.26                 | 84.74 | 100.42 | 127.51 |
| C | Placer (SV) | Summer | 2019 | 370.64             | 428.12 | 504.63 | 643.16 | 73.32                 | 84.86 | 100.50 | 127.69 |
| C | Placer (SV) | Summer | 2020 | 370.71             | 428.40 | 504.60 | 643.51 | 73.41                 | 84.99 | 100.58 | 127.86 |
| C | Placer (SV) | Summer | 2021 | 370.75             | 428.64 | 504.55 | 643.79 | 73.48                 | 85.13 | 100.66 | 127.99 |
| C | Placer (SV) | Summer | 2022 | 370.78             | 428.85 | 504.51 | 644.02 | 73.53                 | 85.25 | 100.72 | 128.10 |
| C | Placer (SV) | Summer | 2023 | 370.81             | 429.03 | 504.48 | 644.20 | 73.57                 | 85.36 | 100.78 | 128.24 |
| C | Placer (SV) | Summer | 2024 | 370.81             | 429.19 | 504.44 | 644.33 | 73.59                 | 85.45 | 100.82 | 128.36 |
| C | Placer (SV) | Summer | 2025 | 370.82             | 429.33 | 504.41 | 644.45 | 73.61                 | 85.53 | 100.86 | 128.48 |
| C | Placer (SV) | Summer | 2026 | 370.84             | 429.49 | 504.38 | 644.55 | 73.63                 | 85.62 | 100.89 | 128.59 |
| C | Placer (SV) | Summer | 2027 | 370.86             | 429.64 | 504.37 | 644.64 | 73.64                 | 85.69 | 100.92 | 128.68 |
| C | Placer (SV) | Summer | 2028 | 370.88             | 429.80 | 504.36 | 644.75 | 73.65                 | 85.75 | 100.94 | 128.77 |
| C | Placer (SV) | Summer | 2029 | 370.90             | 429.96 | 504.35 | 644.85 | 73.66                 | 85.82 | 100.95 | 128.85 |
| C | Placer (SV) | Summer | 2030 | 370.91             | 430.12 | 504.35 | 644.96 | 73.67                 | 85.88 | 100.96 | 128.92 |
| C | Placer (SV) | Summer | 2031 | 370.92             | 430.27 | 504.34 | 645.06 | 73.67                 | 85.94 | 100.97 | 128.99 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Placer (SV) | Summer | 2032 | 370.92             | 430.41 | 504.33 | 645.17 | 73.67                 | 85.99 | 100.97 | 129.06 |
| C | Placer (SV) | Summer | 2033 | 370.93             | 430.52 | 504.33 | 645.28 | 73.68                 | 86.04 | 100.98 | 129.12 |
| C | Placer (SV) | Summer | 2034 | 370.93             | 430.61 | 504.33 | 645.39 | 73.68                 | 86.08 | 100.99 | 129.18 |
| C | Placer (SV) | Summer | 2035 | 370.92             | 430.68 | 504.32 | 645.50 | 73.68                 | 86.12 | 100.99 | 129.23 |
| C | Placer (SV) | Winter | 2010 | 320.40             | 370.94 | 440.06 | 557.29 | 73.02                 | 85.63 | 99.77  | 125.72 |
| C | Placer (SV) | Winter | 2011 | 320.57             | 371.41 | 439.94 | 557.81 | 73.00                 | 85.31 | 99.84  | 125.93 |
| C | Placer (SV) | Winter | 2012 | 320.73             | 371.86 | 439.86 | 558.35 | 72.98                 | 85.12 | 99.94  | 126.16 |
| C | Placer (SV) | Winter | 2013 | 320.93             | 372.24 | 439.79 | 558.86 | 73.02                 | 84.98 | 100.04 | 126.39 |
| C | Placer (SV) | Winter | 2014 | 321.08             | 372.59 | 439.74 | 559.36 | 73.02                 | 84.89 | 100.12 | 126.62 |
| C | Placer (SV) | Winter | 2015 | 321.25             | 372.91 | 439.70 | 559.84 | 73.07                 | 84.82 | 100.20 | 126.84 |
| C | Placer (SV) | Winter | 2016 | 321.42             | 373.21 | 439.68 | 560.29 | 73.15                 | 84.80 | 100.28 | 127.07 |
| C | Placer (SV) | Winter | 2017 | 321.54             | 373.46 | 439.65 | 560.71 | 73.21                 | 84.75 | 100.34 | 127.30 |
| C | Placer (SV) | Winter | 2018 | 321.65             | 373.69 | 439.64 | 561.06 | 73.26                 | 84.74 | 100.42 | 127.51 |
| C | Placer (SV) | Winter | 2019 | 321.15             | 373.25 | 438.84 | 560.35 | 73.32                 | 84.86 | 100.50 | 127.69 |
| C | Placer (SV) | Winter | 2020 | 321.23             | 373.45 | 438.84 | 560.62 | 73.41                 | 84.99 | 100.58 | 127.86 |
| C | Placer (SV) | Winter | 2021 | 321.29             | 373.63 | 438.84 | 560.82 | 73.48                 | 85.13 | 100.66 | 127.99 |
| C | Placer (SV) | Winter | 2022 | 321.34             | 373.79 | 438.83 | 561.00 | 73.53                 | 85.25 | 100.72 | 128.10 |
| C | Placer (SV) | Winter | 2023 | 321.36             | 373.92 | 438.83 | 561.14 | 73.57                 | 85.36 | 100.78 | 128.24 |
| C | Placer (SV) | Winter | 2024 | 321.37             | 374.01 | 438.82 | 561.25 | 73.59                 | 85.45 | 100.82 | 128.36 |
| C | Placer (SV) | Winter | 2025 | 321.38             | 374.10 | 438.82 | 561.37 | 73.61                 | 85.53 | 100.86 | 128.48 |
| C | Placer (SV) | Winter | 2026 | 321.40             | 374.20 | 438.81 | 561.48 | 73.63                 | 85.62 | 100.89 | 128.59 |
| C | Placer (SV) | Winter | 2027 | 321.42             | 374.30 | 438.80 | 561.59 | 73.64                 | 85.69 | 100.92 | 128.68 |
| C | Placer (SV) | Winter | 2028 | 321.43             | 374.39 | 438.79 | 561.70 | 73.65                 | 85.75 | 100.94 | 128.77 |
| C | Placer (SV) | Winter | 2029 | 321.43             | 374.48 | 438.78 | 561.80 | 73.66                 | 85.82 | 100.95 | 128.85 |
| C | Placer (SV) | Winter | 2030 | 321.44             | 374.58 | 438.77 | 561.91 | 73.67                 | 85.88 | 100.96 | 128.92 |
| C | Placer (SV) | Winter | 2031 | 321.44             | 374.67 | 438.76 | 562.01 | 73.67                 | 85.94 | 100.97 | 128.99 |
| C | Placer (SV) | Winter | 2032 | 321.44             | 374.76 | 438.76 | 562.12 | 73.67                 | 85.99 | 100.97 | 129.06 |
| C | Placer (SV) | Winter | 2033 | 321.45             | 374.83 | 438.75 | 562.21 | 73.68                 | 86.04 | 100.98 | 129.12 |
| C | Placer (SV) | Winter | 2034 | 321.45             | 374.90 | 438.74 | 562.30 | 73.68                 | 86.08 | 100.99 | 129.18 |
| C | Placer (SV) | Winter | 2035 | 321.44             | 374.96 | 438.74 | 562.37 | 73.68                 | 86.12 | 100.99 | 129.23 |
| C | Plumas (MC) | Annual | 2010 | 383.48             | 448.24 | 524.45 | 653.78 | 74.50                 | 93.88 | 101.47 | 124.70 |
| C | Plumas (MC) | Annual | 2011 | 383.12             | 447.42 | 523.71 | 654.62 | 74.27                 | 92.26 | 101.32 | 124.82 |
| C | Plumas (MC) | Annual | 2012 | 382.79             | 446.84 | 523.14 | 655.56 | 73.97                 | 91.08 | 101.21 | 124.99 |
| C | Plumas (MC) | Annual | 2013 | 382.71             | 446.31 | 522.67 | 656.57 | 73.86                 | 90.01 | 101.00 | 125.19 |
| C | Plumas (MC) | Annual | 2014 | 382.50             | 445.90 | 522.32 | 657.55 | 73.59                 | 89.13 | 100.92 | 125.40 |
| C | Plumas (MC) | Annual | 2015 | 382.45             | 445.52 | 522.05 | 658.55 | 73.48                 | 88.27 | 100.95 | 125.66 |
| C | Plumas (MC) | Annual | 2016 | 382.50             | 445.23 | 521.82 | 659.51 | 73.48                 | 87.57 | 100.95 | 125.92 |
| C | Plumas (MC) | Annual | 2017 | 382.49             | 444.92 | 521.63 | 660.38 | 73.43                 | 86.78 | 100.84 | 126.20 |
| C | Plumas (MC) | Annual | 2018 | 382.47             | 444.69 | 521.48 | 661.15 | 73.38                 | 86.22 | 100.83 | 126.45 |
| C | Plumas (MC) | Annual | 2019 | 382.41             | 444.56 | 521.35 | 661.77 | 73.32                 | 85.87 | 100.81 | 126.70 |
| C | Plumas (MC) | Annual | 2020 | 382.39             | 444.47 | 521.25 | 662.32 | 73.39                 | 85.75 | 100.84 | 126.93 |
| C | Plumas (MC) | Annual | 2021 | 382.31             | 444.37 | 521.14 | 662.71 | 73.42                 | 85.71 | 100.88 | 127.10 |
| C | Plumas (MC) | Annual | 2022 | 382.11             | 444.28 | 521.03 | 663.00 | 73.41                 | 85.69 | 100.91 | 127.19 |
| C | Plumas (MC) | Annual | 2023 | 381.98             | 444.15 | 520.94 | 663.22 | 73.42                 | 85.64 | 100.93 | 127.37 |
| C | Plumas (MC) | Annual | 2024 | 381.82             | 444.05 | 520.85 | 663.39 | 73.40                 | 85.62 | 100.95 | 127.54 |
| C | Plumas (MC) | Annual | 2025 | 381.72             | 444.07 | 520.79 | 663.57 | 73.41                 | 85.67 | 100.98 | 127.71 |
| C | Plumas (MC) | Annual | 2026 | 381.70             | 444.20 | 520.72 | 663.78 | 73.43                 | 85.76 | 101.00 | 127.87 |
| C | Plumas (MC) | Annual | 2027 | 381.70             | 444.30 | 520.66 | 664.00 | 73.44                 | 85.84 | 101.01 | 128.03 |
| C | Plumas (MC) | Annual | 2028 | 381.68             | 444.43 | 520.60 | 664.24 | 73.45                 | 85.91 | 101.02 | 128.17 |
| C | Plumas (MC) | Annual | 2029 | 381.63             | 444.54 | 520.52 | 664.46 | 73.45                 | 85.98 | 101.01 | 128.30 |
| C | Plumas (MC) | Annual | 2030 | 381.60             | 444.65 | 520.45 | 664.68 | 73.45                 | 86.04 | 101.01 | 128.43 |
| C | Plumas (MC) | Annual | 2031 | 381.59             | 444.76 | 520.41 | 664.95 | 73.46                 | 86.10 | 101.01 | 128.56 |
| C | Plumas (MC) | Annual | 2032 | 381.58             | 444.86 | 520.38 | 665.22 | 73.46                 | 86.16 | 101.01 | 128.68 |
| C | Plumas (MC) | Annual | 2033 | 381.57             | 444.95 | 520.36 | 665.45 | 73.47                 | 86.21 | 101.01 | 128.79 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Plumas (MC) | Annual | 2034 | 381.56             | 445.03 | 520.33 | 665.67 | 73.47                 | 86.26 | 101.02 | 128.89 |
| C | Plumas (MC) | Annual | 2035 | 381.55             | 445.09 | 520.31 | 665.86 | 73.47                 | 86.30 | 101.02 | 128.98 |
| C | Plumas (MC) | Summer | 2010 | 408.76             | 472.90 | 558.33 | 694.63 | 74.50                 | 93.88 | 101.47 | 124.70 |
| C | Plumas (MC) | Summer | 2011 | 408.75             | 473.23 | 557.90 | 695.71 | 74.27                 | 92.26 | 101.32 | 124.82 |
| C | Plumas (MC) | Summer | 2012 | 408.69             | 473.46 | 557.59 | 696.96 | 73.97                 | 91.08 | 101.21 | 124.99 |
| C | Plumas (MC) | Summer | 2013 | 408.80             | 473.57 | 557.38 | 698.32 | 73.86                 | 90.01 | 101.00 | 125.19 |
| C | Plumas (MC) | Summer | 2014 | 408.76             | 473.64 | 557.21 | 699.63 | 73.59                 | 89.13 | 100.92 | 125.40 |
| C | Plumas (MC) | Summer | 2015 | 408.82             | 473.68 | 557.08 | 701.00 | 73.48                 | 88.27 | 100.95 | 125.66 |
| C | Plumas (MC) | Summer | 2016 | 408.94             | 473.71 | 556.97 | 702.30 | 73.48                 | 87.57 | 100.95 | 125.92 |
| C | Plumas (MC) | Summer | 2017 | 408.96             | 473.70 | 556.88 | 703.46 | 73.43                 | 86.78 | 100.84 | 126.20 |
| C | Plumas (MC) | Summer | 2018 | 408.94             | 473.67 | 556.77 | 704.48 | 73.38                 | 86.22 | 100.83 | 126.45 |
| C | Plumas (MC) | Summer | 2019 | 408.89             | 473.69 | 556.67 | 705.32 | 73.32                 | 85.87 | 100.81 | 126.70 |
| C | Plumas (MC) | Summer | 2020 | 408.86             | 473.73 | 556.58 | 706.05 | 73.39                 | 85.75 | 100.84 | 126.93 |
| C | Plumas (MC) | Summer | 2021 | 408.78             | 473.74 | 556.48 | 706.60 | 73.42                 | 85.71 | 100.88 | 127.10 |
| C | Plumas (MC) | Summer | 2022 | 408.58             | 473.77 | 556.38 | 707.04 | 73.41                 | 85.69 | 100.91 | 127.19 |
| C | Plumas (MC) | Summer | 2023 | 408.46             | 473.75 | 556.30 | 707.36 | 73.42                 | 85.64 | 100.93 | 127.37 |
| C | Plumas (MC) | Summer | 2024 | 408.30             | 473.76 | 556.22 | 707.63 | 73.40                 | 85.62 | 100.95 | 127.54 |
| C | Plumas (MC) | Summer | 2025 | 408.21             | 473.84 | 556.16 | 707.88 | 73.41                 | 85.67 | 100.98 | 127.71 |
| C | Plumas (MC) | Summer | 2026 | 408.22             | 474.03 | 556.10 | 708.13 | 73.43                 | 85.76 | 101.00 | 127.87 |
| C | Plumas (MC) | Summer | 2027 | 408.23             | 474.17 | 556.06 | 708.38 | 73.44                 | 85.84 | 101.01 | 128.03 |
| C | Plumas (MC) | Summer | 2028 | 408.23             | 474.35 | 556.02 | 708.66 | 73.45                 | 85.91 | 101.02 | 128.17 |
| C | Plumas (MC) | Summer | 2029 | 408.21             | 474.53 | 555.96 | 708.94 | 73.45                 | 85.98 | 101.01 | 128.30 |
| C | Plumas (MC) | Summer | 2030 | 408.20             | 474.69 | 555.90 | 709.22 | 73.45                 | 86.04 | 101.01 | 128.43 |
| C | Plumas (MC) | Summer | 2031 | 408.20             | 474.85 | 555.87 | 709.55 | 73.46                 | 86.10 | 101.01 | 128.56 |
| C | Plumas (MC) | Summer | 2032 | 408.20             | 474.98 | 555.85 | 709.87 | 73.46                 | 86.16 | 101.01 | 128.68 |
| C | Plumas (MC) | Summer | 2033 | 408.19             | 475.10 | 555.83 | 710.16 | 73.47                 | 86.21 | 101.01 | 128.79 |
| C | Plumas (MC) | Summer | 2034 | 408.18             | 475.21 | 555.80 | 710.43 | 73.47                 | 86.26 | 101.02 | 128.89 |
| C | Plumas (MC) | Summer | 2035 | 408.16             | 475.28 | 555.78 | 710.66 | 73.47                 | 86.30 | 101.02 | 128.98 |
| C | Plumas (MC) | Winter | 2010 | 378.05             | 442.95 | 517.17 | 645.01 | 74.50                 | 93.88 | 101.47 | 124.70 |
| C | Plumas (MC) | Winter | 2011 | 377.62             | 441.88 | 516.37 | 645.79 | 74.27                 | 92.26 | 101.32 | 124.82 |
| C | Plumas (MC) | Winter | 2012 | 377.22             | 441.12 | 515.74 | 646.67 | 73.97                 | 91.08 | 101.21 | 124.99 |
| C | Plumas (MC) | Winter | 2013 | 377.10             | 440.45 | 515.22 | 647.61 | 73.86                 | 90.01 | 101.00 | 125.19 |
| C | Plumas (MC) | Winter | 2014 | 376.86             | 439.94 | 514.83 | 648.51 | 73.59                 | 89.13 | 100.92 | 125.40 |
| C | Plumas (MC) | Winter | 2015 | 376.79             | 439.47 | 514.52 | 649.44 | 73.48                 | 88.27 | 100.95 | 125.66 |
| C | Plumas (MC) | Winter | 2016 | 376.82             | 439.11 | 514.28 | 650.32 | 73.48                 | 87.57 | 100.95 | 125.92 |
| C | Plumas (MC) | Winter | 2017 | 376.81             | 438.74 | 514.06 | 651.13 | 73.43                 | 86.78 | 100.84 | 126.20 |
| C | Plumas (MC) | Winter | 2018 | 376.78             | 438.47 | 513.90 | 651.84 | 73.38                 | 86.22 | 100.83 | 126.45 |
| C | Plumas (MC) | Winter | 2019 | 376.73             | 438.30 | 513.77 | 652.42 | 73.32                 | 85.87 | 100.81 | 126.70 |
| C | Plumas (MC) | Winter | 2020 | 376.70             | 438.19 | 513.66 | 652.93 | 73.39                 | 85.75 | 100.84 | 126.93 |
| C | Plumas (MC) | Winter | 2021 | 376.63             | 438.06 | 513.55 | 653.29 | 73.42                 | 85.71 | 100.88 | 127.10 |
| C | Plumas (MC) | Winter | 2022 | 376.42             | 437.94 | 513.44 | 653.55 | 73.41                 | 85.69 | 100.91 | 127.19 |
| C | Plumas (MC) | Winter | 2023 | 376.29             | 437.79 | 513.34 | 653.74 | 73.42                 | 85.64 | 100.93 | 127.37 |
| C | Plumas (MC) | Winter | 2024 | 376.13             | 437.66 | 513.26 | 653.89 | 73.40                 | 85.62 | 100.95 | 127.54 |
| C | Plumas (MC) | Winter | 2025 | 376.03             | 437.68 | 513.20 | 654.05 | 73.41                 | 85.67 | 100.98 | 127.71 |
| C | Plumas (MC) | Winter | 2026 | 376.01             | 437.79 | 513.12 | 654.25 | 73.43                 | 85.76 | 101.00 | 127.87 |
| C | Plumas (MC) | Winter | 2027 | 376.00             | 437.89 | 513.06 | 654.47 | 73.44                 | 85.84 | 101.01 | 128.03 |
| C | Plumas (MC) | Winter | 2028 | 375.97             | 438.00 | 513.00 | 654.70 | 73.45                 | 85.91 | 101.02 | 128.17 |
| C | Plumas (MC) | Winter | 2029 | 375.92             | 438.10 | 512.91 | 654.91 | 73.45                 | 85.98 | 101.01 | 128.30 |
| C | Plumas (MC) | Winter | 2030 | 375.89             | 438.20 | 512.83 | 655.12 | 73.45                 | 86.04 | 101.01 | 128.43 |
| C | Plumas (MC) | Winter | 2031 | 375.88             | 438.30 | 512.79 | 655.37 | 73.46                 | 86.10 | 101.01 | 128.56 |
| C | Plumas (MC) | Winter | 2032 | 375.87             | 438.39 | 512.76 | 655.62 | 73.46                 | 86.16 | 101.01 | 128.68 |
| C | Plumas (MC) | Winter | 2033 | 375.86             | 438.47 | 512.74 | 655.85 | 73.47                 | 86.21 | 101.01 | 128.79 |
| C | Plumas (MC) | Winter | 2034 | 375.85             | 438.54 | 512.72 | 656.06 | 73.47                 | 86.26 | 101.02 | 128.89 |
| C | Plumas (MC) | Winter | 2035 | 375.84             | 438.60 | 512.70 | 656.24 | 73.47                 | 86.30 | 101.02 | 128.98 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Riverside (MD/MDAQMD) | Annual | 2010 | 369.67             | 426.53 | 505.92 | 638.18 | 73.80                 | 88.32 | 101.83 | 126.09 |
| C | Riverside (MD/MDAQMD) | Annual | 2011 | 363.13             | 419.45 | 496.23 | 627.22 | 73.74                 | 87.52 | 101.71 | 126.32 |
| C | Riverside (MD/MDAQMD) | Annual | 2012 | 363.45             | 420.07 | 495.98 | 628.06 | 73.81                 | 87.02 | 101.53 | 126.58 |
| C | Riverside (MD/MDAQMD) | Annual | 2013 | 355.83             | 411.52 | 485.10 | 615.48 | 73.74                 | 86.56 | 101.33 | 126.89 |
| C | Riverside (MD/MDAQMD) | Annual | 2014 | 356.04             | 411.97 | 484.98 | 616.31 | 73.77                 | 86.37 | 101.22 | 127.18 |
| C | Riverside (MD/MDAQMD) | Annual | 2015 | 343.49             | 397.67 | 467.64 | 595.16 | 73.80                 | 86.23 | 101.12 | 127.47 |
| C | Riverside (MD/MDAQMD) | Annual | 2016 | 343.62             | 397.92 | 467.57 | 595.81 | 73.85                 | 86.05 | 100.99 | 127.72 |
| C | Riverside (MD/MDAQMD) | Annual | 2017 | 343.68             | 398.10 | 467.49 | 596.37 | 73.82                 | 85.88 | 100.89 | 127.96 |
| C | Riverside (MD/MDAQMD) | Annual | 2018 | 343.71             | 398.23 | 467.40 | 596.79 | 73.83                 | 85.77 | 100.94 | 128.17 |
| C | Riverside (MD/MDAQMD) | Annual | 2019 | 342.93             | 397.41 | 466.27 | 595.71 | 73.85                 | 85.71 | 100.91 | 128.35 |
| C | Riverside (MD/MDAQMD) | Annual | 2020 | 342.93             | 397.49 | 466.18 | 595.93 | 73.90                 | 85.74 | 100.94 | 128.50 |
| C | Riverside (MD/MDAQMD) | Annual | 2021 | 341.38             | 395.73 | 464.03 | 593.37 | 73.93                 | 85.79 | 100.97 | 128.60 |
| C | Riverside (MD/MDAQMD) | Annual | 2022 | 341.32             | 395.69 | 463.91 | 593.40 | 73.94                 | 85.82 | 100.98 | 128.68 |
| C | Riverside (MD/MDAQMD) | Annual | 2023 | 341.26             | 395.69 | 463.82 | 593.44 | 73.95                 | 85.86 | 100.99 | 128.77 |
| C | Riverside (MD/MDAQMD) | Annual | 2024 | 341.57             | 396.13 | 464.28 | 594.16 | 73.95                 | 85.89 | 101.00 | 128.86 |
| C | Riverside (MD/MDAQMD) | Annual | 2025 | 341.55             | 396.17 | 464.23 | 594.18 | 73.95                 | 85.94 | 101.02 | 128.94 |
| C | Riverside (MD/MDAQMD) | Annual | 2026 | 341.54             | 396.24 | 464.17 | 594.20 | 73.96                 | 86.00 | 101.02 | 129.01 |
| C | Riverside (MD/MDAQMD) | Annual | 2027 | 341.55             | 396.33 | 464.13 | 594.25 | 73.97                 | 86.05 | 101.03 | 129.07 |
| C | Riverside (MD/MDAQMD) | Annual | 2028 | 341.55             | 396.42 | 464.10 | 594.31 | 73.97                 | 86.10 | 101.03 | 129.13 |
| C | Riverside (MD/MDAQMD) | Annual | 2029 | 341.56             | 396.52 | 464.08 | 594.39 | 73.97                 | 86.15 | 101.04 | 129.19 |
| C | Riverside (MD/MDAQMD) | Annual | 2030 | 341.57             | 396.62 | 464.07 | 594.47 | 73.98                 | 86.19 | 101.04 | 129.24 |
| C | Riverside (MD/MDAQMD) | Annual | 2031 | 341.64             | 396.78 | 464.16 | 594.65 | 73.98                 | 86.23 | 101.04 | 129.28 |
| C | Riverside (MD/MDAQMD) | Annual | 2032 | 341.65             | 396.86 | 464.15 | 594.71 | 73.98                 | 86.26 | 101.04 | 129.33 |
| C | Riverside (MD/MDAQMD) | Annual | 2033 | 341.65             | 396.92 | 464.14 | 594.77 | 73.98                 | 86.29 | 101.05 | 129.37 |
| C | Riverside (MD/MDAQMD) | Annual | 2034 | 341.65             | 396.98 | 464.13 | 594.83 | 73.99                 | 86.32 | 101.05 | 129.40 |
| C | Riverside (MD/MDAQMD) | Annual | 2035 | 341.65             | 397.03 | 464.13 | 594.88 | 73.99                 | 86.34 | 101.05 | 129.43 |
| C | Riverside (MD/MDAQMD) | Summer | 2010 | 377.81             | 434.15 | 516.42 | 651.64 | 73.80                 | 88.32 | 101.83 | 126.09 |
| C | Riverside (MD/MDAQMD) | Summer | 2011 | 371.35             | 427.52 | 506.84 | 640.74 | 73.74                 | 87.52 | 101.71 | 126.32 |
| C | Riverside (MD/MDAQMD) | Summer | 2012 | 371.72             | 428.43 | 506.69 | 641.64 | 73.81                 | 87.02 | 101.53 | 126.58 |
| C | Riverside (MD/MDAQMD) | Summer | 2013 | 364.01             | 420.00 | 495.73 | 628.91 | 73.74                 | 86.56 | 101.33 | 126.89 |
| C | Riverside (MD/MDAQMD) | Summer | 2014 | 364.25             | 420.62 | 495.68 | 629.84 | 73.77                 | 86.37 | 101.22 | 127.18 |
| C | Riverside (MD/MDAQMD) | Summer | 2015 | 351.17             | 405.87 | 477.68 | 607.85 | 73.80                 | 86.23 | 101.12 | 127.47 |
| C | Riverside (MD/MDAQMD) | Summer | 2016 | 351.32             | 406.21 | 477.66 | 608.58 | 73.85                 | 86.05 | 100.99 | 127.72 |
| C | Riverside (MD/MDAQMD) | Summer | 2017 | 351.38             | 406.47 | 477.62 | 609.19 | 73.82                 | 85.88 | 100.89 | 127.96 |
| C | Riverside (MD/MDAQMD) | Summer | 2018 | 351.42             | 406.65 | 477.53 | 609.64 | 73.83                 | 85.77 | 100.94 | 128.17 |
| C | Riverside (MD/MDAQMD) | Summer | 2019 | 350.38             | 405.58 | 476.07 | 608.16 | 73.85                 | 85.71 | 100.91 | 128.35 |
| C | Riverside (MD/MDAQMD) | Summer | 2020 | 350.37             | 405.69 | 475.97 | 608.38 | 73.90                 | 85.74 | 100.94 | 128.50 |
| C | Riverside (MD/MDAQMD) | Summer | 2021 | 348.75             | 403.88 | 473.74 | 605.72 | 73.93                 | 85.79 | 100.97 | 128.60 |
| C | Riverside (MD/MDAQMD) | Summer | 2022 | 348.67             | 403.84 | 473.61 | 605.74 | 73.94                 | 85.82 | 100.98 | 128.68 |
| C | Riverside (MD/MDAQMD) | Summer | 2023 | 348.60             | 403.83 | 473.50 | 605.75 | 73.95                 | 85.86 | 100.99 | 128.77 |
| C | Riverside (MD/MDAQMD) | Summer | 2024 | 348.76             | 404.12 | 473.75 | 606.20 | 73.95                 | 85.89 | 101.00 | 128.86 |
| C | Riverside (MD/MDAQMD) | Summer | 2025 | 348.73             | 404.15 | 473.70 | 606.22 | 73.95                 | 85.94 | 101.02 | 128.94 |
| C | Riverside (MD/MDAQMD) | Summer | 2026 | 348.72             | 404.23 | 473.62 | 606.22 | 73.96                 | 86.00 | 101.02 | 129.01 |
| C | Riverside (MD/MDAQMD) | Summer | 2027 | 348.73             | 404.32 | 473.59 | 606.26 | 73.97                 | 86.05 | 101.03 | 129.07 |
| C | Riverside (MD/MDAQMD) | Summer | 2028 | 348.74             | 404.42 | 473.56 | 606.32 | 73.97                 | 86.10 | 101.03 | 129.13 |
| C | Riverside (MD/MDAQMD) | Summer | 2029 | 348.75             | 404.53 | 473.55 | 606.40 | 73.97                 | 86.15 | 101.04 | 129.19 |
| C | Riverside (MD/MDAQMD) | Summer | 2030 | 348.77             | 404.64 | 473.54 | 606.49 | 73.98                 | 86.19 | 101.04 | 129.24 |
| C | Riverside (MD/MDAQMD) | Summer | 2031 | 348.83             | 404.79 | 473.62 | 606.65 | 73.98                 | 86.23 | 101.04 | 129.28 |
| C | Riverside (MD/MDAQMD) | Summer | 2032 | 348.84             | 404.88 | 473.60 | 606.70 | 73.98                 | 86.26 | 101.04 | 129.33 |
| C | Riverside (MD/MDAQMD) | Summer | 2033 | 348.84             | 404.95 | 473.59 | 606.76 | 73.98                 | 86.29 | 101.05 | 129.37 |
| C | Riverside (MD/MDAQMD) | Summer | 2034 | 348.84             | 405.01 | 473.58 | 606.82 | 73.99                 | 86.32 | 101.05 | 129.40 |
| C | Riverside (MD/MDAQMD) | Summer | 2035 | 348.84             | 405.06 | 473.57 | 606.88 | 73.99                 | 86.34 | 101.05 | 129.43 |
| C | Riverside (MD/MDAQMD) | Winter | 2010 | 370.14             | 426.97 | 506.53 | 638.95 | 73.80                 | 88.32 | 101.83 | 126.09 |
| C | Riverside (MD/MDAQMD) | Winter | 2011 | 363.52             | 419.84 | 496.74 | 627.87 | 73.74                 | 87.52 | 101.71 | 126.32 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Riverside (MD/MDAQMD) | Winter | 2012 | 363.85             | 420.46 | 496.49 | 628.71 | 73.81                 | 87.02 | 101.53 | 126.58 |
| C | Riverside (MD/MDAQMD) | Winter | 2013 | 356.20             | 411.90 | 485.58 | 616.08 | 73.74                 | 86.56 | 101.33 | 126.89 |
| C | Riverside (MD/MDAQMD) | Winter | 2014 | 356.41             | 412.36 | 485.46 | 616.93 | 73.77                 | 86.37 | 101.22 | 127.18 |
| C | Riverside (MD/MDAQMD) | Winter | 2015 | 343.96             | 398.17 | 468.25 | 595.93 | 73.80                 | 86.23 | 101.12 | 127.47 |
| C | Riverside (MD/MDAQMD) | Winter | 2016 | 344.09             | 398.43 | 468.18 | 596.59 | 73.85                 | 86.05 | 100.99 | 127.72 |
| C | Riverside (MD/MDAQMD) | Winter | 2017 | 344.14             | 398.61 | 468.11 | 597.15 | 73.82                 | 85.88 | 100.89 | 127.96 |
| C | Riverside (MD/MDAQMD) | Winter | 2018 | 344.18             | 398.74 | 468.02 | 597.57 | 73.83                 | 85.77 | 100.94 | 128.17 |
| C | Riverside (MD/MDAQMD) | Winter | 2019 | 343.49             | 398.02 | 467.00 | 596.64 | 73.85                 | 85.71 | 100.91 | 128.35 |
| C | Riverside (MD/MDAQMD) | Winter | 2020 | 343.49             | 398.11 | 466.91 | 596.86 | 73.90                 | 85.74 | 100.94 | 128.50 |
| C | Riverside (MD/MDAQMD) | Winter | 2021 | 341.93             | 396.34 | 464.75 | 594.29 | 73.93                 | 85.79 | 100.97 | 128.60 |
| C | Riverside (MD/MDAQMD) | Winter | 2022 | 341.87             | 396.30 | 464.64 | 594.33 | 73.94                 | 85.82 | 100.98 | 128.68 |
| C | Riverside (MD/MDAQMD) | Winter | 2023 | 341.81             | 396.29 | 464.54 | 594.36 | 73.95                 | 85.86 | 100.99 | 128.77 |
| C | Riverside (MD/MDAQMD) | Winter | 2024 | 342.18             | 396.81 | 465.08 | 595.17 | 73.95                 | 85.89 | 101.00 | 128.86 |
| C | Riverside (MD/MDAQMD) | Winter | 2025 | 342.15             | 396.84 | 465.03 | 595.20 | 73.95                 | 85.94 | 101.02 | 128.94 |
| C | Riverside (MD/MDAQMD) | Winter | 2026 | 342.15             | 396.91 | 464.96 | 595.22 | 73.96                 | 86.00 | 101.02 | 129.01 |
| C | Riverside (MD/MDAQMD) | Winter | 2027 | 342.15             | 397.00 | 464.93 | 595.26 | 73.97                 | 86.05 | 101.03 | 129.07 |
| C | Riverside (MD/MDAQMD) | Winter | 2028 | 342.16             | 397.09 | 464.90 | 595.32 | 73.97                 | 86.10 | 101.03 | 129.13 |
| C | Riverside (MD/MDAQMD) | Winter | 2029 | 342.17             | 397.19 | 464.88 | 595.40 | 73.97                 | 86.15 | 101.04 | 129.19 |
| C | Riverside (MD/MDAQMD) | Winter | 2030 | 342.18             | 397.30 | 464.87 | 595.48 | 73.98                 | 86.19 | 101.04 | 129.24 |
| C | Riverside (MD/MDAQMD) | Winter | 2031 | 342.26             | 397.46 | 464.97 | 595.67 | 73.98                 | 86.23 | 101.04 | 129.28 |
| C | Riverside (MD/MDAQMD) | Winter | 2032 | 342.26             | 397.54 | 464.96 | 595.73 | 73.98                 | 86.26 | 101.04 | 129.33 |
| C | Riverside (MD/MDAQMD) | Winter | 2033 | 342.26             | 397.61 | 464.95 | 595.79 | 73.98                 | 86.29 | 101.05 | 129.37 |
| C | Riverside (MD/MDAQMD) | Winter | 2034 | 342.26             | 397.67 | 464.94 | 595.85 | 73.99                 | 86.32 | 101.05 | 129.40 |
| C | Riverside (MD/MDAQMD) | Winter | 2035 | 342.26             | 397.71 | 464.93 | 595.90 | 73.99                 | 86.34 | 101.05 | 129.43 |
| C | Riverside (MD/SCAQMD) | Annual | 2010 | 368.30             | 421.09 | 501.55 | 627.35 | 74.21                 | 89.30 | 100.37 | 124.62 |
| C | Riverside (MD/SCAQMD) | Annual | 2011 | 364.70             | 417.57 | 496.50 | 622.41 | 73.31                 | 88.07 | 100.40 | 124.81 |
| C | Riverside (MD/SCAQMD) | Annual | 2012 | 365.13             | 418.21 | 496.21 | 623.50 | 73.47                 | 87.63 | 100.46 | 125.06 |
| C | Riverside (MD/SCAQMD) | Annual | 2013 | 364.41             | 417.34 | 494.60 | 622.65 | 73.63                 | 86.84 | 100.29 | 125.29 |
| C | Riverside (MD/SCAQMD) | Annual | 2014 | 364.62             | 417.45 | 494.44 | 623.55 | 73.54                 | 85.83 | 100.38 | 125.53 |
| C | Riverside (MD/SCAQMD) | Annual | 2015 | 360.62             | 413.24 | 488.80 | 617.43 | 73.46                 | 85.76 | 100.49 | 125.76 |
| C | Riverside (MD/SCAQMD) | Annual | 2016 | 360.86             | 413.52 | 488.70 | 618.47 | 73.61                 | 85.42 | 100.59 | 125.87 |
| C | Riverside (MD/SCAQMD) | Annual | 2017 | 360.81             | 413.70 | 488.63 | 619.42 | 73.30                 | 84.92 | 100.34 | 126.01 |
| C | Riverside (MD/SCAQMD) | Annual | 2018 | 361.00             | 413.85 | 488.56 | 620.00 | 73.42                 | 84.56 | 100.45 | 126.29 |
| C | Riverside (MD/SCAQMD) | Annual | 2019 | 360.39             | 413.29 | 487.47 | 619.19 | 73.52                 | 84.71 | 100.55 | 126.54 |
| C | Riverside (MD/SCAQMD) | Annual | 2020 | 360.36             | 413.49 | 487.42 | 619.63 | 73.53                 | 84.74 | 100.63 | 126.78 |
| C | Riverside (MD/SCAQMD) | Annual | 2021 | 357.25             | 410.70 | 483.71 | 615.42 | 73.38                 | 84.91 | 100.71 | 127.03 |
| C | Riverside (MD/SCAQMD) | Annual | 2022 | 357.24             | 411.02 | 483.66 | 615.84 | 73.37                 | 85.06 | 100.75 | 127.25 |
| C | Riverside (MD/SCAQMD) | Annual | 2023 | 357.29             | 411.28 | 483.62 | 616.06 | 73.42                 | 85.19 | 100.79 | 127.40 |
| C | Riverside (MD/SCAQMD) | Annual | 2024 | 353.97             | 407.66 | 479.14 | 610.61 | 73.45                 | 85.28 | 100.82 | 127.55 |
| C | Riverside (MD/SCAQMD) | Annual | 2025 | 354.02             | 407.88 | 479.11 | 610.79 | 73.47                 | 85.39 | 100.84 | 127.70 |
| C | Riverside (MD/SCAQMD) | Annual | 2026 | 354.03             | 408.12 | 479.09 | 611.05 | 73.49                 | 85.50 | 100.88 | 127.88 |
| C | Riverside (MD/SCAQMD) | Annual | 2027 | 354.04             | 408.39 | 479.07 | 611.31 | 73.50                 | 85.60 | 100.90 | 128.04 |
| C | Riverside (MD/SCAQMD) | Annual | 2028 | 354.03             | 408.61 | 479.05 | 611.54 | 73.51                 | 85.69 | 100.92 | 128.18 |
| C | Riverside (MD/SCAQMD) | Annual | 2029 | 354.00             | 408.81 | 478.99 | 611.77 | 73.51                 | 85.77 | 100.93 | 128.31 |
| C | Riverside (MD/SCAQMD) | Annual | 2030 | 353.99             | 408.95 | 478.97 | 612.01 | 73.51                 | 85.84 | 100.94 | 128.44 |
| C | Riverside (MD/SCAQMD) | Annual | 2031 | 348.76             | 403.17 | 472.01 | 603.39 | 73.52                 | 85.91 | 100.94 | 128.56 |
| C | Riverside (MD/SCAQMD) | Annual | 2032 | 348.75             | 403.31 | 471.99 | 603.62 | 73.52                 | 85.98 | 100.95 | 128.67 |
| C | Riverside (MD/SCAQMD) | Annual | 2033 | 348.75             | 403.45 | 471.97 | 603.82 | 73.53                 | 86.04 | 100.95 | 128.77 |
| C | Riverside (MD/SCAQMD) | Annual | 2034 | 348.75             | 403.54 | 471.94 | 604.00 | 73.53                 | 86.09 | 100.95 | 128.86 |
| C | Riverside (MD/SCAQMD) | Annual | 2035 | 348.75             | 403.63 | 471.92 | 604.15 | 73.54                 | 86.13 | 100.96 | 128.94 |
| C | Riverside (MD/SCAQMD) | Summer | 2010 | 375.92             | 428.57 | 511.53 | 639.58 | 74.21                 | 89.30 | 100.37 | 124.62 |
| C | Riverside (MD/SCAQMD) | Summer | 2011 | 372.44             | 425.34 | 506.60 | 634.78 | 73.31                 | 88.07 | 100.40 | 124.81 |
| C | Riverside (MD/SCAQMD) | Summer | 2012 | 372.90             | 426.14 | 506.36 | 635.94 | 73.47                 | 87.63 | 100.46 | 125.06 |
| C | Riverside (MD/SCAQMD) | Summer | 2013 | 372.17             | 425.39 | 504.79 | 635.14 | 73.63                 | 86.84 | 100.29 | 125.29 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location              | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Riverside (MD/SCAQMD) | Summer | 2014 | 372.39             | 425.65 | 504.66 | 636.10 | 73.54                 | 85.83 | 100.38 | 125.53 |
| C | Riverside (MD/SCAQMD) | Summer | 2015 | 368.38             | 421.47 | 499.01 | 630.01 | 73.46                 | 85.76 | 100.49 | 125.76 |
| C | Riverside (MD/SCAQMD) | Summer | 2016 | 368.61             | 421.83 | 498.93 | 631.14 | 73.61                 | 85.42 | 100.59 | 125.87 |
| C | Riverside (MD/SCAQMD) | Summer | 2017 | 368.58             | 422.08 | 498.91 | 632.16 | 73.30                 | 84.92 | 100.34 | 126.01 |
| C | Riverside (MD/SCAQMD) | Summer | 2018 | 368.76             | 422.29 | 498.84 | 632.79 | 73.42                 | 84.56 | 100.45 | 126.29 |
| C | Riverside (MD/SCAQMD) | Summer | 2019 | 368.21             | 421.80 | 497.81 | 632.10 | 73.52                 | 84.71 | 100.55 | 126.54 |
| C | Riverside (MD/SCAQMD) | Summer | 2020 | 368.19             | 422.05 | 497.77 | 632.57 | 73.53                 | 84.74 | 100.63 | 126.78 |
| C | Riverside (MD/SCAQMD) | Summer | 2021 | 365.00             | 419.18 | 493.93 | 628.25 | 73.38                 | 84.91 | 100.71 | 127.03 |
| C | Riverside (MD/SCAQMD) | Summer | 2022 | 365.00             | 419.52 | 493.91 | 628.71 | 73.37                 | 85.06 | 100.75 | 127.25 |
| C | Riverside (MD/SCAQMD) | Summer | 2023 | 365.06             | 419.82 | 493.88 | 628.97 | 73.42                 | 85.19 | 100.79 | 127.40 |
| C | Riverside (MD/SCAQMD) | Summer | 2024 | 361.68             | 416.17 | 489.34 | 623.45 | 73.45                 | 85.28 | 100.82 | 127.55 |
| C | Riverside (MD/SCAQMD) | Summer | 2025 | 361.74             | 416.41 | 489.31 | 623.66 | 73.47                 | 85.39 | 100.84 | 127.70 |
| C | Riverside (MD/SCAQMD) | Summer | 2026 | 361.74             | 416.69 | 489.30 | 623.93 | 73.49                 | 85.50 | 100.88 | 127.88 |
| C | Riverside (MD/SCAQMD) | Summer | 2027 | 361.75             | 416.99 | 489.28 | 624.20 | 73.50                 | 85.60 | 100.90 | 128.04 |
| C | Riverside (MD/SCAQMD) | Summer | 2028 | 361.74             | 417.23 | 489.25 | 624.45 | 73.51                 | 85.69 | 100.92 | 128.18 |
| C | Riverside (MD/SCAQMD) | Summer | 2029 | 361.71             | 417.46 | 489.20 | 624.68 | 73.51                 | 85.77 | 100.93 | 128.31 |
| C | Riverside (MD/SCAQMD) | Summer | 2030 | 361.70             | 417.60 | 489.17 | 624.93 | 73.51                 | 85.84 | 100.94 | 128.44 |
| C | Riverside (MD/SCAQMD) | Summer | 2031 | 356.48             | 411.83 | 482.22 | 616.32 | 73.52                 | 85.91 | 100.94 | 128.56 |
| C | Riverside (MD/SCAQMD) | Summer | 2032 | 356.47             | 411.98 | 482.20 | 616.56 | 73.52                 | 85.98 | 100.95 | 128.67 |
| C | Riverside (MD/SCAQMD) | Summer | 2033 | 356.47             | 412.12 | 482.18 | 616.78 | 73.53                 | 86.04 | 100.95 | 128.77 |
| C | Riverside (MD/SCAQMD) | Summer | 2034 | 356.47             | 412.23 | 482.15 | 616.96 | 73.53                 | 86.09 | 100.95 | 128.86 |
| C | Riverside (MD/SCAQMD) | Summer | 2035 | 356.47             | 412.31 | 482.14 | 617.12 | 73.54                 | 86.13 | 100.96 | 128.94 |
| C | Riverside (MD/SCAQMD) | Winter | 2010 | 367.80             | 420.60 | 500.90 | 626.55 | 74.21                 | 89.30 | 100.37 | 124.62 |
| C | Riverside (MD/SCAQMD) | Winter | 2011 | 364.17             | 417.04 | 495.80 | 621.56 | 73.31                 | 88.07 | 100.40 | 124.81 |
| C | Riverside (MD/SCAQMD) | Winter | 2012 | 364.60             | 417.67 | 495.51 | 622.64 | 73.47                 | 87.63 | 100.46 | 125.06 |
| C | Riverside (MD/SCAQMD) | Winter | 2013 | 363.88             | 416.78 | 493.90 | 621.79 | 73.63                 | 86.84 | 100.29 | 125.29 |
| C | Riverside (MD/SCAQMD) | Winter | 2014 | 364.09             | 416.89 | 493.73 | 622.68 | 73.54                 | 85.83 | 100.38 | 125.53 |
| C | Riverside (MD/SCAQMD) | Winter | 2015 | 360.08             | 412.67 | 488.09 | 616.56 | 73.46                 | 85.76 | 100.49 | 125.76 |
| C | Riverside (MD/SCAQMD) | Winter | 2016 | 360.32             | 412.95 | 487.99 | 617.59 | 73.61                 | 85.42 | 100.59 | 125.87 |
| C | Riverside (MD/SCAQMD) | Winter | 2017 | 360.27             | 413.11 | 487.92 | 618.53 | 73.30                 | 84.92 | 100.34 | 126.01 |
| C | Riverside (MD/SCAQMD) | Winter | 2018 | 360.46             | 413.26 | 487.85 | 619.11 | 73.42                 | 84.56 | 100.45 | 126.29 |
| C | Riverside (MD/SCAQMD) | Winter | 2019 | 359.82             | 412.66 | 486.71 | 618.24 | 73.52                 | 84.71 | 100.55 | 126.54 |
| C | Riverside (MD/SCAQMD) | Winter | 2020 | 359.79             | 412.87 | 486.67 | 618.68 | 73.53                 | 84.74 | 100.63 | 126.78 |
| C | Riverside (MD/SCAQMD) | Winter | 2021 | 356.70             | 410.11 | 482.99 | 614.53 | 73.38                 | 84.91 | 100.71 | 127.03 |
| C | Riverside (MD/SCAQMD) | Winter | 2022 | 356.70             | 410.42 | 482.95 | 614.94 | 73.37                 | 85.06 | 100.75 | 127.25 |
| C | Riverside (MD/SCAQMD) | Winter | 2023 | 356.75             | 410.69 | 482.90 | 615.16 | 73.42                 | 85.19 | 100.79 | 127.40 |
| C | Riverside (MD/SCAQMD) | Winter | 2024 | 353.42             | 407.06 | 478.42 | 609.70 | 73.45                 | 85.28 | 100.82 | 127.55 |
| C | Riverside (MD/SCAQMD) | Winter | 2025 | 353.47             | 407.28 | 478.39 | 609.88 | 73.47                 | 85.39 | 100.84 | 127.70 |
| C | Riverside (MD/SCAQMD) | Winter | 2026 | 353.48             | 407.52 | 478.37 | 610.14 | 73.49                 | 85.50 | 100.88 | 127.88 |
| C | Riverside (MD/SCAQMD) | Winter | 2027 | 353.49             | 407.78 | 478.35 | 610.40 | 73.50                 | 85.60 | 100.90 | 128.04 |
| C | Riverside (MD/SCAQMD) | Winter | 2028 | 353.49             | 408.00 | 478.32 | 610.63 | 73.51                 | 85.69 | 100.92 | 128.18 |
| C | Riverside (MD/SCAQMD) | Winter | 2029 | 353.45             | 408.20 | 478.26 | 610.85 | 73.51                 | 85.77 | 100.93 | 128.31 |
| C | Riverside (MD/SCAQMD) | Winter | 2030 | 353.44             | 408.34 | 478.24 | 611.09 | 73.51                 | 85.84 | 100.94 | 128.44 |
| C | Riverside (MD/SCAQMD) | Winter | 2031 | 348.17             | 402.51 | 471.23 | 602.40 | 73.52                 | 85.91 | 100.94 | 128.56 |
| C | Riverside (MD/SCAQMD) | Winter | 2032 | 348.17             | 402.65 | 471.21 | 602.63 | 73.52                 | 85.98 | 100.95 | 128.67 |
| C | Riverside (MD/SCAQMD) | Winter | 2033 | 348.17             | 402.78 | 471.19 | 602.83 | 73.53                 | 86.04 | 100.95 | 128.77 |
| C | Riverside (MD/SCAQMD) | Winter | 2034 | 348.16             | 402.88 | 471.16 | 603.01 | 73.53                 | 86.09 | 100.95 | 128.86 |
| C | Riverside (MD/SCAQMD) | Winter | 2035 | 348.16             | 402.97 | 471.14 | 603.16 | 73.54                 | 86.13 | 100.96 | 128.94 |
| C | Riverside (SC)        | Annual | 2010 | 330.61             | 378.40 | 452.04 | 571.52 | 73.26                 | 83.74 | 99.63  | 125.20 |
| C | Riverside (SC)        | Annual | 2011 | 330.55             | 378.98 | 451.62 | 571.70 | 73.27                 | 83.73 | 99.72  | 125.46 |
| C | Riverside (SC)        | Annual | 2012 | 330.76             | 379.75 | 451.57 | 572.32 | 73.30                 | 83.78 | 99.83  | 125.73 |
| C | Riverside (SC)        | Annual | 2013 | 331.56             | 381.10 | 452.35 | 573.99 | 73.35                 | 83.84 | 99.94  | 126.00 |
| C | Riverside (SC)        | Annual | 2014 | 331.76             | 381.69 | 452.34 | 574.61 | 73.39                 | 83.91 | 100.04 | 126.27 |
| C | Riverside (SC)        | Annual | 2015 | 330.28             | 380.32 | 450.07 | 572.35 | 73.45                 | 84.02 | 100.14 | 126.55 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Riverside (SC) | Annual | 2016 | 330.47              | 380.81 | 450.07 | 572.90 | 73.52                 | 84.14 | 100.24 | 126.81 |
| C | Riverside (SC) | Annual | 2017 | 330.61              | 381.25 | 450.08 | 573.42 | 73.57                 | 84.25 | 100.32 | 127.07 |
| C | Riverside (SC) | Annual | 2018 | 330.73              | 381.62 | 450.08 | 573.86 | 73.62                 | 84.36 | 100.39 | 127.30 |
| C | Riverside (SC) | Annual | 2019 | 330.84              | 382.00 | 450.08 | 574.28 | 73.67                 | 84.54 | 100.48 | 127.53 |
| C | Riverside (SC) | Annual | 2020 | 330.93              | 382.33 | 450.08 | 574.64 | 73.76                 | 84.73 | 100.56 | 127.74 |
| C | Riverside (SC) | Annual | 2021 | 331.65              | 383.36 | 450.95 | 576.02 | 73.83                 | 84.91 | 100.65 | 127.90 |
| C | Riverside (SC) | Annual | 2022 | 331.69              | 383.60 | 450.94 | 576.24 | 73.88                 | 85.06 | 100.71 | 128.05 |
| C | Riverside (SC) | Annual | 2023 | 331.71              | 383.78 | 450.92 | 576.41 | 73.92                 | 85.20 | 100.77 | 128.20 |
| C | Riverside (SC) | Annual | 2024 | 332.10              | 384.41 | 451.45 | 577.22 | 73.94                 | 85.32 | 100.81 | 128.33 |
| C | Riverside (SC) | Annual | 2025 | 332.10              | 384.56 | 451.44 | 577.35 | 73.96                 | 85.43 | 100.85 | 128.45 |
| C | Riverside (SC) | Annual | 2026 | 332.12              | 384.71 | 451.42 | 577.47 | 73.98                 | 85.53 | 100.89 | 128.57 |
| C | Riverside (SC) | Annual | 2027 | 332.13              | 384.85 | 451.41 | 577.58 | 73.99                 | 85.62 | 100.91 | 128.67 |
| C | Riverside (SC) | Annual | 2028 | 332.13              | 385.00 | 451.40 | 577.69 | 74.00                 | 85.70 | 100.93 | 128.76 |
| C | Riverside (SC) | Annual | 2029 | 332.13              | 385.14 | 451.39 | 577.80 | 74.01                 | 85.78 | 100.94 | 128.85 |
| C | Riverside (SC) | Annual | 2030 | 332.13              | 385.28 | 451.38 | 577.91 | 74.01                 | 85.85 | 100.95 | 128.92 |
| C | Riverside (SC) | Annual | 2031 | 332.06              | 385.34 | 451.29 | 577.92 | 74.02                 | 85.92 | 100.96 | 129.00 |
| C | Riverside (SC) | Annual | 2032 | 332.06              | 385.47 | 451.29 | 578.03 | 74.02                 | 85.99 | 100.97 | 129.07 |
| C | Riverside (SC) | Annual | 2033 | 332.06              | 385.59 | 451.29 | 578.14 | 74.02                 | 86.05 | 100.97 | 129.13 |
| C | Riverside (SC) | Annual | 2034 | 332.05              | 385.69 | 451.28 | 578.24 | 74.03                 | 86.10 | 100.98 | 129.19 |
| C | Riverside (SC) | Annual | 2035 | 332.05              | 385.77 | 451.28 | 578.33 | 74.03                 | 86.15 | 100.98 | 129.25 |
| C | Riverside (SC) | Summer | 2010 | 357.99              | 406.64 | 488.13 | 617.11 | 73.26                 | 83.74 | 99.63  | 125.20 |
| C | Riverside (SC) | Summer | 2011 | 358.00              | 407.69 | 487.77 | 617.21 | 73.27                 | 83.73 | 99.72  | 125.46 |
| C | Riverside (SC) | Summer | 2012 | 358.27              | 408.86 | 487.80 | 617.86 | 73.30                 | 83.78 | 99.83  | 125.73 |
| C | Riverside (SC) | Summer | 2013 | 359.18              | 410.58 | 488.73 | 619.69 | 73.35                 | 83.84 | 99.94  | 126.00 |
| C | Riverside (SC) | Summer | 2014 | 359.43              | 411.42 | 488.83 | 620.44 | 73.39                 | 83.91 | 100.04 | 126.27 |
| C | Riverside (SC) | Summer | 2015 | 357.84              | 410.09 | 486.45 | 618.08 | 73.45                 | 84.02 | 100.14 | 126.55 |
| C | Riverside (SC) | Summer | 2016 | 358.07              | 410.74 | 486.54 | 618.78 | 73.52                 | 84.14 | 100.24 | 126.81 |
| C | Riverside (SC) | Summer | 2017 | 358.25              | 411.31 | 486.60 | 619.42 | 73.57                 | 84.25 | 100.32 | 127.07 |
| C | Riverside (SC) | Summer | 2018 | 358.38              | 411.77 | 486.62 | 619.96 | 73.62                 | 84.36 | 100.39 | 127.30 |
| C | Riverside (SC) | Summer | 2019 | 358.52              | 412.25 | 486.65 | 620.48 | 73.67                 | 84.54 | 100.48 | 127.53 |
| C | Riverside (SC) | Summer | 2020 | 358.63              | 412.66 | 486.66 | 620.93 | 73.76                 | 84.73 | 100.56 | 127.74 |
| C | Riverside (SC) | Summer | 2021 | 359.40              | 413.82 | 487.58 | 622.43 | 73.83                 | 84.91 | 100.65 | 127.90 |
| C | Riverside (SC) | Summer | 2022 | 359.44              | 414.11 | 487.54 | 622.67 | 73.88                 | 85.06 | 100.71 | 128.05 |
| C | Riverside (SC) | Summer | 2023 | 359.45              | 414.35 | 487.50 | 622.84 | 73.92                 | 85.20 | 100.77 | 128.20 |
| C | Riverside (SC) | Summer | 2024 | 359.88              | 415.08 | 488.05 | 623.73 | 73.94                 | 85.32 | 100.81 | 128.33 |
| C | Riverside (SC) | Summer | 2025 | 359.88              | 415.29 | 488.02 | 623.84 | 73.96                 | 85.43 | 100.85 | 128.45 |
| C | Riverside (SC) | Summer | 2026 | 359.88              | 415.48 | 488.00 | 623.94 | 73.98                 | 85.53 | 100.89 | 128.57 |
| C | Riverside (SC) | Summer | 2027 | 359.89              | 415.67 | 487.98 | 624.04 | 73.99                 | 85.62 | 100.91 | 128.67 |
| C | Riverside (SC) | Summer | 2028 | 359.90              | 415.85 | 487.97 | 624.14 | 74.00                 | 85.70 | 100.93 | 128.76 |
| C | Riverside (SC) | Summer | 2029 | 359.90              | 416.04 | 487.97 | 624.25 | 74.01                 | 85.78 | 100.94 | 128.85 |
| C | Riverside (SC) | Summer | 2030 | 359.90              | 416.22 | 487.97 | 624.36 | 74.01                 | 85.85 | 100.95 | 128.92 |
| C | Riverside (SC) | Summer | 2031 | 359.83              | 416.35 | 487.90 | 624.40 | 74.02                 | 85.92 | 100.96 | 129.00 |
| C | Riverside (SC) | Summer | 2032 | 359.82              | 416.52 | 487.90 | 624.53 | 74.02                 | 85.99 | 100.97 | 129.07 |
| C | Riverside (SC) | Summer | 2033 | 359.82              | 416.67 | 487.90 | 624.65 | 74.02                 | 86.05 | 100.97 | 129.13 |
| C | Riverside (SC) | Summer | 2034 | 359.82              | 416.80 | 487.89 | 624.78 | 74.03                 | 86.10 | 100.98 | 129.19 |
| C | Riverside (SC) | Summer | 2035 | 359.82              | 416.89 | 487.89 | 624.88 | 74.03                 | 86.15 | 100.98 | 129.25 |
| C | Riverside (SC) | Winter | 2010 | 325.98              | 373.62 | 445.94 | 563.82 | 73.26                 | 83.74 | 99.63  | 125.20 |
| C | Riverside (SC) | Winter | 2011 | 325.92              | 374.13 | 445.52 | 564.01 | 73.27                 | 83.73 | 99.72  | 125.46 |
| C | Riverside (SC) | Winter | 2012 | 326.12              | 374.83 | 445.45 | 564.63 | 73.30                 | 83.78 | 99.83  | 125.73 |
| C | Riverside (SC) | Winter | 2013 | 326.90              | 376.11 | 446.20 | 566.26 | 73.35                 | 83.84 | 99.94  | 126.00 |
| C | Riverside (SC) | Winter | 2014 | 327.08              | 376.67 | 446.18 | 566.87 | 73.39                 | 83.91 | 100.04 | 126.27 |
| C | Riverside (SC) | Winter | 2015 | 325.62              | 375.29 | 443.92 | 564.62 | 73.45                 | 84.02 | 100.14 | 126.55 |
| C | Riverside (SC) | Winter | 2016 | 325.80              | 375.75 | 443.91 | 565.15 | 73.52                 | 84.14 | 100.24 | 126.81 |
| C | Riverside (SC) | Winter | 2017 | 325.94              | 376.17 | 443.90 | 565.64 | 73.57                 | 84.25 | 100.32 | 127.07 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Riverside (SC) | Winter | 2018 | 326.05             | 376.52 | 443.90 | 566.07 | 73.62                 | 84.36 | 100.39 | 127.30 |
| C | Riverside (SC) | Winter | 2019 | 326.16             | 376.88 | 443.90 | 566.47 | 73.67                 | 84.54 | 100.48 | 127.53 |
| C | Riverside (SC) | Winter | 2020 | 326.25             | 377.20 | 443.90 | 566.82 | 73.76                 | 84.73 | 100.56 | 127.74 |
| C | Riverside (SC) | Winter | 2021 | 326.96             | 378.22 | 444.77 | 568.19 | 73.83                 | 84.91 | 100.65 | 127.90 |
| C | Riverside (SC) | Winter | 2022 | 327.00             | 378.44 | 444.76 | 568.40 | 73.88                 | 85.06 | 100.71 | 128.05 |
| C | Riverside (SC) | Winter | 2023 | 327.02             | 378.62 | 444.75 | 568.56 | 73.92                 | 85.20 | 100.77 | 128.20 |
| C | Riverside (SC) | Winter | 2024 | 327.40             | 379.22 | 445.26 | 569.36 | 73.94                 | 85.32 | 100.81 | 128.33 |
| C | Riverside (SC) | Winter | 2025 | 327.41             | 379.36 | 445.25 | 569.49 | 73.96                 | 85.43 | 100.85 | 128.45 |
| C | Riverside (SC) | Winter | 2026 | 327.42             | 379.51 | 445.24 | 569.61 | 73.98                 | 85.53 | 100.89 | 128.57 |
| C | Riverside (SC) | Winter | 2027 | 327.43             | 379.64 | 445.23 | 569.72 | 73.99                 | 85.62 | 100.91 | 128.67 |
| C | Riverside (SC) | Winter | 2028 | 327.44             | 379.78 | 445.22 | 569.84 | 74.00                 | 85.70 | 100.93 | 128.76 |
| C | Riverside (SC) | Winter | 2029 | 327.44             | 379.91 | 445.21 | 569.95 | 74.01                 | 85.78 | 100.94 | 128.85 |
| C | Riverside (SC) | Winter | 2030 | 327.44             | 380.04 | 445.20 | 570.06 | 74.01                 | 85.85 | 100.95 | 128.92 |
| C | Riverside (SC) | Winter | 2031 | 327.36             | 380.09 | 445.10 | 570.05 | 74.02                 | 85.92 | 100.96 | 129.00 |
| C | Riverside (SC) | Winter | 2032 | 327.36             | 380.22 | 445.09 | 570.16 | 74.02                 | 85.99 | 100.97 | 129.07 |
| C | Riverside (SC) | Winter | 2033 | 327.36             | 380.33 | 445.09 | 570.27 | 74.02                 | 86.05 | 100.97 | 129.13 |
| C | Riverside (SC) | Winter | 2034 | 327.35             | 380.42 | 445.09 | 570.36 | 74.03                 | 86.10 | 100.98 | 129.19 |
| C | Riverside (SC) | Winter | 2035 | 327.35             | 380.50 | 445.08 | 570.45 | 74.03                 | 86.15 | 100.98 | 129.25 |
| C | Riverside (SS) | Annual | 2010 | 345.46             | 396.10 | 472.54 | 596.54 | 72.91                 | 83.80 | 99.54  | 124.93 |
| C | Riverside (SS) | Annual | 2011 | 344.74             | 395.84 | 471.06 | 595.48 | 72.99                 | 83.84 | 99.65  | 125.24 |
| C | Riverside (SS) | Annual | 2012 | 345.04             | 396.66 | 471.03 | 596.25 | 73.08                 | 83.91 | 99.78  | 125.55 |
| C | Riverside (SS) | Annual | 2013 | 343.99             | 395.85 | 469.20 | 594.73 | 73.18                 | 84.00 | 99.91  | 125.87 |
| C | Riverside (SS) | Annual | 2014 | 344.25             | 396.49 | 469.22 | 595.50 | 73.27                 | 84.11 | 100.03 | 126.18 |
| C | Riverside (SS) | Annual | 2015 | 342.36             | 394.67 | 466.40 | 592.65 | 73.35                 | 84.23 | 100.15 | 126.49 |
| C | Riverside (SS) | Annual | 2016 | 342.56             | 395.18 | 466.43 | 593.33 | 73.44                 | 84.37 | 100.27 | 126.78 |
| C | Riverside (SS) | Annual | 2017 | 342.72             | 395.62 | 466.45 | 593.94 | 73.51                 | 84.48 | 100.36 | 127.06 |
| C | Riverside (SS) | Annual | 2018 | 342.82             | 395.99 | 466.46 | 594.46 | 73.56                 | 84.61 | 100.44 | 127.32 |
| C | Riverside (SS) | Annual | 2019 | 342.80             | 396.23 | 466.32 | 594.75 | 73.63                 | 84.79 | 100.52 | 127.56 |
| C | Riverside (SS) | Annual | 2020 | 342.88             | 396.55 | 466.32 | 595.17 | 73.71                 | 84.97 | 100.61 | 127.78 |
| C | Riverside (SS) | Annual | 2021 | 343.69             | 397.75 | 467.39 | 596.87 | 73.77                 | 85.14 | 100.69 | 127.97 |
| C | Riverside (SS) | Annual | 2022 | 343.72             | 397.99 | 467.38 | 597.16 | 73.81                 | 85.28 | 100.75 | 128.14 |
| C | Riverside (SS) | Annual | 2023 | 343.72             | 398.19 | 467.37 | 597.38 | 73.84                 | 85.41 | 100.81 | 128.29 |
| C | Riverside (SS) | Annual | 2024 | 348.57             | 403.98 | 473.99 | 606.03 | 73.86                 | 85.52 | 100.85 | 128.43 |
| C | Riverside (SS) | Annual | 2025 | 348.57             | 404.13 | 473.98 | 606.18 | 73.88                 | 85.62 | 100.88 | 128.56 |
| C | Riverside (SS) | Annual | 2026 | 348.58             | 404.26 | 473.95 | 606.32 | 73.89                 | 85.71 | 100.91 | 128.68 |
| C | Riverside (SS) | Annual | 2027 | 348.58             | 404.39 | 473.93 | 606.44 | 73.91                 | 85.79 | 100.93 | 128.78 |
| C | Riverside (SS) | Annual | 2028 | 348.59             | 404.52 | 473.91 | 606.56 | 73.91                 | 85.86 | 100.95 | 128.87 |
| C | Riverside (SS) | Annual | 2029 | 348.59             | 404.64 | 473.90 | 606.67 | 73.92                 | 85.92 | 100.96 | 128.95 |
| C | Riverside (SS) | Annual | 2030 | 348.60             | 404.76 | 473.89 | 606.79 | 73.92                 | 85.99 | 100.97 | 129.03 |
| C | Riverside (SS) | Annual | 2031 | 356.78             | 414.43 | 485.07 | 621.23 | 73.93                 | 86.04 | 100.98 | 129.10 |
| C | Riverside (SS) | Annual | 2032 | 356.78             | 414.55 | 485.07 | 621.35 | 73.93                 | 86.10 | 100.99 | 129.16 |
| C | Riverside (SS) | Annual | 2033 | 356.78             | 414.65 | 485.06 | 621.45 | 73.93                 | 86.14 | 100.99 | 129.22 |
| C | Riverside (SS) | Annual | 2034 | 356.78             | 414.73 | 485.06 | 621.55 | 73.94                 | 86.19 | 100.99 | 129.27 |
| C | Riverside (SS) | Annual | 2035 | 356.78             | 414.80 | 485.06 | 621.64 | 73.94                 | 86.22 | 101.00 | 129.32 |
| C | Riverside (SS) | Summer | 2010 | 351.02             | 401.92 | 479.90 | 605.78 | 72.91                 | 83.80 | 99.54  | 124.93 |
| C | Riverside (SS) | Summer | 2011 | 350.36             | 401.79 | 478.48 | 604.78 | 72.99                 | 83.84 | 99.65  | 125.24 |
| C | Riverside (SS) | Summer | 2012 | 350.68             | 402.68 | 478.47 | 605.56 | 73.08                 | 83.91 | 99.78  | 125.55 |
| C | Riverside (SS) | Summer | 2013 | 349.60             | 401.89 | 476.60 | 604.00 | 73.18                 | 84.00 | 99.91  | 125.87 |
| C | Riverside (SS) | Summer | 2014 | 349.87             | 402.57 | 476.63 | 604.79 | 73.27                 | 84.11 | 100.03 | 126.18 |
| C | Riverside (SS) | Summer | 2015 | 348.02             | 400.82 | 473.87 | 602.03 | 73.35                 | 84.23 | 100.15 | 126.49 |
| C | Riverside (SS) | Summer | 2016 | 348.23             | 401.36 | 473.91 | 602.73 | 73.44                 | 84.37 | 100.27 | 126.78 |
| C | Riverside (SS) | Summer | 2017 | 348.39             | 401.83 | 473.94 | 603.38 | 73.51                 | 84.48 | 100.36 | 127.06 |
| C | Riverside (SS) | Summer | 2018 | 348.50             | 402.21 | 473.95 | 603.92 | 73.56                 | 84.61 | 100.44 | 127.32 |
| C | Riverside (SS) | Summer | 2019 | 348.48             | 402.47 | 473.82 | 604.23 | 73.63                 | 84.79 | 100.52 | 127.56 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location        | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                 |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Riverside (SS)  | Summer | 2020 | 348.57              | 402.81 | 473.83 | 604.66 | 73.71                 | 84.97 | 100.61 | 127.78 |
| C | Riverside (SS)  | Summer | 2021 | 349.38              | 404.03 | 474.91 | 606.40 | 73.77                 | 85.14 | 100.69 | 127.97 |
| C | Riverside (SS)  | Summer | 2022 | 349.41              | 404.29 | 474.90 | 606.70 | 73.81                 | 85.28 | 100.75 | 128.14 |
| C | Riverside (SS)  | Summer | 2023 | 349.41              | 404.50 | 474.89 | 606.93 | 73.84                 | 85.41 | 100.81 | 128.29 |
| C | Riverside (SS)  | Summer | 2024 | 354.32              | 410.38 | 481.59 | 615.69 | 73.86                 | 85.52 | 100.85 | 128.43 |
| C | Riverside (SS)  | Summer | 2025 | 354.32              | 410.53 | 481.58 | 615.85 | 73.88                 | 85.62 | 100.88 | 128.56 |
| C | Riverside (SS)  | Summer | 2026 | 354.33              | 410.67 | 481.55 | 615.98 | 73.89                 | 85.71 | 100.91 | 128.68 |
| C | Riverside (SS)  | Summer | 2027 | 354.33              | 410.80 | 481.52 | 616.10 | 73.91                 | 85.79 | 100.93 | 128.78 |
| C | Riverside (SS)  | Summer | 2028 | 354.34              | 410.94 | 481.50 | 616.22 | 73.91                 | 85.86 | 100.95 | 128.87 |
| C | Riverside (SS)  | Summer | 2029 | 354.35              | 411.07 | 481.49 | 616.33 | 73.92                 | 85.92 | 100.96 | 128.95 |
| C | Riverside (SS)  | Summer | 2030 | 354.35              | 411.20 | 481.48 | 616.45 | 73.92                 | 85.99 | 100.97 | 129.03 |
| C | Riverside (SS)  | Summer | 2031 | 362.73              | 421.10 | 492.92 | 631.22 | 73.93                 | 86.04 | 100.98 | 129.10 |
| C | Riverside (SS)  | Summer | 2032 | 362.73              | 421.22 | 492.92 | 631.34 | 73.93                 | 86.10 | 100.99 | 129.16 |
| C | Riverside (SS)  | Summer | 2033 | 362.73              | 421.32 | 492.91 | 631.45 | 73.93                 | 86.14 | 100.99 | 129.22 |
| C | Riverside (SS)  | Summer | 2034 | 362.73              | 421.41 | 492.91 | 631.55 | 73.94                 | 86.19 | 100.99 | 129.27 |
| C | Riverside (SS)  | Summer | 2035 | 362.72              | 421.48 | 492.91 | 631.64 | 73.94                 | 86.22 | 101.00 | 129.32 |
| C | Riverside (SS)  | Winter | 2010 | 325.60              | 375.29 | 446.23 | 563.52 | 72.91                 | 83.80 | 99.54  | 124.93 |
| C | Riverside (SS)  | Winter | 2011 | 324.87              | 374.79 | 444.80 | 562.57 | 72.99                 | 83.84 | 99.65  | 125.24 |
| C | Riverside (SS)  | Winter | 2012 | 325.11              | 375.37 | 444.73 | 563.31 | 73.08                 | 83.91 | 99.78  | 125.55 |
| C | Riverside (SS)  | Winter | 2013 | 324.10              | 374.44 | 442.96 | 561.85 | 73.18                 | 84.00 | 99.91  | 125.87 |
| C | Riverside (SS)  | Winter | 2014 | 324.31              | 374.92 | 442.92 | 562.52 | 73.27                 | 84.11 | 100.03 | 126.18 |
| C | Riverside (SS)  | Winter | 2015 | 322.52              | 373.10 | 440.22 | 559.77 | 73.35                 | 84.23 | 100.15 | 126.49 |
| C | Riverside (SS)  | Winter | 2016 | 322.69              | 373.51 | 440.21 | 560.35 | 73.44                 | 84.37 | 100.27 | 126.78 |
| C | Riverside (SS)  | Winter | 2017 | 322.83              | 373.87 | 440.19 | 560.87 | 73.51                 | 84.48 | 100.36 | 127.06 |
| C | Riverside (SS)  | Winter | 2018 | 322.93              | 374.18 | 440.18 | 561.32 | 73.56                 | 84.61 | 100.44 | 127.32 |
| C | Riverside (SS)  | Winter | 2019 | 322.91              | 374.36 | 440.04 | 561.55 | 73.63                 | 84.79 | 100.52 | 127.56 |
| C | Riverside (SS)  | Winter | 2020 | 322.98              | 374.63 | 440.03 | 561.91 | 73.71                 | 84.97 | 100.61 | 127.78 |
| C | Riverside (SS)  | Winter | 2021 | 323.74              | 375.72 | 441.03 | 563.48 | 73.77                 | 85.14 | 100.69 | 127.97 |
| C | Riverside (SS)  | Winter | 2022 | 323.78              | 375.91 | 441.03 | 563.73 | 73.81                 | 85.28 | 100.75 | 128.14 |
| C | Riverside (SS)  | Winter | 2023 | 323.79              | 376.06 | 441.02 | 563.92 | 73.84                 | 85.41 | 100.81 | 128.29 |
| C | Riverside (SS)  | Winter | 2024 | 328.34              | 381.51 | 447.26 | 572.06 | 73.86                 | 85.52 | 100.85 | 128.43 |
| C | Riverside (SS)  | Winter | 2025 | 328.35              | 381.62 | 447.25 | 572.22 | 73.88                 | 85.62 | 100.88 | 128.56 |
| C | Riverside (SS)  | Winter | 2026 | 328.36              | 381.74 | 447.25 | 572.36 | 73.89                 | 85.71 | 100.91 | 128.68 |
| C | Riverside (SS)  | Winter | 2027 | 328.37              | 381.84 | 447.24 | 572.49 | 73.91                 | 85.79 | 100.93 | 128.78 |
| C | Riverside (SS)  | Winter | 2028 | 328.38              | 381.95 | 447.23 | 572.61 | 73.91                 | 85.86 | 100.95 | 128.87 |
| C | Riverside (SS)  | Winter | 2029 | 328.38              | 382.05 | 447.22 | 572.73 | 73.92                 | 85.92 | 100.96 | 128.95 |
| C | Riverside (SS)  | Winter | 2030 | 328.38              | 382.15 | 447.22 | 572.85 | 73.92                 | 85.99 | 100.97 | 129.03 |
| C | Riverside (SS)  | Winter | 2031 | 336.08              | 391.25 | 457.76 | 586.47 | 73.93                 | 86.04 | 100.98 | 129.10 |
| C | Riverside (SS)  | Winter | 2032 | 336.08              | 391.34 | 457.75 | 586.58 | 73.93                 | 86.10 | 100.99 | 129.16 |
| C | Riverside (SS)  | Winter | 2033 | 336.08              | 391.43 | 457.75 | 586.68 | 73.93                 | 86.14 | 100.99 | 129.22 |
| C | Riverside (SS)  | Winter | 2034 | 336.08              | 391.50 | 457.75 | 586.76 | 73.94                 | 86.19 | 100.99 | 129.27 |
| C | Riverside (SS)  | Winter | 2035 | 336.08              | 391.56 | 457.74 | 586.84 | 73.94                 | 86.22 | 101.00 | 129.32 |
| C | Sacramento (SV) | Annual | 2010 | 338.27              | 388.45 | 463.58 | 584.38 | 72.89                 | 84.85 | 99.62  | 124.76 |
| C | Sacramento (SV) | Annual | 2011 | 338.59              | 389.26 | 463.49 | 584.93 | 72.94                 | 84.61 | 99.69  | 124.96 |
| C | Sacramento (SV) | Annual | 2012 | 338.89              | 389.98 | 463.44 | 585.56 | 73.00                 | 84.46 | 99.78  | 125.19 |
| C | Sacramento (SV) | Annual | 2013 | 339.19              | 390.61 | 463.40 | 586.25 | 73.08                 | 84.39 | 99.88  | 125.44 |
| C | Sacramento (SV) | Annual | 2014 | 339.46              | 391.17 | 463.38 | 586.94 | 73.15                 | 84.34 | 99.96  | 125.69 |
| C | Sacramento (SV) | Annual | 2015 | 339.72              | 391.68 | 463.38 | 587.65 | 73.24                 | 84.33 | 100.03 | 125.96 |
| C | Sacramento (SV) | Annual | 2016 | 339.95              | 392.11 | 463.38 | 588.32 | 73.35                 | 84.32 | 100.13 | 126.23 |
| C | Sacramento (SV) | Annual | 2017 | 340.12              | 392.49 | 463.38 | 588.95 | 73.41                 | 84.30 | 100.21 | 126.50 |
| C | Sacramento (SV) | Annual | 2018 | 340.26              | 392.81 | 463.37 | 589.51 | 73.47                 | 84.32 | 100.29 | 126.76 |
| C | Sacramento (SV) | Annual | 2019 | 338.61              | 391.09 | 460.99 | 586.96 | 73.53                 | 84.47 | 100.38 | 126.99 |
| C | Sacramento (SV) | Annual | 2020 | 338.72              | 391.37 | 460.98 | 587.40 | 73.64                 | 84.63 | 100.47 | 127.20 |
| C | Sacramento (SV) | Annual | 2021 | 338.80              | 391.64 | 460.97 | 587.73 | 73.72                 | 84.80 | 100.57 | 127.38 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location        | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                 |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Sacramento (SV) | Annual | 2022 | 338.84             | 391.86 | 460.96 | 588.00 | 73.78                 | 84.95 | 100.64 | 127.54 |
| C | Sacramento (SV) | Annual | 2023 | 338.86             | 392.04 | 460.94 | 588.22 | 73.82                 | 85.07 | 100.71 | 127.71 |
| C | Sacramento (SV) | Annual | 2024 | 338.87             | 392.19 | 460.92 | 588.37 | 73.85                 | 85.19 | 100.76 | 127.86 |
| C | Sacramento (SV) | Annual | 2025 | 338.88             | 392.32 | 460.91 | 588.52 | 73.87                 | 85.29 | 100.81 | 128.00 |
| C | Sacramento (SV) | Annual | 2026 | 338.89             | 392.46 | 460.90 | 588.69 | 73.89                 | 85.39 | 100.85 | 128.15 |
| C | Sacramento (SV) | Annual | 2027 | 338.90             | 392.59 | 460.89 | 588.86 | 73.91                 | 85.48 | 100.88 | 128.28 |
| C | Sacramento (SV) | Annual | 2028 | 338.91             | 392.72 | 460.89 | 589.02 | 73.92                 | 85.56 | 100.90 | 128.39 |
| C | Sacramento (SV) | Annual | 2029 | 338.91             | 392.85 | 460.87 | 589.18 | 73.93                 | 85.64 | 100.92 | 128.50 |
| C | Sacramento (SV) | Annual | 2030 | 338.91             | 392.98 | 460.87 | 589.35 | 73.93                 | 85.71 | 100.93 | 128.60 |
| C | Sacramento (SV) | Annual | 2031 | 338.92             | 393.12 | 460.86 | 589.51 | 73.94                 | 85.79 | 100.94 | 128.70 |
| C | Sacramento (SV) | Annual | 2032 | 338.92             | 393.24 | 460.86 | 589.69 | 73.94                 | 85.85 | 100.95 | 128.80 |
| C | Sacramento (SV) | Annual | 2033 | 338.92             | 393.34 | 460.85 | 589.84 | 73.95                 | 85.91 | 100.96 | 128.88 |
| C | Sacramento (SV) | Annual | 2034 | 338.92             | 393.44 | 460.84 | 589.99 | 73.95                 | 85.97 | 100.96 | 128.96 |
| C | Sacramento (SV) | Annual | 2035 | 338.92             | 393.51 | 460.84 | 590.12 | 73.95                 | 86.02 | 100.97 | 129.04 |
| C | Sacramento (SV) | Summer | 2010 | 375.62             | 427.51 | 513.20 | 646.48 | 72.89                 | 84.85 | 99.62  | 124.76 |
| C | Sacramento (SV) | Summer | 2011 | 376.19             | 429.01 | 513.26 | 646.92 | 72.94                 | 84.61 | 99.69  | 124.96 |
| C | Sacramento (SV) | Summer | 2012 | 376.70             | 430.30 | 513.35 | 647.57 | 73.00                 | 84.46 | 99.78  | 125.19 |
| C | Sacramento (SV) | Summer | 2013 | 377.16             | 431.37 | 513.46 | 648.38 | 73.08                 | 84.39 | 99.88  | 125.44 |
| C | Sacramento (SV) | Summer | 2014 | 377.55             | 432.28 | 513.62 | 649.25 | 73.15                 | 84.34 | 99.96  | 125.69 |
| C | Sacramento (SV) | Summer | 2015 | 377.89             | 433.05 | 513.77 | 650.20 | 73.24                 | 84.33 | 100.03 | 125.96 |
| C | Sacramento (SV) | Summer | 2016 | 378.19             | 433.69 | 513.89 | 651.12 | 73.35                 | 84.32 | 100.13 | 126.23 |
| C | Sacramento (SV) | Summer | 2017 | 378.39             | 434.26 | 513.97 | 651.99 | 73.41                 | 84.30 | 100.21 | 126.50 |
| C | Sacramento (SV) | Summer | 2018 | 378.53             | 434.71 | 513.99 | 652.74 | 73.47                 | 84.32 | 100.29 | 126.76 |
| C | Sacramento (SV) | Summer | 2019 | 376.67             | 432.84 | 511.33 | 650.00 | 73.53                 | 84.47 | 100.38 | 126.99 |
| C | Sacramento (SV) | Summer | 2020 | 376.76             | 433.18 | 511.31 | 650.57 | 73.64                 | 84.63 | 100.47 | 127.20 |
| C | Sacramento (SV) | Summer | 2021 | 376.83             | 433.55 | 511.26 | 650.99 | 73.72                 | 84.80 | 100.57 | 127.38 |
| C | Sacramento (SV) | Summer | 2022 | 376.86             | 433.86 | 511.21 | 651.34 | 73.78                 | 84.95 | 100.64 | 127.54 |
| C | Sacramento (SV) | Summer | 2023 | 376.88             | 434.12 | 511.16 | 651.60 | 73.82                 | 85.07 | 100.71 | 127.71 |
| C | Sacramento (SV) | Summer | 2024 | 376.89             | 434.33 | 511.11 | 651.76 | 73.85                 | 85.19 | 100.76 | 127.86 |
| C | Sacramento (SV) | Summer | 2025 | 376.91             | 434.52 | 511.07 | 651.91 | 73.87                 | 85.29 | 100.81 | 128.00 |
| C | Sacramento (SV) | Summer | 2026 | 376.91             | 434.70 | 511.07 | 652.09 | 73.89                 | 85.39 | 100.85 | 128.15 |
| C | Sacramento (SV) | Summer | 2027 | 376.93             | 434.88 | 511.07 | 652.26 | 73.91                 | 85.48 | 100.88 | 128.28 |
| C | Sacramento (SV) | Summer | 2028 | 376.94             | 435.06 | 511.07 | 652.43 | 73.92                 | 85.56 | 100.90 | 128.39 |
| C | Sacramento (SV) | Summer | 2029 | 376.95             | 435.25 | 511.08 | 652.61 | 73.93                 | 85.64 | 100.92 | 128.50 |
| C | Sacramento (SV) | Summer | 2030 | 376.96             | 435.44 | 511.08 | 652.80 | 73.93                 | 85.71 | 100.93 | 128.60 |
| C | Sacramento (SV) | Summer | 2031 | 376.96             | 435.63 | 511.08 | 652.97 | 73.94                 | 85.79 | 100.94 | 128.70 |
| C | Sacramento (SV) | Summer | 2032 | 376.97             | 435.80 | 511.07 | 653.16 | 73.94                 | 85.85 | 100.95 | 128.80 |
| C | Sacramento (SV) | Summer | 2033 | 376.98             | 435.94 | 511.07 | 653.35 | 73.95                 | 85.91 | 100.96 | 128.88 |
| C | Sacramento (SV) | Summer | 2034 | 376.98             | 436.06 | 511.06 | 653.53 | 73.95                 | 85.97 | 100.96 | 128.96 |
| C | Sacramento (SV) | Summer | 2035 | 376.98             | 436.16 | 511.05 | 653.69 | 73.95                 | 86.02 | 100.97 | 129.04 |
| C | Sacramento (SV) | Winter | 2010 | 328.26             | 377.97 | 450.28 | 567.73 | 72.89                 | 84.85 | 99.62  | 124.76 |
| C | Sacramento (SV) | Winter | 2011 | 328.50             | 378.59 | 450.15 | 568.31 | 72.94                 | 84.61 | 99.69  | 124.96 |
| C | Sacramento (SV) | Winter | 2012 | 328.76             | 379.17 | 450.05 | 568.93 | 73.00                 | 84.46 | 99.78  | 125.19 |
| C | Sacramento (SV) | Winter | 2013 | 329.01             | 379.69 | 449.97 | 569.59 | 73.08                 | 84.39 | 99.88  | 125.44 |
| C | Sacramento (SV) | Winter | 2014 | 329.25             | 380.15 | 449.91 | 570.23 | 73.15                 | 84.34 | 99.96  | 125.69 |
| C | Sacramento (SV) | Winter | 2015 | 329.48             | 380.58 | 449.87 | 570.88 | 73.24                 | 84.33 | 100.03 | 125.96 |
| C | Sacramento (SV) | Winter | 2016 | 329.69             | 380.95 | 449.84 | 571.48 | 73.35                 | 84.32 | 100.13 | 126.23 |
| C | Sacramento (SV) | Winter | 2017 | 329.86             | 381.29 | 449.81 | 572.05 | 73.41                 | 84.30 | 100.21 | 126.50 |
| C | Sacramento (SV) | Winter | 2018 | 329.99             | 381.58 | 449.80 | 572.55 | 73.47                 | 84.32 | 100.29 | 126.76 |
| C | Sacramento (SV) | Winter | 2019 | 328.41             | 379.90 | 447.49 | 570.06 | 73.53                 | 84.47 | 100.38 | 126.99 |
| C | Sacramento (SV) | Winter | 2020 | 328.52             | 380.16 | 447.49 | 570.46 | 73.64                 | 84.63 | 100.47 | 127.20 |
| C | Sacramento (SV) | Winter | 2021 | 328.60             | 380.41 | 447.49 | 570.77 | 73.72                 | 84.80 | 100.57 | 127.38 |
| C | Sacramento (SV) | Winter | 2022 | 328.65             | 380.61 | 447.49 | 571.03 | 73.78                 | 84.95 | 100.64 | 127.54 |
| C | Sacramento (SV) | Winter | 2023 | 328.67             | 380.77 | 447.48 | 571.23 | 73.82                 | 85.07 | 100.71 | 127.71 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Sacramento (SV)  | Winter | 2024 | 328.67             | 380.89 | 447.47 | 571.38 | 73.85                 | 85.19 | 100.76 | 127.86 |
| C | Sacramento (SV)  | Winter | 2025 | 328.68             | 381.01 | 447.47 | 571.53 | 73.87                 | 85.29 | 100.81 | 128.00 |
| C | Sacramento (SV)  | Winter | 2026 | 328.70             | 381.14 | 447.46 | 571.70 | 73.89                 | 85.39 | 100.85 | 128.15 |
| C | Sacramento (SV)  | Winter | 2027 | 328.71             | 381.25 | 447.45 | 571.86 | 73.91                 | 85.48 | 100.88 | 128.28 |
| C | Sacramento (SV)  | Winter | 2028 | 328.72             | 381.37 | 447.43 | 572.02 | 73.92                 | 85.56 | 100.90 | 128.39 |
| C | Sacramento (SV)  | Winter | 2029 | 328.72             | 381.49 | 447.42 | 572.18 | 73.93                 | 85.64 | 100.92 | 128.50 |
| C | Sacramento (SV)  | Winter | 2030 | 328.72             | 381.60 | 447.41 | 572.34 | 73.93                 | 85.71 | 100.93 | 128.60 |
| C | Sacramento (SV)  | Winter | 2031 | 328.72             | 381.72 | 447.40 | 572.50 | 73.94                 | 85.79 | 100.94 | 128.70 |
| C | Sacramento (SV)  | Winter | 2032 | 328.72             | 381.83 | 447.39 | 572.67 | 73.94                 | 85.85 | 100.95 | 128.80 |
| C | Sacramento (SV)  | Winter | 2033 | 328.72             | 381.92 | 447.39 | 572.82 | 73.95                 | 85.91 | 100.96 | 128.88 |
| C | Sacramento (SV)  | Winter | 2034 | 328.72             | 382.01 | 447.38 | 572.96 | 73.95                 | 85.97 | 100.96 | 128.96 |
| C | Sacramento (SV)  | Winter | 2035 | 328.71             | 382.08 | 447.37 | 573.07 | 73.95                 | 86.02 | 100.97 | 129.04 |
| C | San Benito (NCC) | Annual | 2010 | 325.03             | 378.79 | 446.10 | 558.62 | 73.58                 | 90.26 | 100.51 | 124.39 |
| C | San Benito (NCC) | Annual | 2011 | 324.49             | 377.95 | 444.83 | 558.19 | 73.44                 | 89.27 | 100.47 | 124.58 |
| C | San Benito (NCC) | Annual | 2012 | 324.56             | 377.80 | 444.45 | 558.83 | 73.36                 | 88.39 | 100.46 | 124.79 |
| C | San Benito (NCC) | Annual | 2013 | 324.65             | 377.73 | 444.16 | 559.51 | 73.29                 | 87.78 | 100.47 | 125.03 |
| C | San Benito (NCC) | Annual | 2014 | 324.77             | 377.62 | 443.93 | 560.19 | 73.27                 | 87.07 | 100.45 | 125.29 |
| C | San Benito (NCC) | Annual | 2015 | 324.91             | 377.55 | 443.75 | 560.89 | 73.27                 | 86.50 | 100.41 | 125.55 |
| C | San Benito (NCC) | Annual | 2016 | 325.03             | 377.52 | 443.61 | 561.56 | 73.28                 | 86.06 | 100.42 | 125.83 |
| C | San Benito (NCC) | Annual | 2017 | 325.14             | 377.48 | 443.50 | 562.21 | 73.30                 | 85.60 | 100.47 | 126.11 |
| C | San Benito (NCC) | Annual | 2018 | 325.25             | 377.47 | 443.42 | 562.78 | 73.34                 | 85.28 | 100.54 | 126.37 |
| C | San Benito (NCC) | Annual | 2019 | 325.34             | 377.52 | 443.35 | 563.28 | 73.38                 | 85.14 | 100.57 | 126.63 |
| C | San Benito (NCC) | Annual | 2020 | 325.44             | 377.57 | 443.30 | 563.72 | 73.48                 | 85.11 | 100.63 | 126.87 |
| C | San Benito (NCC) | Annual | 2021 | 327.69             | 380.23 | 446.27 | 567.90 | 73.56                 | 85.21 | 100.71 | 127.04 |
| C | San Benito (NCC) | Annual | 2022 | 327.72             | 380.33 | 446.23 | 568.20 | 73.62                 | 85.30 | 100.77 | 127.19 |
| C | San Benito (NCC) | Annual | 2023 | 327.73             | 380.40 | 446.18 | 568.43 | 73.65                 | 85.38 | 100.82 | 127.38 |
| C | San Benito (NCC) | Annual | 2024 | 327.70             | 380.45 | 446.14 | 568.59 | 73.67                 | 85.46 | 100.87 | 127.55 |
| C | San Benito (NCC) | Annual | 2025 | 327.68             | 380.50 | 446.10 | 568.77 | 73.69                 | 85.53 | 100.90 | 127.71 |
| C | San Benito (NCC) | Annual | 2026 | 326.83             | 379.57 | 444.86 | 567.43 | 73.71                 | 85.60 | 100.93 | 127.87 |
| C | San Benito (NCC) | Annual | 2027 | 326.84             | 379.64 | 444.80 | 567.61 | 73.73                 | 85.66 | 100.94 | 128.01 |
| C | San Benito (NCC) | Annual | 2028 | 326.84             | 379.71 | 444.76 | 567.79 | 73.74                 | 85.72 | 100.96 | 128.14 |
| C | San Benito (NCC) | Annual | 2029 | 326.84             | 379.78 | 444.71 | 567.97 | 73.75                 | 85.78 | 100.96 | 128.26 |
| C | San Benito (NCC) | Annual | 2030 | 326.83             | 379.86 | 444.66 | 568.16 | 73.75                 | 85.83 | 100.96 | 128.38 |
| C | San Benito (NCC) | Annual | 2031 | 326.83             | 379.95 | 444.63 | 568.37 | 73.76                 | 85.89 | 100.97 | 128.50 |
| C | San Benito (NCC) | Annual | 2032 | 326.83             | 380.02 | 444.61 | 568.59 | 73.76                 | 85.94 | 100.97 | 128.62 |
| C | San Benito (NCC) | Annual | 2033 | 326.83             | 380.08 | 444.59 | 568.79 | 73.77                 | 85.98 | 100.97 | 128.73 |
| C | San Benito (NCC) | Annual | 2034 | 326.82             | 380.15 | 444.56 | 568.97 | 73.77                 | 86.03 | 100.98 | 128.83 |
| C | San Benito (NCC) | Annual | 2035 | 326.82             | 380.20 | 444.55 | 569.13 | 73.77                 | 86.07 | 100.98 | 128.92 |
| C | San Benito (NCC) | Summer | 2010 | 348.46             | 403.82 | 476.85 | 597.56 | 73.58                 | 90.26 | 100.51 | 124.39 |
| C | San Benito (NCC) | Summer | 2011 | 348.02             | 403.22 | 475.82 | 597.01 | 73.44                 | 89.27 | 100.47 | 124.58 |
| C | San Benito (NCC) | Summer | 2012 | 348.22             | 403.33 | 475.66 | 597.67 | 73.36                 | 88.39 | 100.46 | 124.79 |
| C | San Benito (NCC) | Summer | 2013 | 348.41             | 403.45 | 475.54 | 598.44 | 73.29                 | 87.78 | 100.47 | 125.03 |
| C | San Benito (NCC) | Summer | 2014 | 348.61             | 403.53 | 475.46 | 599.25 | 73.27                 | 87.07 | 100.45 | 125.29 |
| C | San Benito (NCC) | Summer | 2015 | 348.80             | 403.62 | 475.40 | 600.11 | 73.27                 | 86.50 | 100.41 | 125.55 |
| C | San Benito (NCC) | Summer | 2016 | 348.97             | 403.71 | 475.33 | 600.96 | 73.28                 | 86.06 | 100.42 | 125.83 |
| C | San Benito (NCC) | Summer | 2017 | 349.11             | 403.80 | 475.24 | 601.77 | 73.30                 | 85.60 | 100.47 | 126.11 |
| C | San Benito (NCC) | Summer | 2018 | 349.22             | 403.90 | 475.15 | 602.48 | 73.34                 | 85.28 | 100.54 | 126.37 |
| C | San Benito (NCC) | Summer | 2019 | 349.32             | 404.05 | 475.09 | 603.09 | 73.38                 | 85.14 | 100.57 | 126.63 |
| C | San Benito (NCC) | Summer | 2020 | 349.41             | 404.18 | 475.03 | 603.62 | 73.48                 | 85.11 | 100.63 | 126.87 |
| C | San Benito (NCC) | Summer | 2021 | 351.80             | 407.05 | 478.18 | 608.12 | 73.56                 | 85.21 | 100.71 | 127.04 |
| C | San Benito (NCC) | Summer | 2022 | 351.84             | 407.19 | 478.12 | 608.48 | 73.62                 | 85.30 | 100.77 | 127.19 |
| C | San Benito (NCC) | Summer | 2023 | 351.84             | 407.30 | 478.07 | 608.74 | 73.65                 | 85.38 | 100.82 | 127.38 |
| C | San Benito (NCC) | Summer | 2024 | 351.83             | 407.39 | 478.02 | 608.91 | 73.67                 | 85.46 | 100.87 | 127.55 |
| C | San Benito (NCC) | Summer | 2025 | 351.81             | 407.48 | 477.98 | 609.08 | 73.69                 | 85.53 | 100.90 | 127.71 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location            | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                     |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Benito (NCC)    | Summer | 2026 | 350.90             | 406.50 | 476.68 | 607.62 | 73.71                 | 85.60 | 100.93 | 127.87 |
| C | San Benito (NCC)    | Summer | 2027 | 350.91             | 406.57 | 476.64 | 607.79 | 73.73                 | 85.66 | 100.94 | 128.01 |
| C | San Benito (NCC)    | Summer | 2028 | 350.91             | 406.66 | 476.62 | 607.96 | 73.74                 | 85.72 | 100.96 | 128.14 |
| C | San Benito (NCC)    | Summer | 2029 | 350.92             | 406.76 | 476.59 | 608.15 | 73.75                 | 85.78 | 100.96 | 128.26 |
| C | San Benito (NCC)    | Summer | 2030 | 350.91             | 406.88 | 476.56 | 608.35 | 73.75                 | 85.83 | 100.96 | 128.38 |
| C | San Benito (NCC)    | Summer | 2031 | 350.91             | 406.98 | 476.54 | 608.60 | 73.76                 | 85.89 | 100.97 | 128.50 |
| C | San Benito (NCC)    | Summer | 2032 | 350.91             | 407.07 | 476.53 | 608.85 | 73.76                 | 85.94 | 100.97 | 128.62 |
| C | San Benito (NCC)    | Summer | 2033 | 350.91             | 407.14 | 476.52 | 609.09 | 73.77                 | 85.98 | 100.97 | 128.73 |
| C | San Benito (NCC)    | Summer | 2034 | 350.91             | 407.22 | 476.50 | 609.32 | 73.77                 | 86.03 | 100.98 | 128.83 |
| C | San Benito (NCC)    | Summer | 2035 | 350.90             | 407.28 | 476.48 | 609.52 | 73.77                 | 86.07 | 100.98 | 128.92 |
| C | San Benito (NCC)    | Winter | 2010 | 322.42             | 376.00 | 442.67 | 554.28 | 73.58                 | 90.26 | 100.51 | 124.39 |
| C | San Benito (NCC)    | Winter | 2011 | 321.86             | 375.13 | 441.38 | 553.87 | 73.44                 | 89.27 | 100.47 | 124.58 |
| C | San Benito (NCC)    | Winter | 2012 | 321.93             | 374.95 | 440.98 | 554.50 | 73.36                 | 88.39 | 100.46 | 124.79 |
| C | San Benito (NCC)    | Winter | 2013 | 322.00             | 374.87 | 440.67 | 555.17 | 73.29                 | 87.78 | 100.47 | 125.03 |
| C | San Benito (NCC)    | Winter | 2014 | 322.12             | 374.73 | 440.42 | 555.83 | 73.27                 | 87.07 | 100.45 | 125.29 |
| C | San Benito (NCC)    | Winter | 2015 | 322.25             | 374.65 | 440.23 | 556.52 | 73.27                 | 86.50 | 100.41 | 125.55 |
| C | San Benito (NCC)    | Winter | 2016 | 322.36             | 374.60 | 440.08 | 557.17 | 73.28                 | 86.06 | 100.42 | 125.83 |
| C | San Benito (NCC)    | Winter | 2017 | 322.47             | 374.54 | 439.96 | 557.80 | 73.30                 | 85.60 | 100.47 | 126.11 |
| C | San Benito (NCC)    | Winter | 2018 | 322.58             | 374.52 | 439.88 | 558.36 | 73.34                 | 85.28 | 100.54 | 126.37 |
| C | San Benito (NCC)    | Winter | 2019 | 322.67             | 374.56 | 439.82 | 558.85 | 73.38                 | 85.14 | 100.57 | 126.63 |
| C | San Benito (NCC)    | Winter | 2020 | 322.76             | 374.60 | 439.77 | 559.28 | 73.48                 | 85.11 | 100.63 | 126.87 |
| C | San Benito (NCC)    | Winter | 2021 | 325.00             | 377.24 | 442.71 | 563.42 | 73.56                 | 85.21 | 100.71 | 127.04 |
| C | San Benito (NCC)    | Winter | 2022 | 325.04             | 377.33 | 442.67 | 563.71 | 73.62                 | 85.30 | 100.77 | 127.19 |
| C | San Benito (NCC)    | Winter | 2023 | 325.04             | 377.40 | 442.63 | 563.94 | 73.65                 | 85.38 | 100.82 | 127.38 |
| C | San Benito (NCC)    | Winter | 2024 | 325.01             | 377.45 | 442.59 | 564.10 | 73.67                 | 85.46 | 100.87 | 127.55 |
| C | San Benito (NCC)    | Winter | 2025 | 324.99             | 377.50 | 442.55 | 564.28 | 73.69                 | 85.53 | 100.90 | 127.71 |
| C | San Benito (NCC)    | Winter | 2026 | 324.15             | 376.57 | 441.32 | 562.96 | 73.71                 | 85.60 | 100.93 | 127.87 |
| C | San Benito (NCC)    | Winter | 2027 | 324.16             | 376.63 | 441.26 | 563.14 | 73.73                 | 85.66 | 100.94 | 128.01 |
| C | San Benito (NCC)    | Winter | 2028 | 324.16             | 376.70 | 441.21 | 563.31 | 73.74                 | 85.72 | 100.96 | 128.14 |
| C | San Benito (NCC)    | Winter | 2029 | 324.15             | 376.78 | 441.16 | 563.50 | 73.75                 | 85.78 | 100.96 | 128.26 |
| C | San Benito (NCC)    | Winter | 2030 | 324.15             | 376.85 | 441.11 | 563.68 | 73.75                 | 85.83 | 100.96 | 128.38 |
| C | San Benito (NCC)    | Winter | 2031 | 324.15             | 376.93 | 441.08 | 563.89 | 73.76                 | 85.89 | 100.97 | 128.50 |
| C | San Benito (NCC)    | Winter | 2032 | 324.14             | 377.01 | 441.05 | 564.10 | 73.76                 | 85.94 | 100.97 | 128.62 |
| C | San Benito (NCC)    | Winter | 2033 | 324.14             | 377.07 | 441.03 | 564.30 | 73.77                 | 85.98 | 100.97 | 128.73 |
| C | San Benito (NCC)    | Winter | 2034 | 324.14             | 377.13 | 441.00 | 564.48 | 73.77                 | 86.03 | 100.98 | 128.83 |
| C | San Benito (NCC)    | Winter | 2035 | 324.13             | 377.18 | 440.99 | 564.63 | 73.77                 | 86.07 | 100.98 | 128.92 |
| C | San Bernardino (MD) | Annual | 2010 | 340.99             | 391.67 | 465.83 | 586.60 | 73.90                 | 86.73 | 100.39 | 125.34 |
| C | San Bernardino (MD) | Annual | 2011 | 340.30             | 391.38 | 464.50 | 585.97 | 73.82                 | 86.20 | 100.37 | 125.56 |
| C | San Bernardino (MD) | Annual | 2012 | 340.45             | 391.95 | 464.33 | 586.73 | 73.80                 | 85.85 | 100.40 | 125.81 |
| C | San Bernardino (MD) | Annual | 2013 | 339.36             | 390.94 | 462.54 | 585.33 | 73.76                 | 85.58 | 100.42 | 126.05 |
| C | San Bernardino (MD) | Annual | 2014 | 339.48             | 391.26 | 462.45 | 586.03 | 73.71                 | 85.30 | 100.42 | 126.29 |
| C | San Bernardino (MD) | Annual | 2015 | 336.34             | 387.79 | 457.95 | 581.12 | 73.70                 | 85.10 | 100.45 | 126.55 |
| C | San Bernardino (MD) | Annual | 2016 | 336.48             | 388.06 | 457.90 | 581.76 | 73.72                 | 84.97 | 100.48 | 126.80 |
| C | San Bernardino (MD) | Annual | 2017 | 336.59             | 388.29 | 457.86 | 582.35 | 73.71                 | 84.82 | 100.50 | 127.04 |
| C | San Bernardino (MD) | Annual | 2018 | 336.66             | 388.49 | 457.82 | 582.86 | 73.70                 | 84.74 | 100.51 | 127.27 |
| C | San Bernardino (MD) | Annual | 2019 | 335.72             | 387.59 | 456.41 | 581.59 | 73.71                 | 84.81 | 100.56 | 127.49 |
| C | San Bernardino (MD) | Annual | 2020 | 335.80             | 387.84 | 456.38 | 582.01 | 73.79                 | 84.93 | 100.63 | 127.69 |
| C | San Bernardino (MD) | Annual | 2021 | 334.92             | 387.02 | 455.09 | 580.70 | 73.85                 | 85.08 | 100.70 | 127.85 |
| C | San Bernardino (MD) | Annual | 2022 | 334.94             | 387.24 | 455.05 | 580.96 | 73.89                 | 85.22 | 100.76 | 127.97 |
| C | San Bernardino (MD) | Annual | 2023 | 334.94             | 387.42 | 455.02 | 581.16 | 73.92                 | 85.34 | 100.81 | 128.13 |
| C | San Bernardino (MD) | Annual | 2024 | 334.33             | 386.89 | 454.20 | 580.31 | 73.93                 | 85.44 | 100.85 | 128.27 |
| C | San Bernardino (MD) | Annual | 2025 | 334.33             | 387.03 | 454.18 | 580.47 | 73.95                 | 85.54 | 100.89 | 128.40 |
| C | San Bernardino (MD) | Annual | 2026 | 334.34             | 387.19 | 454.15 | 580.62 | 73.97                 | 85.64 | 100.91 | 128.53 |
| C | San Bernardino (MD) | Annual | 2027 | 334.35             | 387.33 | 454.12 | 580.76 | 73.98                 | 85.72 | 100.93 | 128.64 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location            | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                     |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Bernardino (MD) | Annual | 2028 | 334.35              | 387.47 | 454.10 | 580.90 | 73.99                 | 85.80 | 100.95 | 128.74 |
| C | San Bernardino (MD) | Annual | 2029 | 334.35              | 387.61 | 454.07 | 581.04 | 74.00                 | 85.87 | 100.96 | 128.83 |
| C | San Bernardino (MD) | Annual | 2030 | 334.34              | 387.74 | 454.05 | 581.17 | 74.00                 | 85.93 | 100.96 | 128.92 |
| C | San Bernardino (MD) | Annual | 2031 | 333.08              | 386.42 | 452.34 | 579.13 | 74.01                 | 86.00 | 100.97 | 129.00 |
| C | San Bernardino (MD) | Annual | 2032 | 333.08              | 386.54 | 452.33 | 579.26 | 74.01                 | 86.06 | 100.98 | 129.07 |
| C | San Bernardino (MD) | Annual | 2033 | 333.08              | 386.65 | 452.32 | 579.38 | 74.01                 | 86.11 | 100.98 | 129.14 |
| C | San Bernardino (MD) | Annual | 2034 | 333.07              | 386.73 | 452.31 | 579.49 | 74.02                 | 86.16 | 100.99 | 129.20 |
| C | San Bernardino (MD) | Annual | 2035 | 333.07              | 386.80 | 452.30 | 579.59 | 74.02                 | 86.20 | 100.99 | 129.25 |
| C | San Bernardino (MD) | Summer | 2010 | 377.87              | 429.15 | 513.95 | 647.62 | 73.90                 | 86.73 | 100.39 | 125.34 |
| C | San Bernardino (MD) | Summer | 2011 | 377.22              | 429.71 | 512.80 | 646.86 | 73.82                 | 86.20 | 100.37 | 125.56 |
| C | San Bernardino (MD) | Summer | 2012 | 377.49              | 430.99 | 512.88 | 647.75 | 73.80                 | 85.85 | 100.40 | 125.81 |
| C | San Bernardino (MD) | Summer | 2013 | 376.35              | 430.29 | 511.11 | 646.28 | 73.76                 | 85.58 | 100.42 | 126.05 |
| C | San Bernardino (MD) | Summer | 2014 | 376.53              | 431.00 | 511.22 | 647.17 | 73.71                 | 85.30 | 100.42 | 126.29 |
| C | San Bernardino (MD) | Summer | 2015 | 373.08              | 427.39 | 506.40 | 641.89 | 73.70                 | 85.10 | 100.45 | 126.55 |
| C | San Bernardino (MD) | Summer | 2016 | 373.30              | 427.88 | 506.49 | 642.74 | 73.72                 | 84.97 | 100.48 | 126.80 |
| C | San Bernardino (MD) | Summer | 2017 | 373.45              | 428.30 | 506.54 | 643.55 | 73.71                 | 84.82 | 100.50 | 127.04 |
| C | San Bernardino (MD) | Summer | 2018 | 373.54              | 428.65 | 506.55 | 644.21 | 73.70                 | 84.74 | 100.51 | 127.27 |
| C | San Bernardino (MD) | Summer | 2019 | 372.54              | 427.76 | 505.03 | 642.91 | 73.71                 | 84.81 | 100.56 | 127.49 |
| C | San Bernardino (MD) | Summer | 2020 | 372.64              | 428.12 | 505.01 | 643.47 | 73.79                 | 84.93 | 100.63 | 127.69 |
| C | San Bernardino (MD) | Summer | 2021 | 371.67              | 427.32 | 503.58 | 642.10 | 73.85                 | 85.08 | 100.70 | 127.85 |
| C | San Bernardino (MD) | Summer | 2022 | 371.71              | 427.66 | 503.54 | 642.44 | 73.89                 | 85.22 | 100.76 | 127.97 |
| C | San Bernardino (MD) | Summer | 2023 | 371.71              | 427.95 | 503.51 | 642.70 | 73.92                 | 85.34 | 100.81 | 128.13 |
| C | San Bernardino (MD) | Summer | 2024 | 371.03              | 427.44 | 502.59 | 641.76 | 73.93                 | 85.44 | 100.85 | 128.27 |
| C | San Bernardino (MD) | Summer | 2025 | 371.03              | 427.68 | 502.57 | 641.95 | 73.95                 | 85.54 | 100.89 | 128.40 |
| C | San Bernardino (MD) | Summer | 2026 | 371.04              | 427.91 | 502.53 | 642.10 | 73.97                 | 85.64 | 100.91 | 128.53 |
| C | San Bernardino (MD) | Summer | 2027 | 371.04              | 428.12 | 502.50 | 642.24 | 73.98                 | 85.72 | 100.93 | 128.64 |
| C | San Bernardino (MD) | Summer | 2028 | 371.04              | 428.32 | 502.48 | 642.38 | 73.99                 | 85.80 | 100.95 | 128.74 |
| C | San Bernardino (MD) | Summer | 2029 | 371.04              | 428.52 | 502.46 | 642.52 | 74.00                 | 85.87 | 100.96 | 128.83 |
| C | San Bernardino (MD) | Summer | 2030 | 371.04              | 428.71 | 502.44 | 642.66 | 74.00                 | 85.93 | 100.96 | 128.92 |
| C | San Bernardino (MD) | Summer | 2031 | 369.65              | 427.34 | 500.58 | 640.44 | 74.01                 | 86.00 | 100.97 | 129.00 |
| C | San Bernardino (MD) | Summer | 2032 | 369.64              | 427.51 | 500.58 | 640.59 | 74.01                 | 86.06 | 100.98 | 129.07 |
| C | San Bernardino (MD) | Summer | 2033 | 369.64              | 427.65 | 500.58 | 640.73 | 74.01                 | 86.11 | 100.98 | 129.14 |
| C | San Bernardino (MD) | Summer | 2034 | 369.64              | 427.77 | 500.57 | 640.87 | 74.02                 | 86.16 | 100.99 | 129.20 |
| C | San Bernardino (MD) | Summer | 2035 | 369.64              | 427.86 | 500.57 | 640.99 | 74.02                 | 86.20 | 100.99 | 129.25 |
| C | San Bernardino (MD) | Winter | 2010 | 330.16              | 380.67 | 451.70 | 568.69 | 73.90                 | 86.73 | 100.39 | 125.34 |
| C | San Bernardino (MD) | Winter | 2011 | 329.46              | 380.14 | 450.33 | 568.10 | 73.82                 | 86.20 | 100.37 | 125.56 |
| C | San Bernardino (MD) | Winter | 2012 | 329.59              | 380.50 | 450.09 | 568.82 | 73.80                 | 85.85 | 100.40 | 125.81 |
| C | San Bernardino (MD) | Winter | 2013 | 328.50              | 379.38 | 448.27 | 567.43 | 73.76                 | 85.58 | 100.42 | 126.05 |
| C | San Bernardino (MD) | Winter | 2014 | 328.60              | 379.59 | 448.13 | 568.07 | 73.71                 | 85.30 | 100.42 | 126.29 |
| C | San Bernardino (MD) | Winter | 2015 | 325.56              | 376.16 | 443.73 | 563.29 | 73.70                 | 85.10 | 100.45 | 126.55 |
| C | San Bernardino (MD) | Winter | 2016 | 325.68              | 376.37 | 443.64 | 563.85 | 73.72                 | 84.97 | 100.48 | 126.80 |
| C | San Bernardino (MD) | Winter | 2017 | 325.76              | 376.54 | 443.57 | 564.39 | 73.71                 | 84.82 | 100.50 | 127.04 |
| C | San Bernardino (MD) | Winter | 2018 | 325.83              | 376.71 | 443.51 | 564.85 | 73.70                 | 84.74 | 100.51 | 127.27 |
| C | San Bernardino (MD) | Winter | 2019 | 324.92              | 375.81 | 442.14 | 563.59 | 73.71                 | 84.81 | 100.56 | 127.49 |
| C | San Bernardino (MD) | Winter | 2020 | 324.99              | 376.02 | 442.11 | 563.97 | 73.79                 | 84.93 | 100.63 | 127.69 |
| C | San Bernardino (MD) | Winter | 2021 | 324.14              | 375.20 | 440.86 | 562.69 | 73.85                 | 85.08 | 100.70 | 127.85 |
| C | San Bernardino (MD) | Winter | 2022 | 324.16              | 375.38 | 440.83 | 562.93 | 73.89                 | 85.22 | 100.76 | 127.97 |
| C | San Bernardino (MD) | Winter | 2023 | 324.15              | 375.53 | 440.80 | 563.11 | 73.92                 | 85.34 | 100.81 | 128.13 |
| C | San Bernardino (MD) | Winter | 2024 | 323.56              | 375.00 | 440.01 | 562.29 | 73.93                 | 85.44 | 100.85 | 128.27 |
| C | San Bernardino (MD) | Winter | 2025 | 323.56              | 375.11 | 439.99 | 562.44 | 73.95                 | 85.54 | 100.89 | 128.40 |
| C | San Bernardino (MD) | Winter | 2026 | 323.57              | 375.24 | 439.95 | 562.59 | 73.97                 | 85.64 | 100.91 | 128.53 |
| C | San Bernardino (MD) | Winter | 2027 | 323.58              | 375.37 | 439.93 | 562.73 | 73.98                 | 85.72 | 100.93 | 128.64 |
| C | San Bernardino (MD) | Winter | 2028 | 323.58              | 375.49 | 439.91 | 562.87 | 73.99                 | 85.80 | 100.95 | 128.74 |
| C | San Bernardino (MD) | Winter | 2029 | 323.58              | 375.60 | 439.88 | 563.00 | 74.00                 | 85.87 | 100.96 | 128.83 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location            | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                     |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Bernardino (MD) | Winter | 2030 | 323.58              | 375.72 | 439.85 | 563.13 | 74.00                 | 85.93 | 100.96 | 128.92 |
| C | San Bernardino (MD) | Winter | 2031 | 322.35              | 374.41 | 438.18 | 561.14 | 74.01                 | 86.00 | 100.97 | 129.00 |
| C | San Bernardino (MD) | Winter | 2032 | 322.35              | 374.52 | 438.17 | 561.27 | 74.01                 | 86.06 | 100.98 | 129.07 |
| C | San Bernardino (MD) | Winter | 2033 | 322.35              | 374.61 | 438.16 | 561.38 | 74.01                 | 86.11 | 100.98 | 129.14 |
| C | San Bernardino (MD) | Winter | 2034 | 322.34              | 374.69 | 438.15 | 561.48 | 74.02                 | 86.16 | 100.99 | 129.20 |
| C | San Bernardino (MD) | Winter | 2035 | 322.34              | 374.76 | 438.14 | 561.57 | 74.02                 | 86.20 | 100.99 | 129.25 |
| C | San Bernardino (SC) | Annual | 2010 | 339.66              | 388.73 | 464.33 | 586.23 | 73.39                 | 84.10 | 99.67  | 125.16 |
| C | San Bernardino (SC) | Annual | 2011 | 341.99              | 392.10 | 467.19 | 590.60 | 73.38                 | 84.04 | 99.75  | 125.39 |
| C | San Bernardino (SC) | Annual | 2012 | 342.17              | 392.88 | 467.10 | 591.25 | 73.40                 | 84.04 | 99.85  | 125.63 |
| C | San Bernardino (SC) | Annual | 2013 | 343.26              | 394.52 | 468.27 | 593.42 | 73.45                 | 84.04 | 99.95  | 125.87 |
| C | San Bernardino (SC) | Annual | 2014 | 343.43              | 395.06 | 468.23 | 594.04 | 73.48                 | 84.04 | 100.03 | 126.12 |
| C | San Bernardino (SC) | Annual | 2015 | 345.48              | 397.75 | 470.76 | 597.94 | 73.53                 | 84.10 | 100.12 | 126.38 |
| C | San Bernardino (SC) | Annual | 2016 | 345.67              | 398.22 | 470.75 | 598.55 | 73.60                 | 84.17 | 100.22 | 126.63 |
| C | San Bernardino (SC) | Annual | 2017 | 345.81              | 398.64 | 470.74 | 599.13 | 73.64                 | 84.24 | 100.30 | 126.88 |
| C | San Bernardino (SC) | Annual | 2018 | 345.92              | 399.00 | 470.73 | 599.62 | 73.67                 | 84.33 | 100.37 | 127.12 |
| C | San Bernardino (SC) | Annual | 2019 | 344.25              | 397.30 | 468.27 | 596.96 | 73.72                 | 84.50 | 100.45 | 127.34 |
| C | San Bernardino (SC) | Annual | 2020 | 344.34              | 397.63 | 468.27 | 597.37 | 73.81                 | 84.69 | 100.54 | 127.55 |
| C | San Bernardino (SC) | Annual | 2021 | 346.63              | 400.48 | 471.28 | 601.51 | 73.89                 | 84.86 | 100.63 | 127.71 |
| C | San Bernardino (SC) | Annual | 2022 | 346.66              | 400.72 | 471.26 | 601.76 | 73.94                 | 85.01 | 100.70 | 127.85 |
| C | San Bernardino (SC) | Annual | 2023 | 346.67              | 400.92 | 471.24 | 601.94 | 73.97                 | 85.15 | 100.75 | 128.01 |
| C | San Bernardino (SC) | Annual | 2024 | 350.85              | 405.93 | 476.91 | 609.35 | 73.99                 | 85.27 | 100.80 | 128.14 |
| C | San Bernardino (SC) | Annual | 2025 | 350.85              | 406.09 | 476.89 | 609.49 | 74.01                 | 85.37 | 100.84 | 128.28 |
| C | San Bernardino (SC) | Annual | 2026 | 350.86              | 406.25 | 476.88 | 609.62 | 74.03                 | 85.48 | 100.87 | 128.40 |
| C | San Bernardino (SC) | Annual | 2027 | 350.87              | 406.40 | 476.86 | 609.75 | 74.05                 | 85.57 | 100.90 | 128.51 |
| C | San Bernardino (SC) | Annual | 2028 | 350.87              | 406.55 | 476.84 | 609.88 | 74.06                 | 85.66 | 100.92 | 128.61 |
| C | San Bernardino (SC) | Annual | 2029 | 350.87              | 406.71 | 476.83 | 610.02 | 74.06                 | 85.74 | 100.93 | 128.70 |
| C | San Bernardino (SC) | Annual | 2030 | 350.87              | 406.87 | 476.82 | 610.15 | 74.07                 | 85.81 | 100.94 | 128.79 |
| C | San Bernardino (SC) | Annual | 2031 | 352.60              | 409.05 | 479.18 | 613.34 | 74.07                 | 85.89 | 100.95 | 128.88 |
| C | San Bernardino (SC) | Annual | 2032 | 352.60              | 409.21 | 479.18 | 613.50 | 74.08                 | 85.96 | 100.96 | 128.96 |
| C | San Bernardino (SC) | Annual | 2033 | 352.60              | 409.34 | 479.17 | 613.65 | 74.08                 | 86.02 | 100.97 | 129.03 |
| C | San Bernardino (SC) | Annual | 2034 | 352.60              | 409.46 | 479.17 | 613.78 | 74.08                 | 86.08 | 100.97 | 129.10 |
| C | San Bernardino (SC) | Annual | 2035 | 352.59              | 409.55 | 479.16 | 613.89 | 74.09                 | 86.13 | 100.98 | 129.17 |
| C | San Bernardino (SC) | Summer | 2010 | 368.22              | 417.94 | 501.93 | 633.75 | 73.39                 | 84.10 | 99.67  | 125.16 |
| C | San Bernardino (SC) | Summer | 2011 | 370.87              | 422.11 | 505.20 | 638.44 | 73.38                 | 84.04 | 99.75  | 125.39 |
| C | San Bernardino (SC) | Summer | 2012 | 371.15              | 423.36 | 505.23 | 639.12 | 73.40                 | 84.04 | 99.85  | 125.63 |
| C | San Bernardino (SC) | Summer | 2013 | 372.38              | 425.43 | 506.60 | 641.49 | 73.45                 | 84.04 | 99.95  | 125.87 |
| C | San Bernardino (SC) | Summer | 2014 | 372.60              | 426.25 | 506.67 | 642.21 | 73.48                 | 84.04 | 100.03 | 126.12 |
| C | San Bernardino (SC) | Summer | 2015 | 374.88              | 429.36 | 509.55 | 646.57 | 73.53                 | 84.10 | 100.12 | 126.38 |
| C | San Bernardino (SC) | Summer | 2016 | 375.13              | 430.02 | 509.63 | 647.35 | 73.60                 | 84.17 | 100.22 | 126.63 |
| C | San Bernardino (SC) | Summer | 2017 | 375.32              | 430.61 | 509.69 | 648.09 | 73.64                 | 84.24 | 100.30 | 126.88 |
| C | San Bernardino (SC) | Summer | 2018 | 375.45              | 431.08 | 509.71 | 648.71 | 73.67                 | 84.33 | 100.37 | 127.12 |
| C | San Bernardino (SC) | Summer | 2019 | 373.62              | 429.29 | 507.04 | 645.87 | 73.72                 | 84.50 | 100.45 | 127.34 |
| C | San Bernardino (SC) | Summer | 2020 | 373.74              | 429.71 | 507.04 | 646.38 | 73.81                 | 84.69 | 100.54 | 127.55 |
| C | San Bernardino (SC) | Summer | 2021 | 376.24              | 432.88 | 510.33 | 650.95 | 73.89                 | 84.86 | 100.63 | 127.71 |
| C | San Bernardino (SC) | Summer | 2022 | 376.28              | 433.20 | 510.29 | 651.23 | 73.94                 | 85.01 | 100.70 | 127.85 |
| C | San Bernardino (SC) | Summer | 2023 | 376.28              | 433.46 | 510.25 | 651.43 | 73.97                 | 85.15 | 100.75 | 128.01 |
| C | San Bernardino (SC) | Summer | 2024 | 380.91              | 439.05 | 516.50 | 659.60 | 73.99                 | 85.27 | 100.80 | 128.14 |
| C | San Bernardino (SC) | Summer | 2025 | 380.90              | 439.27 | 516.47 | 659.73 | 74.01                 | 85.37 | 100.84 | 128.28 |
| C | San Bernardino (SC) | Summer | 2026 | 380.91              | 439.49 | 516.44 | 659.84 | 74.03                 | 85.48 | 100.87 | 128.40 |
| C | San Bernardino (SC) | Summer | 2027 | 380.91              | 439.69 | 516.43 | 659.96 | 74.05                 | 85.57 | 100.90 | 128.51 |
| C | San Bernardino (SC) | Summer | 2028 | 380.91              | 439.90 | 516.42 | 660.08 | 74.06                 | 85.66 | 100.92 | 128.61 |
| C | San Bernardino (SC) | Summer | 2029 | 380.91              | 440.11 | 516.41 | 660.21 | 74.06                 | 85.74 | 100.93 | 128.70 |
| C | San Bernardino (SC) | Summer | 2030 | 380.92              | 440.32 | 516.41 | 660.35 | 74.07                 | 85.81 | 100.94 | 128.79 |
| C | San Bernardino (SC) | Summer | 2031 | 382.84              | 442.80 | 519.04 | 663.90 | 74.07                 | 85.89 | 100.95 | 128.88 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location            | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                     |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Bernardino (SC) | Summer | 2032 | 382.83             | 443.01 | 519.04 | 664.10 | 74.08                 | 85.96 | 100.96 | 128.96 |
| C | San Bernardino (SC) | Summer | 2033 | 382.83             | 443.18 | 519.04 | 664.28 | 74.08                 | 86.02 | 100.97 | 129.03 |
| C | San Bernardino (SC) | Summer | 2034 | 382.83             | 443.34 | 519.04 | 664.45 | 74.08                 | 86.08 | 100.97 | 129.10 |
| C | San Bernardino (SC) | Summer | 2035 | 382.83             | 443.45 | 519.03 | 664.60 | 74.09                 | 86.13 | 100.98 | 129.17 |
| C | San Bernardino (SC) | Winter | 2010 | 334.32             | 383.27 | 457.30 | 577.34 | 73.39                 | 84.10 | 99.67  | 125.16 |
| C | San Bernardino (SC) | Winter | 2011 | 336.58             | 386.48 | 460.07 | 581.64 | 73.38                 | 84.04 | 99.75  | 125.39 |
| C | San Bernardino (SC) | Winter | 2012 | 336.74             | 387.17 | 459.96 | 582.29 | 73.40                 | 84.04 | 99.85  | 125.63 |
| C | San Bernardino (SC) | Winter | 2013 | 337.81             | 388.73 | 461.09 | 584.42 | 73.45                 | 84.04 | 99.95  | 125.87 |
| C | San Bernardino (SC) | Winter | 2014 | 337.97             | 389.22 | 461.03 | 585.02 | 73.48                 | 84.04 | 100.03 | 126.12 |
| C | San Bernardino (SC) | Winter | 2015 | 339.97             | 391.82 | 463.49 | 588.82 | 73.53                 | 84.10 | 100.12 | 126.38 |
| C | San Bernardino (SC) | Winter | 2016 | 340.15             | 392.25 | 463.46 | 589.40 | 73.60                 | 84.17 | 100.22 | 126.63 |
| C | San Bernardino (SC) | Winter | 2017 | 340.28             | 392.65 | 463.44 | 589.94 | 73.64                 | 84.24 | 100.30 | 126.88 |
| C | San Bernardino (SC) | Winter | 2018 | 340.39             | 392.99 | 463.42 | 590.42 | 73.67                 | 84.33 | 100.37 | 127.12 |
| C | San Bernardino (SC) | Winter | 2019 | 338.74             | 391.31 | 461.01 | 587.80 | 73.72                 | 84.50 | 100.45 | 127.34 |
| C | San Bernardino (SC) | Winter | 2020 | 338.84             | 391.63 | 461.00 | 588.19 | 73.81                 | 84.69 | 100.54 | 127.55 |
| C | San Bernardino (SC) | Winter | 2021 | 341.07             | 394.40 | 463.95 | 592.23 | 73.89                 | 84.86 | 100.63 | 127.71 |
| C | San Bernardino (SC) | Winter | 2022 | 341.11             | 394.63 | 463.94 | 592.47 | 73.94                 | 85.01 | 100.70 | 127.85 |
| C | San Bernardino (SC) | Winter | 2023 | 341.12             | 394.81 | 463.92 | 592.65 | 73.97                 | 85.15 | 100.75 | 128.01 |
| C | San Bernardino (SC) | Winter | 2024 | 345.19             | 399.71 | 469.47 | 599.90 | 73.99                 | 85.27 | 100.80 | 128.14 |
| C | San Bernardino (SC) | Winter | 2025 | 345.19             | 399.85 | 469.45 | 600.04 | 74.01                 | 85.37 | 100.84 | 128.28 |
| C | San Bernardino (SC) | Winter | 2026 | 345.21             | 400.00 | 469.43 | 600.18 | 74.03                 | 85.48 | 100.87 | 128.40 |
| C | San Bernardino (SC) | Winter | 2027 | 345.22             | 400.14 | 469.42 | 600.31 | 74.05                 | 85.57 | 100.90 | 128.51 |
| C | San Bernardino (SC) | Winter | 2028 | 345.22             | 400.28 | 469.40 | 600.45 | 74.06                 | 85.66 | 100.92 | 128.61 |
| C | San Bernardino (SC) | Winter | 2029 | 345.22             | 400.43 | 469.39 | 600.58 | 74.06                 | 85.74 | 100.93 | 128.70 |
| C | San Bernardino (SC) | Winter | 2030 | 345.22             | 400.57 | 469.37 | 600.71 | 74.07                 | 85.81 | 100.94 | 128.79 |
| C | San Bernardino (SC) | Winter | 2031 | 346.90             | 402.69 | 471.67 | 603.81 | 74.07                 | 85.89 | 100.95 | 128.88 |
| C | San Bernardino (SC) | Winter | 2032 | 346.90             | 402.83 | 471.66 | 603.96 | 74.08                 | 85.96 | 100.96 | 128.96 |
| C | San Bernardino (SC) | Winter | 2033 | 346.90             | 402.96 | 471.65 | 604.10 | 74.08                 | 86.02 | 100.97 | 129.03 |
| C | San Bernardino (SC) | Winter | 2034 | 346.90             | 403.07 | 471.65 | 604.22 | 74.08                 | 86.08 | 100.97 | 129.10 |
| C | San Bernardino (SC) | Winter | 2035 | 346.89             | 403.16 | 471.64 | 604.33 | 74.09                 | 86.13 | 100.98 | 129.17 |
| C | San Diego (SD)      | Annual | 2010 | 352.52             | 405.15 | 482.46 | 610.22 | 72.99                 | 83.92 | 99.34  | 125.27 |
| C | San Diego (SD)      | Annual | 2011 | 353.81             | 407.05 | 483.85 | 612.57 | 73.01                 | 83.88 | 99.44  | 125.44 |
| C | San Diego (SD)      | Annual | 2012 | 354.03             | 407.67 | 483.80 | 613.09 | 73.05                 | 83.89 | 99.57  | 125.64 |
| C | San Diego (SD)      | Annual | 2013 | 354.28             | 408.23 | 483.77 | 613.65 | 73.12                 | 83.94 | 99.70  | 125.85 |
| C | San Diego (SD)      | Annual | 2014 | 354.50             | 408.76 | 483.75 | 614.21 | 73.17                 | 83.99 | 99.82  | 126.06 |
| C | San Diego (SD)      | Annual | 2015 | 354.72             | 409.25 | 483.74 | 614.79 | 73.24                 | 84.07 | 99.93  | 126.29 |
| C | San Diego (SD)      | Annual | 2016 | 354.92             | 409.69 | 483.74 | 615.32 | 73.32                 | 84.16 | 100.05 | 126.52 |
| C | San Diego (SD)      | Annual | 2017 | 355.08             | 410.10 | 483.73 | 615.84 | 73.37                 | 84.25 | 100.15 | 126.74 |
| C | San Diego (SD)      | Annual | 2018 | 355.21             | 410.47 | 483.74 | 616.29 | 73.41                 | 84.35 | 100.25 | 126.96 |
| C | San Diego (SD)      | Annual | 2019 | 355.33             | 410.82 | 483.74 | 616.69 | 73.46                 | 84.52 | 100.35 | 127.15 |
| C | San Diego (SD)      | Annual | 2020 | 355.43             | 411.15 | 483.75 | 617.07 | 73.55                 | 84.69 | 100.45 | 127.34 |
| C | San Diego (SD)      | Annual | 2021 | 356.07             | 412.11 | 484.56 | 618.41 | 73.62                 | 84.87 | 100.55 | 127.52 |
| C | San Diego (SD)      | Annual | 2022 | 356.11             | 412.36 | 484.56 | 618.69 | 73.67                 | 85.02 | 100.63 | 127.67 |
| C | San Diego (SD)      | Annual | 2023 | 356.12             | 412.55 | 484.56 | 618.89 | 73.71                 | 85.15 | 100.70 | 127.83 |
| C | San Diego (SD)      | Annual | 2024 | 356.12             | 412.71 | 484.55 | 619.06 | 73.72                 | 85.27 | 100.76 | 127.98 |
| C | San Diego (SD)      | Annual | 2025 | 356.11             | 412.86 | 484.55 | 619.23 | 73.74                 | 85.38 | 100.81 | 128.12 |
| C | San Diego (SD)      | Annual | 2026 | 356.13             | 413.01 | 484.54 | 619.39 | 73.76                 | 85.48 | 100.85 | 128.26 |
| C | San Diego (SD)      | Annual | 2027 | 356.14             | 413.16 | 484.53 | 619.54 | 73.77                 | 85.57 | 100.88 | 128.38 |
| C | San Diego (SD)      | Annual | 2028 | 356.15             | 413.30 | 484.51 | 619.69 | 73.78                 | 85.66 | 100.90 | 128.48 |
| C | San Diego (SD)      | Annual | 2029 | 356.15             | 413.45 | 484.50 | 619.84 | 73.79                 | 85.74 | 100.92 | 128.58 |
| C | San Diego (SD)      | Annual | 2030 | 356.14             | 413.59 | 484.49 | 619.98 | 73.79                 | 85.81 | 100.93 | 128.68 |
| C | San Diego (SD)      | Annual | 2031 | 356.14             | 413.74 | 484.48 | 620.13 | 73.80                 | 85.89 | 100.94 | 128.77 |
| C | San Diego (SD)      | Annual | 2032 | 356.14             | 413.87 | 484.48 | 620.29 | 73.80                 | 85.96 | 100.95 | 128.86 |
| C | San Diego (SD)      | Annual | 2033 | 356.14             | 414.00 | 484.47 | 620.43 | 73.80                 | 86.02 | 100.96 | 128.93 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Diego (SD) | Annual | 2034 | 356.13             | 414.10 | 484.46 | 620.55 | 73.80                 | 86.08 | 100.97 | 129.01 |
| C | San Diego (SD) | Annual | 2035 | 356.13             | 414.20 | 484.46 | 620.67 | 73.81                 | 86.13 | 100.97 | 129.08 |
| C | San Diego (SD) | Summer | 2010 | 372.46             | 426.19 | 509.00 | 643.64 | 72.99                 | 83.92 | 99.34  | 125.27 |
| C | San Diego (SD) | Summer | 2011 | 373.89             | 428.41 | 510.48 | 645.96 | 73.01                 | 83.88 | 99.44  | 125.44 |
| C | San Diego (SD) | Summer | 2012 | 374.19             | 429.26 | 510.46 | 646.43 | 73.05                 | 83.89 | 99.57  | 125.64 |
| C | San Diego (SD) | Summer | 2013 | 374.48             | 430.00 | 510.47 | 646.99 | 73.12                 | 83.94 | 99.70  | 125.85 |
| C | San Diego (SD) | Summer | 2014 | 374.75             | 430.67 | 510.51 | 647.60 | 73.17                 | 83.99 | 99.82  | 126.06 |
| C | San Diego (SD) | Summer | 2015 | 375.00             | 431.27 | 510.56 | 648.26 | 73.24                 | 84.07 | 99.93  | 126.29 |
| C | San Diego (SD) | Summer | 2016 | 375.24             | 431.81 | 510.61 | 648.90 | 73.32                 | 84.16 | 100.05 | 126.52 |
| C | San Diego (SD) | Summer | 2017 | 375.42             | 432.30 | 510.65 | 649.52 | 73.37                 | 84.25 | 100.15 | 126.74 |
| C | San Diego (SD) | Summer | 2018 | 375.55             | 432.74 | 510.67 | 650.05 | 73.41                 | 84.35 | 100.25 | 126.96 |
| C | San Diego (SD) | Summer | 2019 | 375.68             | 433.15 | 510.68 | 650.53 | 73.46                 | 84.52 | 100.35 | 127.15 |
| C | San Diego (SD) | Summer | 2020 | 375.78             | 433.52 | 510.68 | 650.97 | 73.55                 | 84.69 | 100.45 | 127.34 |
| C | San Diego (SD) | Summer | 2021 | 376.47             | 434.60 | 511.57 | 652.47 | 73.62                 | 84.87 | 100.55 | 127.52 |
| C | San Diego (SD) | Summer | 2022 | 376.52             | 434.90 | 511.57 | 652.82 | 73.67                 | 85.02 | 100.63 | 127.67 |
| C | San Diego (SD) | Summer | 2023 | 376.54             | 435.14 | 511.57 | 653.07 | 73.71                 | 85.15 | 100.70 | 127.83 |
| C | San Diego (SD) | Summer | 2024 | 376.54             | 435.34 | 511.56 | 653.27 | 73.72                 | 85.27 | 100.76 | 127.98 |
| C | San Diego (SD) | Summer | 2025 | 376.54             | 435.52 | 511.56 | 653.45 | 73.74                 | 85.38 | 100.81 | 128.12 |
| C | San Diego (SD) | Summer | 2026 | 376.55             | 435.72 | 511.54 | 653.62 | 73.76                 | 85.48 | 100.85 | 128.26 |
| C | San Diego (SD) | Summer | 2027 | 376.56             | 435.90 | 511.53 | 653.77 | 73.77                 | 85.57 | 100.88 | 128.38 |
| C | San Diego (SD) | Summer | 2028 | 376.57             | 436.07 | 511.51 | 653.92 | 73.78                 | 85.66 | 100.90 | 128.48 |
| C | San Diego (SD) | Summer | 2029 | 376.58             | 436.25 | 511.49 | 654.06 | 73.79                 | 85.74 | 100.92 | 128.58 |
| C | San Diego (SD) | Summer | 2030 | 376.58             | 436.43 | 511.48 | 654.21 | 73.79                 | 85.81 | 100.93 | 128.68 |
| C | San Diego (SD) | Summer | 2031 | 376.57             | 436.61 | 511.47 | 654.35 | 73.80                 | 85.89 | 100.94 | 128.77 |
| C | San Diego (SD) | Summer | 2032 | 376.57             | 436.77 | 511.46 | 654.51 | 73.80                 | 85.96 | 100.95 | 128.86 |
| C | San Diego (SD) | Summer | 2033 | 376.57             | 436.92 | 511.45 | 654.65 | 73.80                 | 86.02 | 100.96 | 128.93 |
| C | San Diego (SD) | Summer | 2034 | 376.57             | 437.04 | 511.45 | 654.79 | 73.80                 | 86.08 | 100.97 | 129.01 |
| C | San Diego (SD) | Summer | 2035 | 376.57             | 437.14 | 511.44 | 654.92 | 73.81                 | 86.13 | 100.97 | 129.08 |
| C | San Diego (SD) | Winter | 2010 | 348.91             | 401.34 | 477.65 | 604.17 | 72.99                 | 83.92 | 99.34  | 125.27 |
| C | San Diego (SD) | Winter | 2011 | 350.18             | 403.18 | 479.04 | 606.53 | 73.01                 | 83.88 | 99.44  | 125.44 |
| C | San Diego (SD) | Winter | 2012 | 350.39             | 403.76 | 478.98 | 607.06 | 73.05                 | 83.89 | 99.57  | 125.64 |
| C | San Diego (SD) | Winter | 2013 | 350.62             | 404.30 | 478.94 | 607.62 | 73.12                 | 83.94 | 99.70  | 125.85 |
| C | San Diego (SD) | Winter | 2014 | 350.83             | 404.79 | 478.91 | 608.17 | 73.17                 | 83.99 | 99.82  | 126.06 |
| C | San Diego (SD) | Winter | 2015 | 351.05             | 405.26 | 478.89 | 608.73 | 73.24                 | 84.07 | 99.93  | 126.29 |
| C | San Diego (SD) | Winter | 2016 | 351.25             | 405.69 | 478.88 | 609.25 | 73.32                 | 84.16 | 100.05 | 126.52 |
| C | San Diego (SD) | Winter | 2017 | 351.40             | 406.08 | 478.87 | 609.75 | 73.37                 | 84.25 | 100.15 | 126.74 |
| C | San Diego (SD) | Winter | 2018 | 351.53             | 406.44 | 478.86 | 610.18 | 73.41                 | 84.35 | 100.25 | 126.96 |
| C | San Diego (SD) | Winter | 2019 | 351.65             | 406.78 | 478.87 | 610.57 | 73.46                 | 84.52 | 100.35 | 127.15 |
| C | San Diego (SD) | Winter | 2020 | 351.75             | 407.10 | 478.87 | 610.94 | 73.55                 | 84.69 | 100.45 | 127.34 |
| C | San Diego (SD) | Winter | 2021 | 352.38             | 408.04 | 479.67 | 612.25 | 73.62                 | 84.87 | 100.55 | 127.52 |
| C | San Diego (SD) | Winter | 2022 | 352.42             | 408.28 | 479.67 | 612.51 | 73.67                 | 85.02 | 100.63 | 127.67 |
| C | San Diego (SD) | Winter | 2023 | 352.43             | 408.47 | 479.67 | 612.71 | 73.71                 | 85.15 | 100.70 | 127.83 |
| C | San Diego (SD) | Winter | 2024 | 352.42             | 408.62 | 479.66 | 612.87 | 73.72                 | 85.27 | 100.76 | 127.98 |
| C | San Diego (SD) | Winter | 2025 | 352.42             | 408.75 | 479.66 | 613.03 | 73.74                 | 85.38 | 100.81 | 128.12 |
| C | San Diego (SD) | Winter | 2026 | 352.43             | 408.90 | 479.65 | 613.20 | 73.76                 | 85.48 | 100.85 | 128.26 |
| C | San Diego (SD) | Winter | 2027 | 352.44             | 409.04 | 479.64 | 613.35 | 73.77                 | 85.57 | 100.88 | 128.38 |
| C | San Diego (SD) | Winter | 2028 | 352.45             | 409.18 | 479.63 | 613.50 | 73.78                 | 85.66 | 100.90 | 128.48 |
| C | San Diego (SD) | Winter | 2029 | 352.45             | 409.32 | 479.62 | 613.64 | 73.79                 | 85.74 | 100.92 | 128.58 |
| C | San Diego (SD) | Winter | 2030 | 352.45             | 409.46 | 479.60 | 613.79 | 73.79                 | 85.81 | 100.93 | 128.68 |
| C | San Diego (SD) | Winter | 2031 | 352.44             | 409.60 | 479.60 | 613.94 | 73.80                 | 85.89 | 100.94 | 128.77 |
| C | San Diego (SD) | Winter | 2032 | 352.44             | 409.73 | 479.59 | 614.10 | 73.80                 | 85.96 | 100.95 | 128.86 |
| C | San Diego (SD) | Winter | 2033 | 352.44             | 409.85 | 479.59 | 614.23 | 73.80                 | 86.02 | 100.96 | 128.93 |
| C | San Diego (SD) | Winter | 2034 | 352.44             | 409.95 | 479.58 | 614.36 | 73.80                 | 86.08 | 100.97 | 129.01 |
| C | San Diego (SD) | Winter | 2035 | 352.43             | 410.04 | 479.57 | 614.47 | 73.81                 | 86.13 | 100.97 | 129.08 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location           | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                    |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Francisco (SF) | Annual | 2010 | 371.60             | 426.62 | 509.35 | 643.69 | 72.64                 | 83.27 | 99.11  | 125.09 |
| C | San Francisco (SF) | Annual | 2011 | 371.82             | 427.18 | 509.24 | 644.17 | 72.74                 | 83.30 | 99.23  | 125.27 |
| C | San Francisco (SF) | Annual | 2012 | 372.04             | 427.76 | 509.17 | 644.70 | 72.83                 | 83.38 | 99.38  | 125.47 |
| C | San Francisco (SF) | Annual | 2013 | 372.29             | 428.30 | 509.11 | 645.27 | 72.93                 | 83.46 | 99.53  | 125.68 |
| C | San Francisco (SF) | Annual | 2014 | 372.52             | 428.84 | 509.06 | 645.84 | 73.02                 | 83.59 | 99.67  | 125.91 |
| C | San Francisco (SF) | Annual | 2015 | 372.76             | 429.37 | 509.04 | 646.43 | 73.13                 | 83.72 | 99.83  | 126.14 |
| C | San Francisco (SF) | Annual | 2016 | 372.99             | 429.87 | 509.03 | 646.98 | 73.24                 | 83.88 | 99.96  | 126.36 |
| C | San Francisco (SF) | Annual | 2017 | 373.17             | 430.33 | 509.01 | 647.52 | 73.31                 | 84.02 | 100.10 | 126.59 |
| C | San Francisco (SF) | Annual | 2018 | 373.32             | 430.73 | 509.01 | 647.97 | 73.38                 | 84.17 | 100.21 | 126.81 |
| C | San Francisco (SF) | Annual | 2019 | 373.44             | 431.08 | 509.02 | 648.39 | 73.44                 | 84.32 | 100.32 | 127.01 |
| C | San Francisco (SF) | Annual | 2020 | 373.57             | 431.40 | 509.03 | 648.77 | 73.54                 | 84.48 | 100.42 | 127.20 |
| C | San Francisco (SF) | Annual | 2021 | 373.65             | 431.70 | 509.03 | 649.09 | 73.62                 | 84.65 | 100.52 | 127.37 |
| C | San Francisco (SF) | Annual | 2022 | 373.71             | 431.95 | 509.04 | 649.36 | 73.68                 | 84.79 | 100.60 | 127.51 |
| C | San Francisco (SF) | Annual | 2023 | 373.73             | 432.14 | 509.03 | 649.57 | 73.72                 | 84.92 | 100.67 | 127.66 |
| C | San Francisco (SF) | Annual | 2024 | 373.72             | 432.29 | 509.03 | 649.73 | 73.74                 | 85.03 | 100.73 | 127.80 |
| C | San Francisco (SF) | Annual | 2025 | 373.72             | 432.42 | 509.02 | 649.90 | 73.77                 | 85.13 | 100.78 | 127.94 |
| C | San Francisco (SF) | Annual | 2026 | 373.74             | 432.57 | 509.01 | 650.08 | 73.79                 | 85.23 | 100.82 | 128.07 |
| C | San Francisco (SF) | Annual | 2027 | 373.76             | 432.71 | 509.00 | 650.24 | 73.81                 | 85.31 | 100.85 | 128.19 |
| C | San Francisco (SF) | Annual | 2028 | 373.76             | 432.86 | 508.98 | 650.41 | 73.82                 | 85.39 | 100.88 | 128.29 |
| C | San Francisco (SF) | Annual | 2029 | 373.76             | 433.01 | 508.96 | 650.58 | 73.83                 | 85.47 | 100.89 | 128.39 |
| C | San Francisco (SF) | Annual | 2030 | 373.75             | 433.17 | 508.95 | 650.75 | 73.83                 | 85.54 | 100.91 | 128.49 |
| C | San Francisco (SF) | Annual | 2031 | 373.75             | 433.33 | 508.94 | 650.93 | 73.84                 | 85.62 | 100.92 | 128.59 |
| C | San Francisco (SF) | Annual | 2032 | 373.75             | 433.50 | 508.93 | 651.11 | 73.84                 | 85.69 | 100.93 | 128.68 |
| C | San Francisco (SF) | Annual | 2033 | 373.75             | 433.64 | 508.92 | 651.27 | 73.85                 | 85.75 | 100.94 | 128.76 |
| C | San Francisco (SF) | Annual | 2034 | 373.74             | 433.77 | 508.91 | 651.42 | 73.85                 | 85.81 | 100.94 | 128.84 |
| C | San Francisco (SF) | Annual | 2035 | 373.74             | 433.88 | 508.90 | 651.56 | 73.85                 | 85.87 | 100.95 | 128.91 |
| C | San Francisco (SF) | Summer | 2010 | 395.05             | 451.58 | 540.63 | 683.09 | 72.64                 | 83.27 | 99.11  | 125.09 |
| C | San Francisco (SF) | Summer | 2011 | 395.38             | 452.34 | 540.53 | 683.40 | 72.74                 | 83.30 | 99.23  | 125.27 |
| C | San Francisco (SF) | Summer | 2012 | 395.71             | 453.09 | 540.48 | 683.83 | 72.83                 | 83.38 | 99.38  | 125.47 |
| C | San Francisco (SF) | Summer | 2013 | 396.03             | 453.80 | 540.46 | 684.36 | 72.93                 | 83.46 | 99.53  | 125.68 |
| C | San Francisco (SF) | Summer | 2014 | 396.33             | 454.46 | 540.48 | 684.94 | 73.02                 | 83.59 | 99.67  | 125.91 |
| C | San Francisco (SF) | Summer | 2015 | 396.62             | 455.11 | 540.51 | 685.61 | 73.13                 | 83.72 | 99.83  | 126.14 |
| C | San Francisco (SF) | Summer | 2016 | 396.88             | 455.72 | 540.56 | 686.28 | 73.24                 | 83.88 | 99.96  | 126.36 |
| C | San Francisco (SF) | Summer | 2017 | 397.07             | 456.29 | 540.60 | 686.95 | 73.31                 | 84.02 | 100.10 | 126.59 |
| C | San Francisco (SF) | Summer | 2018 | 397.24             | 456.76 | 540.61 | 687.49 | 73.38                 | 84.17 | 100.21 | 126.81 |
| C | San Francisco (SF) | Summer | 2019 | 397.37             | 457.20 | 540.63 | 688.00 | 73.44                 | 84.32 | 100.32 | 127.01 |
| C | San Francisco (SF) | Summer | 2020 | 397.50             | 457.58 | 540.65 | 688.47 | 73.54                 | 84.48 | 100.42 | 127.20 |
| C | San Francisco (SF) | Summer | 2021 | 397.58             | 457.93 | 540.66 | 688.86 | 73.62                 | 84.65 | 100.52 | 127.37 |
| C | San Francisco (SF) | Summer | 2022 | 397.64             | 458.23 | 540.66 | 689.20 | 73.68                 | 84.79 | 100.60 | 127.51 |
| C | San Francisco (SF) | Summer | 2023 | 397.66             | 458.47 | 540.66 | 689.46 | 73.72                 | 84.92 | 100.67 | 127.66 |
| C | San Francisco (SF) | Summer | 2024 | 397.65             | 458.66 | 540.64 | 689.67 | 73.74                 | 85.03 | 100.73 | 127.80 |
| C | San Francisco (SF) | Summer | 2025 | 397.65             | 458.84 | 540.63 | 689.88 | 73.77                 | 85.13 | 100.78 | 127.94 |
| C | San Francisco (SF) | Summer | 2026 | 397.67             | 459.02 | 540.61 | 690.09 | 73.79                 | 85.23 | 100.82 | 128.07 |
| C | San Francisco (SF) | Summer | 2027 | 397.69             | 459.20 | 540.59 | 690.26 | 73.81                 | 85.31 | 100.85 | 128.19 |
| C | San Francisco (SF) | Summer | 2028 | 397.70             | 459.38 | 540.57 | 690.44 | 73.82                 | 85.39 | 100.88 | 128.29 |
| C | San Francisco (SF) | Summer | 2029 | 397.70             | 459.57 | 540.54 | 690.62 | 73.83                 | 85.47 | 100.89 | 128.39 |
| C | San Francisco (SF) | Summer | 2030 | 397.70             | 459.77 | 540.53 | 690.81 | 73.83                 | 85.54 | 100.91 | 128.49 |
| C | San Francisco (SF) | Summer | 2031 | 397.70             | 459.99 | 540.52 | 690.99 | 73.84                 | 85.62 | 100.92 | 128.59 |
| C | San Francisco (SF) | Summer | 2032 | 397.71             | 460.19 | 540.51 | 691.17 | 73.84                 | 85.69 | 100.93 | 128.68 |
| C | San Francisco (SF) | Summer | 2033 | 397.71             | 460.36 | 540.50 | 691.35 | 73.85                 | 85.75 | 100.94 | 128.76 |
| C | San Francisco (SF) | Summer | 2034 | 397.71             | 460.52 | 540.50 | 691.51 | 73.85                 | 85.81 | 100.94 | 128.84 |
| C | San Francisco (SF) | Summer | 2035 | 397.70             | 460.65 | 540.49 | 691.66 | 73.85                 | 85.87 | 100.95 | 128.91 |
| C | San Francisco (SF) | Winter | 2010 | 370.78             | 425.74 | 508.25 | 642.31 | 72.64                 | 83.27 | 99.11  | 125.09 |
| C | San Francisco (SF) | Winter | 2011 | 370.99             | 426.30 | 508.14 | 642.79 | 72.74                 | 83.30 | 99.23  | 125.27 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location           | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                    |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Francisco (SF) | Winter | 2012 | 371.21              | 426.87 | 508.07 | 643.32 | 72.83                 | 83.38 | 99.38  | 125.47 |
| C | San Francisco (SF) | Winter | 2013 | 371.46              | 427.41 | 508.01 | 643.90 | 72.93                 | 83.46 | 99.53  | 125.68 |
| C | San Francisco (SF) | Winter | 2014 | 371.69              | 427.94 | 507.96 | 644.46 | 73.02                 | 83.59 | 99.67  | 125.91 |
| C | San Francisco (SF) | Winter | 2015 | 371.93              | 428.46 | 507.94 | 645.05 | 73.13                 | 83.72 | 99.83  | 126.14 |
| C | San Francisco (SF) | Winter | 2016 | 372.16              | 428.96 | 507.92 | 645.60 | 73.24                 | 83.88 | 99.96  | 126.36 |
| C | San Francisco (SF) | Winter | 2017 | 372.33              | 429.42 | 507.91 | 646.13 | 73.31                 | 84.02 | 100.10 | 126.59 |
| C | San Francisco (SF) | Winter | 2018 | 372.48              | 429.81 | 507.90 | 646.58 | 73.38                 | 84.17 | 100.21 | 126.81 |
| C | San Francisco (SF) | Winter | 2019 | 372.60              | 430.17 | 507.91 | 647.00 | 73.44                 | 84.32 | 100.32 | 127.01 |
| C | San Francisco (SF) | Winter | 2020 | 372.73              | 430.49 | 507.92 | 647.38 | 73.54                 | 84.48 | 100.42 | 127.20 |
| C | San Francisco (SF) | Winter | 2021 | 372.81              | 430.78 | 507.92 | 647.69 | 73.62                 | 84.65 | 100.52 | 127.37 |
| C | San Francisco (SF) | Winter | 2022 | 372.87              | 431.02 | 507.93 | 647.96 | 73.68                 | 84.79 | 100.60 | 127.51 |
| C | San Francisco (SF) | Winter | 2023 | 372.89              | 431.21 | 507.92 | 648.17 | 73.72                 | 84.92 | 100.67 | 127.66 |
| C | San Francisco (SF) | Winter | 2024 | 372.88              | 431.36 | 507.92 | 648.33 | 73.74                 | 85.03 | 100.73 | 127.80 |
| C | San Francisco (SF) | Winter | 2025 | 372.88              | 431.50 | 507.91 | 648.50 | 73.77                 | 85.13 | 100.78 | 127.94 |
| C | San Francisco (SF) | Winter | 2026 | 372.90              | 431.64 | 507.90 | 648.67 | 73.79                 | 85.23 | 100.82 | 128.07 |
| C | San Francisco (SF) | Winter | 2027 | 372.92              | 431.78 | 507.89 | 648.84 | 73.81                 | 85.31 | 100.85 | 128.19 |
| C | San Francisco (SF) | Winter | 2028 | 372.92              | 431.93 | 507.87 | 649.00 | 73.82                 | 85.39 | 100.88 | 128.29 |
| C | San Francisco (SF) | Winter | 2029 | 372.92              | 432.08 | 507.85 | 649.17 | 73.83                 | 85.47 | 100.89 | 128.39 |
| C | San Francisco (SF) | Winter | 2030 | 372.91              | 432.23 | 507.84 | 649.34 | 73.83                 | 85.54 | 100.91 | 128.49 |
| C | San Francisco (SF) | Winter | 2031 | 372.91              | 432.40 | 507.83 | 649.52 | 73.84                 | 85.62 | 100.92 | 128.59 |
| C | San Francisco (SF) | Winter | 2032 | 372.91              | 432.56 | 507.82 | 649.71 | 73.84                 | 85.69 | 100.93 | 128.68 |
| C | San Francisco (SF) | Winter | 2033 | 372.91              | 432.70 | 507.81 | 649.87 | 73.85                 | 85.75 | 100.94 | 128.76 |
| C | San Francisco (SF) | Winter | 2034 | 372.90              | 432.83 | 507.81 | 650.02 | 73.85                 | 85.81 | 100.94 | 128.84 |
| C | San Francisco (SF) | Winter | 2035 | 372.90              | 432.95 | 507.80 | 650.15 | 73.85                 | 85.87 | 100.95 | 128.91 |
| C | San Joaquin (SJV)  | Annual | 2010 | 341.15              | 391.09 | 467.02 | 587.28 | 73.38                 | 84.95 | 100.04 | 124.39 |
| C | San Joaquin (SJV)  | Annual | 2011 | 341.42              | 391.91 | 466.87 | 587.92 | 73.37                 | 84.69 | 100.05 | 124.61 |
| C | San Joaquin (SJV)  | Annual | 2012 | 340.62              | 391.44 | 465.29 | 586.82 | 73.40                 | 84.55 | 100.10 | 124.86 |
| C | San Joaquin (SJV)  | Annual | 2013 | 340.63              | 391.84 | 464.86 | 587.24 | 73.41                 | 84.46 | 100.15 | 125.16 |
| C | San Joaquin (SJV)  | Annual | 2014 | 340.87              | 392.44 | 464.82 | 588.06 | 73.44                 | 84.41 | 100.20 | 125.45 |
| C | San Joaquin (SJV)  | Annual | 2015 | 342.48              | 394.54 | 466.66 | 591.27 | 73.49                 | 84.37 | 100.25 | 125.76 |
| C | San Joaquin (SJV)  | Annual | 2016 | 342.68              | 395.00 | 466.64 | 592.05 | 73.55                 | 84.37 | 100.31 | 126.07 |
| C | San Joaquin (SJV)  | Annual | 2017 | 342.83              | 395.40 | 466.61 | 592.77 | 73.57                 | 84.38 | 100.33 | 126.38 |
| C | San Joaquin (SJV)  | Annual | 2018 | 341.73              | 394.34 | 464.95 | 591.28 | 73.61                 | 84.41 | 100.38 | 126.66 |
| C | San Joaquin (SJV)  | Annual | 2019 | 341.83              | 394.66 | 464.93 | 591.82 | 73.66                 | 84.55 | 100.43 | 126.92 |
| C | San Joaquin (SJV)  | Annual | 2020 | 341.92              | 394.95 | 464.91 | 592.29 | 73.75                 | 84.71 | 100.52 | 127.16 |
| C | San Joaquin (SJV)  | Annual | 2021 | 340.58              | 393.59 | 462.99 | 590.24 | 73.83                 | 84.88 | 100.61 | 127.36 |
| C | San Joaquin (SJV)  | Annual | 2022 | 340.62              | 393.80 | 462.97 | 590.55 | 73.88                 | 85.03 | 100.68 | 127.52 |
| C | San Joaquin (SJV)  | Annual | 2023 | 340.62              | 393.98 | 462.95 | 590.80 | 73.91                 | 85.16 | 100.74 | 127.71 |
| C | San Joaquin (SJV)  | Annual | 2024 | 338.98              | 392.24 | 460.72 | 588.16 | 73.93                 | 85.27 | 100.79 | 127.88 |
| C | San Joaquin (SJV)  | Annual | 2025 | 338.99              | 392.38 | 460.71 | 588.34 | 73.95                 | 85.37 | 100.83 | 128.04 |
| C | San Joaquin (SJV)  | Annual | 2026 | 338.96              | 392.48 | 460.64 | 588.42 | 73.97                 | 85.47 | 100.87 | 128.18 |
| C | San Joaquin (SJV)  | Annual | 2027 | 338.97              | 392.63 | 460.62 | 588.56 | 73.99                 | 85.56 | 100.89 | 128.30 |
| C | San Joaquin (SJV)  | Annual | 2028 | 338.98              | 392.77 | 460.61 | 588.70 | 74.00                 | 85.65 | 100.91 | 128.42 |
| C | San Joaquin (SJV)  | Annual | 2029 | 338.98              | 392.91 | 460.59 | 588.85 | 74.00                 | 85.73 | 100.93 | 128.53 |
| C | San Joaquin (SJV)  | Annual | 2030 | 338.98              | 393.05 | 460.58 | 589.01 | 74.01                 | 85.80 | 100.94 | 128.63 |
| C | San Joaquin (SJV)  | Annual | 2031 | 338.98              | 393.19 | 460.57 | 589.19 | 74.01                 | 85.88 | 100.95 | 128.73 |
| C | San Joaquin (SJV)  | Annual | 2032 | 338.98              | 393.31 | 460.56 | 589.38 | 74.02                 | 85.94 | 100.95 | 128.83 |
| C | San Joaquin (SJV)  | Annual | 2033 | 338.98              | 393.42 | 460.55 | 589.55 | 74.02                 | 86.00 | 100.96 | 128.92 |
| C | San Joaquin (SJV)  | Annual | 2034 | 338.98              | 393.52 | 460.54 | 589.70 | 74.03                 | 86.06 | 100.97 | 129.00 |
| C | San Joaquin (SJV)  | Annual | 2035 | 338.97              | 393.60 | 460.53 | 589.84 | 74.03                 | 86.10 | 100.97 | 129.07 |
| C | San Joaquin (SJV)  | Summer | 2010 | 372.14              | 422.80 | 507.85 | 638.60 | 73.38                 | 84.95 | 100.04 | 124.39 |
| C | San Joaquin (SJV)  | Summer | 2011 | 372.63              | 424.33 | 507.90 | 639.20 | 73.37                 | 84.69 | 100.05 | 124.61 |
| C | San Joaquin (SJV)  | Summer | 2012 | 371.92              | 424.32 | 506.38 | 638.02 | 73.40                 | 84.55 | 100.10 | 124.86 |
| C | San Joaquin (SJV)  | Summer | 2013 | 372.06              | 425.18 | 506.12 | 638.59 | 73.41                 | 84.46 | 100.15 | 125.16 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location              | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Joaquin (SJV)     | Summer | 2014 | 372.42             | 426.15 | 506.26 | 639.64 | 73.44                 | 84.41 | 100.20 | 125.45 |
| C | San Joaquin (SJV)     | Summer | 2015 | 374.24             | 428.69 | 508.43 | 643.31 | 73.49                 | 84.37 | 100.25 | 125.76 |
| C | San Joaquin (SJV)     | Summer | 2016 | 374.50             | 429.38 | 508.53 | 644.34 | 73.55                 | 84.37 | 100.31 | 126.07 |
| C | San Joaquin (SJV)     | Summer | 2017 | 374.68             | 429.96 | 508.59 | 645.29 | 73.57                 | 84.38 | 100.33 | 126.38 |
| C | San Joaquin (SJV)     | Summer | 2018 | 373.47             | 428.89 | 506.81 | 643.78 | 73.61                 | 84.41 | 100.38 | 126.66 |
| C | San Joaquin (SJV)     | Summer | 2019 | 373.56             | 429.29 | 506.79 | 644.44 | 73.66                 | 84.55 | 100.43 | 126.92 |
| C | San Joaquin (SJV)     | Summer | 2020 | 373.63             | 429.66 | 506.76 | 645.01 | 73.75                 | 84.71 | 100.52 | 127.16 |
| C | San Joaquin (SJV)     | Summer | 2021 | 372.14             | 428.21 | 504.64 | 642.81 | 73.83                 | 84.88 | 100.61 | 127.36 |
| C | San Joaquin (SJV)     | Summer | 2022 | 372.16             | 428.49 | 504.59 | 643.19 | 73.88                 | 85.03 | 100.68 | 127.52 |
| C | San Joaquin (SJV)     | Summer | 2023 | 372.17             | 428.73 | 504.55 | 643.46 | 73.91                 | 85.16 | 100.74 | 127.71 |
| C | San Joaquin (SJV)     | Summer | 2024 | 370.38             | 426.89 | 502.11 | 640.59 | 73.93                 | 85.27 | 100.79 | 127.88 |
| C | San Joaquin (SJV)     | Summer | 2025 | 370.39             | 427.09 | 502.08 | 640.78 | 73.95                 | 85.37 | 100.83 | 128.04 |
| C | San Joaquin (SJV)     | Summer | 2026 | 370.34             | 427.23 | 501.98 | 640.76 | 73.97                 | 85.47 | 100.87 | 128.18 |
| C | San Joaquin (SJV)     | Summer | 2027 | 370.36             | 427.43 | 501.95 | 640.85 | 73.99                 | 85.56 | 100.89 | 128.30 |
| C | San Joaquin (SJV)     | Summer | 2028 | 370.37             | 427.63 | 501.94 | 640.96 | 74.00                 | 85.65 | 100.91 | 128.42 |
| C | San Joaquin (SJV)     | Summer | 2029 | 370.39             | 427.83 | 501.92 | 641.09 | 74.00                 | 85.73 | 100.93 | 128.53 |
| C | San Joaquin (SJV)     | Summer | 2030 | 370.40             | 428.04 | 501.92 | 641.25 | 74.01                 | 85.80 | 100.94 | 128.63 |
| C | San Joaquin (SJV)     | Summer | 2031 | 370.39             | 428.23 | 501.91 | 641.47 | 74.01                 | 85.88 | 100.95 | 128.73 |
| C | San Joaquin (SJV)     | Summer | 2032 | 370.39             | 428.39 | 501.90 | 641.69 | 74.02                 | 85.94 | 100.95 | 128.83 |
| C | San Joaquin (SJV)     | Summer | 2033 | 370.39             | 428.53 | 501.89 | 641.91 | 74.02                 | 86.00 | 100.96 | 128.92 |
| C | San Joaquin (SJV)     | Summer | 2034 | 370.38             | 428.65 | 501.89 | 642.11 | 74.03                 | 86.06 | 100.97 | 129.00 |
| C | San Joaquin (SJV)     | Summer | 2035 | 370.38             | 428.74 | 501.89 | 642.30 | 74.03                 | 86.10 | 100.97 | 129.07 |
| C | San Joaquin (SJV)     | Winter | 2010 | 331.39             | 381.10 | 454.15 | 571.11 | 73.38                 | 84.95 | 100.04 | 124.39 |
| C | San Joaquin (SJV)     | Winter | 2011 | 331.58             | 381.70 | 453.94 | 571.76 | 73.37                 | 84.69 | 100.05 | 124.61 |
| C | San Joaquin (SJV)     | Winter | 2012 | 330.76             | 381.08 | 452.34 | 570.69 | 73.40                 | 84.55 | 100.10 | 124.86 |
| C | San Joaquin (SJV)     | Winter | 2013 | 330.73             | 381.33 | 451.86 | 571.05 | 73.41                 | 84.46 | 100.15 | 125.16 |
| C | San Joaquin (SJV)     | Winter | 2014 | 330.93             | 381.81 | 451.76 | 571.81 | 73.44                 | 84.41 | 100.20 | 125.45 |
| C | San Joaquin (SJV)     | Winter | 2015 | 332.47             | 383.78 | 453.50 | 574.87 | 73.49                 | 84.37 | 100.25 | 125.76 |
| C | San Joaquin (SJV)     | Winter | 2016 | 332.66             | 384.17 | 453.44 | 575.57 | 73.55                 | 84.37 | 100.31 | 126.07 |
| C | San Joaquin (SJV)     | Winter | 2017 | 332.79             | 384.52 | 453.39 | 576.22 | 73.57                 | 84.38 | 100.33 | 126.38 |
| C | San Joaquin (SJV)     | Winter | 2018 | 331.73             | 383.45 | 451.75 | 574.74 | 73.61                 | 84.41 | 100.38 | 126.66 |
| C | San Joaquin (SJV)     | Winter | 2019 | 331.83             | 383.74 | 451.73 | 575.23 | 73.66                 | 84.55 | 100.43 | 126.92 |
| C | San Joaquin (SJV)     | Winter | 2020 | 331.93             | 384.01 | 451.72 | 575.67 | 73.75                 | 84.71 | 100.52 | 127.16 |
| C | San Joaquin (SJV)     | Winter | 2021 | 330.64             | 382.68 | 449.87 | 573.67 | 73.83                 | 84.88 | 100.61 | 127.36 |
| C | San Joaquin (SJV)     | Winter | 2022 | 330.67             | 382.87 | 449.86 | 573.97 | 73.88                 | 85.03 | 100.68 | 127.52 |
| C | San Joaquin (SJV)     | Winter | 2023 | 330.68             | 383.03 | 449.84 | 574.20 | 73.91                 | 85.16 | 100.74 | 127.71 |
| C | San Joaquin (SJV)     | Winter | 2024 | 329.09             | 381.32 | 447.68 | 571.64 | 73.93                 | 85.27 | 100.79 | 127.88 |
| C | San Joaquin (SJV)     | Winter | 2025 | 329.10             | 381.44 | 447.67 | 571.82 | 73.95                 | 85.37 | 100.83 | 128.04 |
| C | San Joaquin (SJV)     | Winter | 2026 | 329.07             | 381.53 | 447.62 | 571.92 | 73.97                 | 85.47 | 100.87 | 128.18 |
| C | San Joaquin (SJV)     | Winter | 2027 | 329.08             | 381.66 | 447.60 | 572.08 | 73.99                 | 85.56 | 100.89 | 128.30 |
| C | San Joaquin (SJV)     | Winter | 2028 | 329.09             | 381.79 | 447.58 | 572.23 | 74.00                 | 85.65 | 100.91 | 128.42 |
| C | San Joaquin (SJV)     | Winter | 2029 | 329.09             | 381.91 | 447.56 | 572.39 | 74.00                 | 85.73 | 100.93 | 128.53 |
| C | San Joaquin (SJV)     | Winter | 2030 | 329.08             | 382.03 | 447.55 | 572.55 | 74.01                 | 85.80 | 100.94 | 128.63 |
| C | San Joaquin (SJV)     | Winter | 2031 | 329.08             | 382.15 | 447.54 | 572.72 | 74.01                 | 85.88 | 100.95 | 128.73 |
| C | San Joaquin (SJV)     | Winter | 2032 | 329.08             | 382.26 | 447.53 | 572.89 | 74.02                 | 85.94 | 100.95 | 128.83 |
| C | San Joaquin (SJV)     | Winter | 2033 | 329.08             | 382.36 | 447.52 | 573.05 | 74.02                 | 86.00 | 100.96 | 128.92 |
| C | San Joaquin (SJV)     | Winter | 2034 | 329.08             | 382.45 | 447.51 | 573.19 | 74.03                 | 86.06 | 100.97 | 129.00 |
| C | San Joaquin (SJV)     | Winter | 2035 | 329.08             | 382.52 | 447.50 | 573.31 | 74.03                 | 86.10 | 100.97 | 129.07 |
| C | San Luis Obispo (SCC) | Annual | 2010 | 323.71             | 378.06 | 444.34 | 556.25 | 73.66                 | 90.73 | 100.02 | 124.73 |
| C | San Luis Obispo (SCC) | Annual | 2011 | 323.66             | 377.48 | 443.78 | 556.86 | 73.53                 | 89.58 | 100.04 | 124.90 |
| C | San Luis Obispo (SCC) | Annual | 2012 | 323.65             | 377.05 | 443.34 | 557.51 | 73.41                 | 88.66 | 100.08 | 125.11 |
| C | San Luis Obispo (SCC) | Annual | 2013 | 323.72             | 376.63 | 442.99 | 558.19 | 73.36                 | 87.82 | 100.14 | 125.34 |
| C | San Luis Obispo (SCC) | Annual | 2014 | 323.79             | 376.32 | 442.72 | 558.85 | 73.31                 | 87.15 | 100.20 | 125.58 |
| C | San Luis Obispo (SCC) | Annual | 2015 | 323.89             | 376.00 | 442.50 | 559.54 | 73.31                 | 86.48 | 100.25 | 125.85 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location              | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Luis Obispo (SCC) | Annual | 2016 | 323.99             | 375.75 | 442.33 | 560.18 | 73.31                 | 85.95 | 100.33 | 126.11 |
| C | San Luis Obispo (SCC) | Annual | 2017 | 324.07             | 375.53 | 442.19 | 560.79 | 73.31                 | 85.47 | 100.39 | 126.38 |
| C | San Luis Obispo (SCC) | Annual | 2018 | 324.12             | 375.39 | 442.08 | 561.33 | 73.30                 | 85.15 | 100.47 | 126.64 |
| C | San Luis Obispo (SCC) | Annual | 2019 | 324.17             | 375.38 | 441.99 | 561.79 | 73.31                 | 85.03 | 100.54 | 126.87 |
| C | San Luis Obispo (SCC) | Annual | 2020 | 324.24             | 375.40 | 441.92 | 562.20 | 73.40                 | 85.04 | 100.62 | 127.10 |
| C | San Luis Obispo (SCC) | Annual | 2021 | 324.29             | 375.51 | 441.85 | 562.51 | 73.47                 | 85.15 | 100.70 | 127.27 |
| C | San Luis Obispo (SCC) | Annual | 2022 | 324.32             | 375.62 | 441.79 | 562.77 | 73.52                 | 85.25 | 100.76 | 127.41 |
| C | San Luis Obispo (SCC) | Annual | 2023 | 324.30             | 375.69 | 441.73 | 562.97 | 73.56                 | 85.34 | 100.82 | 127.59 |
| C | San Luis Obispo (SCC) | Annual | 2024 | 324.27             | 375.76 | 441.66 | 563.12 | 73.57                 | 85.42 | 100.86 | 127.74 |
| C | San Luis Obispo (SCC) | Annual | 2025 | 324.25             | 375.82 | 441.61 | 563.29 | 73.59                 | 85.49 | 100.89 | 127.90 |
| C | San Luis Obispo (SCC) | Annual | 2026 | 324.27             | 375.91 | 441.54 | 563.46 | 73.61                 | 85.57 | 100.92 | 128.06 |
| C | San Luis Obispo (SCC) | Annual | 2027 | 324.28             | 375.99 | 441.47 | 563.63 | 73.63                 | 85.63 | 100.94 | 128.19 |
| C | San Luis Obispo (SCC) | Annual | 2028 | 324.28             | 376.07 | 441.40 | 563.80 | 73.64                 | 85.68 | 100.95 | 128.31 |
| C | San Luis Obispo (SCC) | Annual | 2029 | 324.27             | 376.16 | 441.32 | 563.96 | 73.64                 | 85.74 | 100.95 | 128.43 |
| C | San Luis Obispo (SCC) | Annual | 2030 | 324.26             | 376.24 | 441.24 | 564.13 | 73.65                 | 85.79 | 100.95 | 128.54 |
| C | San Luis Obispo (SCC) | Annual | 2031 | 324.26             | 376.33 | 441.20 | 564.31 | 73.65                 | 85.84 | 100.96 | 128.65 |
| C | San Luis Obispo (SCC) | Annual | 2032 | 324.26             | 376.41 | 441.16 | 564.49 | 73.66                 | 85.88 | 100.96 | 128.75 |
| C | San Luis Obispo (SCC) | Annual | 2033 | 324.25             | 376.48 | 441.13 | 564.65 | 73.66                 | 85.92 | 100.97 | 128.84 |
| C | San Luis Obispo (SCC) | Annual | 2034 | 324.25             | 376.54 | 441.10 | 564.79 | 73.67                 | 85.96 | 100.97 | 128.93 |
| C | San Luis Obispo (SCC) | Annual | 2035 | 324.24             | 376.60 | 441.08 | 564.92 | 73.67                 | 86.00 | 100.97 | 129.01 |
| C | San Luis Obispo (SCC) | Summer | 2010 | 337.08             | 392.11 | 461.85 | 578.62 | 73.66                 | 90.73 | 100.02 | 124.73 |
| C | San Luis Obispo (SCC) | Summer | 2011 | 337.15             | 391.73 | 461.44 | 579.22 | 73.53                 | 89.58 | 100.04 | 124.90 |
| C | San Luis Obispo (SCC) | Summer | 2012 | 337.23             | 391.46 | 461.13 | 579.91 | 73.41                 | 88.66 | 100.08 | 125.11 |
| C | San Luis Obispo (SCC) | Summer | 2013 | 337.36             | 391.21 | 460.89 | 580.65 | 73.36                 | 87.82 | 100.14 | 125.34 |
| C | San Luis Obispo (SCC) | Summer | 2014 | 337.49             | 391.02 | 460.71 | 581.40 | 73.31                 | 87.15 | 100.20 | 125.58 |
| C | San Luis Obispo (SCC) | Summer | 2015 | 337.63             | 390.82 | 460.57 | 582.19 | 73.31                 | 86.48 | 100.25 | 125.85 |
| C | San Luis Obispo (SCC) | Summer | 2016 | 337.76             | 390.68 | 460.46 | 582.94 | 73.31                 | 85.95 | 100.33 | 126.11 |
| C | San Luis Obispo (SCC) | Summer | 2017 | 337.85             | 390.56 | 460.36 | 583.64 | 73.31                 | 85.47 | 100.39 | 126.38 |
| C | San Luis Obispo (SCC) | Summer | 2018 | 337.91             | 390.51 | 460.26 | 584.25 | 73.30                 | 85.15 | 100.47 | 126.64 |
| C | San Luis Obispo (SCC) | Summer | 2019 | 337.96             | 390.55 | 460.18 | 584.77 | 73.31                 | 85.03 | 100.54 | 126.87 |
| C | San Luis Obispo (SCC) | Summer | 2020 | 338.03             | 390.62 | 460.11 | 585.24 | 73.40                 | 85.04 | 100.62 | 127.10 |
| C | San Luis Obispo (SCC) | Summer | 2021 | 338.07             | 390.76 | 460.04 | 585.58 | 73.47                 | 85.15 | 100.70 | 127.27 |
| C | San Luis Obispo (SCC) | Summer | 2022 | 338.10             | 390.89 | 459.97 | 585.87 | 73.52                 | 85.25 | 100.76 | 127.41 |
| C | San Luis Obispo (SCC) | Summer | 2023 | 338.08             | 390.99 | 459.91 | 586.10 | 73.56                 | 85.34 | 100.82 | 127.59 |
| C | San Luis Obispo (SCC) | Summer | 2024 | 338.05             | 391.07 | 459.85 | 586.26 | 73.57                 | 85.42 | 100.86 | 127.74 |
| C | San Luis Obispo (SCC) | Summer | 2025 | 338.04             | 391.16 | 459.80 | 586.42 | 73.59                 | 85.49 | 100.89 | 127.90 |
| C | San Luis Obispo (SCC) | Summer | 2026 | 338.05             | 391.26 | 459.73 | 586.60 | 73.61                 | 85.57 | 100.92 | 128.06 |
| C | San Luis Obispo (SCC) | Summer | 2027 | 338.07             | 391.36 | 459.67 | 586.77 | 73.63                 | 85.63 | 100.94 | 128.19 |
| C | San Luis Obispo (SCC) | Summer | 2028 | 338.07             | 391.45 | 459.61 | 586.94 | 73.64                 | 85.68 | 100.95 | 128.31 |
| C | San Luis Obispo (SCC) | Summer | 2029 | 338.07             | 391.55 | 459.54 | 587.11 | 73.64                 | 85.74 | 100.95 | 128.43 |
| C | San Luis Obispo (SCC) | Summer | 2030 | 338.06             | 391.65 | 459.47 | 587.29 | 73.65                 | 85.79 | 100.95 | 128.54 |
| C | San Luis Obispo (SCC) | Summer | 2031 | 338.06             | 391.75 | 459.44 | 587.47 | 73.65                 | 85.84 | 100.96 | 128.65 |
| C | San Luis Obispo (SCC) | Summer | 2032 | 338.06             | 391.85 | 459.41 | 587.66 | 73.66                 | 85.88 | 100.96 | 128.75 |
| C | San Luis Obispo (SCC) | Summer | 2033 | 338.06             | 391.93 | 459.38 | 587.84 | 73.66                 | 85.92 | 100.97 | 128.84 |
| C | San Luis Obispo (SCC) | Summer | 2034 | 338.06             | 391.99 | 459.35 | 588.00 | 73.67                 | 85.96 | 100.97 | 128.93 |
| C | San Luis Obispo (SCC) | Summer | 2035 | 338.05             | 392.05 | 459.33 | 588.14 | 73.67                 | 86.00 | 100.97 | 129.01 |
| C | San Luis Obispo (SCC) | Winter | 2010 | 321.04             | 375.26 | 440.86 | 551.80 | 73.66                 | 90.73 | 100.02 | 124.73 |
| C | San Luis Obispo (SCC) | Winter | 2011 | 320.97             | 374.65 | 440.26 | 552.41 | 73.53                 | 89.58 | 100.04 | 124.90 |
| C | San Luis Obispo (SCC) | Winter | 2012 | 320.95             | 374.18 | 439.80 | 553.05 | 73.41                 | 88.66 | 100.08 | 125.11 |
| C | San Luis Obispo (SCC) | Winter | 2013 | 321.01             | 373.73 | 439.43 | 553.72 | 73.36                 | 87.82 | 100.14 | 125.34 |
| C | San Luis Obispo (SCC) | Winter | 2014 | 321.07             | 373.40 | 439.14 | 554.36 | 73.31                 | 87.15 | 100.20 | 125.58 |
| C | San Luis Obispo (SCC) | Winter | 2015 | 321.16             | 373.05 | 438.90 | 555.03 | 73.31                 | 86.48 | 100.25 | 125.85 |
| C | San Luis Obispo (SCC) | Winter | 2016 | 321.25             | 372.78 | 438.72 | 555.65 | 73.31                 | 85.95 | 100.33 | 126.11 |
| C | San Luis Obispo (SCC) | Winter | 2017 | 321.32             | 372.53 | 438.57 | 556.25 | 73.31                 | 85.47 | 100.39 | 126.38 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Luis Obispo (SCC) | Winter | 2018 | 321.37             | 372.38 | 438.46 | 556.77 | 73.30                 | 85.15 | 100.47 | 126.64 |
| C | San Luis Obispo (SCC) | Winter | 2019 | 321.42             | 372.35 | 438.37 | 557.21 | 73.31                 | 85.03 | 100.54 | 126.87 |
| C | San Luis Obispo (SCC) | Winter | 2020 | 321.50             | 372.37 | 438.30 | 557.61 | 73.40                 | 85.04 | 100.62 | 127.10 |
| C | San Luis Obispo (SCC) | Winter | 2021 | 321.55             | 372.47 | 438.23 | 557.91 | 73.47                 | 85.15 | 100.70 | 127.27 |
| C | San Luis Obispo (SCC) | Winter | 2022 | 321.57             | 372.57 | 438.17 | 558.16 | 73.52                 | 85.25 | 100.76 | 127.41 |
| C | San Luis Obispo (SCC) | Winter | 2023 | 321.56             | 372.64 | 438.10 | 558.37 | 73.56                 | 85.34 | 100.82 | 127.59 |
| C | San Luis Obispo (SCC) | Winter | 2024 | 321.53             | 372.71 | 438.04 | 558.51 | 73.57                 | 85.42 | 100.86 | 127.74 |
| C | San Luis Obispo (SCC) | Winter | 2025 | 321.51             | 372.77 | 437.99 | 558.68 | 73.59                 | 85.49 | 100.89 | 127.90 |
| C | San Luis Obispo (SCC) | Winter | 2026 | 321.52             | 372.85 | 437.92 | 558.85 | 73.61                 | 85.57 | 100.92 | 128.06 |
| C | San Luis Obispo (SCC) | Winter | 2027 | 321.53             | 372.93 | 437.84 | 559.02 | 73.63                 | 85.63 | 100.94 | 128.19 |
| C | San Luis Obispo (SCC) | Winter | 2028 | 321.53             | 373.01 | 437.77 | 559.19 | 73.64                 | 85.68 | 100.95 | 128.31 |
| C | San Luis Obispo (SCC) | Winter | 2029 | 321.52             | 373.09 | 437.69 | 559.35 | 73.64                 | 85.74 | 100.95 | 128.43 |
| C | San Luis Obispo (SCC) | Winter | 2030 | 321.51             | 373.17 | 437.61 | 559.52 | 73.65                 | 85.79 | 100.95 | 128.54 |
| C | San Luis Obispo (SCC) | Winter | 2031 | 321.51             | 373.25 | 437.57 | 559.69 | 73.65                 | 85.84 | 100.96 | 128.65 |
| C | San Luis Obispo (SCC) | Winter | 2032 | 321.51             | 373.33 | 437.53 | 559.87 | 73.66                 | 85.88 | 100.96 | 128.75 |
| C | San Luis Obispo (SCC) | Winter | 2033 | 321.50             | 373.40 | 437.50 | 560.03 | 73.66                 | 85.92 | 100.97 | 128.84 |
| C | San Luis Obispo (SCC) | Winter | 2034 | 321.50             | 373.46 | 437.47 | 560.17 | 73.67                 | 85.96 | 100.97 | 128.93 |
| C | San Luis Obispo (SCC) | Winter | 2035 | 321.49             | 373.52 | 437.45 | 560.29 | 73.67                 | 86.00 | 100.97 | 129.01 |
| C | San Mateo (SF)        | Annual | 2010 | 331.46             | 381.30 | 453.00 | 571.70 | 73.17                 | 84.42 | 99.27  | 124.79 |
| C | San Mateo (SF)        | Annual | 2011 | 331.52             | 381.54 | 452.87 | 572.19 | 73.20                 | 84.32 | 99.39  | 124.99 |
| C | San Mateo (SF)        | Annual | 2012 | 331.59             | 381.82 | 452.77 | 572.72 | 73.21                 | 84.27 | 99.52  | 125.21 |
| C | San Mateo (SF)        | Annual | 2013 | 331.72             | 382.13 | 452.69 | 573.27 | 73.27                 | 84.28 | 99.65  | 125.45 |
| C | San Mateo (SF)        | Annual | 2014 | 331.82             | 382.41 | 452.63 | 573.84 | 73.28                 | 84.28 | 99.79  | 125.69 |
| C | San Mateo (SF)        | Annual | 2015 | 331.97             | 382.71 | 452.60 | 574.41 | 73.35                 | 84.33 | 99.92  | 125.94 |
| C | San Mateo (SF)        | Annual | 2016 | 332.12             | 383.02 | 452.57 | 574.97 | 73.43                 | 84.40 | 100.06 | 126.20 |
| C | San Mateo (SF)        | Annual | 2017 | 332.23             | 383.29 | 452.55 | 575.50 | 73.47                 | 84.45 | 100.17 | 126.46 |
| C | San Mateo (SF)        | Annual | 2018 | 332.33             | 383.54 | 452.54 | 575.97 | 73.52                 | 84.52 | 100.27 | 126.70 |
| C | San Mateo (SF)        | Annual | 2019 | 332.44             | 383.81 | 452.54 | 576.38 | 73.58                 | 84.64 | 100.37 | 126.93 |
| C | San Mateo (SF)        | Annual | 2020 | 332.53             | 384.05 | 452.54 | 576.75 | 73.67                 | 84.78 | 100.47 | 127.15 |
| C | San Mateo (SF)        | Annual | 2021 | 332.60             | 384.28 | 452.54 | 577.07 | 73.74                 | 84.93 | 100.56 | 127.33 |
| C | San Mateo (SF)        | Annual | 2022 | 332.63             | 384.48 | 452.54 | 577.34 | 73.79                 | 85.06 | 100.64 | 127.49 |
| C | San Mateo (SF)        | Annual | 2023 | 332.64             | 384.63 | 452.53 | 577.54 | 73.83                 | 85.17 | 100.70 | 127.66 |
| C | San Mateo (SF)        | Annual | 2024 | 332.61             | 384.75 | 452.52 | 577.70 | 73.85                 | 85.27 | 100.76 | 127.81 |
| C | San Mateo (SF)        | Annual | 2025 | 332.60             | 384.86 | 452.51 | 577.87 | 73.87                 | 85.37 | 100.81 | 127.96 |
| C | San Mateo (SF)        | Annual | 2026 | 332.62             | 385.00 | 452.50 | 578.03 | 73.89                 | 85.46 | 100.84 | 128.10 |
| C | San Mateo (SF)        | Annual | 2027 | 332.63             | 385.15 | 452.48 | 578.19 | 73.90                 | 85.54 | 100.87 | 128.23 |
| C | San Mateo (SF)        | Annual | 2028 | 332.63             | 385.29 | 452.46 | 578.34 | 73.91                 | 85.61 | 100.89 | 128.34 |
| C | San Mateo (SF)        | Annual | 2029 | 332.63             | 385.44 | 452.44 | 578.49 | 73.92                 | 85.69 | 100.91 | 128.45 |
| C | San Mateo (SF)        | Annual | 2030 | 332.62             | 385.59 | 452.42 | 578.65 | 73.92                 | 85.76 | 100.92 | 128.55 |
| C | San Mateo (SF)        | Annual | 2031 | 332.61             | 385.75 | 452.41 | 578.81 | 73.93                 | 85.83 | 100.93 | 128.65 |
| C | San Mateo (SF)        | Annual | 2032 | 332.61             | 385.91 | 452.40 | 578.98 | 73.93                 | 85.89 | 100.94 | 128.74 |
| C | San Mateo (SF)        | Annual | 2033 | 332.61             | 386.05 | 452.38 | 579.13 | 73.93                 | 85.95 | 100.95 | 128.83 |
| C | San Mateo (SF)        | Annual | 2034 | 332.60             | 386.18 | 452.37 | 579.27 | 73.94                 | 86.01 | 100.96 | 128.91 |
| C | San Mateo (SF)        | Annual | 2035 | 332.60             | 386.30 | 452.36 | 579.39 | 73.94                 | 86.06 | 100.96 | 128.99 |
| C | San Mateo (SF)        | Summer | 2010 | 352.26             | 402.67 | 480.50 | 606.46 | 73.17                 | 84.42 | 99.27  | 124.79 |
| C | San Mateo (SF)        | Summer | 2011 | 352.41             | 403.17 | 480.38 | 606.84 | 73.20                 | 84.32 | 99.39  | 124.99 |
| C | San Mateo (SF)        | Summer | 2012 | 352.55             | 403.67 | 480.30 | 607.32 | 73.21                 | 84.27 | 99.52  | 125.21 |
| C | San Mateo (SF)        | Summer | 2013 | 352.74             | 404.17 | 480.27 | 607.88 | 73.27                 | 84.28 | 99.65  | 125.45 |
| C | San Mateo (SF)        | Summer | 2014 | 352.88             | 404.61 | 480.26 | 608.49 | 73.28                 | 84.28 | 99.79  | 125.69 |
| C | San Mateo (SF)        | Summer | 2015 | 353.05             | 405.04 | 480.27 | 609.14 | 73.35                 | 84.33 | 99.92  | 125.94 |
| C | San Mateo (SF)        | Summer | 2016 | 353.22             | 405.45 | 480.29 | 609.82 | 73.43                 | 84.40 | 100.06 | 126.20 |
| C | San Mateo (SF)        | Summer | 2017 | 353.34             | 405.84 | 480.32 | 610.47 | 73.47                 | 84.45 | 100.17 | 126.46 |
| C | San Mateo (SF)        | Summer | 2018 | 353.44             | 406.19 | 480.34 | 611.04 | 73.52                 | 84.52 | 100.27 | 126.70 |
| C | San Mateo (SF)        | Summer | 2019 | 353.55             | 406.55 | 480.36 | 611.53 | 73.58                 | 84.64 | 100.37 | 126.93 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location                          | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | San Mateo (SF)                    | Summer | 2020 | 353.65             | 406.87 | 480.38 | 611.98 | 73.67                 | 84.78 | 100.47 | 127.15 |
| C | San Mateo (SF)                    | Summer | 2021 | 353.72             | 407.17 | 480.38 | 612.36 | 73.74                 | 84.93 | 100.56 | 127.33 |
| C | San Mateo (SF)                    | Summer | 2022 | 353.76             | 407.44 | 480.37 | 612.69 | 73.79                 | 85.06 | 100.64 | 127.49 |
| C | San Mateo (SF)                    | Summer | 2023 | 353.77             | 407.65 | 480.36 | 612.93 | 73.83                 | 85.17 | 100.70 | 127.66 |
| C | San Mateo (SF)                    | Summer | 2024 | 353.75             | 407.83 | 480.34 | 613.13 | 73.85                 | 85.27 | 100.76 | 127.81 |
| C | San Mateo (SF)                    | Summer | 2025 | 353.74             | 408.00 | 480.32 | 613.31 | 73.87                 | 85.37 | 100.81 | 127.96 |
| C | San Mateo (SF)                    | Summer | 2026 | 353.77             | 408.19 | 480.30 | 613.48 | 73.89                 | 85.46 | 100.84 | 128.10 |
| C | San Mateo (SF)                    | Summer | 2027 | 353.78             | 408.39 | 480.28 | 613.64 | 73.90                 | 85.54 | 100.87 | 128.23 |
| C | San Mateo (SF)                    | Summer | 2028 | 353.79             | 408.58 | 480.25 | 613.80 | 73.91                 | 85.61 | 100.89 | 128.34 |
| C | San Mateo (SF)                    | Summer | 2029 | 353.79             | 408.79 | 480.23 | 613.96 | 73.92                 | 85.69 | 100.91 | 128.45 |
| C | San Mateo (SF)                    | Summer | 2030 | 353.78             | 408.99 | 480.21 | 614.12 | 73.92                 | 85.76 | 100.92 | 128.55 |
| C | San Mateo (SF)                    | Summer | 2031 | 353.78             | 409.21 | 480.20 | 614.29 | 73.93                 | 85.83 | 100.93 | 128.65 |
| C | San Mateo (SF)                    | Summer | 2032 | 353.78             | 409.41 | 480.19 | 614.46 | 73.93                 | 85.89 | 100.94 | 128.74 |
| C | San Mateo (SF)                    | Summer | 2033 | 353.78             | 409.59 | 480.19 | 614.63 | 73.93                 | 85.95 | 100.95 | 128.83 |
| C | San Mateo (SF)                    | Summer | 2034 | 353.78             | 409.75 | 480.18 | 614.78 | 73.94                 | 86.01 | 100.96 | 128.91 |
| C | San Mateo (SF)                    | Summer | 2035 | 353.77             | 409.88 | 480.17 | 614.93 | 73.94                 | 86.06 | 100.96 | 128.99 |
| C | San Mateo (SF)                    | Winter | 2010 | 330.18             | 379.99 | 451.31 | 569.56 | 73.17                 | 84.42 | 99.27  | 124.79 |
| C | San Mateo (SF)                    | Winter | 2011 | 330.23             | 380.21 | 451.18 | 570.06 | 73.20                 | 84.32 | 99.39  | 124.99 |
| C | San Mateo (SF)                    | Winter | 2012 | 330.30             | 380.48 | 451.08 | 570.59 | 73.21                 | 84.27 | 99.52  | 125.21 |
| C | San Mateo (SF)                    | Winter | 2013 | 330.43             | 380.78 | 451.00 | 571.15 | 73.27                 | 84.28 | 99.65  | 125.45 |
| C | San Mateo (SF)                    | Winter | 2014 | 330.52             | 381.04 | 450.94 | 571.71 | 73.28                 | 84.28 | 99.79  | 125.69 |
| C | San Mateo (SF)                    | Winter | 2015 | 330.67             | 381.34 | 450.90 | 572.28 | 73.35                 | 84.33 | 99.92  | 125.94 |
| C | San Mateo (SF)                    | Winter | 2016 | 330.82             | 381.64 | 450.87 | 572.83 | 73.43                 | 84.40 | 100.06 | 126.20 |
| C | San Mateo (SF)                    | Winter | 2017 | 330.94             | 381.91 | 450.84 | 573.35 | 73.47                 | 84.45 | 100.17 | 126.46 |
| C | San Mateo (SF)                    | Winter | 2018 | 331.03             | 382.14 | 450.83 | 573.82 | 73.52                 | 84.52 | 100.27 | 126.70 |
| C | San Mateo (SF)                    | Winter | 2019 | 331.14             | 382.41 | 450.83 | 574.22 | 73.58                 | 84.64 | 100.37 | 126.93 |
| C | San Mateo (SF)                    | Winter | 2020 | 331.23             | 382.65 | 450.83 | 574.59 | 73.67                 | 84.78 | 100.47 | 127.15 |
| C | San Mateo (SF)                    | Winter | 2021 | 331.30             | 382.88 | 450.83 | 574.90 | 73.74                 | 84.93 | 100.56 | 127.33 |
| C | San Mateo (SF)                    | Winter | 2022 | 331.34             | 383.07 | 450.83 | 575.17 | 73.79                 | 85.06 | 100.64 | 127.49 |
| C | San Mateo (SF)                    | Winter | 2023 | 331.34             | 383.21 | 450.82 | 575.36 | 73.83                 | 85.17 | 100.70 | 127.66 |
| C | San Mateo (SF)                    | Winter | 2024 | 331.31             | 383.33 | 450.81 | 575.53 | 73.85                 | 85.27 | 100.76 | 127.81 |
| C | San Mateo (SF)                    | Winter | 2025 | 331.30             | 383.44 | 450.81 | 575.69 | 73.87                 | 85.37 | 100.81 | 127.96 |
| C | San Mateo (SF)                    | Winter | 2026 | 331.32             | 383.58 | 450.79 | 575.85 | 73.89                 | 85.46 | 100.84 | 128.10 |
| C | San Mateo (SF)                    | Winter | 2027 | 331.33             | 383.72 | 450.77 | 576.01 | 73.90                 | 85.54 | 100.87 | 128.23 |
| C | San Mateo (SF)                    | Winter | 2028 | 331.33             | 383.86 | 450.75 | 576.16 | 73.91                 | 85.61 | 100.89 | 128.34 |
| C | San Mateo (SF)                    | Winter | 2029 | 331.33             | 384.00 | 450.73 | 576.31 | 73.92                 | 85.69 | 100.91 | 128.45 |
| C | San Mateo (SF)                    | Winter | 2030 | 331.31             | 384.15 | 450.71 | 576.47 | 73.92                 | 85.76 | 100.92 | 128.55 |
| C | San Mateo (SF)                    | Winter | 2031 | 331.31             | 384.31 | 450.70 | 576.63 | 73.93                 | 85.83 | 100.93 | 128.65 |
| C | San Mateo (SF)                    | Winter | 2032 | 331.31             | 384.47 | 450.69 | 576.80 | 73.93                 | 85.89 | 100.94 | 128.74 |
| C | San Mateo (SF)                    | Winter | 2033 | 331.31             | 384.61 | 450.67 | 576.95 | 73.93                 | 85.95 | 100.95 | 128.83 |
| C | San Mateo (SF)                    | Winter | 2034 | 331.30             | 384.74 | 450.66 | 577.09 | 73.94                 | 86.01 | 100.96 | 128.91 |
| C | San Mateo (SF)                    | Winter | 2035 | 331.30             | 384.85 | 450.65 | 577.21 | 73.94                 | 86.06 | 100.96 | 128.99 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2010 | 310.84             | 363.09 | 427.75 | 535.11 | 73.30                 | 88.99 | 99.96  | 124.67 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2011 | 310.88             | 362.63 | 427.11 | 535.68 | 73.27                 | 88.16 | 99.98  | 124.88 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2012 | 310.95             | 362.25 | 426.61 | 536.31 | 73.24                 | 87.48 | 100.03 | 125.11 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2013 | 311.07             | 361.91 | 426.21 | 536.98 | 73.26                 | 86.88 | 100.11 | 125.37 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2014 | 311.18             | 361.62 | 425.89 | 537.62 | 73.27                 | 86.37 | 100.18 | 125.64 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2015 | 313.00             | 363.39 | 428.01 | 541.26 | 73.31                 | 85.95 | 100.25 | 125.92 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2016 | 313.13             | 363.16 | 427.81 | 541.86 | 73.36                 | 85.55 | 100.33 | 126.20 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2017 | 313.22             | 362.94 | 427.65 | 542.43 | 73.38                 | 85.18 | 100.40 | 126.48 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2018 | 313.28             | 362.85 | 427.53 | 542.93 | 73.40                 | 85.00 | 100.47 | 126.74 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2019 | 313.35             | 362.86 | 427.43 | 543.35 | 73.43                 | 84.95 | 100.55 | 126.99 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2020 | 313.43             | 362.88 | 427.35 | 543.74 | 73.53                 | 84.99 | 100.64 | 127.22 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2021 | 313.48             | 362.96 | 427.30 | 543.99 | 73.59                 | 85.09 | 100.71 | 127.38 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location                          | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                                   |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Santa Barbara-North of Santa Ynez | Annual | 2022 | 313.49             | 363.03 | 427.24 | 544.20 | 73.64                 | 85.18 | 100.77 | 127.51 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2023 | 313.48             | 363.09 | 427.17 | 544.37 | 73.67                 | 85.26 | 100.82 | 127.66 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2024 | 313.44             | 363.12 | 427.11 | 544.49 | 73.68                 | 85.33 | 100.86 | 127.80 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2025 | 313.43             | 363.17 | 427.06 | 544.63 | 73.70                 | 85.40 | 100.90 | 127.95 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2026 | 311.28             | 360.68 | 423.96 | 540.92 | 73.71                 | 85.47 | 100.92 | 128.08 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2027 | 311.28             | 360.75 | 423.88 | 541.07 | 73.73                 | 85.52 | 100.94 | 128.21 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2028 | 311.28             | 360.82 | 423.82 | 541.22 | 73.74                 | 85.58 | 100.95 | 128.32 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2029 | 311.28             | 360.90 | 423.73 | 541.36 | 73.74                 | 85.63 | 100.95 | 128.43 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2030 | 311.26             | 360.97 | 423.64 | 541.52 | 73.75                 | 85.67 | 100.95 | 128.53 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2031 | 311.26             | 361.06 | 423.58 | 541.68 | 73.75                 | 85.72 | 100.96 | 128.63 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2032 | 311.25             | 361.13 | 423.54 | 541.85 | 73.76                 | 85.77 | 100.96 | 128.73 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2033 | 311.25             | 361.21 | 423.50 | 542.00 | 73.76                 | 85.81 | 100.96 | 128.82 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2034 | 311.24             | 361.27 | 423.46 | 542.14 | 73.76                 | 85.85 | 100.97 | 128.90 |
| C | Santa Barbara-North of Santa Ynez | Annual | 2035 | 311.24             | 361.32 | 423.43 | 542.26 | 73.77                 | 85.88 | 100.97 | 128.98 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2010 | 318.00             | 370.60 | 437.04 | 547.10 | 73.30                 | 88.99 | 99.96  | 124.67 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2011 | 318.11             | 370.21 | 436.50 | 547.67 | 73.27                 | 88.16 | 99.98  | 124.88 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2012 | 318.23             | 369.92 | 436.07 | 548.31 | 73.24                 | 87.48 | 100.03 | 125.11 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2013 | 318.39             | 369.65 | 435.73 | 549.01 | 73.26                 | 86.88 | 100.11 | 125.37 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2014 | 318.53             | 369.43 | 435.47 | 549.69 | 73.27                 | 86.37 | 100.18 | 125.64 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2015 | 320.38             | 371.28 | 437.66 | 553.41 | 73.31                 | 85.95 | 100.25 | 125.92 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2016 | 320.52             | 371.11 | 437.49 | 554.06 | 73.36                 | 85.55 | 100.33 | 126.20 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2017 | 320.61             | 370.94 | 437.35 | 554.68 | 73.38                 | 85.18 | 100.40 | 126.48 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2018 | 320.68             | 370.90 | 437.24 | 555.21 | 73.40                 | 85.00 | 100.47 | 126.74 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2019 | 320.75             | 370.93 | 437.14 | 555.67 | 73.43                 | 84.95 | 100.55 | 126.99 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2020 | 320.82             | 370.99 | 437.07 | 556.08 | 73.53                 | 84.99 | 100.64 | 127.22 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2021 | 320.86             | 371.07 | 437.00 | 556.34 | 73.59                 | 85.09 | 100.71 | 127.38 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2022 | 320.87             | 371.15 | 436.93 | 556.55 | 73.64                 | 85.18 | 100.77 | 127.51 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2023 | 320.85             | 371.21 | 436.86 | 556.71 | 73.67                 | 85.26 | 100.82 | 127.66 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2024 | 320.82             | 371.26 | 436.79 | 556.83 | 73.68                 | 85.33 | 100.86 | 127.80 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2025 | 320.80             | 371.31 | 436.74 | 556.96 | 73.70                 | 85.40 | 100.90 | 127.95 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2026 | 318.61             | 368.79 | 433.59 | 553.19 | 73.71                 | 85.47 | 100.92 | 128.08 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2027 | 318.61             | 368.86 | 433.51 | 553.33 | 73.73                 | 85.52 | 100.94 | 128.21 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2028 | 318.62             | 368.94 | 433.45 | 553.48 | 73.74                 | 85.58 | 100.95 | 128.32 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2029 | 318.61             | 369.02 | 433.37 | 553.64 | 73.74                 | 85.63 | 100.95 | 128.43 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2030 | 318.60             | 369.11 | 433.28 | 553.80 | 73.75                 | 85.67 | 100.95 | 128.53 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2031 | 318.60             | 369.20 | 433.24 | 553.96 | 73.75                 | 85.72 | 100.96 | 128.63 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2032 | 318.60             | 369.29 | 433.20 | 554.14 | 73.76                 | 85.77 | 100.96 | 128.73 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2033 | 318.60             | 369.37 | 433.17 | 554.30 | 73.76                 | 85.81 | 100.96 | 128.82 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2034 | 318.59             | 369.44 | 433.13 | 554.45 | 73.76                 | 85.85 | 100.97 | 128.90 |
| C | Santa Barbara-North of Santa Ynez | Summer | 2035 | 318.59             | 369.50 | 433.10 | 554.58 | 73.77                 | 85.88 | 100.97 | 128.98 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2010 | 310.39             | 362.63 | 427.17 | 534.37 | 73.30                 | 88.99 | 99.96  | 124.67 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2011 | 310.43             | 362.16 | 426.53 | 534.94 | 73.27                 | 88.16 | 99.98  | 124.88 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2012 | 310.50             | 361.77 | 426.02 | 535.57 | 73.24                 | 87.48 | 100.03 | 125.11 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2013 | 310.62             | 361.43 | 425.62 | 536.23 | 73.26                 | 86.88 | 100.11 | 125.37 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2014 | 310.73             | 361.13 | 425.30 | 536.87 | 73.27                 | 86.37 | 100.18 | 125.64 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2015 | 312.55             | 362.90 | 427.42 | 540.51 | 73.31                 | 85.95 | 100.25 | 125.92 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2016 | 312.67             | 362.67 | 427.21 | 541.11 | 73.36                 | 85.55 | 100.33 | 126.20 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2017 | 312.76             | 362.45 | 427.05 | 541.68 | 73.38                 | 85.18 | 100.40 | 126.48 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2018 | 312.83             | 362.36 | 426.93 | 542.17 | 73.40                 | 85.00 | 100.47 | 126.74 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2019 | 312.90             | 362.36 | 426.83 | 542.59 | 73.43                 | 84.95 | 100.55 | 126.99 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2020 | 312.97             | 362.38 | 426.75 | 542.98 | 73.53                 | 84.99 | 100.64 | 127.22 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2021 | 313.02             | 362.45 | 426.70 | 543.23 | 73.59                 | 85.09 | 100.71 | 127.38 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2022 | 313.04             | 362.53 | 426.64 | 543.44 | 73.64                 | 85.18 | 100.77 | 127.51 |
| C | Santa Barbara-North of Santa Ynez | Winter | 2023 | 313.02             | 362.58 | 426.57 | 543.61 | 73.67                 | 85.26 | 100.82 | 127.66 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location                              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2024 | 312.99             | 362.62 | 426.51 | 543.73 | 73.68                 | 85.33 | 100.86 | 127.80 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2025 | 312.98             | 362.66 | 426.46 | 543.87 | 73.70                 | 85.40 | 100.90 | 127.95 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2026 | 310.82             | 360.18 | 423.37 | 540.16 | 73.71                 | 85.47 | 100.92 | 128.08 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2027 | 310.83             | 360.25 | 423.29 | 540.31 | 73.73                 | 85.52 | 100.94 | 128.21 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2028 | 310.83             | 360.32 | 423.22 | 540.46 | 73.74                 | 85.58 | 100.95 | 128.32 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2029 | 310.82             | 360.40 | 423.14 | 540.60 | 73.74                 | 85.63 | 100.95 | 128.43 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2030 | 310.81             | 360.47 | 423.04 | 540.76 | 73.75                 | 85.67 | 100.95 | 128.53 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2031 | 310.80             | 360.55 | 422.99 | 540.92 | 73.75                 | 85.72 | 100.96 | 128.63 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2032 | 310.80             | 360.63 | 422.94 | 541.09 | 73.76                 | 85.77 | 100.96 | 128.73 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2033 | 310.80             | 360.70 | 422.90 | 541.24 | 73.76                 | 85.81 | 100.96 | 128.82 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2034 | 310.79             | 360.76 | 422.87 | 541.38 | 73.76                 | 85.85 | 100.97 | 128.90 |
| C | Santa Barbara-North of Santa Ynez     | Winter | 2035 | 310.78             | 360.82 | 422.83 | 541.50 | 73.77                 | 85.88 | 100.97 | 128.98 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2010 | 310.84             | 363.09 | 427.75 | 535.11 | 73.30                 | 88.99 | 99.96  | 124.67 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2011 | 310.88             | 362.63 | 427.11 | 535.68 | 73.27                 | 88.16 | 99.98  | 124.88 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2012 | 310.95             | 362.25 | 426.61 | 536.31 | 73.24                 | 87.48 | 100.03 | 125.11 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2013 | 311.07             | 361.91 | 426.21 | 536.98 | 73.26                 | 86.88 | 100.11 | 125.37 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2014 | 311.18             | 361.62 | 425.89 | 537.62 | 73.27                 | 86.37 | 100.18 | 125.64 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2015 | 313.00             | 363.39 | 428.01 | 541.26 | 73.31                 | 85.95 | 100.25 | 125.92 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2016 | 313.13             | 363.16 | 427.81 | 541.86 | 73.36                 | 85.55 | 100.33 | 126.20 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2017 | 313.22             | 362.94 | 427.65 | 542.43 | 73.38                 | 85.18 | 100.40 | 126.48 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2018 | 313.28             | 362.85 | 427.53 | 542.93 | 73.40                 | 85.00 | 100.47 | 126.74 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2019 | 313.35             | 362.86 | 427.43 | 543.35 | 73.43                 | 84.95 | 100.55 | 126.99 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2020 | 313.43             | 362.88 | 427.35 | 543.74 | 73.53                 | 84.99 | 100.64 | 127.22 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2021 | 313.48             | 362.96 | 427.30 | 543.99 | 73.59                 | 85.09 | 100.71 | 127.38 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2022 | 313.49             | 363.03 | 427.24 | 544.20 | 73.64                 | 85.18 | 100.77 | 127.51 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2023 | 313.48             | 363.09 | 427.17 | 544.37 | 73.67                 | 85.26 | 100.82 | 127.66 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2024 | 313.44             | 363.12 | 427.11 | 544.49 | 73.68                 | 85.33 | 100.86 | 127.80 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2025 | 313.43             | 363.17 | 427.06 | 544.63 | 73.70                 | 85.40 | 100.90 | 127.95 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2026 | 311.28             | 360.68 | 423.96 | 540.92 | 73.71                 | 85.47 | 100.92 | 128.08 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2027 | 311.28             | 360.75 | 423.88 | 541.07 | 73.73                 | 85.52 | 100.94 | 128.21 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2028 | 311.28             | 360.82 | 423.82 | 541.22 | 73.74                 | 85.58 | 100.95 | 128.32 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2029 | 311.28             | 360.90 | 423.73 | 541.36 | 73.74                 | 85.63 | 100.95 | 128.43 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2030 | 311.26             | 360.97 | 423.64 | 541.52 | 73.75                 | 85.67 | 100.95 | 128.53 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2031 | 311.26             | 361.06 | 423.58 | 541.68 | 73.75                 | 85.72 | 100.96 | 128.63 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2032 | 311.25             | 361.13 | 423.54 | 541.85 | 73.76                 | 85.77 | 100.96 | 128.73 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2033 | 311.25             | 361.21 | 423.50 | 542.00 | 73.76                 | 85.81 | 100.96 | 128.82 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2034 | 311.24             | 361.27 | 423.46 | 542.14 | 73.76                 | 85.85 | 100.97 | 128.90 |
| C | Santa Barbara-South of Santa Ynez Ran | Annual | 2035 | 311.24             | 361.32 | 423.43 | 542.26 | 73.77                 | 85.88 | 100.97 | 128.98 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2010 | 318.00             | 370.60 | 437.04 | 547.10 | 73.30                 | 88.99 | 99.96  | 124.67 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2011 | 318.11             | 370.21 | 436.50 | 547.67 | 73.27                 | 88.16 | 99.98  | 124.88 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2012 | 318.23             | 369.92 | 436.07 | 548.31 | 73.24                 | 87.48 | 100.03 | 125.11 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2013 | 318.39             | 369.65 | 435.73 | 549.01 | 73.26                 | 86.88 | 100.11 | 125.37 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2014 | 318.53             | 369.43 | 435.47 | 549.69 | 73.27                 | 86.37 | 100.18 | 125.64 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2015 | 320.38             | 371.28 | 437.66 | 553.41 | 73.31                 | 85.95 | 100.25 | 125.92 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2016 | 320.52             | 371.11 | 437.49 | 554.06 | 73.36                 | 85.55 | 100.33 | 126.20 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2017 | 320.61             | 370.94 | 437.35 | 554.68 | 73.38                 | 85.18 | 100.40 | 126.48 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2018 | 320.68             | 370.90 | 437.24 | 555.21 | 73.40                 | 85.00 | 100.47 | 126.74 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2019 | 320.75             | 370.93 | 437.14 | 555.67 | 73.43                 | 84.95 | 100.55 | 126.99 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2020 | 320.82             | 370.99 | 437.07 | 556.08 | 73.53                 | 84.99 | 100.64 | 127.22 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2021 | 320.86             | 371.07 | 437.00 | 556.34 | 73.59                 | 85.09 | 100.71 | 127.38 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2022 | 320.87             | 371.15 | 436.93 | 556.55 | 73.64                 | 85.18 | 100.77 | 127.51 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2023 | 320.85             | 371.21 | 436.86 | 556.71 | 73.67                 | 85.26 | 100.82 | 127.66 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2024 | 320.82             | 371.26 | 436.79 | 556.83 | 73.68                 | 85.33 | 100.86 | 127.80 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2025 | 320.80             | 371.31 | 436.74 | 556.96 | 73.70                 | 85.40 | 100.90 | 127.95 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location                              | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------------------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                                       |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2026 | 318.61             | 368.79 | 433.59 | 553.19 | 73.71                 | 85.47 | 100.92 | 128.08 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2027 | 318.61             | 368.86 | 433.51 | 553.33 | 73.73                 | 85.52 | 100.94 | 128.21 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2028 | 318.62             | 368.94 | 433.45 | 553.48 | 73.74                 | 85.58 | 100.95 | 128.32 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2029 | 318.61             | 369.02 | 433.37 | 553.64 | 73.74                 | 85.63 | 100.95 | 128.43 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2030 | 318.60             | 369.11 | 433.28 | 553.80 | 73.75                 | 85.67 | 100.95 | 128.53 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2031 | 318.60             | 369.20 | 433.24 | 553.96 | 73.75                 | 85.72 | 100.96 | 128.63 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2032 | 318.60             | 369.29 | 433.20 | 554.14 | 73.76                 | 85.77 | 100.96 | 128.73 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2033 | 318.60             | 369.37 | 433.17 | 554.30 | 73.76                 | 85.81 | 100.96 | 128.82 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2034 | 318.59             | 369.44 | 433.13 | 554.45 | 73.76                 | 85.85 | 100.97 | 128.90 |
| C | Santa Barbara-South of Santa Ynez Ran | Summer | 2035 | 318.59             | 369.50 | 433.10 | 554.58 | 73.77                 | 85.88 | 100.97 | 128.98 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2010 | 310.39             | 362.63 | 427.17 | 534.37 | 73.30                 | 88.99 | 99.96  | 124.67 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2011 | 310.43             | 362.16 | 426.53 | 534.94 | 73.27                 | 88.16 | 99.98  | 124.88 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2012 | 310.50             | 361.77 | 426.02 | 535.57 | 73.24                 | 87.48 | 100.03 | 125.11 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2013 | 310.62             | 361.43 | 425.62 | 536.23 | 73.26                 | 86.88 | 100.11 | 125.37 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2014 | 310.73             | 361.13 | 425.30 | 536.87 | 73.27                 | 86.37 | 100.18 | 125.64 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2015 | 312.55             | 362.90 | 427.42 | 540.51 | 73.31                 | 85.95 | 100.25 | 125.92 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2016 | 312.67             | 362.67 | 427.21 | 541.11 | 73.36                 | 85.55 | 100.33 | 126.20 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2017 | 312.76             | 362.45 | 427.05 | 541.68 | 73.38                 | 85.18 | 100.40 | 126.48 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2018 | 312.83             | 362.36 | 426.93 | 542.17 | 73.40                 | 85.00 | 100.47 | 126.74 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2019 | 312.90             | 362.36 | 426.83 | 542.59 | 73.43                 | 84.95 | 100.55 | 126.99 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2020 | 312.97             | 362.38 | 426.75 | 542.98 | 73.53                 | 84.99 | 100.64 | 127.22 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2021 | 313.02             | 362.45 | 426.70 | 543.23 | 73.59                 | 85.09 | 100.71 | 127.38 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2022 | 313.04             | 362.53 | 426.64 | 543.44 | 73.64                 | 85.18 | 100.77 | 127.51 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2023 | 313.02             | 362.58 | 426.57 | 543.61 | 73.67                 | 85.26 | 100.82 | 127.66 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2024 | 312.99             | 362.62 | 426.51 | 543.73 | 73.68                 | 85.33 | 100.86 | 127.80 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2025 | 312.98             | 362.66 | 426.46 | 543.87 | 73.70                 | 85.40 | 100.90 | 127.95 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2026 | 310.82             | 360.18 | 423.37 | 540.16 | 73.71                 | 85.47 | 100.92 | 128.08 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2027 | 310.83             | 360.25 | 423.29 | 540.31 | 73.73                 | 85.52 | 100.94 | 128.21 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2028 | 310.83             | 360.32 | 423.22 | 540.46 | 73.74                 | 85.58 | 100.95 | 128.32 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2029 | 310.82             | 360.40 | 423.14 | 540.60 | 73.74                 | 85.63 | 100.95 | 128.43 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2030 | 310.81             | 360.47 | 423.04 | 540.76 | 73.75                 | 85.67 | 100.95 | 128.53 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2031 | 310.80             | 360.55 | 422.99 | 540.92 | 73.75                 | 85.72 | 100.96 | 128.63 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2032 | 310.80             | 360.63 | 422.94 | 541.09 | 73.76                 | 85.77 | 100.96 | 128.73 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2033 | 310.80             | 360.70 | 422.90 | 541.24 | 73.76                 | 85.81 | 100.96 | 128.82 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2034 | 310.79             | 360.76 | 422.87 | 541.38 | 73.76                 | 85.85 | 100.97 | 128.90 |
| C | Santa Barbara-South of Santa Ynez Ran | Winter | 2035 | 310.78             | 360.82 | 422.83 | 541.50 | 73.77                 | 85.88 | 100.97 | 128.98 |
| C | Santa Clara (SF)                      | Annual | 2010 | 329.54             | 379.42 | 451.34 | 568.91 | 72.72                 | 84.35 | 99.27  | 124.50 |
| C | Santa Clara (SF)                      | Annual | 2011 | 329.74             | 379.85 | 451.25 | 569.47 | 72.79                 | 84.25 | 99.38  | 124.72 |
| C | Santa Clara (SF)                      | Annual | 2012 | 329.96             | 380.27 | 451.20 | 570.08 | 72.88                 | 84.20 | 99.53  | 124.96 |
| C | Santa Clara (SF)                      | Annual | 2013 | 330.20             | 380.67 | 451.15 | 570.74 | 72.98                 | 84.20 | 99.67  | 125.22 |
| C | Santa Clara (SF)                      | Annual | 2014 | 330.42             | 381.04 | 451.13 | 571.39 | 73.07                 | 84.19 | 99.80  | 125.48 |
| C | Santa Clara (SF)                      | Annual | 2015 | 330.66             | 381.39 | 451.11 | 572.06 | 73.19                 | 84.22 | 99.92  | 125.76 |
| C | Santa Clara (SF)                      | Annual | 2016 | 330.88             | 381.76 | 451.11 | 572.69 | 73.31                 | 84.28 | 100.05 | 126.03 |
| C | Santa Clara (SF)                      | Annual | 2017 | 331.05             | 382.11 | 451.10 | 573.29 | 73.40                 | 84.35 | 100.15 | 126.31 |
| C | Santa Clara (SF)                      | Annual | 2018 | 331.20             | 382.41 | 451.10 | 573.81 | 73.48                 | 84.42 | 100.25 | 126.57 |
| C | Santa Clara (SF)                      | Annual | 2019 | 331.33             | 382.70 | 451.11 | 574.27 | 73.56                 | 84.54 | 100.35 | 126.81 |
| C | Santa Clara (SF)                      | Annual | 2020 | 331.44             | 382.97 | 451.11 | 574.68 | 73.67                 | 84.69 | 100.45 | 127.04 |
| C | Santa Clara (SF)                      | Annual | 2021 | 331.53             | 383.22 | 451.12 | 575.01 | 73.75                 | 84.85 | 100.55 | 127.23 |
| C | Santa Clara (SF)                      | Annual | 2022 | 331.58             | 383.42 | 451.12 | 575.30 | 73.81                 | 84.99 | 100.63 | 127.38 |
| C | Santa Clara (SF)                      | Annual | 2023 | 331.60             | 383.59 | 451.11 | 575.52 | 73.85                 | 85.11 | 100.70 | 127.56 |
| C | Santa Clara (SF)                      | Annual | 2024 | 331.59             | 383.72 | 451.11 | 575.69 | 73.88                 | 85.22 | 100.75 | 127.72 |
| C | Santa Clara (SF)                      | Annual | 2025 | 331.60             | 383.84 | 451.10 | 575.86 | 73.91                 | 85.32 | 100.80 | 127.87 |
| C | Santa Clara (SF)                      | Annual | 2026 | 331.62             | 383.98 | 451.09 | 576.04 | 73.93                 | 85.42 | 100.84 | 128.02 |
| C | Santa Clara (SF)                      | Annual | 2027 | 331.63             | 384.13 | 451.08 | 576.20 | 73.94                 | 85.51 | 100.87 | 128.15 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Santa Clara (SF) | Annual | 2028 | 331.63             | 384.27 | 451.07 | 576.37 | 73.95                 | 85.59 | 100.89 | 128.27 |
| C | Santa Clara (SF) | Annual | 2029 | 331.63             | 384.42 | 451.05 | 576.54 | 73.96                 | 85.67 | 100.91 | 128.38 |
| C | Santa Clara (SF) | Annual | 2030 | 331.63             | 384.57 | 451.04 | 576.71 | 73.97                 | 85.74 | 100.93 | 128.49 |
| C | Santa Clara (SF) | Annual | 2031 | 331.63             | 384.73 | 451.03 | 576.89 | 73.97                 | 85.82 | 100.94 | 128.60 |
| C | Santa Clara (SF) | Annual | 2032 | 331.62             | 384.87 | 451.03 | 577.08 | 73.98                 | 85.89 | 100.95 | 128.70 |
| C | Santa Clara (SF) | Annual | 2033 | 331.62             | 385.01 | 451.02 | 577.25 | 73.98                 | 85.95 | 100.95 | 128.80 |
| C | Santa Clara (SF) | Annual | 2034 | 331.62             | 385.12 | 451.01 | 577.41 | 73.99                 | 86.01 | 100.96 | 128.88 |
| C | Santa Clara (SF) | Annual | 2035 | 331.62             | 385.22 | 451.00 | 577.55 | 73.99                 | 86.06 | 100.97 | 128.96 |
| C | Santa Clara (SF) | Summer | 2010 | 355.01             | 405.62 | 485.21 | 611.43 | 72.72                 | 84.35 | 99.27  | 124.50 |
| C | Santa Clara (SF) | Summer | 2011 | 355.38             | 406.43 | 485.18 | 611.92 | 72.79                 | 84.25 | 99.38  | 124.72 |
| C | Santa Clara (SF) | Summer | 2012 | 355.73             | 407.17 | 485.18 | 612.54 | 72.88                 | 84.20 | 99.53  | 124.96 |
| C | Santa Clara (SF) | Summer | 2013 | 356.08             | 407.85 | 485.21 | 613.25 | 72.98                 | 84.20 | 99.67  | 125.22 |
| C | Santa Clara (SF) | Summer | 2014 | 356.38             | 408.44 | 485.27 | 614.00 | 73.07                 | 84.19 | 99.80  | 125.48 |
| C | Santa Clara (SF) | Summer | 2015 | 356.67             | 408.98 | 485.34 | 614.82 | 73.19                 | 84.22 | 99.92  | 125.76 |
| C | Santa Clara (SF) | Summer | 2016 | 356.93             | 409.53 | 485.41 | 615.61 | 73.31                 | 84.28 | 100.05 | 126.03 |
| C | Santa Clara (SF) | Summer | 2017 | 357.13             | 410.03 | 485.47 | 616.36 | 73.40                 | 84.35 | 100.15 | 126.31 |
| C | Santa Clara (SF) | Summer | 2018 | 357.28             | 410.48 | 485.51 | 617.01 | 73.48                 | 84.42 | 100.25 | 126.57 |
| C | Santa Clara (SF) | Summer | 2019 | 357.41             | 410.89 | 485.53 | 617.56 | 73.56                 | 84.54 | 100.35 | 126.81 |
| C | Santa Clara (SF) | Summer | 2020 | 357.52             | 411.27 | 485.53 | 618.06 | 73.67                 | 84.69 | 100.45 | 127.04 |
| C | Santa Clara (SF) | Summer | 2021 | 357.60             | 411.59 | 485.53 | 618.46 | 73.75                 | 84.85 | 100.55 | 127.23 |
| C | Santa Clara (SF) | Summer | 2022 | 357.65             | 411.88 | 485.52 | 618.80 | 73.81                 | 84.99 | 100.63 | 127.38 |
| C | Santa Clara (SF) | Summer | 2023 | 357.67             | 412.12 | 485.51 | 619.06 | 73.85                 | 85.11 | 100.70 | 127.56 |
| C | Santa Clara (SF) | Summer | 2024 | 357.67             | 412.32 | 485.49 | 619.25 | 73.88                 | 85.22 | 100.75 | 127.72 |
| C | Santa Clara (SF) | Summer | 2025 | 357.67             | 412.50 | 485.48 | 619.43 | 73.91                 | 85.32 | 100.80 | 127.87 |
| C | Santa Clara (SF) | Summer | 2026 | 357.69             | 412.71 | 485.46 | 619.61 | 73.93                 | 85.42 | 100.84 | 128.02 |
| C | Santa Clara (SF) | Summer | 2027 | 357.71             | 412.91 | 485.44 | 619.78 | 73.94                 | 85.51 | 100.87 | 128.15 |
| C | Santa Clara (SF) | Summer | 2028 | 357.72             | 413.11 | 485.42 | 619.95 | 73.95                 | 85.59 | 100.89 | 128.27 |
| C | Santa Clara (SF) | Summer | 2029 | 357.73             | 413.32 | 485.41 | 620.13 | 73.96                 | 85.67 | 100.91 | 128.38 |
| C | Santa Clara (SF) | Summer | 2030 | 357.73             | 413.53 | 485.40 | 620.32 | 73.97                 | 85.74 | 100.93 | 128.49 |
| C | Santa Clara (SF) | Summer | 2031 | 357.73             | 413.75 | 485.39 | 620.53 | 73.97                 | 85.82 | 100.94 | 128.60 |
| C | Santa Clara (SF) | Summer | 2032 | 357.74             | 413.95 | 485.38 | 620.74 | 73.98                 | 85.89 | 100.95 | 128.70 |
| C | Santa Clara (SF) | Summer | 2033 | 357.74             | 414.12 | 485.38 | 620.94 | 73.98                 | 85.95 | 100.95 | 128.80 |
| C | Santa Clara (SF) | Summer | 2034 | 357.74             | 414.27 | 485.37 | 621.13 | 73.99                 | 86.01 | 100.96 | 128.88 |
| C | Santa Clara (SF) | Summer | 2035 | 357.73             | 414.39 | 485.37 | 621.30 | 73.99                 | 86.06 | 100.97 | 128.96 |
| C | Santa Clara (SF) | Winter | 2010 | 325.35             | 375.11 | 445.76 | 561.90 | 72.72                 | 84.35 | 99.27  | 124.50 |
| C | Santa Clara (SF) | Winter | 2011 | 325.51             | 375.47 | 445.67 | 562.47 | 72.79                 | 84.25 | 99.38  | 124.72 |
| C | Santa Clara (SF) | Winter | 2012 | 325.71             | 375.83 | 445.60 | 563.09 | 72.88                 | 84.20 | 99.53  | 124.96 |
| C | Santa Clara (SF) | Winter | 2013 | 325.93             | 376.19 | 445.54 | 563.73 | 72.98                 | 84.20 | 99.67  | 125.22 |
| C | Santa Clara (SF) | Winter | 2014 | 326.15             | 376.52 | 445.50 | 564.37 | 73.07                 | 84.19 | 99.80  | 125.48 |
| C | Santa Clara (SF) | Winter | 2015 | 326.37             | 376.85 | 445.47 | 565.01 | 73.19                 | 84.22 | 99.92  | 125.76 |
| C | Santa Clara (SF) | Winter | 2016 | 326.59             | 377.19 | 445.45 | 565.62 | 73.31                 | 84.28 | 100.05 | 126.03 |
| C | Santa Clara (SF) | Winter | 2017 | 326.76             | 377.50 | 445.44 | 566.19 | 73.40                 | 84.35 | 100.15 | 126.31 |
| C | Santa Clara (SF) | Winter | 2018 | 326.90             | 377.78 | 445.43 | 566.70 | 73.48                 | 84.42 | 100.25 | 126.57 |
| C | Santa Clara (SF) | Winter | 2019 | 327.03             | 378.05 | 445.44 | 567.14 | 73.56                 | 84.54 | 100.35 | 126.81 |
| C | Santa Clara (SF) | Winter | 2020 | 327.15             | 378.31 | 445.44 | 567.53 | 73.67                 | 84.69 | 100.45 | 127.04 |
| C | Santa Clara (SF) | Winter | 2021 | 327.23             | 378.54 | 445.45 | 567.85 | 73.75                 | 84.85 | 100.55 | 127.23 |
| C | Santa Clara (SF) | Winter | 2022 | 327.28             | 378.74 | 445.45 | 568.13 | 73.81                 | 84.99 | 100.63 | 127.38 |
| C | Santa Clara (SF) | Winter | 2023 | 327.30             | 378.89 | 445.45 | 568.35 | 73.85                 | 85.11 | 100.70 | 127.56 |
| C | Santa Clara (SF) | Winter | 2024 | 327.30             | 379.01 | 445.44 | 568.51 | 73.88                 | 85.22 | 100.75 | 127.72 |
| C | Santa Clara (SF) | Winter | 2025 | 327.30             | 379.11 | 445.44 | 568.68 | 73.91                 | 85.32 | 100.80 | 127.87 |
| C | Santa Clara (SF) | Winter | 2026 | 327.32             | 379.25 | 445.43 | 568.86 | 73.93                 | 85.42 | 100.84 | 128.02 |
| C | Santa Clara (SF) | Winter | 2027 | 327.33             | 379.38 | 445.42 | 569.02 | 73.94                 | 85.51 | 100.87 | 128.15 |
| C | Santa Clara (SF) | Winter | 2028 | 327.33             | 379.52 | 445.41 | 569.19 | 73.95                 | 85.59 | 100.89 | 128.27 |
| C | Santa Clara (SF) | Winter | 2029 | 327.33             | 379.66 | 445.39 | 569.35 | 73.96                 | 85.67 | 100.91 | 128.38 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Santa Clara (SF) | Winter | 2030 | 327.33             | 379.80 | 445.38 | 569.52 | 73.97                 | 85.74 | 100.93 | 128.49 |
| C | Santa Clara (SF) | Winter | 2031 | 327.32             | 379.94 | 445.37 | 569.70 | 73.97                 | 85.82 | 100.94 | 128.60 |
| C | Santa Clara (SF) | Winter | 2032 | 327.32             | 380.08 | 445.37 | 569.89 | 73.98                 | 85.89 | 100.95 | 128.70 |
| C | Santa Clara (SF) | Winter | 2033 | 327.32             | 380.21 | 445.36 | 570.06 | 73.98                 | 85.95 | 100.95 | 128.80 |
| C | Santa Clara (SF) | Winter | 2034 | 327.32             | 380.32 | 445.35 | 570.21 | 73.99                 | 86.01 | 100.96 | 128.88 |
| C | Santa Clara (SF) | Winter | 2035 | 327.31             | 380.42 | 445.34 | 570.34 | 73.99                 | 86.06 | 100.97 | 128.96 |
| C | Santa Cruz (NCC) | Annual | 2010 | 342.18             | 398.70 | 471.90 | 588.13 | 72.83                 | 89.70 | 99.97  | 123.98 |
| C | Santa Cruz (NCC) | Annual | 2011 | 344.76             | 401.21 | 474.70 | 593.14 | 72.81                 | 88.62 | 99.97  | 124.15 |
| C | Santa Cruz (NCC) | Annual | 2012 | 344.81             | 400.83 | 474.13 | 593.83 | 72.75                 | 87.71 | 100.01 | 124.36 |
| C | Santa Cruz (NCC) | Annual | 2013 | 344.95             | 400.57 | 473.67 | 594.62 | 72.78                 | 87.04 | 100.08 | 124.60 |
| C | Santa Cruz (NCC) | Annual | 2014 | 345.06             | 400.34 | 473.31 | 595.40 | 72.76                 | 86.42 | 100.14 | 124.86 |
| C | Santa Cruz (NCC) | Annual | 2015 | 345.22             | 400.10 | 473.04 | 596.22 | 72.81                 | 85.81 | 100.22 | 125.15 |
| C | Santa Cruz (NCC) | Annual | 2016 | 345.38             | 399.90 | 472.82 | 597.00 | 72.88                 | 85.29 | 100.31 | 125.44 |
| C | Santa Cruz (NCC) | Annual | 2017 | 345.51             | 399.79 | 472.64 | 597.74 | 72.93                 | 84.93 | 100.39 | 125.75 |
| C | Santa Cruz (NCC) | Annual | 2018 | 345.60             | 399.69 | 472.51 | 598.40 | 72.95                 | 84.60 | 100.46 | 126.03 |
| C | Santa Cruz (NCC) | Annual | 2019 | 345.68             | 399.71 | 472.40 | 598.98 | 72.99                 | 84.49 | 100.53 | 126.31 |
| C | Santa Cruz (NCC) | Annual | 2020 | 345.78             | 399.78 | 472.32 | 599.51 | 73.09                 | 84.55 | 100.62 | 126.57 |
| C | Santa Cruz (NCC) | Annual | 2021 | 347.98             | 402.45 | 475.22 | 603.70 | 73.17                 | 84.68 | 100.70 | 126.78 |
| C | Santa Cruz (NCC) | Annual | 2022 | 348.01             | 402.58 | 475.14 | 604.04 | 73.23                 | 84.80 | 100.77 | 126.94 |
| C | Santa Cruz (NCC) | Annual | 2023 | 347.99             | 402.69 | 475.06 | 604.31 | 73.26                 | 84.91 | 100.82 | 127.15 |
| C | Santa Cruz (NCC) | Annual | 2024 | 347.94             | 402.76 | 474.98 | 604.50 | 73.27                 | 85.00 | 100.86 | 127.33 |
| C | Santa Cruz (NCC) | Annual | 2025 | 347.93             | 402.83 | 474.91 | 604.71 | 73.30                 | 85.09 | 100.90 | 127.51 |
| C | Santa Cruz (NCC) | Annual | 2026 | 347.93             | 402.92 | 474.83 | 604.93 | 73.32                 | 85.18 | 100.92 | 127.68 |
| C | Santa Cruz (NCC) | Annual | 2027 | 347.94             | 403.00 | 474.74 | 605.14 | 73.33                 | 85.25 | 100.94 | 127.83 |
| C | Santa Cruz (NCC) | Annual | 2028 | 347.93             | 403.10 | 474.65 | 605.36 | 73.34                 | 85.31 | 100.95 | 127.98 |
| C | Santa Cruz (NCC) | Annual | 2029 | 347.92             | 403.20 | 474.53 | 605.57 | 73.35                 | 85.38 | 100.95 | 128.11 |
| C | Santa Cruz (NCC) | Annual | 2030 | 347.91             | 403.30 | 474.43 | 605.80 | 73.35                 | 85.44 | 100.94 | 128.24 |
| C | Santa Cruz (NCC) | Annual | 2031 | 347.90             | 403.41 | 474.37 | 606.04 | 73.36                 | 85.50 | 100.95 | 128.37 |
| C | Santa Cruz (NCC) | Annual | 2032 | 347.90             | 403.52 | 474.32 | 606.30 | 73.37                 | 85.56 | 100.95 | 128.50 |
| C | Santa Cruz (NCC) | Annual | 2033 | 347.90             | 403.62 | 474.28 | 606.52 | 73.37                 | 85.61 | 100.96 | 128.62 |
| C | Santa Cruz (NCC) | Annual | 2034 | 347.89             | 403.71 | 474.24 | 606.73 | 73.38                 | 85.66 | 100.96 | 128.72 |
| C | Santa Cruz (NCC) | Annual | 2035 | 347.88             | 403.77 | 474.20 | 606.91 | 73.38                 | 85.70 | 100.96 | 128.83 |
| C | Santa Cruz (NCC) | Summer | 2010 | 359.20             | 416.81 | 494.15 | 616.49 | 72.83                 | 89.70 | 99.97  | 123.98 |
| C | Santa Cruz (NCC) | Summer | 2011 | 362.08             | 419.64 | 497.38 | 621.70 | 72.81                 | 88.62 | 99.97  | 124.15 |
| C | Santa Cruz (NCC) | Summer | 2012 | 362.25             | 419.43 | 497.01 | 622.43 | 72.75                 | 87.71 | 100.01 | 124.36 |
| C | Santa Cruz (NCC) | Summer | 2013 | 362.49             | 419.31 | 496.73 | 623.32 | 72.78                 | 87.04 | 100.08 | 124.60 |
| C | Santa Cruz (NCC) | Summer | 2014 | 362.67             | 419.21 | 496.51 | 624.22 | 72.76                 | 86.42 | 100.14 | 124.86 |
| C | Santa Cruz (NCC) | Summer | 2015 | 362.88             | 419.11 | 496.33 | 625.19 | 72.81                 | 85.81 | 100.22 | 125.15 |
| C | Santa Cruz (NCC) | Summer | 2016 | 363.08             | 419.04 | 496.18 | 626.11 | 72.88                 | 85.29 | 100.31 | 125.44 |
| C | Santa Cruz (NCC) | Summer | 2017 | 363.22             | 419.05 | 496.05 | 626.99 | 72.93                 | 84.93 | 100.39 | 125.75 |
| C | Santa Cruz (NCC) | Summer | 2018 | 363.31             | 419.05 | 495.92 | 627.77 | 72.95                 | 84.60 | 100.46 | 126.03 |
| C | Santa Cruz (NCC) | Summer | 2019 | 363.39             | 419.15 | 495.82 | 628.45 | 72.99                 | 84.49 | 100.53 | 126.31 |
| C | Santa Cruz (NCC) | Summer | 2020 | 363.48             | 419.29 | 495.74 | 629.06 | 73.09                 | 84.55 | 100.62 | 126.57 |
| C | Santa Cruz (NCC) | Summer | 2021 | 365.79             | 422.13 | 498.77 | 633.49 | 73.17                 | 84.68 | 100.70 | 126.78 |
| C | Santa Cruz (NCC) | Summer | 2022 | 365.81             | 422.31 | 498.69 | 633.89 | 73.23                 | 84.80 | 100.77 | 126.94 |
| C | Santa Cruz (NCC) | Summer | 2023 | 365.79             | 422.46 | 498.61 | 634.19 | 73.26                 | 84.91 | 100.82 | 127.15 |
| C | Santa Cruz (NCC) | Summer | 2024 | 365.75             | 422.57 | 498.54 | 634.39 | 73.27                 | 85.00 | 100.86 | 127.33 |
| C | Santa Cruz (NCC) | Summer | 2025 | 365.74             | 422.66 | 498.48 | 634.61 | 73.30                 | 85.09 | 100.90 | 127.51 |
| C | Santa Cruz (NCC) | Summer | 2026 | 365.75             | 422.78 | 498.40 | 634.82 | 73.32                 | 85.18 | 100.92 | 127.68 |
| C | Santa Cruz (NCC) | Summer | 2027 | 365.76             | 422.88 | 498.33 | 635.04 | 73.33                 | 85.25 | 100.94 | 127.83 |
| C | Santa Cruz (NCC) | Summer | 2028 | 365.76             | 422.99 | 498.25 | 635.25 | 73.34                 | 85.31 | 100.95 | 127.98 |
| C | Santa Cruz (NCC) | Summer | 2029 | 365.75             | 423.11 | 498.15 | 635.48 | 73.35                 | 85.38 | 100.95 | 128.11 |
| C | Santa Cruz (NCC) | Summer | 2030 | 365.75             | 423.23 | 498.06 | 635.71 | 73.35                 | 85.44 | 100.94 | 128.24 |
| C | Santa Cruz (NCC) | Summer | 2031 | 365.75             | 423.36 | 498.02 | 635.98 | 73.36                 | 85.50 | 100.95 | 128.37 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Santa Cruz (NCC) | Summer | 2032 | 365.75             | 423.49 | 497.98 | 636.26 | 73.37                 | 85.56 | 100.95 | 128.50 |
| C | Santa Cruz (NCC) | Summer | 2033 | 365.75             | 423.60 | 497.95 | 636.52 | 73.37                 | 85.61 | 100.96 | 128.62 |
| C | Santa Cruz (NCC) | Summer | 2034 | 365.75             | 423.70 | 497.91 | 636.76 | 73.38                 | 85.66 | 100.96 | 128.72 |
| C | Santa Cruz (NCC) | Summer | 2035 | 365.74             | 423.77 | 497.88 | 636.97 | 73.38                 | 85.70 | 100.96 | 128.83 |
| C | Santa Cruz (NCC) | Winter | 2010 | 341.89             | 398.39 | 471.51 | 587.64 | 72.83                 | 89.70 | 99.97  | 123.98 |
| C | Santa Cruz (NCC) | Winter | 2011 | 344.46             | 400.89 | 474.31 | 592.65 | 72.81                 | 88.62 | 99.97  | 124.15 |
| C | Santa Cruz (NCC) | Winter | 2012 | 344.51             | 400.51 | 473.73 | 593.34 | 72.75                 | 87.71 | 100.01 | 124.36 |
| C | Santa Cruz (NCC) | Winter | 2013 | 344.64             | 400.25 | 473.27 | 594.13 | 72.78                 | 87.04 | 100.08 | 124.60 |
| C | Santa Cruz (NCC) | Winter | 2014 | 344.75             | 400.01 | 472.91 | 594.90 | 72.76                 | 86.42 | 100.14 | 124.86 |
| C | Santa Cruz (NCC) | Winter | 2015 | 344.91             | 399.77 | 472.63 | 595.72 | 72.81                 | 85.81 | 100.22 | 125.15 |
| C | Santa Cruz (NCC) | Winter | 2016 | 345.08             | 399.57 | 472.41 | 596.49 | 72.88                 | 85.29 | 100.31 | 125.44 |
| C | Santa Cruz (NCC) | Winter | 2017 | 345.20             | 399.46 | 472.24 | 597.23 | 72.93                 | 84.93 | 100.39 | 125.75 |
| C | Santa Cruz (NCC) | Winter | 2018 | 345.29             | 399.35 | 472.10 | 597.89 | 72.95                 | 84.60 | 100.46 | 126.03 |
| C | Santa Cruz (NCC) | Winter | 2019 | 345.38             | 399.37 | 472.00 | 598.47 | 72.99                 | 84.49 | 100.53 | 126.31 |
| C | Santa Cruz (NCC) | Winter | 2020 | 345.47             | 399.45 | 471.92 | 598.99 | 73.09                 | 84.55 | 100.62 | 126.57 |
| C | Santa Cruz (NCC) | Winter | 2021 | 347.68             | 402.11 | 474.81 | 603.18 | 73.17                 | 84.68 | 100.70 | 126.78 |
| C | Santa Cruz (NCC) | Winter | 2022 | 347.70             | 402.24 | 474.73 | 603.53 | 73.23                 | 84.80 | 100.77 | 126.94 |
| C | Santa Cruz (NCC) | Winter | 2023 | 347.69             | 402.34 | 474.65 | 603.79 | 73.26                 | 84.91 | 100.82 | 127.15 |
| C | Santa Cruz (NCC) | Winter | 2024 | 347.64             | 402.42 | 474.57 | 603.98 | 73.27                 | 85.00 | 100.86 | 127.33 |
| C | Santa Cruz (NCC) | Winter | 2025 | 347.62             | 402.49 | 474.51 | 604.19 | 73.30                 | 85.09 | 100.90 | 127.51 |
| C | Santa Cruz (NCC) | Winter | 2026 | 347.63             | 402.58 | 474.42 | 604.41 | 73.32                 | 85.18 | 100.92 | 127.68 |
| C | Santa Cruz (NCC) | Winter | 2027 | 347.63             | 402.66 | 474.33 | 604.63 | 73.33                 | 85.25 | 100.94 | 127.83 |
| C | Santa Cruz (NCC) | Winter | 2028 | 347.63             | 402.75 | 474.24 | 604.84 | 73.34                 | 85.31 | 100.95 | 127.98 |
| C | Santa Cruz (NCC) | Winter | 2029 | 347.61             | 402.85 | 474.12 | 605.05 | 73.35                 | 85.38 | 100.95 | 128.11 |
| C | Santa Cruz (NCC) | Winter | 2030 | 347.60             | 402.96 | 474.02 | 605.28 | 73.35                 | 85.44 | 100.94 | 128.24 |
| C | Santa Cruz (NCC) | Winter | 2031 | 347.60             | 403.07 | 473.96 | 605.52 | 73.36                 | 85.50 | 100.95 | 128.37 |
| C | Santa Cruz (NCC) | Winter | 2032 | 347.59             | 403.18 | 473.91 | 605.78 | 73.37                 | 85.56 | 100.95 | 128.50 |
| C | Santa Cruz (NCC) | Winter | 2033 | 347.59             | 403.27 | 473.87 | 606.01 | 73.37                 | 85.61 | 100.96 | 128.62 |
| C | Santa Cruz (NCC) | Winter | 2034 | 347.58             | 403.36 | 473.83 | 606.21 | 73.38                 | 85.66 | 100.96 | 128.72 |
| C | Santa Cruz (NCC) | Winter | 2035 | 347.58             | 403.43 | 473.79 | 606.39 | 73.38                 | 85.70 | 100.96 | 128.83 |
| C | Shasta (SV)      | Annual | 2010 | 350.80             | 413.29 | 482.10 | 601.62 | 74.15                 | 98.71 | 101.24 | 125.46 |
| C | Shasta (SV)      | Annual | 2011 | 350.90             | 412.33 | 481.45 | 602.23 | 73.97                 | 96.26 | 101.09 | 125.49 |
| C | Shasta (SV)      | Annual | 2012 | 351.01             | 411.55 | 480.95 | 602.95 | 73.79                 | 94.20 | 101.00 | 125.59 |
| C | Shasta (SV)      | Annual | 2013 | 351.16             | 410.88 | 480.56 | 603.76 | 73.67                 | 92.45 | 100.93 | 125.73 |
| C | Shasta (SV)      | Annual | 2014 | 351.28             | 410.22 | 480.26 | 604.58 | 73.54                 | 90.71 | 100.85 | 125.88 |
| C | Shasta (SV)      | Annual | 2015 | 351.43             | 409.72 | 480.02 | 605.45 | 73.48                 | 89.34 | 100.76 | 126.07 |
| C | Shasta (SV)      | Annual | 2016 | 351.59             | 409.32 | 479.82 | 606.30 | 73.48                 | 88.23 | 100.75 | 126.28 |
| C | Shasta (SV)      | Annual | 2017 | 351.70             | 408.85 | 479.65 | 607.09 | 73.46                 | 86.94 | 100.68 | 126.51 |
| C | Shasta (SV)      | Annual | 2018 | 351.78             | 408.50 | 479.51 | 607.77 | 73.42                 | 85.93 | 100.65 | 126.73 |
| C | Shasta (SV)      | Annual | 2019 | 351.86             | 408.40 | 479.39 | 608.38 | 73.43                 | 85.58 | 100.66 | 126.93 |
| C | Shasta (SV)      | Annual | 2020 | 351.92             | 408.34 | 479.30 | 608.94 | 73.52                 | 85.46 | 100.71 | 127.12 |
| C | Shasta (SV)      | Annual | 2021 | 351.97             | 408.41 | 479.21 | 609.29 | 73.59                 | 85.54 | 100.78 | 127.19 |
| C | Shasta (SV)      | Annual | 2022 | 352.00             | 408.47 | 479.13 | 609.57 | 73.64                 | 85.60 | 100.83 | 127.24 |
| C | Shasta (SV)      | Annual | 2023 | 351.99             | 408.52 | 479.04 | 609.77 | 73.67                 | 85.66 | 100.87 | 127.40 |
| C | Shasta (SV)      | Annual | 2024 | 351.96             | 408.57 | 478.97 | 609.93 | 73.69                 | 85.71 | 100.90 | 127.56 |
| C | Shasta (SV)      | Annual | 2025 | 351.96             | 408.62 | 478.91 | 610.13 | 73.71                 | 85.77 | 100.93 | 127.72 |
| C | Shasta (SV)      | Annual | 2026 | 351.98             | 408.69 | 478.84 | 610.34 | 73.73                 | 85.83 | 100.95 | 127.89 |
| C | Shasta (SV)      | Annual | 2027 | 351.99             | 408.74 | 478.77 | 610.55 | 73.74                 | 85.87 | 100.96 | 128.04 |
| C | Shasta (SV)      | Annual | 2028 | 352.00             | 408.80 | 478.71 | 610.77 | 73.75                 | 85.92 | 100.97 | 128.18 |
| C | Shasta (SV)      | Annual | 2029 | 352.00             | 408.87 | 478.63 | 610.99 | 73.76                 | 85.96 | 100.97 | 128.31 |
| C | Shasta (SV)      | Annual | 2030 | 351.99             | 408.94 | 478.56 | 611.21 | 73.76                 | 86.00 | 100.96 | 128.43 |
| C | Shasta (SV)      | Annual | 2031 | 351.99             | 409.00 | 478.53 | 611.45 | 73.77                 | 86.04 | 100.96 | 128.55 |
| C | Shasta (SV)      | Annual | 2032 | 351.99             | 409.07 | 478.50 | 611.69 | 73.78                 | 86.08 | 100.96 | 128.67 |
| C | Shasta (SV)      | Annual | 2033 | 351.98             | 409.12 | 478.47 | 611.91 | 73.78                 | 86.11 | 100.97 | 128.77 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Shasta (SV) | Annual | 2034 | 351.98             | 409.16 | 478.44 | 612.11 | 73.78                 | 86.14 | 100.97 | 128.87 |
| C | Shasta (SV) | Annual | 2035 | 351.97             | 409.20 | 478.42 | 612.29 | 73.79                 | 86.17 | 100.97 | 128.96 |
| C | Shasta (SV) | Summer | 2010 | 377.12             | 440.81 | 516.16 | 644.42 | 74.15                 | 98.71 | 101.24 | 125.46 |
| C | Shasta (SV) | Summer | 2011 | 377.45             | 440.35 | 515.97 | 645.10 | 73.97                 | 96.26 | 101.09 | 125.49 |
| C | Shasta (SV) | Summer | 2012 | 377.75             | 439.98 | 515.82 | 645.96 | 73.79                 | 94.20 | 101.00 | 125.59 |
| C | Shasta (SV) | Summer | 2013 | 378.03             | 439.65 | 515.70 | 646.99 | 73.67                 | 92.45 | 100.93 | 125.73 |
| C | Shasta (SV) | Summer | 2014 | 378.26             | 439.31 | 515.62 | 648.05 | 73.54                 | 90.71 | 100.85 | 125.88 |
| C | Shasta (SV) | Summer | 2015 | 378.49             | 439.05 | 515.56 | 649.19 | 73.48                 | 89.34 | 100.76 | 126.07 |
| C | Shasta (SV) | Summer | 2016 | 378.71             | 438.86 | 515.49 | 650.32 | 73.48                 | 88.23 | 100.75 | 126.28 |
| C | Shasta (SV) | Summer | 2017 | 378.85             | 438.66 | 515.40 | 651.36 | 73.46                 | 86.94 | 100.68 | 126.51 |
| C | Shasta (SV) | Summer | 2018 | 378.93             | 438.50 | 515.27 | 652.24 | 73.42                 | 85.93 | 100.65 | 126.73 |
| C | Shasta (SV) | Summer | 2019 | 379.01             | 438.48 | 515.17 | 653.03 | 73.43                 | 85.58 | 100.66 | 126.93 |
| C | Shasta (SV) | Summer | 2020 | 379.07             | 438.49 | 515.07 | 653.75 | 73.52                 | 85.46 | 100.71 | 127.12 |
| C | Shasta (SV) | Summer | 2021 | 379.11             | 438.58 | 514.97 | 654.24 | 73.59                 | 85.54 | 100.78 | 127.19 |
| C | Shasta (SV) | Summer | 2022 | 379.12             | 438.68 | 514.88 | 654.63 | 73.64                 | 85.60 | 100.83 | 127.24 |
| C | Shasta (SV) | Summer | 2023 | 379.11             | 438.76 | 514.80 | 654.91 | 73.67                 | 85.66 | 100.87 | 127.40 |
| C | Shasta (SV) | Summer | 2024 | 379.10             | 438.85 | 514.73 | 655.11 | 73.69                 | 85.71 | 100.90 | 127.56 |
| C | Shasta (SV) | Summer | 2025 | 379.11             | 438.93 | 514.68 | 655.32 | 73.71                 | 85.77 | 100.93 | 127.72 |
| C | Shasta (SV) | Summer | 2026 | 379.13             | 439.02 | 514.61 | 655.54 | 73.73                 | 85.83 | 100.95 | 127.89 |
| C | Shasta (SV) | Summer | 2027 | 379.15             | 439.10 | 514.56 | 655.77 | 73.74                 | 85.87 | 100.96 | 128.04 |
| C | Shasta (SV) | Summer | 2028 | 379.16             | 439.18 | 514.51 | 656.00 | 73.75                 | 85.92 | 100.97 | 128.18 |
| C | Shasta (SV) | Summer | 2029 | 379.17             | 439.28 | 514.46 | 656.24 | 73.76                 | 85.96 | 100.97 | 128.31 |
| C | Shasta (SV) | Summer | 2030 | 379.18             | 439.37 | 514.41 | 656.49 | 73.76                 | 86.00 | 100.96 | 128.43 |
| C | Shasta (SV) | Summer | 2031 | 379.17             | 439.46 | 514.40 | 656.77 | 73.77                 | 86.04 | 100.96 | 128.55 |
| C | Shasta (SV) | Summer | 2032 | 379.17             | 439.53 | 514.40 | 657.05 | 73.78                 | 86.08 | 100.96 | 128.67 |
| C | Shasta (SV) | Summer | 2033 | 379.17             | 439.59 | 514.38 | 657.31 | 73.78                 | 86.11 | 100.97 | 128.77 |
| C | Shasta (SV) | Summer | 2034 | 379.16             | 439.64 | 514.37 | 657.55 | 73.78                 | 86.14 | 100.97 | 128.87 |
| C | Shasta (SV) | Summer | 2035 | 379.16             | 439.67 | 514.35 | 657.77 | 73.79                 | 86.17 | 100.97 | 128.96 |
| C | Shasta (SV) | Winter | 2010 | 339.28             | 401.24 | 467.18 | 582.88 | 74.15                 | 98.71 | 101.24 | 125.46 |
| C | Shasta (SV) | Winter | 2011 | 339.28             | 400.06 | 466.34 | 583.46 | 73.97                 | 96.26 | 101.09 | 125.49 |
| C | Shasta (SV) | Winter | 2012 | 339.31             | 399.10 | 465.69 | 584.12 | 73.79                 | 94.20 | 101.00 | 125.59 |
| C | Shasta (SV) | Winter | 2013 | 339.39             | 398.29 | 465.18 | 584.84 | 73.67                 | 92.45 | 100.93 | 125.73 |
| C | Shasta (SV) | Winter | 2014 | 339.47             | 397.49 | 464.78 | 585.56 | 73.54                 | 90.71 | 100.85 | 125.88 |
| C | Shasta (SV) | Winter | 2015 | 339.58             | 396.87 | 464.45 | 586.30 | 73.48                 | 89.34 | 100.76 | 126.07 |
| C | Shasta (SV) | Winter | 2016 | 339.72             | 396.38 | 464.21 | 587.03 | 73.48                 | 88.23 | 100.75 | 126.28 |
| C | Shasta (SV) | Winter | 2017 | 339.82             | 395.81 | 464.01 | 587.71 | 73.46                 | 86.94 | 100.68 | 126.51 |
| C | Shasta (SV) | Winter | 2018 | 339.89             | 395.36 | 463.85 | 588.30 | 73.42                 | 85.93 | 100.65 | 126.73 |
| C | Shasta (SV) | Winter | 2019 | 339.97             | 395.23 | 463.73 | 588.83 | 73.43                 | 85.58 | 100.66 | 126.93 |
| C | Shasta (SV) | Winter | 2020 | 340.04             | 395.15 | 463.64 | 589.32 | 73.52                 | 85.46 | 100.71 | 127.12 |
| C | Shasta (SV) | Winter | 2021 | 340.09             | 395.20 | 463.55 | 589.61 | 73.59                 | 85.54 | 100.78 | 127.19 |
| C | Shasta (SV) | Winter | 2022 | 340.12             | 395.24 | 463.47 | 589.84 | 73.64                 | 85.60 | 100.83 | 127.24 |
| C | Shasta (SV) | Winter | 2023 | 340.11             | 395.29 | 463.39 | 590.01 | 73.67                 | 85.66 | 100.87 | 127.40 |
| C | Shasta (SV) | Winter | 2024 | 340.09             | 395.32 | 463.31 | 590.15 | 73.69                 | 85.71 | 100.90 | 127.56 |
| C | Shasta (SV) | Winter | 2025 | 340.08             | 395.35 | 463.25 | 590.34 | 73.71                 | 85.77 | 100.93 | 127.72 |
| C | Shasta (SV) | Winter | 2026 | 340.10             | 395.41 | 463.18 | 590.55 | 73.73                 | 85.83 | 100.95 | 127.89 |
| C | Shasta (SV) | Winter | 2027 | 340.11             | 395.45 | 463.10 | 590.76 | 73.74                 | 85.87 | 100.96 | 128.04 |
| C | Shasta (SV) | Winter | 2028 | 340.11             | 395.50 | 463.03 | 590.97 | 73.75                 | 85.92 | 100.97 | 128.18 |
| C | Shasta (SV) | Winter | 2029 | 340.10             | 395.56 | 462.95 | 591.18 | 73.76                 | 85.96 | 100.97 | 128.31 |
| C | Shasta (SV) | Winter | 2030 | 340.09             | 395.62 | 462.87 | 591.39 | 73.76                 | 86.00 | 100.96 | 128.43 |
| C | Shasta (SV) | Winter | 2031 | 340.09             | 395.67 | 462.82 | 591.61 | 73.77                 | 86.04 | 100.96 | 128.55 |
| C | Shasta (SV) | Winter | 2032 | 340.09             | 395.73 | 462.78 | 591.84 | 73.78                 | 86.08 | 100.96 | 128.67 |
| C | Shasta (SV) | Winter | 2033 | 340.08             | 395.78 | 462.74 | 592.04 | 73.78                 | 86.11 | 100.97 | 128.77 |
| C | Shasta (SV) | Winter | 2034 | 340.08             | 395.82 | 462.71 | 592.22 | 73.78                 | 86.14 | 100.97 | 128.87 |
| C | Shasta (SV) | Winter | 2035 | 340.07             | 395.85 | 462.69 | 592.38 | 73.79                 | 86.17 | 100.97 | 128.96 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Sierra (MC) | Annual | 2010 | 394.31             | 460.95 | 537.66 | 667.48 | 75.24                 | 95.17 | 101.22 | 124.75 |
| C | Sierra (MC) | Annual | 2011 | 393.91             | 460.02 | 536.89 | 668.54 | 74.99                 | 93.66 | 101.08 | 124.84 |
| C | Sierra (MC) | Annual | 2012 | 393.71             | 459.20 | 536.28 | 669.74 | 74.85                 | 92.36 | 100.98 | 124.99 |
| C | Sierra (MC) | Annual | 2013 | 393.19             | 458.30 | 535.81 | 670.93 | 74.35                 | 90.80 | 100.93 | 125.18 |
| C | Sierra (MC) | Annual | 2014 | 393.12             | 457.50 | 535.44 | 672.21 | 74.25                 | 89.29 | 100.90 | 125.31 |
| C | Sierra (MC) | Annual | 2015 | 393.22             | 457.02 | 535.14 | 673.47 | 74.30                 | 88.37 | 100.90 | 125.53 |
| C | Sierra (MC) | Annual | 2016 | 393.24             | 456.69 | 534.90 | 674.71 | 74.27                 | 87.71 | 100.92 | 125.76 |
| C | Sierra (MC) | Annual | 2017 | 393.16             | 456.21 | 534.68 | 675.79 | 74.16                 | 86.66 | 100.76 | 126.04 |
| C | Sierra (MC) | Annual | 2018 | 393.07             | 456.05 | 534.52 | 676.75 | 74.05                 | 86.33 | 100.74 | 126.28 |
| C | Sierra (MC) | Annual | 2019 | 393.02             | 455.89 | 534.40 | 677.53 | 73.99                 | 85.96 | 100.82 | 126.51 |
| C | Sierra (MC) | Annual | 2020 | 392.91             | 455.79 | 534.29 | 678.12 | 74.03                 | 85.85 | 100.87 | 126.76 |
| C | Sierra (MC) | Annual | 2021 | 392.57             | 455.71 | 534.18 | 678.52 | 73.98                 | 85.83 | 100.91 | 126.84 |
| C | Sierra (MC) | Annual | 2022 | 392.58             | 455.55 | 534.05 | 678.95 | 74.03                 | 85.77 | 100.92 | 127.02 |
| C | Sierra (MC) | Annual | 2023 | 392.31             | 455.42 | 533.96 | 679.25 | 74.00                 | 85.73 | 100.95 | 127.23 |
| C | Sierra (MC) | Annual | 2024 | 392.00             | 455.21 | 533.85 | 679.49 | 73.94                 | 85.67 | 100.96 | 127.42 |
| C | Sierra (MC) | Annual | 2025 | 391.81             | 455.26 | 533.79 | 679.66 | 73.93                 | 85.73 | 100.98 | 127.58 |
| C | Sierra (MC) | Annual | 2026 | 391.81             | 455.38 | 533.71 | 679.96 | 73.95                 | 85.81 | 101.00 | 127.77 |
| C | Sierra (MC) | Annual | 2027 | 391.82             | 455.49 | 533.63 | 680.24 | 73.96                 | 85.89 | 101.01 | 127.94 |
| C | Sierra (MC) | Annual | 2028 | 391.79             | 455.60 | 533.57 | 680.51 | 73.97                 | 85.96 | 101.02 | 128.10 |
| C | Sierra (MC) | Annual | 2029 | 391.77             | 455.71 | 533.49 | 680.80 | 73.97                 | 86.02 | 101.01 | 128.25 |
| C | Sierra (MC) | Annual | 2030 | 391.72             | 455.81 | 533.43 | 681.08 | 73.97                 | 86.09 | 101.01 | 128.39 |
| C | Sierra (MC) | Annual | 2031 | 391.70             | 455.92 | 533.38 | 681.39 | 73.98                 | 86.15 | 101.01 | 128.53 |
| C | Sierra (MC) | Annual | 2032 | 391.69             | 456.01 | 533.35 | 681.70 | 73.98                 | 86.20 | 101.01 | 128.66 |
| C | Sierra (MC) | Annual | 2033 | 391.68             | 456.10 | 533.32 | 681.99 | 73.99                 | 86.25 | 101.01 | 128.78 |
| C | Sierra (MC) | Annual | 2034 | 391.67             | 456.18 | 533.30 | 682.24 | 73.99                 | 86.30 | 101.02 | 128.89 |
| C | Sierra (MC) | Annual | 2035 | 391.66             | 456.24 | 533.28 | 682.46 | 73.99                 | 86.34 | 101.02 | 129.00 |
| C | Sierra (MC) | Summer | 2010 | 417.17             | 483.16 | 568.10 | 703.78 | 75.24                 | 95.17 | 101.22 | 124.75 |
| C | Sierra (MC) | Summer | 2011 | 417.07             | 483.15 | 567.61 | 705.13 | 74.99                 | 93.66 | 101.08 | 124.84 |
| C | Sierra (MC) | Summer | 2012 | 417.11             | 483.07 | 567.23 | 706.66 | 74.85                 | 92.36 | 100.98 | 124.99 |
| C | Sierra (MC) | Summer | 2013 | 416.81             | 482.81 | 566.93 | 708.19 | 74.35                 | 90.80 | 100.93 | 125.18 |
| C | Sierra (MC) | Summer | 2014 | 416.85             | 482.52 | 566.72 | 709.83 | 74.25                 | 89.29 | 100.90 | 125.31 |
| C | Sierra (MC) | Summer | 2015 | 417.03             | 482.41 | 566.56 | 711.46 | 74.30                 | 88.37 | 100.90 | 125.53 |
| C | Sierra (MC) | Summer | 2016 | 417.11             | 482.32 | 566.42 | 713.05 | 74.27                 | 87.71 | 100.92 | 125.76 |
| C | Sierra (MC) | Summer | 2017 | 417.07             | 482.13 | 566.32 | 714.42 | 74.16                 | 86.66 | 100.76 | 126.04 |
| C | Sierra (MC) | Summer | 2018 | 416.99             | 482.09 | 566.20 | 715.64 | 74.05                 | 86.33 | 100.74 | 126.28 |
| C | Sierra (MC) | Summer | 2019 | 416.95             | 482.09 | 566.09 | 716.63 | 73.99                 | 85.96 | 100.82 | 126.51 |
| C | Sierra (MC) | Summer | 2020 | 416.84             | 482.12 | 565.99 | 717.36 | 74.03                 | 85.85 | 100.87 | 126.76 |
| C | Sierra (MC) | Summer | 2021 | 416.51             | 482.14 | 565.90 | 717.92 | 73.98                 | 85.83 | 100.91 | 126.84 |
| C | Sierra (MC) | Summer | 2022 | 416.51             | 482.11 | 565.79 | 718.46 | 74.03                 | 85.77 | 100.92 | 127.02 |
| C | Sierra (MC) | Summer | 2023 | 416.26             | 482.09 | 565.70 | 718.85 | 74.00                 | 85.73 | 100.95 | 127.23 |
| C | Sierra (MC) | Summer | 2024 | 415.97             | 482.00 | 565.61 | 719.16 | 73.94                 | 85.67 | 100.96 | 127.42 |
| C | Sierra (MC) | Summer | 2025 | 415.79             | 482.07 | 565.55 | 719.41 | 73.93                 | 85.73 | 100.98 | 127.58 |
| C | Sierra (MC) | Summer | 2026 | 415.80             | 482.23 | 565.48 | 719.74 | 73.95                 | 85.81 | 101.00 | 127.77 |
| C | Sierra (MC) | Summer | 2027 | 415.82             | 482.38 | 565.42 | 720.07 | 73.96                 | 85.89 | 101.01 | 127.94 |
| C | Sierra (MC) | Summer | 2028 | 415.81             | 482.52 | 565.37 | 720.41 | 73.97                 | 85.96 | 101.02 | 128.10 |
| C | Sierra (MC) | Summer | 2029 | 415.80             | 482.68 | 565.30 | 720.76 | 73.97                 | 86.02 | 101.01 | 128.25 |
| C | Sierra (MC) | Summer | 2030 | 415.77             | 482.82 | 565.25 | 721.10 | 73.97                 | 86.09 | 101.01 | 128.39 |
| C | Sierra (MC) | Summer | 2031 | 415.77             | 482.97 | 565.22 | 721.46 | 73.98                 | 86.15 | 101.01 | 128.53 |
| C | Sierra (MC) | Summer | 2032 | 415.76             | 483.08 | 565.20 | 721.82 | 73.98                 | 86.20 | 101.01 | 128.66 |
| C | Sierra (MC) | Summer | 2033 | 415.75             | 483.19 | 565.18 | 722.16 | 73.99                 | 86.25 | 101.01 | 128.78 |
| C | Sierra (MC) | Summer | 2034 | 415.74             | 483.29 | 565.16 | 722.46 | 73.99                 | 86.30 | 101.02 | 128.89 |
| C | Sierra (MC) | Summer | 2035 | 415.73             | 483.36 | 565.14 | 722.72 | 73.99                 | 86.34 | 101.02 | 129.00 |
| C | Sierra (MC) | Winter | 2010 | 390.52             | 457.27 | 532.61 | 661.46 | 75.24                 | 95.17 | 101.22 | 124.75 |
| C | Sierra (MC) | Winter | 2011 | 390.06             | 456.18 | 531.79 | 662.48 | 74.99                 | 93.66 | 101.08 | 124.84 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Sierra (MC)    | Winter | 2012 | 389.83             | 455.24 | 531.15 | 663.62 | 74.85                 | 92.36 | 100.98 | 124.99 |
| C | Sierra (MC)    | Winter | 2013 | 389.27             | 454.24 | 530.65 | 664.75 | 74.35                 | 90.80 | 100.93 | 125.18 |
| C | Sierra (MC)    | Winter | 2014 | 389.18             | 453.35 | 530.26 | 665.97 | 74.25                 | 89.29 | 100.90 | 125.31 |
| C | Sierra (MC)    | Winter | 2015 | 389.27             | 452.81 | 529.93 | 667.17 | 74.30                 | 88.37 | 100.90 | 125.53 |
| C | Sierra (MC)    | Winter | 2016 | 389.28             | 452.44 | 529.67 | 668.35 | 74.27                 | 87.71 | 100.92 | 125.76 |
| C | Sierra (MC)    | Winter | 2017 | 389.20             | 451.91 | 529.44 | 669.38 | 74.16                 | 86.66 | 100.76 | 126.04 |
| C | Sierra (MC)    | Winter | 2018 | 389.10             | 451.73 | 529.27 | 670.31 | 74.05                 | 86.33 | 100.74 | 126.28 |
| C | Sierra (MC)    | Winter | 2019 | 389.05             | 451.54 | 529.14 | 671.05 | 73.99                 | 85.96 | 100.82 | 126.51 |
| C | Sierra (MC)    | Winter | 2020 | 388.94             | 451.43 | 529.03 | 671.61 | 74.03                 | 85.85 | 100.87 | 126.76 |
| C | Sierra (MC)    | Winter | 2021 | 388.60             | 451.33 | 528.92 | 671.99 | 73.98                 | 85.83 | 100.91 | 126.84 |
| C | Sierra (MC)    | Winter | 2022 | 388.61             | 451.15 | 528.78 | 672.40 | 74.03                 | 85.77 | 100.92 | 127.02 |
| C | Sierra (MC)    | Winter | 2023 | 388.34             | 451.00 | 528.70 | 672.69 | 74.00                 | 85.73 | 100.95 | 127.23 |
| C | Sierra (MC)    | Winter | 2024 | 388.02             | 450.77 | 528.58 | 672.91 | 73.94                 | 85.67 | 100.96 | 127.42 |
| C | Sierra (MC)    | Winter | 2025 | 387.84             | 450.82 | 528.52 | 673.07 | 73.93                 | 85.73 | 100.98 | 127.58 |
| C | Sierra (MC)    | Winter | 2026 | 387.83             | 450.93 | 528.44 | 673.36 | 73.95                 | 85.81 | 101.00 | 127.77 |
| C | Sierra (MC)    | Winter | 2027 | 387.85             | 451.03 | 528.36 | 673.63 | 73.96                 | 85.89 | 101.01 | 127.94 |
| C | Sierra (MC)    | Winter | 2028 | 387.81             | 451.14 | 528.30 | 673.89 | 73.97                 | 85.96 | 101.02 | 128.10 |
| C | Sierra (MC)    | Winter | 2029 | 387.79             | 451.24 | 528.22 | 674.17 | 73.97                 | 86.02 | 101.01 | 128.25 |
| C | Sierra (MC)    | Winter | 2030 | 387.74             | 451.33 | 528.15 | 674.45 | 73.97                 | 86.09 | 101.01 | 128.39 |
| C | Sierra (MC)    | Winter | 2031 | 387.71             | 451.44 | 528.10 | 674.74 | 73.98                 | 86.15 | 101.01 | 128.53 |
| C | Sierra (MC)    | Winter | 2032 | 387.70             | 451.52 | 528.07 | 675.05 | 73.98                 | 86.20 | 101.01 | 128.66 |
| C | Sierra (MC)    | Winter | 2033 | 387.69             | 451.61 | 528.04 | 675.33 | 73.99                 | 86.25 | 101.01 | 128.78 |
| C | Sierra (MC)    | Winter | 2034 | 387.68             | 451.68 | 528.01 | 675.57 | 73.99                 | 86.30 | 101.02 | 128.89 |
| C | Sierra (MC)    | Winter | 2035 | 387.67             | 451.74 | 527.99 | 675.79 | 73.99                 | 86.34 | 101.02 | 129.00 |
| C | Siskiyou (NEP) | Annual | 2010 | 378.80             | 444.35 | 519.95 | 649.03 | 74.19                 | 93.56 | 102.24 | 125.12 |
| C | Siskiyou (NEP) | Annual | 2011 | 378.73             | 443.52 | 519.19 | 649.67 | 74.04                 | 92.11 | 102.01 | 125.20 |
| C | Siskiyou (NEP) | Annual | 2012 | 378.70             | 442.82 | 518.58 | 650.49 | 73.88                 | 90.89 | 101.82 | 125.30 |
| C | Siskiyou (NEP) | Annual | 2013 | 378.69             | 442.25 | 518.06 | 651.35 | 73.68                 | 89.89 | 101.54 | 125.46 |
| C | Siskiyou (NEP) | Annual | 2014 | 378.76             | 441.72 | 517.67 | 652.21 | 73.60                 | 88.92 | 101.36 | 125.61 |
| C | Siskiyou (NEP) | Annual | 2015 | 378.86             | 441.26 | 517.36 | 653.09 | 73.55                 | 88.04 | 101.18 | 125.82 |
| C | Siskiyou (NEP) | Annual | 2016 | 378.97             | 440.88 | 517.10 | 653.95 | 73.55                 | 87.27 | 101.06 | 126.05 |
| C | Siskiyou (NEP) | Annual | 2017 | 379.02             | 440.51 | 516.88 | 654.72 | 73.49                 | 86.50 | 100.90 | 126.29 |
| C | Siskiyou (NEP) | Annual | 2018 | 379.03             | 440.25 | 516.71 | 655.39 | 73.41                 | 85.98 | 100.79 | 126.52 |
| C | Siskiyou (NEP) | Annual | 2019 | 379.07             | 440.11 | 516.58 | 655.97 | 73.39                 | 85.68 | 100.76 | 126.74 |
| C | Siskiyou (NEP) | Annual | 2020 | 379.14             | 439.98 | 516.47 | 656.46 | 73.48                 | 85.54 | 100.80 | 126.95 |
| C | Siskiyou (NEP) | Annual | 2021 | 379.12             | 439.88 | 516.35 | 656.80 | 73.52                 | 85.53 | 100.84 | 127.11 |
| C | Siskiyou (NEP) | Annual | 2022 | 379.05             | 439.72 | 516.23 | 657.04 | 73.53                 | 85.50 | 100.87 | 127.20 |
| C | Siskiyou (NEP) | Annual | 2023 | 378.90             | 439.60 | 516.12 | 657.19 | 73.51                 | 85.48 | 100.89 | 127.36 |
| C | Siskiyou (NEP) | Annual | 2024 | 378.77             | 439.53 | 516.02 | 657.33 | 73.48                 | 85.50 | 100.91 | 127.52 |
| C | Siskiyou (NEP) | Annual | 2025 | 378.71             | 439.58 | 515.95 | 657.44 | 73.49                 | 85.56 | 100.93 | 127.67 |
| C | Siskiyou (NEP) | Annual | 2026 | 378.72             | 439.71 | 515.87 | 657.62 | 73.51                 | 85.65 | 100.95 | 127.82 |
| C | Siskiyou (NEP) | Annual | 2027 | 378.72             | 439.84 | 515.80 | 657.81 | 73.52                 | 85.73 | 100.97 | 127.97 |
| C | Siskiyou (NEP) | Annual | 2028 | 378.72             | 439.97 | 515.74 | 658.01 | 73.53                 | 85.81 | 100.98 | 128.11 |
| C | Siskiyou (NEP) | Annual | 2029 | 378.70             | 440.10 | 515.67 | 658.20 | 73.53                 | 85.88 | 100.98 | 128.23 |
| C | Siskiyou (NEP) | Annual | 2030 | 378.68             | 440.21 | 515.58 | 658.40 | 73.54                 | 85.95 | 100.97 | 128.36 |
| C | Siskiyou (NEP) | Annual | 2031 | 378.67             | 440.34 | 515.53 | 658.68 | 73.54                 | 86.01 | 100.97 | 128.49 |
| C | Siskiyou (NEP) | Annual | 2032 | 378.67             | 440.44 | 515.49 | 658.96 | 73.55                 | 86.07 | 100.98 | 128.62 |
| C | Siskiyou (NEP) | Annual | 2033 | 378.66             | 440.54 | 515.46 | 659.20 | 73.55                 | 86.13 | 100.98 | 128.73 |
| C | Siskiyou (NEP) | Annual | 2034 | 378.65             | 440.63 | 515.42 | 659.41 | 73.56                 | 86.18 | 100.98 | 128.83 |
| C | Siskiyou (NEP) | Annual | 2035 | 378.64             | 440.70 | 515.40 | 659.60 | 73.56                 | 86.22 | 100.99 | 128.93 |
| C | Siskiyou (NEP) | Summer | 2010 | 393.78             | 458.70 | 539.46 | 673.02 | 74.19                 | 93.56 | 102.24 | 125.12 |
| C | Siskiyou (NEP) | Summer | 2011 | 393.90             | 458.44 | 538.93 | 673.75 | 74.04                 | 92.11 | 102.01 | 125.20 |
| C | Siskiyou (NEP) | Summer | 2012 | 394.02             | 458.19 | 538.51 | 674.72 | 73.88                 | 90.89 | 101.82 | 125.30 |
| C | Siskiyou (NEP) | Summer | 2013 | 394.12             | 457.97 | 538.18 | 675.77 | 73.68                 | 89.89 | 101.54 | 125.46 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location       | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Siskiyou (NEP) | Summer | 2014 | 394.26             | 457.73 | 537.93 | 676.82 | 73.60                 | 88.92 | 101.36 | 125.61 |
| C | Siskiyou (NEP) | Summer | 2015 | 394.41             | 457.52 | 537.74 | 677.91 | 73.55                 | 88.04 | 101.18 | 125.82 |
| C | Siskiyou (NEP) | Summer | 2016 | 394.55             | 457.35 | 537.58 | 678.96 | 73.55                 | 87.27 | 101.06 | 126.05 |
| C | Siskiyou (NEP) | Summer | 2017 | 394.62             | 457.17 | 537.43 | 679.91 | 73.49                 | 86.50 | 100.90 | 126.29 |
| C | Siskiyou (NEP) | Summer | 2018 | 394.63             | 457.04 | 537.29 | 680.74 | 73.41                 | 85.98 | 100.79 | 126.52 |
| C | Siskiyou (NEP) | Summer | 2019 | 394.66             | 457.01 | 537.18 | 681.46 | 73.39                 | 85.68 | 100.76 | 126.74 |
| C | Siskiyou (NEP) | Summer | 2020 | 394.72             | 456.98 | 537.09 | 682.06 | 73.48                 | 85.54 | 100.80 | 126.95 |
| C | Siskiyou (NEP) | Summer | 2021 | 394.69             | 456.95 | 536.97 | 682.49 | 73.52                 | 85.53 | 100.84 | 127.11 |
| C | Siskiyou (NEP) | Summer | 2022 | 394.62             | 456.88 | 536.86 | 682.82 | 73.53                 | 85.50 | 100.87 | 127.20 |
| C | Siskiyou (NEP) | Summer | 2023 | 394.48             | 456.83 | 536.76 | 683.03 | 73.51                 | 85.48 | 100.89 | 127.36 |
| C | Siskiyou (NEP) | Summer | 2024 | 394.35             | 456.84 | 536.67 | 683.22 | 73.48                 | 85.50 | 100.91 | 127.52 |
| C | Siskiyou (NEP) | Summer | 2025 | 394.30             | 456.94 | 536.61 | 683.38 | 73.49                 | 85.56 | 100.93 | 127.67 |
| C | Siskiyou (NEP) | Summer | 2026 | 394.32             | 457.11 | 536.53 | 683.57 | 73.51                 | 85.65 | 100.95 | 127.82 |
| C | Siskiyou (NEP) | Summer | 2027 | 394.33             | 457.28 | 536.46 | 683.78 | 73.52                 | 85.73 | 100.97 | 127.97 |
| C | Siskiyou (NEP) | Summer | 2028 | 394.34             | 457.44 | 536.40 | 684.00 | 73.53                 | 85.81 | 100.98 | 128.11 |
| C | Siskiyou (NEP) | Summer | 2029 | 394.33             | 457.61 | 536.34 | 684.23 | 73.53                 | 85.88 | 100.98 | 128.23 |
| C | Siskiyou (NEP) | Summer | 2030 | 394.32             | 457.77 | 536.26 | 684.47 | 73.54                 | 85.95 | 100.97 | 128.36 |
| C | Siskiyou (NEP) | Summer | 2031 | 394.32             | 457.91 | 536.23 | 684.79 | 73.54                 | 86.01 | 100.97 | 128.49 |
| C | Siskiyou (NEP) | Summer | 2032 | 394.32             | 458.04 | 536.21 | 685.10 | 73.55                 | 86.07 | 100.98 | 128.62 |
| C | Siskiyou (NEP) | Summer | 2033 | 394.31             | 458.15 | 536.18 | 685.38 | 73.55                 | 86.13 | 100.98 | 128.73 |
| C | Siskiyou (NEP) | Summer | 2034 | 394.30             | 458.25 | 536.16 | 685.63 | 73.56                 | 86.18 | 100.98 | 128.83 |
| C | Siskiyou (NEP) | Summer | 2035 | 394.29             | 458.31 | 536.14 | 685.85 | 73.56                 | 86.22 | 100.99 | 128.93 |
| C | Siskiyou (NEP) | Winter | 2010 | 373.71             | 439.47 | 513.32 | 640.88 | 74.19                 | 93.56 | 102.24 | 125.12 |
| C | Siskiyou (NEP) | Winter | 2011 | 373.57             | 438.45 | 512.48 | 641.49 | 74.04                 | 92.11 | 102.01 | 125.20 |
| C | Siskiyou (NEP) | Winter | 2012 | 373.50             | 437.60 | 511.81 | 642.25 | 73.88                 | 90.89 | 101.82 | 125.30 |
| C | Siskiyou (NEP) | Winter | 2013 | 373.45             | 436.91 | 511.23 | 643.06 | 73.68                 | 89.89 | 101.54 | 125.46 |
| C | Siskiyou (NEP) | Winter | 2014 | 373.49             | 436.28 | 510.79 | 643.86 | 73.60                 | 88.92 | 101.36 | 125.61 |
| C | Siskiyou (NEP) | Winter | 2015 | 373.58             | 435.74 | 510.43 | 644.66 | 73.55                 | 88.04 | 101.18 | 125.82 |
| C | Siskiyou (NEP) | Winter | 2016 | 373.68             | 435.28 | 510.15 | 645.45 | 73.55                 | 87.27 | 101.06 | 126.05 |
| C | Siskiyou (NEP) | Winter | 2017 | 373.73             | 434.85 | 509.90 | 646.16 | 73.49                 | 86.50 | 100.90 | 126.29 |
| C | Siskiyou (NEP) | Winter | 2018 | 373.74             | 434.55 | 509.71 | 646.78 | 73.41                 | 85.98 | 100.79 | 126.52 |
| C | Siskiyou (NEP) | Winter | 2019 | 373.78             | 434.37 | 509.58 | 647.31 | 73.39                 | 85.68 | 100.76 | 126.74 |
| C | Siskiyou (NEP) | Winter | 2020 | 373.85             | 434.21 | 509.47 | 647.77 | 73.48                 | 85.54 | 100.80 | 126.95 |
| C | Siskiyou (NEP) | Winter | 2021 | 373.83             | 434.08 | 509.34 | 648.08 | 73.52                 | 85.53 | 100.84 | 127.11 |
| C | Siskiyou (NEP) | Winter | 2022 | 373.76             | 433.89 | 509.22 | 648.29 | 73.53                 | 85.50 | 100.87 | 127.20 |
| C | Siskiyou (NEP) | Winter | 2023 | 373.61             | 433.74 | 509.10 | 648.41 | 73.51                 | 85.48 | 100.89 | 127.36 |
| C | Siskiyou (NEP) | Winter | 2024 | 373.47             | 433.65 | 509.00 | 648.53 | 73.48                 | 85.50 | 100.91 | 127.52 |
| C | Siskiyou (NEP) | Winter | 2025 | 373.42             | 433.68 | 508.93 | 648.63 | 73.49                 | 85.56 | 100.93 | 127.67 |
| C | Siskiyou (NEP) | Winter | 2026 | 373.42             | 433.81 | 508.85 | 648.81 | 73.51                 | 85.65 | 100.95 | 127.82 |
| C | Siskiyou (NEP) | Winter | 2027 | 373.42             | 433.92 | 508.79 | 648.99 | 73.52                 | 85.73 | 100.97 | 127.97 |
| C | Siskiyou (NEP) | Winter | 2028 | 373.41             | 434.03 | 508.72 | 649.17 | 73.53                 | 85.81 | 100.98 | 128.11 |
| C | Siskiyou (NEP) | Winter | 2029 | 373.39             | 434.14 | 508.65 | 649.35 | 73.53                 | 85.88 | 100.98 | 128.23 |
| C | Siskiyou (NEP) | Winter | 2030 | 373.36             | 434.25 | 508.56 | 649.55 | 73.54                 | 85.95 | 100.97 | 128.36 |
| C | Siskiyou (NEP) | Winter | 2031 | 373.36             | 434.37 | 508.50 | 649.81 | 73.54                 | 86.01 | 100.97 | 128.49 |
| C | Siskiyou (NEP) | Winter | 2032 | 373.35             | 434.47 | 508.45 | 650.08 | 73.55                 | 86.07 | 100.98 | 128.62 |
| C | Siskiyou (NEP) | Winter | 2033 | 373.34             | 434.56 | 508.42 | 650.30 | 73.55                 | 86.13 | 100.98 | 128.73 |
| C | Siskiyou (NEP) | Winter | 2034 | 373.34             | 434.64 | 508.38 | 650.51 | 73.56                 | 86.18 | 100.98 | 128.83 |
| C | Siskiyou (NEP) | Winter | 2035 | 373.33             | 434.71 | 508.36 | 650.69 | 73.56                 | 86.22 | 100.99 | 128.93 |
| C | Solano (SF)    | Annual | 2010 | 341.84             | 392.72 | 467.77 | 590.01 | 73.22                 | 84.56 | 99.66  | 124.82 |
| C | Solano (SF)    | Annual | 2011 | 342.07             | 393.39 | 467.67 | 590.47 | 73.26                 | 84.38 | 99.73  | 124.98 |
| C | Solano (SF)    | Annual | 2012 | 342.31             | 394.02 | 467.59 | 591.01 | 73.28                 | 84.33 | 99.81  | 125.17 |
| C | Solano (SF)    | Annual | 2013 | 342.55             | 394.58 | 467.54 | 591.61 | 73.32                 | 84.30 | 99.90  | 125.38 |
| C | Solano (SF)    | Annual | 2014 | 342.76             | 395.08 | 467.51 | 592.23 | 73.35                 | 84.27 | 99.99  | 125.61 |
| C | Solano (SF)    | Annual | 2015 | 342.97             | 395.55 | 467.49 | 592.87 | 73.38                 | 84.28 | 100.07 | 125.85 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Solano (SF) | Annual | 2016 | 343.17             | 395.96 | 467.48 | 593.49 | 73.44                 | 84.27 | 100.15 | 126.09 |
| C | Solano (SF) | Annual | 2017 | 343.32             | 396.33 | 467.47 | 594.08 | 73.48                 | 84.28 | 100.20 | 126.34 |
| C | Solano (SF) | Annual | 2018 | 343.45             | 396.64 | 467.47 | 594.62 | 73.51                 | 84.28 | 100.28 | 126.59 |
| C | Solano (SF) | Annual | 2019 | 343.58             | 396.96 | 467.47 | 595.08 | 73.57                 | 84.39 | 100.35 | 126.82 |
| C | Solano (SF) | Annual | 2020 | 343.67             | 397.24 | 467.47 | 595.50 | 73.66                 | 84.54 | 100.44 | 127.04 |
| C | Solano (SF) | Annual | 2021 | 343.75             | 397.51 | 467.47 | 595.82 | 73.74                 | 84.71 | 100.53 | 127.19 |
| C | Solano (SF) | Annual | 2022 | 343.79             | 397.75 | 467.46 | 596.09 | 73.80                 | 84.87 | 100.61 | 127.33 |
| C | Solano (SF) | Annual | 2023 | 343.81             | 397.93 | 467.45 | 596.30 | 73.84                 | 85.01 | 100.68 | 127.49 |
| C | Solano (SF) | Annual | 2024 | 343.81             | 398.09 | 467.44 | 596.45 | 73.86                 | 85.13 | 100.74 | 127.65 |
| C | Solano (SF) | Annual | 2025 | 343.82             | 398.22 | 467.44 | 596.62 | 73.88                 | 85.24 | 100.79 | 127.80 |
| C | Solano (SF) | Annual | 2026 | 343.84             | 398.37 | 467.43 | 596.79 | 73.91                 | 85.35 | 100.83 | 127.95 |
| C | Solano (SF) | Annual | 2027 | 343.85             | 398.52 | 467.42 | 596.95 | 73.92                 | 85.44 | 100.86 | 128.08 |
| C | Solano (SF) | Annual | 2028 | 343.86             | 398.66 | 467.41 | 597.12 | 73.93                 | 85.53 | 100.88 | 128.20 |
| C | Solano (SF) | Annual | 2029 | 343.86             | 398.80 | 467.39 | 597.29 | 73.94                 | 85.62 | 100.90 | 128.31 |
| C | Solano (SF) | Annual | 2030 | 343.86             | 398.94 | 467.38 | 597.46 | 73.95                 | 85.70 | 100.91 | 128.42 |
| C | Solano (SF) | Annual | 2031 | 343.86             | 399.08 | 467.38 | 597.67 | 73.95                 | 85.78 | 100.93 | 128.53 |
| C | Solano (SF) | Annual | 2032 | 343.86             | 399.22 | 467.37 | 597.88 | 73.96                 | 85.86 | 100.93 | 128.64 |
| C | Solano (SF) | Annual | 2033 | 343.86             | 399.33 | 467.36 | 598.08 | 73.96                 | 85.93 | 100.94 | 128.74 |
| C | Solano (SF) | Annual | 2034 | 343.86             | 399.44 | 467.35 | 598.25 | 73.97                 | 86.00 | 100.95 | 128.83 |
| C | Solano (SF) | Annual | 2035 | 343.85             | 399.53 | 467.34 | 598.40 | 73.97                 | 86.05 | 100.95 | 128.92 |
| C | Solano (SF) | Summer | 2010 | 368.80             | 420.88 | 503.66 | 634.87 | 73.22                 | 84.56 | 99.66  | 124.82 |
| C | Solano (SF) | Summer | 2011 | 369.20             | 422.00 | 503.59 | 635.19 | 73.26                 | 84.38 | 99.73  | 124.98 |
| C | Solano (SF) | Summer | 2012 | 369.56             | 422.99 | 503.57 | 635.69 | 73.28                 | 84.33 | 99.81  | 125.17 |
| C | Solano (SF) | Summer | 2013 | 369.90             | 423.83 | 503.59 | 636.34 | 73.32                 | 84.30 | 99.90  | 125.38 |
| C | Solano (SF) | Summer | 2014 | 370.19             | 424.57 | 503.65 | 637.06 | 73.35                 | 84.27 | 99.99  | 125.61 |
| C | Solano (SF) | Summer | 2015 | 370.46             | 425.22 | 503.73 | 637.86 | 73.38                 | 84.28 | 100.07 | 125.85 |
| C | Solano (SF) | Summer | 2016 | 370.71             | 425.78 | 503.82 | 638.66 | 73.44                 | 84.27 | 100.15 | 126.09 |
| C | Solano (SF) | Summer | 2017 | 370.89             | 426.29 | 503.89 | 639.43 | 73.48                 | 84.28 | 100.20 | 126.34 |
| C | Solano (SF) | Summer | 2018 | 371.03             | 426.70 | 503.92 | 640.11 | 73.51                 | 84.28 | 100.28 | 126.59 |
| C | Solano (SF) | Summer | 2019 | 371.15             | 427.11 | 503.94 | 640.69 | 73.57                 | 84.39 | 100.35 | 126.82 |
| C | Solano (SF) | Summer | 2020 | 371.25             | 427.47 | 503.95 | 641.22 | 73.66                 | 84.54 | 100.44 | 127.04 |
| C | Solano (SF) | Summer | 2021 | 371.33             | 427.82 | 503.93 | 641.62 | 73.74                 | 84.71 | 100.53 | 127.19 |
| C | Solano (SF) | Summer | 2022 | 371.37             | 428.13 | 503.90 | 641.96 | 73.80                 | 84.87 | 100.61 | 127.33 |
| C | Solano (SF) | Summer | 2023 | 371.39             | 428.38 | 503.88 | 642.20 | 73.84                 | 85.01 | 100.68 | 127.49 |
| C | Solano (SF) | Summer | 2024 | 371.40             | 428.59 | 503.87 | 642.36 | 73.86                 | 85.13 | 100.74 | 127.65 |
| C | Solano (SF) | Summer | 2025 | 371.41             | 428.78 | 503.86 | 642.52 | 73.88                 | 85.24 | 100.79 | 127.80 |
| C | Solano (SF) | Summer | 2026 | 371.43             | 428.97 | 503.85 | 642.69 | 73.91                 | 85.35 | 100.83 | 127.95 |
| C | Solano (SF) | Summer | 2027 | 371.44             | 429.16 | 503.84 | 642.85 | 73.92                 | 85.44 | 100.86 | 128.08 |
| C | Solano (SF) | Summer | 2028 | 371.46             | 429.35 | 503.83 | 643.02 | 73.93                 | 85.53 | 100.88 | 128.20 |
| C | Solano (SF) | Summer | 2029 | 371.46             | 429.54 | 503.82 | 643.19 | 73.94                 | 85.62 | 100.90 | 128.31 |
| C | Solano (SF) | Summer | 2030 | 371.47             | 429.73 | 503.81 | 643.37 | 73.95                 | 85.70 | 100.91 | 128.42 |
| C | Solano (SF) | Summer | 2031 | 371.47             | 429.92 | 503.80 | 643.63 | 73.95                 | 85.78 | 100.93 | 128.53 |
| C | Solano (SF) | Summer | 2032 | 371.47             | 430.10 | 503.78 | 643.88 | 73.96                 | 85.86 | 100.93 | 128.64 |
| C | Solano (SF) | Summer | 2033 | 371.47             | 430.24 | 503.77 | 644.12 | 73.96                 | 85.93 | 100.94 | 128.74 |
| C | Solano (SF) | Summer | 2034 | 371.47             | 430.38 | 503.77 | 644.34 | 73.97                 | 86.00 | 100.95 | 128.83 |
| C | Solano (SF) | Summer | 2035 | 371.47             | 430.48 | 503.76 | 644.54 | 73.97                 | 86.05 | 100.95 | 128.92 |
| C | Solano (SF) | Winter | 2010 | 336.93             | 387.60 | 461.24 | 581.85 | 73.22                 | 84.56 | 99.66  | 124.82 |
| C | Solano (SF) | Winter | 2011 | 337.14             | 388.18 | 461.13 | 582.33 | 73.26                 | 84.38 | 99.73  | 124.98 |
| C | Solano (SF) | Winter | 2012 | 337.35             | 388.75 | 461.05 | 582.88 | 73.28                 | 84.33 | 99.81  | 125.17 |
| C | Solano (SF) | Winter | 2013 | 337.57             | 389.26 | 460.99 | 583.48 | 73.32                 | 84.30 | 99.90  | 125.38 |
| C | Solano (SF) | Winter | 2014 | 337.77             | 389.72 | 460.94 | 584.07 | 73.35                 | 84.27 | 99.99  | 125.61 |
| C | Solano (SF) | Winter | 2015 | 337.97             | 390.15 | 460.90 | 584.69 | 73.38                 | 84.28 | 100.07 | 125.85 |
| C | Solano (SF) | Winter | 2016 | 338.16             | 390.53 | 460.87 | 585.28 | 73.44                 | 84.27 | 100.15 | 126.09 |
| C | Solano (SF) | Winter | 2017 | 338.31             | 390.89 | 460.85 | 585.84 | 73.48                 | 84.28 | 100.20 | 126.34 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Solano (SF) | Winter | 2018 | 338.44             | 391.17 | 460.84 | 586.34 | 73.51                 | 84.28 | 100.28 | 126.59 |
| C | Solano (SF) | Winter | 2019 | 338.56             | 391.48 | 460.84 | 586.78 | 73.57                 | 84.39 | 100.35 | 126.82 |
| C | Solano (SF) | Winter | 2020 | 338.66             | 391.75 | 460.83 | 587.18 | 73.66                 | 84.54 | 100.44 | 127.04 |
| C | Solano (SF) | Winter | 2021 | 338.74             | 392.00 | 460.84 | 587.49 | 73.74                 | 84.71 | 100.53 | 127.19 |
| C | Solano (SF) | Winter | 2022 | 338.78             | 392.22 | 460.83 | 587.75 | 73.80                 | 84.87 | 100.61 | 127.33 |
| C | Solano (SF) | Winter | 2023 | 338.79             | 392.40 | 460.83 | 587.95 | 73.84                 | 85.01 | 100.68 | 127.49 |
| C | Solano (SF) | Winter | 2024 | 338.79             | 392.54 | 460.82 | 588.10 | 73.86                 | 85.13 | 100.74 | 127.65 |
| C | Solano (SF) | Winter | 2025 | 338.80             | 392.67 | 460.81 | 588.27 | 73.88                 | 85.24 | 100.79 | 127.80 |
| C | Solano (SF) | Winter | 2026 | 338.82             | 392.81 | 460.80 | 588.44 | 73.91                 | 85.35 | 100.83 | 127.95 |
| C | Solano (SF) | Winter | 2027 | 338.84             | 392.94 | 460.79 | 588.61 | 73.92                 | 85.44 | 100.86 | 128.08 |
| C | Solano (SF) | Winter | 2028 | 338.84             | 393.08 | 460.78 | 588.77 | 73.93                 | 85.53 | 100.88 | 128.20 |
| C | Solano (SF) | Winter | 2029 | 338.84             | 393.21 | 460.77 | 588.94 | 73.94                 | 85.62 | 100.90 | 128.31 |
| C | Solano (SF) | Winter | 2030 | 338.84             | 393.34 | 460.76 | 589.11 | 73.95                 | 85.70 | 100.91 | 128.42 |
| C | Solano (SF) | Winter | 2031 | 338.84             | 393.47 | 460.75 | 589.31 | 73.95                 | 85.78 | 100.93 | 128.53 |
| C | Solano (SF) | Winter | 2032 | 338.84             | 393.60 | 460.74 | 589.52 | 73.96                 | 85.86 | 100.93 | 128.64 |
| C | Solano (SF) | Winter | 2033 | 338.84             | 393.71 | 460.74 | 589.70 | 73.96                 | 85.93 | 100.94 | 128.74 |
| C | Solano (SF) | Winter | 2034 | 338.83             | 393.81 | 460.73 | 589.87 | 73.97                 | 86.00 | 100.95 | 128.83 |
| C | Solano (SF) | Winter | 2035 | 338.83             | 393.90 | 460.72 | 590.01 | 73.97                 | 86.05 | 100.95 | 128.92 |
| C | Solano (SV) | Annual | 2010 | 361.72             | 414.56 | 494.70 | 624.60 | 73.68                 | 84.80 | 100.13 | 125.07 |
| C | Solano (SV) | Annual | 2011 | 361.94             | 415.33 | 494.60 | 625.06 | 73.63                 | 84.64 | 100.12 | 125.23 |
| C | Solano (SV) | Annual | 2012 | 362.12             | 416.01 | 494.53 | 625.61 | 73.53                 | 84.49 | 100.15 | 125.40 |
| C | Solano (SV) | Annual | 2013 | 362.32             | 416.57 | 494.48 | 626.21 | 73.46                 | 84.35 | 100.21 | 125.60 |
| C | Solano (SV) | Annual | 2014 | 362.52             | 417.08 | 494.45 | 626.83 | 73.42                 | 84.23 | 100.22 | 125.81 |
| C | Solano (SV) | Annual | 2015 | 362.70             | 417.55 | 494.44 | 627.46 | 73.39                 | 84.20 | 100.24 | 126.04 |
| C | Solano (SV) | Annual | 2016 | 371.75             | 428.17 | 506.54 | 643.44 | 73.44                 | 84.21 | 100.30 | 126.28 |
| C | Solano (SV) | Annual | 2017 | 371.90             | 428.52 | 506.54 | 644.06 | 73.44                 | 84.13 | 100.29 | 126.51 |
| C | Solano (SV) | Annual | 2018 | 372.04             | 428.84 | 506.54 | 644.61 | 73.47                 | 84.18 | 100.31 | 126.74 |
| C | Solano (SV) | Annual | 2019 | 372.18             | 429.19 | 506.54 | 645.09 | 73.51                 | 84.31 | 100.36 | 126.94 |
| C | Solano (SV) | Annual | 2020 | 372.30             | 429.49 | 506.54 | 645.54 | 73.61                 | 84.45 | 100.45 | 127.14 |
| C | Solano (SV) | Annual | 2021 | 372.41             | 429.77 | 506.54 | 645.87 | 73.70                 | 84.61 | 100.54 | 127.29 |
| C | Solano (SV) | Annual | 2022 | 372.46             | 430.00 | 506.53 | 646.17 | 73.76                 | 84.76 | 100.62 | 127.44 |
| C | Solano (SV) | Annual | 2023 | 372.49             | 430.19 | 506.52 | 646.37 | 73.80                 | 84.88 | 100.69 | 127.60 |
| C | Solano (SV) | Annual | 2024 | 372.51             | 430.37 | 506.51 | 646.51 | 73.83                 | 85.01 | 100.74 | 127.74 |
| C | Solano (SV) | Annual | 2025 | 372.53             | 430.53 | 506.49 | 646.67 | 73.86                 | 85.11 | 100.79 | 127.89 |
| C | Solano (SV) | Annual | 2026 | 375.02             | 433.55 | 509.84 | 651.12 | 73.88                 | 85.22 | 100.83 | 128.03 |
| C | Solano (SV) | Annual | 2027 | 375.04             | 433.71 | 509.83 | 651.28 | 73.90                 | 85.31 | 100.86 | 128.15 |
| C | Solano (SV) | Annual | 2028 | 375.06             | 433.87 | 509.82 | 651.44 | 73.91                 | 85.40 | 100.88 | 128.26 |
| C | Solano (SV) | Annual | 2029 | 375.06             | 434.03 | 509.81 | 651.60 | 73.92                 | 85.48 | 100.90 | 128.37 |
| C | Solano (SV) | Annual | 2030 | 375.06             | 434.19 | 509.80 | 651.77 | 73.92                 | 85.56 | 100.92 | 128.47 |
| C | Solano (SV) | Annual | 2031 | 375.06             | 434.35 | 509.79 | 651.99 | 73.93                 | 85.64 | 100.93 | 128.58 |
| C | Solano (SV) | Annual | 2032 | 375.06             | 434.50 | 509.79 | 652.21 | 73.93                 | 85.71 | 100.94 | 128.68 |
| C | Solano (SV) | Annual | 2033 | 375.06             | 434.63 | 509.78 | 652.41 | 73.94                 | 85.78 | 100.94 | 128.78 |
| C | Solano (SV) | Annual | 2034 | 375.06             | 434.74 | 509.77 | 652.59 | 73.94                 | 85.84 | 100.95 | 128.87 |
| C | Solano (SV) | Annual | 2035 | 375.06             | 434.82 | 509.76 | 652.75 | 73.94                 | 85.90 | 100.96 | 128.95 |
| C | Solano (SV) | Summer | 2010 | 396.63             | 451.00 | 541.05 | 682.70 | 73.68                 | 84.80 | 100.13 | 125.07 |
| C | Solano (SV) | Summer | 2011 | 397.01             | 452.35 | 540.98 | 682.98 | 73.63                 | 84.64 | 100.12 | 125.23 |
| C | Solano (SV) | Summer | 2012 | 397.34             | 453.51 | 540.96 | 683.47 | 73.53                 | 84.49 | 100.15 | 125.40 |
| C | Solano (SV) | Summer | 2013 | 397.66             | 454.46 | 540.99 | 684.11 | 73.46                 | 84.35 | 100.21 | 125.60 |
| C | Solano (SV) | Summer | 2014 | 397.96             | 455.28 | 541.09 | 684.86 | 73.42                 | 84.23 | 100.22 | 125.81 |
| C | Solano (SV) | Summer | 2015 | 398.22             | 455.97 | 541.22 | 685.68 | 73.39                 | 84.20 | 100.24 | 126.04 |
| C | Solano (SV) | Summer | 2016 | 408.16             | 467.64 | 554.55 | 703.24 | 73.44                 | 84.21 | 100.30 | 126.28 |
| C | Solano (SV) | Summer | 2017 | 408.35             | 468.15 | 554.68 | 704.08 | 73.44                 | 84.13 | 100.29 | 126.51 |
| C | Solano (SV) | Summer | 2018 | 408.51             | 468.56 | 554.75 | 704.81 | 73.47                 | 84.18 | 100.31 | 126.74 |
| C | Solano (SV) | Summer | 2019 | 408.65             | 469.03 | 554.77 | 705.45 | 73.51                 | 84.31 | 100.36 | 126.94 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Solano (SV) | Summer | 2020 | 408.77              | 469.44 | 554.78 | 706.04 | 73.61                 | 84.45 | 100.45 | 127.14 |
| C | Solano (SV) | Summer | 2021 | 408.88              | 469.80 | 554.77 | 706.47 | 73.70                 | 84.61 | 100.54 | 127.29 |
| C | Solano (SV) | Summer | 2022 | 408.94              | 470.12 | 554.74 | 706.85 | 73.76                 | 84.76 | 100.62 | 127.44 |
| C | Solano (SV) | Summer | 2023 | 408.97              | 470.39 | 554.71 | 707.11 | 73.80                 | 84.88 | 100.69 | 127.60 |
| C | Solano (SV) | Summer | 2024 | 409.00              | 470.66 | 554.66 | 707.27 | 73.83                 | 85.01 | 100.74 | 127.74 |
| C | Solano (SV) | Summer | 2025 | 409.02              | 470.89 | 554.62 | 707.42 | 73.86                 | 85.11 | 100.79 | 127.89 |
| C | Solano (SV) | Summer | 2026 | 411.74              | 474.21 | 558.28 | 712.22 | 73.88                 | 85.22 | 100.83 | 128.03 |
| C | Solano (SV) | Summer | 2027 | 411.77              | 474.42 | 558.28 | 712.36 | 73.90                 | 85.31 | 100.86 | 128.15 |
| C | Solano (SV) | Summer | 2028 | 411.78              | 474.63 | 558.28 | 712.51 | 73.91                 | 85.40 | 100.88 | 128.26 |
| C | Solano (SV) | Summer | 2029 | 411.79              | 474.86 | 558.27 | 712.66 | 73.92                 | 85.48 | 100.90 | 128.37 |
| C | Solano (SV) | Summer | 2030 | 411.80              | 475.08 | 558.27 | 712.84 | 73.92                 | 85.56 | 100.92 | 128.47 |
| C | Solano (SV) | Summer | 2031 | 411.79              | 475.31 | 558.26 | 713.12 | 73.93                 | 85.64 | 100.93 | 128.58 |
| C | Solano (SV) | Summer | 2032 | 411.79              | 475.50 | 558.25 | 713.41 | 73.93                 | 85.71 | 100.94 | 128.68 |
| C | Solano (SV) | Summer | 2033 | 411.79              | 475.67 | 558.24 | 713.67 | 73.94                 | 85.78 | 100.94 | 128.78 |
| C | Solano (SV) | Summer | 2034 | 411.79              | 475.81 | 558.23 | 713.92 | 73.94                 | 85.84 | 100.95 | 128.87 |
| C | Solano (SV) | Summer | 2035 | 411.78              | 475.92 | 558.22 | 714.15 | 73.94                 | 85.90 | 100.96 | 128.95 |
| C | Solano (SV) | Winter | 2010 | 353.45              | 405.93 | 483.73 | 610.84 | 73.68                 | 84.80 | 100.13 | 125.07 |
| C | Solano (SV) | Winter | 2011 | 353.63              | 406.57 | 483.61 | 611.35 | 73.63                 | 84.64 | 100.12 | 125.23 |
| C | Solano (SV) | Winter | 2012 | 353.78              | 407.13 | 483.53 | 611.91 | 73.53                 | 84.49 | 100.15 | 125.40 |
| C | Solano (SV) | Winter | 2013 | 353.95              | 407.60 | 483.47 | 612.50 | 73.46                 | 84.35 | 100.21 | 125.60 |
| C | Solano (SV) | Winter | 2014 | 354.13              | 408.03 | 483.41 | 613.09 | 73.42                 | 84.23 | 100.22 | 125.81 |
| C | Solano (SV) | Winter | 2015 | 354.29              | 408.45 | 483.37 | 613.68 | 73.39                 | 84.20 | 100.24 | 126.04 |
| C | Solano (SV) | Winter | 2016 | 363.12              | 418.81 | 495.16 | 629.27 | 73.44                 | 84.21 | 100.30 | 126.28 |
| C | Solano (SV) | Winter | 2017 | 363.26              | 419.12 | 495.13 | 629.83 | 73.44                 | 84.13 | 100.29 | 126.51 |
| C | Solano (SV) | Winter | 2018 | 363.40              | 419.42 | 495.11 | 630.33 | 73.47                 | 84.18 | 100.31 | 126.74 |
| C | Solano (SV) | Winter | 2019 | 363.53              | 419.75 | 495.10 | 630.78 | 73.51                 | 84.31 | 100.36 | 126.94 |
| C | Solano (SV) | Winter | 2020 | 363.65              | 420.02 | 495.10 | 631.20 | 73.61                 | 84.45 | 100.45 | 127.14 |
| C | Solano (SV) | Winter | 2021 | 363.76              | 420.27 | 495.11 | 631.50 | 73.70                 | 84.61 | 100.54 | 127.29 |
| C | Solano (SV) | Winter | 2022 | 363.81              | 420.49 | 495.10 | 631.78 | 73.76                 | 84.76 | 100.62 | 127.44 |
| C | Solano (SV) | Winter | 2023 | 363.84              | 420.66 | 495.10 | 631.97 | 73.80                 | 84.88 | 100.69 | 127.60 |
| C | Solano (SV) | Winter | 2024 | 363.86              | 420.82 | 495.09 | 632.10 | 73.83                 | 85.01 | 100.74 | 127.74 |
| C | Solano (SV) | Winter | 2025 | 363.88              | 420.96 | 495.08 | 632.26 | 73.86                 | 85.11 | 100.79 | 127.89 |
| C | Solano (SV) | Winter | 2026 | 366.31              | 423.90 | 498.35 | 636.62 | 73.88                 | 85.22 | 100.83 | 128.03 |
| C | Solano (SV) | Winter | 2027 | 366.33              | 424.05 | 498.34 | 636.78 | 73.90                 | 85.31 | 100.86 | 128.15 |
| C | Solano (SV) | Winter | 2028 | 366.34              | 424.20 | 498.33 | 636.95 | 73.91                 | 85.40 | 100.88 | 128.26 |
| C | Solano (SV) | Winter | 2029 | 366.34              | 424.35 | 498.31 | 637.11 | 73.92                 | 85.48 | 100.90 | 128.37 |
| C | Solano (SV) | Winter | 2030 | 366.34              | 424.49 | 498.30 | 637.28 | 73.92                 | 85.56 | 100.92 | 128.47 |
| C | Solano (SV) | Winter | 2031 | 366.35              | 424.64 | 498.30 | 637.49 | 73.93                 | 85.64 | 100.93 | 128.58 |
| C | Solano (SV) | Winter | 2032 | 366.35              | 424.77 | 498.29 | 637.69 | 73.93                 | 85.71 | 100.94 | 128.68 |
| C | Solano (SV) | Winter | 2033 | 366.35              | 424.89 | 498.28 | 637.88 | 73.94                 | 85.78 | 100.94 | 128.78 |
| C | Solano (SV) | Winter | 2034 | 366.35              | 424.99 | 498.28 | 638.04 | 73.94                 | 85.84 | 100.95 | 128.87 |
| C | Solano (SV) | Winter | 2035 | 366.34              | 425.08 | 498.27 | 638.19 | 73.94                 | 85.90 | 100.96 | 128.95 |
| C | Sonoma (NC) | Annual | 2010 | 390.51              | 449.32 | 534.32 | 668.22 | 73.44                 | 86.67 | 100.89 | 124.24 |
| C | Sonoma (NC) | Annual | 2011 | 390.41              | 449.46 | 533.78 | 668.92 | 73.35                 | 86.07 | 100.76 | 124.42 |
| C | Sonoma (NC) | Annual | 2012 | 390.39              | 449.72 | 533.36 | 669.75 | 73.28                 | 85.75 | 100.71 | 124.64 |
| C | Sonoma (NC) | Annual | 2013 | 390.45              | 449.93 | 533.03 | 670.64 | 73.24                 | 85.48 | 100.70 | 124.89 |
| C | Sonoma (NC) | Annual | 2014 | 390.51              | 450.12 | 532.77 | 671.53 | 73.21                 | 85.23 | 100.66 | 125.14 |
| C | Sonoma (NC) | Annual | 2015 | 390.56              | 450.29 | 532.56 | 672.43 | 73.15                 | 84.99 | 100.59 | 125.42 |
| C | Sonoma (NC) | Annual | 2016 | 389.58              | 449.24 | 530.90 | 671.41 | 73.14                 | 84.86 | 100.60 | 125.69 |
| C | Sonoma (NC) | Annual | 2017 | 389.62              | 449.43 | 530.76 | 672.22 | 73.11                 | 84.74 | 100.59 | 125.97 |
| C | Sonoma (NC) | Annual | 2018 | 389.63              | 449.60 | 530.64 | 672.91 | 73.05                 | 84.67 | 100.59 | 126.25 |
| C | Sonoma (NC) | Annual | 2019 | 389.66              | 449.79 | 530.55 | 673.52 | 73.04                 | 84.68 | 100.60 | 126.51 |
| C | Sonoma (NC) | Annual | 2020 | 389.72              | 449.99 | 530.48 | 674.07 | 73.12                 | 84.77 | 100.66 | 126.75 |
| C | Sonoma (NC) | Annual | 2021 | 389.70              | 450.13 | 530.40 | 674.51 | 73.17                 | 84.88 | 100.73 | 126.95 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Sonoma (NC) | Annual | 2022 | 389.64              | 450.20 | 530.29 | 674.87 | 73.19                 | 84.96 | 100.77 | 127.13 |
| C | Sonoma (NC) | Annual | 2023 | 389.45              | 450.24 | 530.20 | 675.12 | 73.19                 | 85.04 | 100.81 | 127.31 |
| C | Sonoma (NC) | Annual | 2024 | 389.28              | 450.28 | 530.12 | 675.30 | 73.17                 | 85.12 | 100.85 | 127.48 |
| C | Sonoma (NC) | Annual | 2025 | 389.20              | 450.39 | 530.07 | 675.47 | 73.17                 | 85.21 | 100.89 | 127.63 |
| C | Sonoma (NC) | Annual | 2026 | 388.38              | 449.63 | 528.86 | 674.20 | 73.19                 | 85.33 | 100.92 | 127.79 |
| C | Sonoma (NC) | Annual | 2027 | 388.39              | 449.84 | 528.80 | 674.40 | 73.21                 | 85.43 | 100.94 | 127.93 |
| C | Sonoma (NC) | Annual | 2028 | 388.39              | 450.05 | 528.74 | 674.61 | 73.21                 | 85.53 | 100.95 | 128.07 |
| C | Sonoma (NC) | Annual | 2029 | 388.37              | 450.26 | 528.66 | 674.83 | 73.22                 | 85.63 | 100.96 | 128.20 |
| C | Sonoma (NC) | Annual | 2030 | 388.34              | 450.46 | 528.57 | 675.05 | 73.22                 | 85.71 | 100.96 | 128.32 |
| C | Sonoma (NC) | Annual | 2031 | 388.34              | 450.68 | 528.53 | 675.33 | 73.23                 | 85.80 | 100.96 | 128.45 |
| C | Sonoma (NC) | Annual | 2032 | 388.33              | 450.87 | 528.49 | 675.61 | 73.23                 | 85.88 | 100.97 | 128.57 |
| C | Sonoma (NC) | Annual | 2033 | 388.32              | 451.04 | 528.45 | 675.87 | 73.24                 | 85.96 | 100.97 | 128.69 |
| C | Sonoma (NC) | Annual | 2034 | 388.31              | 451.20 | 528.43 | 676.10 | 73.25                 | 86.03 | 100.98 | 128.79 |
| C | Sonoma (NC) | Annual | 2035 | 388.30              | 451.32 | 528.40 | 676.31 | 73.25                 | 86.08 | 100.98 | 128.89 |
| C | Sonoma (NC) | Summer | 2010 | 405.40              | 463.97 | 554.11 | 693.02 | 73.44                 | 86.67 | 100.89 | 124.24 |
| C | Sonoma (NC) | Summer | 2011 | 405.46              | 464.55 | 553.73 | 693.76 | 73.35                 | 86.07 | 100.76 | 124.42 |
| C | Sonoma (NC) | Summer | 2012 | 405.58              | 465.14 | 553.43 | 694.67 | 73.28                 | 85.75 | 100.71 | 124.64 |
| C | Sonoma (NC) | Summer | 2013 | 405.73              | 465.65 | 553.21 | 695.68 | 73.24                 | 85.48 | 100.70 | 124.89 |
| C | Sonoma (NC) | Summer | 2014 | 405.87              | 466.08 | 553.06 | 696.69 | 73.21                 | 85.23 | 100.66 | 125.14 |
| C | Sonoma (NC) | Summer | 2015 | 405.97              | 466.45 | 552.95 | 697.74 | 73.15                 | 84.99 | 100.59 | 125.42 |
| C | Sonoma (NC) | Summer | 2016 | 404.98              | 465.53 | 551.32 | 696.79 | 73.14                 | 84.86 | 100.60 | 125.69 |
| C | Sonoma (NC) | Summer | 2017 | 405.05              | 465.86 | 551.23 | 697.73 | 73.11                 | 84.74 | 100.59 | 125.97 |
| C | Sonoma (NC) | Summer | 2018 | 405.05              | 466.14 | 551.15 | 698.52 | 73.05                 | 84.67 | 100.59 | 126.25 |
| C | Sonoma (NC) | Summer | 2019 | 405.08              | 466.43 | 551.09 | 699.22 | 73.04                 | 84.68 | 100.60 | 126.51 |
| C | Sonoma (NC) | Summer | 2020 | 405.14              | 466.72 | 551.02 | 699.85 | 73.12                 | 84.77 | 100.66 | 126.75 |
| C | Sonoma (NC) | Summer | 2021 | 405.12              | 466.94 | 550.95 | 700.35 | 73.17                 | 84.88 | 100.73 | 126.95 |
| C | Sonoma (NC) | Summer | 2022 | 405.06              | 467.10 | 550.86 | 700.77 | 73.19                 | 84.96 | 100.77 | 127.13 |
| C | Sonoma (NC) | Summer | 2023 | 404.88              | 467.22 | 550.78 | 701.06 | 73.19                 | 85.04 | 100.81 | 127.31 |
| C | Sonoma (NC) | Summer | 2024 | 404.72              | 467.34 | 550.70 | 701.27 | 73.17                 | 85.12 | 100.85 | 127.48 |
| C | Sonoma (NC) | Summer | 2025 | 404.64              | 467.50 | 550.65 | 701.46 | 73.17                 | 85.21 | 100.89 | 127.63 |
| C | Sonoma (NC) | Summer | 2026 | 403.80              | 466.76 | 549.40 | 700.14 | 73.19                 | 85.33 | 100.92 | 127.79 |
| C | Sonoma (NC) | Summer | 2027 | 403.82              | 467.03 | 549.34 | 700.34 | 73.21                 | 85.43 | 100.94 | 127.93 |
| C | Sonoma (NC) | Summer | 2028 | 403.82              | 467.29 | 549.29 | 700.56 | 73.21                 | 85.53 | 100.95 | 128.07 |
| C | Sonoma (NC) | Summer | 2029 | 403.81              | 467.55 | 549.22 | 700.79 | 73.22                 | 85.63 | 100.96 | 128.20 |
| C | Sonoma (NC) | Summer | 2030 | 403.80              | 467.80 | 549.13 | 701.03 | 73.22                 | 85.71 | 100.96 | 128.32 |
| C | Sonoma (NC) | Summer | 2031 | 403.80              | 468.07 | 549.10 | 701.35 | 73.23                 | 85.80 | 100.96 | 128.45 |
| C | Sonoma (NC) | Summer | 2032 | 403.79              | 468.29 | 549.07 | 701.67 | 73.23                 | 85.88 | 100.97 | 128.57 |
| C | Sonoma (NC) | Summer | 2033 | 403.79              | 468.49 | 549.04 | 701.96 | 73.24                 | 85.96 | 100.97 | 128.69 |
| C | Sonoma (NC) | Summer | 2034 | 403.78              | 468.67 | 549.01 | 702.23 | 73.25                 | 86.03 | 100.98 | 128.79 |
| C | Sonoma (NC) | Summer | 2035 | 403.77              | 468.80 | 548.99 | 702.46 | 73.25                 | 86.08 | 100.98 | 128.89 |
| C | Sonoma (NC) | Winter | 2010 | 383.18              | 442.11 | 524.58 | 656.01 | 73.44                 | 86.67 | 100.89 | 124.24 |
| C | Sonoma (NC) | Winter | 2011 | 383.00              | 442.03 | 523.97 | 656.70 | 73.35                 | 86.07 | 100.76 | 124.42 |
| C | Sonoma (NC) | Winter | 2012 | 382.92              | 442.12 | 523.49 | 657.49 | 73.28                 | 85.75 | 100.71 | 124.64 |
| C | Sonoma (NC) | Winter | 2013 | 382.92              | 442.20 | 523.10 | 658.32 | 73.24                 | 85.48 | 100.70 | 124.89 |
| C | Sonoma (NC) | Winter | 2014 | 382.95              | 442.27 | 522.78 | 659.14 | 73.21                 | 85.23 | 100.66 | 125.14 |
| C | Sonoma (NC) | Winter | 2015 | 382.97              | 442.33 | 522.52 | 659.97 | 73.15                 | 84.99 | 100.59 | 125.42 |
| C | Sonoma (NC) | Winter | 2016 | 382.00              | 441.23 | 520.85 | 658.92 | 73.14                 | 84.86 | 100.60 | 125.69 |
| C | Sonoma (NC) | Winter | 2017 | 382.03              | 441.35 | 520.68 | 659.67 | 73.11                 | 84.74 | 100.59 | 125.97 |
| C | Sonoma (NC) | Winter | 2018 | 382.04              | 441.46 | 520.55 | 660.31 | 73.05                 | 84.67 | 100.59 | 126.25 |
| C | Sonoma (NC) | Winter | 2019 | 382.06              | 441.60 | 520.45 | 660.88 | 73.04                 | 84.68 | 100.60 | 126.51 |
| C | Sonoma (NC) | Winter | 2020 | 382.13              | 441.75 | 520.37 | 661.39 | 73.12                 | 84.77 | 100.66 | 126.75 |
| C | Sonoma (NC) | Winter | 2021 | 382.11              | 441.85 | 520.28 | 661.79 | 73.17                 | 84.88 | 100.73 | 126.95 |
| C | Sonoma (NC) | Winter | 2022 | 382.05              | 441.88 | 520.16 | 662.13 | 73.19                 | 84.96 | 100.77 | 127.13 |
| C | Sonoma (NC) | Winter | 2023 | 381.86              | 441.88 | 520.07 | 662.35 | 73.19                 | 85.04 | 100.81 | 127.31 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Sonoma (NC) | Winter | 2024 | 381.68             | 441.89 | 519.99 | 662.52 | 73.17                 | 85.12 | 100.85 | 127.48 |
| C | Sonoma (NC) | Winter | 2025 | 381.60             | 441.97 | 519.94 | 662.68 | 73.17                 | 85.21 | 100.89 | 127.63 |
| C | Sonoma (NC) | Winter | 2026 | 380.80             | 441.20 | 518.76 | 661.43 | 73.19                 | 85.33 | 100.92 | 127.79 |
| C | Sonoma (NC) | Winter | 2027 | 380.81             | 441.38 | 518.69 | 661.63 | 73.21                 | 85.43 | 100.94 | 127.93 |
| C | Sonoma (NC) | Winter | 2028 | 380.79             | 441.56 | 518.63 | 661.84 | 73.21                 | 85.53 | 100.95 | 128.07 |
| C | Sonoma (NC) | Winter | 2029 | 380.77             | 441.75 | 518.54 | 662.05 | 73.22                 | 85.63 | 100.96 | 128.20 |
| C | Sonoma (NC) | Winter | 2030 | 380.74             | 441.93 | 518.44 | 662.26 | 73.22                 | 85.71 | 100.96 | 128.32 |
| C | Sonoma (NC) | Winter | 2031 | 380.73             | 442.12 | 518.40 | 662.52 | 73.23                 | 85.80 | 100.96 | 128.45 |
| C | Sonoma (NC) | Winter | 2032 | 380.72             | 442.30 | 518.36 | 662.79 | 73.23                 | 85.88 | 100.97 | 128.57 |
| C | Sonoma (NC) | Winter | 2033 | 380.71             | 442.46 | 518.33 | 663.03 | 73.24                 | 85.96 | 100.97 | 128.69 |
| C | Sonoma (NC) | Winter | 2034 | 380.70             | 442.60 | 518.30 | 663.25 | 73.25                 | 86.03 | 100.98 | 128.79 |
| C | Sonoma (NC) | Winter | 2035 | 380.69             | 442.72 | 518.27 | 663.43 | 73.25                 | 86.08 | 100.98 | 128.89 |
| C | Sonoma (SF) | Annual | 2010 | 337.75             | 387.87 | 461.89 | 580.89 | 73.29                 | 85.42 | 99.94  | 124.71 |
| C | Sonoma (SF) | Annual | 2011 | 337.74             | 388.23 | 461.68 | 581.45 | 73.21                 | 85.10 | 99.96  | 124.87 |
| C | Sonoma (SF) | Annual | 2012 | 337.78             | 388.61 | 461.51 | 582.06 | 73.15                 | 84.87 | 100.01 | 125.06 |
| C | Sonoma (SF) | Annual | 2013 | 337.89             | 388.97 | 461.38 | 582.74 | 73.14                 | 84.69 | 100.06 | 125.28 |
| C | Sonoma (SF) | Annual | 2014 | 337.98             | 389.31 | 461.27 | 583.41 | 73.12                 | 84.55 | 100.09 | 125.51 |
| C | Sonoma (SF) | Annual | 2015 | 338.11             | 389.63 | 461.19 | 584.10 | 73.14                 | 84.44 | 100.14 | 125.76 |
| C | Sonoma (SF) | Annual | 2016 | 338.27             | 389.97 | 461.13 | 584.74 | 73.20                 | 84.38 | 100.20 | 126.01 |
| C | Sonoma (SF) | Annual | 2017 | 338.37             | 390.26 | 461.08 | 585.37 | 73.22                 | 84.32 | 100.23 | 126.26 |
| C | Sonoma (SF) | Annual | 2018 | 338.47             | 390.53 | 461.05 | 585.92 | 73.25                 | 84.30 | 100.30 | 126.51 |
| C | Sonoma (SF) | Annual | 2019 | 338.56             | 390.82 | 461.02 | 586.41 | 73.29                 | 84.40 | 100.37 | 126.74 |
| C | Sonoma (SF) | Annual | 2020 | 338.66             | 391.09 | 461.01 | 586.85 | 73.39                 | 84.53 | 100.46 | 126.96 |
| C | Sonoma (SF) | Annual | 2021 | 338.74             | 391.37 | 461.00 | 587.19 | 73.47                 | 84.71 | 100.55 | 127.13 |
| C | Sonoma (SF) | Annual | 2022 | 338.77             | 391.60 | 460.98 | 587.46 | 73.53                 | 84.86 | 100.63 | 127.25 |
| C | Sonoma (SF) | Annual | 2023 | 338.78             | 391.79 | 460.96 | 587.68 | 73.57                 | 85.00 | 100.70 | 127.43 |
| C | Sonoma (SF) | Annual | 2024 | 338.76             | 391.93 | 460.93 | 587.83 | 73.60                 | 85.12 | 100.75 | 127.59 |
| C | Sonoma (SF) | Annual | 2025 | 338.75             | 392.07 | 460.92 | 588.01 | 73.62                 | 85.23 | 100.80 | 127.74 |
| C | Sonoma (SF) | Annual | 2026 | 338.77             | 392.22 | 460.89 | 588.19 | 73.64                 | 85.34 | 100.84 | 127.90 |
| C | Sonoma (SF) | Annual | 2027 | 338.78             | 392.38 | 460.87 | 588.37 | 73.66                 | 85.43 | 100.87 | 128.03 |
| C | Sonoma (SF) | Annual | 2028 | 338.78             | 392.54 | 460.84 | 588.55 | 73.67                 | 85.53 | 100.89 | 128.16 |
| C | Sonoma (SF) | Annual | 2029 | 338.78             | 392.70 | 460.81 | 588.73 | 73.68                 | 85.62 | 100.90 | 128.28 |
| C | Sonoma (SF) | Annual | 2030 | 338.76             | 392.87 | 460.79 | 588.92 | 73.68                 | 85.70 | 100.92 | 128.40 |
| C | Sonoma (SF) | Annual | 2031 | 338.76             | 393.04 | 460.77 | 589.13 | 73.69                 | 85.78 | 100.93 | 128.51 |
| C | Sonoma (SF) | Annual | 2032 | 338.76             | 393.20 | 460.76 | 589.35 | 73.69                 | 85.86 | 100.94 | 128.62 |
| C | Sonoma (SF) | Annual | 2033 | 338.75             | 393.34 | 460.74 | 589.54 | 73.70                 | 85.93 | 100.94 | 128.73 |
| C | Sonoma (SF) | Annual | 2034 | 338.75             | 393.47 | 460.73 | 589.72 | 73.70                 | 86.00 | 100.95 | 128.82 |
| C | Sonoma (SF) | Annual | 2035 | 338.74             | 393.58 | 460.71 | 589.88 | 73.71                 | 86.06 | 100.95 | 128.91 |
| C | Sonoma (SF) | Summer | 2010 | 362.22             | 413.09 | 494.52 | 621.95 | 73.29                 | 85.42 | 99.94  | 124.71 |
| C | Sonoma (SF) | Summer | 2011 | 362.43             | 413.89 | 494.43 | 622.45 | 73.21                 | 85.10 | 99.96  | 124.87 |
| C | Sonoma (SF) | Summer | 2012 | 362.64             | 414.65 | 494.39 | 623.09 | 73.15                 | 84.87 | 100.01 | 125.06 |
| C | Sonoma (SF) | Summer | 2013 | 362.88             | 415.33 | 494.38 | 623.85 | 73.14                 | 84.69 | 100.06 | 125.28 |
| C | Sonoma (SF) | Summer | 2014 | 363.07             | 415.93 | 494.41 | 624.65 | 73.12                 | 84.55 | 100.09 | 125.51 |
| C | Sonoma (SF) | Summer | 2015 | 363.28             | 416.48 | 494.45 | 625.51 | 73.14                 | 84.44 | 100.14 | 125.76 |
| C | Sonoma (SF) | Summer | 2016 | 363.48             | 417.01 | 494.48 | 626.33 | 73.20                 | 84.38 | 100.20 | 126.01 |
| C | Sonoma (SF) | Summer | 2017 | 363.61             | 417.48 | 494.51 | 627.12 | 73.22                 | 84.32 | 100.23 | 126.26 |
| C | Sonoma (SF) | Summer | 2018 | 363.71             | 417.89 | 494.51 | 627.81 | 73.25                 | 84.30 | 100.30 | 126.51 |
| C | Sonoma (SF) | Summer | 2019 | 363.81             | 418.29 | 494.51 | 628.42 | 73.29                 | 84.40 | 100.37 | 126.74 |
| C | Sonoma (SF) | Summer | 2020 | 363.90             | 418.65 | 494.49 | 628.96 | 73.39                 | 84.53 | 100.46 | 126.96 |
| C | Sonoma (SF) | Summer | 2021 | 363.97             | 419.02 | 494.47 | 629.37 | 73.47                 | 84.71 | 100.55 | 127.13 |
| C | Sonoma (SF) | Summer | 2022 | 364.00             | 419.34 | 494.43 | 629.72 | 73.53                 | 84.86 | 100.63 | 127.25 |
| C | Sonoma (SF) | Summer | 2023 | 364.01             | 419.60 | 494.40 | 629.97 | 73.57                 | 85.00 | 100.70 | 127.43 |
| C | Sonoma (SF) | Summer | 2024 | 364.00             | 419.81 | 494.37 | 630.15 | 73.60                 | 85.12 | 100.75 | 127.59 |
| C | Sonoma (SF) | Summer | 2025 | 364.00             | 420.01 | 494.34 | 630.33 | 73.62                 | 85.23 | 100.80 | 127.74 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/VMT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Sonoma (SF)      | Summer | 2026 | 364.02              | 420.22 | 494.32 | 630.51 | 73.64                 | 85.34 | 100.84 | 127.90 |
| C | Sonoma (SF)      | Summer | 2027 | 364.03              | 420.43 | 494.30 | 630.69 | 73.66                 | 85.43 | 100.87 | 128.03 |
| C | Sonoma (SF)      | Summer | 2028 | 364.04              | 420.64 | 494.29 | 630.87 | 73.67                 | 85.53 | 100.89 | 128.16 |
| C | Sonoma (SF)      | Summer | 2029 | 364.04              | 420.87 | 494.27 | 631.06 | 73.68                 | 85.62 | 100.90 | 128.28 |
| C | Sonoma (SF)      | Summer | 2030 | 364.04              | 421.09 | 494.25 | 631.26 | 73.68                 | 85.70 | 100.92 | 128.40 |
| C | Sonoma (SF)      | Summer | 2031 | 364.04              | 421.32 | 494.23 | 631.51 | 73.69                 | 85.78 | 100.93 | 128.51 |
| C | Sonoma (SF)      | Summer | 2032 | 364.05              | 421.53 | 494.22 | 631.77 | 73.69                 | 85.86 | 100.94 | 128.62 |
| C | Sonoma (SF)      | Summer | 2033 | 364.05              | 421.71 | 494.21 | 632.00 | 73.70                 | 85.93 | 100.94 | 128.73 |
| C | Sonoma (SF)      | Summer | 2034 | 364.04              | 421.87 | 494.20 | 632.22 | 73.70                 | 86.00 | 100.95 | 128.82 |
| C | Sonoma (SF)      | Summer | 2035 | 364.04              | 421.99 | 494.18 | 632.42 | 73.71                 | 86.06 | 100.95 | 128.91 |
| C | Sonoma (SF)      | Winter | 2010 | 334.63              | 384.66 | 457.75 | 575.67 | 73.29                 | 85.42 | 99.94  | 124.71 |
| C | Sonoma (SF)      | Winter | 2011 | 334.60              | 384.97 | 457.51 | 576.23 | 73.21                 | 85.10 | 99.96  | 124.87 |
| C | Sonoma (SF)      | Winter | 2012 | 334.62              | 385.30 | 457.33 | 576.85 | 73.15                 | 84.87 | 100.01 | 125.06 |
| C | Sonoma (SF)      | Winter | 2013 | 334.71              | 385.62 | 457.18 | 577.51 | 73.14                 | 84.69 | 100.06 | 125.28 |
| C | Sonoma (SF)      | Winter | 2014 | 334.78              | 385.92 | 457.05 | 578.16 | 73.12                 | 84.55 | 100.09 | 125.51 |
| C | Sonoma (SF)      | Winter | 2015 | 334.91              | 386.21 | 456.96 | 578.83 | 73.14                 | 84.44 | 100.14 | 125.76 |
| C | Sonoma (SF)      | Winter | 2016 | 335.06              | 386.53 | 456.89 | 579.45 | 73.20                 | 84.38 | 100.20 | 126.01 |
| C | Sonoma (SF)      | Winter | 2017 | 335.16              | 386.80 | 456.83 | 580.06 | 73.22                 | 84.32 | 100.23 | 126.26 |
| C | Sonoma (SF)      | Winter | 2018 | 335.26              | 387.05 | 456.79 | 580.59 | 73.25                 | 84.30 | 100.30 | 126.51 |
| C | Sonoma (SF)      | Winter | 2019 | 335.35              | 387.33 | 456.77 | 581.07 | 73.29                 | 84.40 | 100.37 | 126.74 |
| C | Sonoma (SF)      | Winter | 2020 | 335.45              | 387.59 | 456.75 | 581.50 | 73.39                 | 84.53 | 100.46 | 126.96 |
| C | Sonoma (SF)      | Winter | 2021 | 335.53              | 387.85 | 456.74 | 581.82 | 73.47                 | 84.71 | 100.55 | 127.13 |
| C | Sonoma (SF)      | Winter | 2022 | 335.56              | 388.08 | 456.72 | 582.09 | 73.53                 | 84.86 | 100.63 | 127.25 |
| C | Sonoma (SF)      | Winter | 2023 | 335.57              | 388.25 | 456.70 | 582.30 | 73.57                 | 85.00 | 100.70 | 127.43 |
| C | Sonoma (SF)      | Winter | 2024 | 335.55              | 388.39 | 456.68 | 582.45 | 73.60                 | 85.12 | 100.75 | 127.59 |
| C | Sonoma (SF)      | Winter | 2025 | 335.54              | 388.51 | 456.67 | 582.62 | 73.62                 | 85.23 | 100.80 | 127.74 |
| C | Sonoma (SF)      | Winter | 2026 | 335.56              | 388.66 | 456.64 | 582.81 | 73.64                 | 85.34 | 100.84 | 127.90 |
| C | Sonoma (SF)      | Winter | 2027 | 335.57              | 388.81 | 456.62 | 582.99 | 73.66                 | 85.43 | 100.87 | 128.03 |
| C | Sonoma (SF)      | Winter | 2028 | 335.57              | 388.97 | 456.59 | 583.17 | 73.67                 | 85.53 | 100.89 | 128.16 |
| C | Sonoma (SF)      | Winter | 2029 | 335.56              | 389.12 | 456.56 | 583.35 | 73.68                 | 85.62 | 100.90 | 128.28 |
| C | Sonoma (SF)      | Winter | 2030 | 335.55              | 389.28 | 456.53 | 583.54 | 73.68                 | 85.70 | 100.92 | 128.40 |
| C | Sonoma (SF)      | Winter | 2031 | 335.55              | 389.44 | 456.52 | 583.74 | 73.69                 | 85.78 | 100.93 | 128.51 |
| C | Sonoma (SF)      | Winter | 2032 | 335.54              | 389.59 | 456.50 | 583.96 | 73.69                 | 85.86 | 100.94 | 128.62 |
| C | Sonoma (SF)      | Winter | 2033 | 335.54              | 389.73 | 456.49 | 584.15 | 73.70                 | 85.93 | 100.94 | 128.73 |
| C | Sonoma (SF)      | Winter | 2034 | 335.53              | 389.86 | 456.47 | 584.32 | 73.70                 | 86.00 | 100.95 | 128.82 |
| C | Sonoma (SF)      | Winter | 2035 | 335.52              | 389.97 | 456.45 | 584.47 | 73.71                 | 86.06 | 100.95 | 128.91 |
| C | Stanislaus (SJV) | Annual | 2010 | 347.54              | 398.75 | 476.31 | 598.46 | 73.30                 | 85.31 | 100.21 | 124.28 |
| C | Stanislaus (SJV) | Annual | 2011 | 347.92              | 399.76 | 476.16 | 599.10 | 73.30                 | 85.02 | 100.19 | 124.50 |
| C | Stanislaus (SJV) | Annual | 2012 | 347.75              | 399.91 | 475.41 | 598.84 | 73.30                 | 84.79 | 100.22 | 124.69 |
| C | Stanislaus (SJV) | Annual | 2013 | 348.56              | 401.20 | 475.99 | 600.52 | 73.33                 | 84.63 | 100.26 | 124.96 |
| C | Stanislaus (SJV) | Annual | 2014 | 348.84              | 401.83 | 475.95 | 601.34 | 73.34                 | 84.51 | 100.27 | 125.24 |
| C | Stanislaus (SJV) | Annual | 2015 | 348.56              | 401.83 | 475.18 | 601.35 | 73.39                 | 84.46 | 100.29 | 125.56 |
| C | Stanislaus (SJV) | Annual | 2016 | 348.81              | 402.38 | 475.17 | 602.26 | 73.47                 | 84.42 | 100.33 | 125.89 |
| C | Stanislaus (SJV) | Annual | 2017 | 348.99              | 402.83 | 475.15 | 603.08 | 73.51                 | 84.39 | 100.35 | 126.22 |
| C | Stanislaus (SJV) | Annual | 2018 | 353.62              | 408.37 | 481.26 | 611.54 | 73.55                 | 84.40 | 100.38 | 126.51 |
| C | Stanislaus (SJV) | Annual | 2019 | 353.73              | 408.70 | 481.23 | 612.13 | 73.61                 | 84.54 | 100.42 | 126.77 |
| C | Stanislaus (SJV) | Annual | 2020 | 353.83              | 408.99 | 481.21 | 612.65 | 73.71                 | 84.70 | 100.51 | 127.02 |
| C | Stanislaus (SJV) | Annual | 2021 | 354.71              | 410.20 | 482.31 | 614.49 | 73.79                 | 84.86 | 100.60 | 127.22 |
| C | Stanislaus (SJV) | Annual | 2022 | 354.74              | 410.42 | 482.28 | 614.83 | 73.84                 | 85.01 | 100.68 | 127.40 |
| C | Stanislaus (SJV) | Annual | 2023 | 354.75              | 410.60 | 482.25 | 615.09 | 73.88                 | 85.14 | 100.74 | 127.59 |
| C | Stanislaus (SJV) | Annual | 2024 | 354.87              | 410.88 | 482.39 | 615.50 | 73.90                 | 85.25 | 100.79 | 127.76 |
| C | Stanislaus (SJV) | Annual | 2025 | 354.87              | 411.01 | 482.37 | 615.70 | 73.92                 | 85.35 | 100.83 | 127.93 |
| C | Stanislaus (SJV) | Annual | 2026 | 355.36              | 411.70 | 482.95 | 616.63 | 73.94                 | 85.46 | 100.86 | 128.08 |
| C | Stanislaus (SJV) | Annual | 2027 | 355.37              | 411.85 | 482.93 | 616.79 | 73.96                 | 85.55 | 100.89 | 128.21 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Stanislaus (SJV) | Annual | 2028 | 355.39             | 412.00 | 482.91 | 616.96 | 73.97                 | 85.64 | 100.91 | 128.34 |
| C | Stanislaus (SJV) | Annual | 2029 | 355.40             | 412.15 | 482.89 | 617.13 | 73.98                 | 85.72 | 100.92 | 128.45 |
| C | Stanislaus (SJV) | Annual | 2030 | 355.40             | 412.30 | 482.87 | 617.31 | 73.98                 | 85.80 | 100.93 | 128.56 |
| C | Stanislaus (SJV) | Annual | 2031 | 355.40             | 412.44 | 482.87 | 617.52 | 73.99                 | 85.88 | 100.94 | 128.67 |
| C | Stanislaus (SJV) | Annual | 2032 | 355.40             | 412.57 | 482.87 | 617.73 | 73.99                 | 85.95 | 100.95 | 128.77 |
| C | Stanislaus (SJV) | Annual | 2033 | 355.40             | 412.68 | 482.86 | 617.92 | 74.00                 | 86.01 | 100.95 | 128.87 |
| C | Stanislaus (SJV) | Annual | 2034 | 355.39             | 412.77 | 482.86 | 618.10 | 74.00                 | 86.07 | 100.96 | 128.95 |
| C | Stanislaus (SJV) | Annual | 2035 | 355.39             | 412.85 | 482.85 | 618.26 | 74.00                 | 86.12 | 100.96 | 129.03 |
| C | Stanislaus (SJV) | Summer | 2010 | 381.95             | 434.06 | 521.66 | 655.34 | 73.30                 | 85.31 | 100.21 | 124.28 |
| C | Stanislaus (SJV) | Summer | 2011 | 382.62             | 435.93 | 521.78 | 655.94 | 73.30                 | 85.02 | 100.19 | 124.50 |
| C | Stanislaus (SJV) | Summer | 2012 | 382.57             | 436.54 | 521.11 | 655.56 | 73.30                 | 84.79 | 100.22 | 124.69 |
| C | Stanislaus (SJV) | Summer | 2013 | 383.60             | 438.42 | 521.96 | 657.48 | 73.33                 | 84.63 | 100.26 | 124.96 |
| C | Stanislaus (SJV) | Summer | 2014 | 384.01             | 439.46 | 522.13 | 658.52 | 73.34                 | 84.51 | 100.27 | 125.24 |
| C | Stanislaus (SJV) | Summer | 2015 | 383.81             | 439.80 | 521.54 | 658.80 | 73.39                 | 84.46 | 100.29 | 125.56 |
| C | Stanislaus (SJV) | Summer | 2016 | 384.15             | 440.64 | 521.70 | 660.06 | 73.47                 | 84.42 | 100.33 | 125.89 |
| C | Stanislaus (SJV) | Summer | 2017 | 384.37             | 441.33 | 521.79 | 661.18 | 73.51                 | 84.39 | 100.35 | 126.22 |
| C | Stanislaus (SJV) | Summer | 2018 | 389.43             | 447.47 | 528.51 | 670.57 | 73.55                 | 84.40 | 100.38 | 126.51 |
| C | Stanislaus (SJV) | Summer | 2019 | 389.52             | 447.88 | 528.49 | 671.33 | 73.61                 | 84.54 | 100.42 | 126.77 |
| C | Stanislaus (SJV) | Summer | 2020 | 389.59             | 448.25 | 528.44 | 671.98 | 73.71                 | 84.70 | 100.51 | 127.02 |
| C | Stanislaus (SJV) | Summer | 2021 | 390.52             | 449.59 | 529.58 | 674.02 | 73.79                 | 84.86 | 100.60 | 127.22 |
| C | Stanislaus (SJV) | Summer | 2022 | 390.53             | 449.87 | 529.51 | 674.42 | 73.84                 | 85.01 | 100.68 | 127.40 |
| C | Stanislaus (SJV) | Summer | 2023 | 390.52             | 450.11 | 529.44 | 674.71 | 73.88                 | 85.14 | 100.74 | 127.59 |
| C | Stanislaus (SJV) | Summer | 2024 | 390.61             | 450.43 | 529.53 | 675.12 | 73.90                 | 85.25 | 100.79 | 127.76 |
| C | Stanislaus (SJV) | Summer | 2025 | 390.61             | 450.61 | 529.49 | 675.31 | 73.92                 | 85.35 | 100.83 | 127.93 |
| C | Stanislaus (SJV) | Summer | 2026 | 391.12             | 451.38 | 530.07 | 676.21 | 73.94                 | 85.46 | 100.86 | 128.08 |
| C | Stanislaus (SJV) | Summer | 2027 | 391.16             | 451.60 | 530.04 | 676.32 | 73.96                 | 85.55 | 100.89 | 128.21 |
| C | Stanislaus (SJV) | Summer | 2028 | 391.19             | 451.82 | 530.03 | 676.46 | 73.97                 | 85.64 | 100.91 | 128.34 |
| C | Stanislaus (SJV) | Summer | 2029 | 391.22             | 452.04 | 530.02 | 676.62 | 73.98                 | 85.72 | 100.92 | 128.45 |
| C | Stanislaus (SJV) | Summer | 2030 | 391.24             | 452.26 | 530.01 | 676.80 | 73.98                 | 85.80 | 100.93 | 128.56 |
| C | Stanislaus (SJV) | Summer | 2031 | 391.23             | 452.46 | 530.03 | 677.05 | 73.99                 | 85.88 | 100.94 | 128.67 |
| C | Stanislaus (SJV) | Summer | 2032 | 391.23             | 452.64 | 530.04 | 677.30 | 73.99                 | 85.95 | 100.95 | 128.77 |
| C | Stanislaus (SJV) | Summer | 2033 | 391.23             | 452.78 | 530.05 | 677.55 | 74.00                 | 86.01 | 100.95 | 128.87 |
| C | Stanislaus (SJV) | Summer | 2034 | 391.23             | 452.91 | 530.06 | 677.79 | 74.00                 | 86.07 | 100.96 | 128.95 |
| C | Stanislaus (SJV) | Summer | 2035 | 391.22             | 453.00 | 530.06 | 678.01 | 74.00                 | 86.12 | 100.96 | 129.03 |
| C | Stanislaus (SJV) | Winter | 2010 | 335.59             | 386.49 | 460.56 | 578.69 | 73.30                 | 85.31 | 100.21 | 124.28 |
| C | Stanislaus (SJV) | Winter | 2011 | 335.86             | 387.20 | 460.31 | 579.35 | 73.30                 | 85.02 | 100.19 | 124.50 |
| C | Stanislaus (SJV) | Winter | 2012 | 335.65             | 387.18 | 459.53 | 579.14 | 73.30                 | 84.79 | 100.22 | 124.69 |
| C | Stanislaus (SJV) | Winter | 2013 | 336.39             | 388.28 | 460.03 | 580.73 | 73.33                 | 84.63 | 100.26 | 124.96 |
| C | Stanislaus (SJV) | Winter | 2014 | 336.63             | 388.77 | 459.91 | 581.48 | 73.34                 | 84.51 | 100.27 | 125.24 |
| C | Stanislaus (SJV) | Winter | 2015 | 336.31             | 388.64 | 459.08 | 581.38 | 73.39                 | 84.46 | 100.29 | 125.56 |
| C | Stanislaus (SJV) | Winter | 2016 | 336.53             | 389.08 | 459.00 | 582.17 | 73.47                 | 84.42 | 100.33 | 125.89 |
| C | Stanislaus (SJV) | Winter | 2017 | 336.70             | 389.46 | 458.95 | 582.89 | 73.51                 | 84.39 | 100.35 | 126.22 |
| C | Stanislaus (SJV) | Winter | 2018 | 341.17             | 394.78 | 464.84 | 591.02 | 73.55                 | 84.40 | 100.38 | 126.51 |
| C | Stanislaus (SJV) | Winter | 2019 | 341.29             | 395.08 | 464.81 | 591.56 | 73.61                 | 84.54 | 100.42 | 126.77 |
| C | Stanislaus (SJV) | Winter | 2020 | 341.40             | 395.35 | 464.80 | 592.04 | 73.71                 | 84.70 | 100.51 | 127.02 |
| C | Stanislaus (SJV) | Winter | 2021 | 342.27             | 396.52 | 465.89 | 593.81 | 73.79                 | 84.86 | 100.60 | 127.22 |
| C | Stanislaus (SJV) | Winter | 2022 | 342.31             | 396.72 | 465.88 | 594.13 | 73.84                 | 85.01 | 100.68 | 127.40 |
| C | Stanislaus (SJV) | Winter | 2023 | 342.33             | 396.88 | 465.86 | 594.38 | 73.88                 | 85.14 | 100.74 | 127.59 |
| C | Stanislaus (SJV) | Winter | 2024 | 342.46             | 397.16 | 466.03 | 594.81 | 73.90                 | 85.25 | 100.79 | 127.76 |
| C | Stanislaus (SJV) | Winter | 2025 | 342.47             | 397.27 | 466.01 | 595.01 | 73.92                 | 85.35 | 100.83 | 127.93 |
| C | Stanislaus (SJV) | Winter | 2026 | 342.95             | 397.93 | 466.61 | 595.97 | 73.94                 | 85.46 | 100.86 | 128.08 |
| C | Stanislaus (SJV) | Winter | 2027 | 342.97             | 398.06 | 466.59 | 596.15 | 73.96                 | 85.55 | 100.89 | 128.21 |
| C | Stanislaus (SJV) | Winter | 2028 | 342.97             | 398.19 | 466.57 | 596.32 | 73.97                 | 85.64 | 100.91 | 128.34 |
| C | Stanislaus (SJV) | Winter | 2029 | 342.97             | 398.32 | 466.55 | 596.50 | 73.98                 | 85.72 | 100.92 | 128.45 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location         | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|------------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |                  |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Stanislaus (SVJ) | Winter | 2030 | 342.97             | 398.44 | 466.53 | 596.68 | 73.98                 | 85.80 | 100.93 | 128.56 |
| C | Stanislaus (SVJ) | Winter | 2031 | 342.97             | 398.56 | 466.52 | 596.87 | 73.99                 | 85.88 | 100.94 | 128.67 |
| C | Stanislaus (SVJ) | Winter | 2032 | 342.97             | 398.67 | 466.51 | 597.07 | 73.99                 | 85.95 | 100.95 | 128.77 |
| C | Stanislaus (SVJ) | Winter | 2033 | 342.97             | 398.77 | 466.50 | 597.24 | 74.00                 | 86.01 | 100.95 | 128.87 |
| C | Stanislaus (SVJ) | Winter | 2034 | 342.97             | 398.86 | 466.49 | 597.40 | 74.00                 | 86.07 | 100.96 | 128.95 |
| C | Stanislaus (SVJ) | Winter | 2035 | 342.97             | 398.93 | 466.48 | 597.54 | 74.00                 | 86.12 | 100.96 | 129.03 |
| C | Sutter (SV)      | Annual | 2010 | 318.92             | 373.37 | 437.75 | 547.81 | 73.35                 | 93.29 | 100.32 | 124.62 |
| C | Sutter (SV)      | Annual | 2011 | 319.09             | 372.86 | 437.29 | 548.53 | 73.38                 | 91.65 | 100.31 | 124.85 |
| C | Sutter (SV)      | Annual | 2012 | 319.27             | 372.51 | 436.94 | 549.31 | 73.42                 | 90.37 | 100.33 | 125.11 |
| C | Sutter (SV)      | Annual | 2013 | 319.44             | 372.11 | 436.67 | 550.12 | 73.45                 | 89.10 | 100.35 | 125.39 |
| C | Sutter (SV)      | Annual | 2014 | 319.59             | 371.91 | 436.46 | 550.89 | 73.47                 | 88.28 | 100.38 | 125.67 |
| C | Sutter (SV)      | Annual | 2015 | 319.76             | 371.61 | 436.29 | 551.68 | 73.54                 | 87.32 | 100.43 | 125.96 |
| C | Sutter (SV)      | Annual | 2016 | 319.90             | 371.42 | 436.15 | 552.41 | 73.59                 | 86.63 | 100.48 | 126.25 |
| C | Sutter (SV)      | Annual | 2017 | 320.00             | 371.27 | 436.03 | 553.09 | 73.62                 | 86.04 | 100.51 | 126.55 |
| C | Sutter (SV)      | Annual | 2018 | 320.08             | 371.06 | 435.93 | 553.68 | 73.65                 | 85.42 | 100.55 | 126.82 |
| C | Sutter (SV)      | Annual | 2019 | 319.95             | 370.85 | 435.58 | 553.80 | 73.68                 | 85.29 | 100.60 | 127.06 |
| C | Sutter (SV)      | Annual | 2020 | 320.03             | 370.87 | 435.52 | 554.22 | 73.77                 | 85.28 | 100.67 | 127.27 |
| C | Sutter (SV)      | Annual | 2021 | 320.09             | 371.00 | 435.45 | 554.53 | 73.84                 | 85.39 | 100.74 | 127.43 |
| C | Sutter (SV)      | Annual | 2022 | 320.10             | 371.10 | 435.39 | 554.80 | 73.89                 | 85.49 | 100.80 | 127.58 |
| C | Sutter (SV)      | Annual | 2023 | 320.09             | 371.18 | 435.33 | 555.01 | 73.92                 | 85.56 | 100.84 | 127.75 |
| C | Sutter (SV)      | Annual | 2024 | 320.06             | 371.22 | 435.28 | 555.15 | 73.94                 | 85.63 | 100.88 | 127.90 |
| C | Sutter (SV)      | Annual | 2025 | 320.07             | 371.28 | 435.23 | 555.29 | 73.96                 | 85.70 | 100.91 | 128.05 |
| C | Sutter (SV)      | Annual | 2026 | 320.08             | 371.36 | 435.18 | 555.44 | 73.98                 | 85.76 | 100.93 | 128.18 |
| C | Sutter (SV)      | Annual | 2027 | 320.09             | 371.42 | 435.13 | 555.59 | 73.99                 | 85.82 | 100.95 | 128.31 |
| C | Sutter (SV)      | Annual | 2028 | 320.10             | 371.49 | 435.09 | 555.75 | 74.00                 | 85.87 | 100.96 | 128.42 |
| C | Sutter (SV)      | Annual | 2029 | 320.10             | 371.57 | 435.03 | 555.90 | 74.01                 | 85.91 | 100.96 | 128.53 |
| C | Sutter (SV)      | Annual | 2030 | 320.10             | 371.64 | 434.98 | 556.07 | 74.01                 | 85.96 | 100.96 | 128.63 |
| C | Sutter (SV)      | Annual | 2031 | 320.09             | 371.71 | 434.96 | 556.25 | 74.02                 | 86.00 | 100.97 | 128.73 |
| C | Sutter (SV)      | Annual | 2032 | 320.09             | 371.77 | 434.94 | 556.44 | 74.02                 | 86.04 | 100.97 | 128.83 |
| C | Sutter (SV)      | Annual | 2033 | 320.08             | 371.83 | 434.92 | 556.61 | 74.03                 | 86.08 | 100.97 | 128.92 |
| C | Sutter (SV)      | Annual | 2034 | 320.08             | 371.88 | 434.90 | 556.76 | 74.03                 | 86.11 | 100.98 | 129.00 |
| C | Sutter (SV)      | Annual | 2035 | 320.07             | 371.92 | 434.88 | 556.90 | 74.03                 | 86.14 | 100.98 | 129.08 |
| C | Sutter (SV)      | Summer | 2010 | 354.18             | 409.96 | 483.57 | 606.30 | 73.35                 | 93.29 | 100.32 | 124.62 |
| C | Sutter (SV)      | Summer | 2011 | 354.64             | 410.22 | 483.65 | 607.07 | 73.38                 | 91.65 | 100.31 | 124.85 |
| C | Sutter (SV)      | Summer | 2012 | 355.05             | 410.47 | 483.72 | 608.00 | 73.42                 | 90.37 | 100.33 | 125.11 |
| C | Sutter (SV)      | Summer | 2013 | 355.40             | 410.65 | 483.78 | 609.02 | 73.45                 | 89.10 | 100.35 | 125.39 |
| C | Sutter (SV)      | Summer | 2014 | 355.68             | 410.81 | 483.83 | 610.04 | 73.47                 | 88.28 | 100.38 | 125.67 |
| C | Sutter (SV)      | Summer | 2015 | 355.95             | 410.91 | 483.85 | 611.10 | 73.54                 | 87.32 | 100.43 | 125.96 |
| C | Sutter (SV)      | Summer | 2016 | 356.16             | 411.00 | 483.85 | 612.11 | 73.59                 | 86.63 | 100.48 | 126.25 |
| C | Sutter (SV)      | Summer | 2017 | 356.29             | 411.07 | 483.81 | 613.03 | 73.62                 | 86.04 | 100.51 | 126.55 |
| C | Sutter (SV)      | Summer | 2018 | 356.37             | 411.10 | 483.72 | 613.81 | 73.65                 | 85.42 | 100.55 | 126.82 |
| C | Sutter (SV)      | Summer | 2019 | 356.22             | 410.93 | 483.33 | 614.02 | 73.68                 | 85.29 | 100.60 | 127.06 |
| C | Sutter (SV)      | Summer | 2020 | 356.26             | 410.99 | 483.23 | 614.53 | 73.77                 | 85.28 | 100.67 | 127.27 |
| C | Sutter (SV)      | Summer | 2021 | 356.29             | 411.17 | 483.13 | 614.91 | 73.84                 | 85.39 | 100.74 | 127.43 |
| C | Sutter (SV)      | Summer | 2022 | 356.29             | 411.33 | 483.05 | 615.24 | 73.89                 | 85.49 | 100.80 | 127.58 |
| C | Sutter (SV)      | Summer | 2023 | 356.27             | 411.46 | 482.98 | 615.49 | 73.92                 | 85.56 | 100.84 | 127.75 |
| C | Sutter (SV)      | Summer | 2024 | 356.26             | 411.55 | 482.91 | 615.61 | 73.94                 | 85.63 | 100.88 | 127.90 |
| C | Sutter (SV)      | Summer | 2025 | 356.28             | 411.64 | 482.86 | 615.74 | 73.96                 | 85.70 | 100.91 | 128.05 |
| C | Sutter (SV)      | Summer | 2026 | 356.31             | 411.75 | 482.80 | 615.87 | 73.98                 | 85.76 | 100.93 | 128.18 |
| C | Sutter (SV)      | Summer | 2027 | 356.33             | 411.83 | 482.77 | 616.01 | 73.99                 | 85.82 | 100.95 | 128.31 |
| C | Sutter (SV)      | Summer | 2028 | 356.36             | 411.94 | 482.75 | 616.16 | 74.00                 | 85.87 | 100.96 | 128.42 |
| C | Sutter (SV)      | Summer | 2029 | 356.37             | 412.05 | 482.71 | 616.33 | 74.01                 | 85.91 | 100.96 | 128.53 |
| C | Sutter (SV)      | Summer | 2030 | 356.38             | 412.16 | 482.69 | 616.52 | 74.01                 | 85.96 | 100.96 | 128.63 |
| C | Sutter (SV)      | Summer | 2031 | 356.37             | 412.24 | 482.71 | 616.77 | 74.02                 | 86.00 | 100.97 | 128.73 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Sutter (SV) | Summer | 2032 | 356.36             | 412.32 | 482.72 | 617.01 | 74.02                 | 86.04 | 100.97 | 128.83 |
| C | Sutter (SV) | Summer | 2033 | 356.35             | 412.39 | 482.72 | 617.23 | 74.03                 | 86.08 | 100.97 | 128.92 |
| C | Sutter (SV) | Summer | 2034 | 356.34             | 412.46 | 482.72 | 617.45 | 74.03                 | 86.11 | 100.98 | 129.00 |
| C | Sutter (SV) | Summer | 2035 | 356.34             | 412.51 | 482.71 | 617.63 | 74.03                 | 86.14 | 100.98 | 129.08 |
| C | Sutter (SV) | Winter | 2010 | 308.69             | 362.76 | 424.46 | 530.84 | 73.35                 | 93.29 | 100.32 | 124.62 |
| C | Sutter (SV) | Winter | 2011 | 308.77             | 362.02 | 423.84 | 531.54 | 73.38                 | 91.65 | 100.31 | 124.85 |
| C | Sutter (SV) | Winter | 2012 | 308.88             | 361.49 | 423.37 | 532.28 | 73.42                 | 90.37 | 100.33 | 125.11 |
| C | Sutter (SV) | Winter | 2013 | 309.01             | 360.92 | 423.00 | 533.03 | 73.45                 | 89.10 | 100.35 | 125.39 |
| C | Sutter (SV) | Winter | 2014 | 309.11             | 360.62 | 422.71 | 533.73 | 73.47                 | 88.28 | 100.38 | 125.67 |
| C | Sutter (SV) | Winter | 2015 | 309.25             | 360.21 | 422.48 | 534.44 | 73.54                 | 87.32 | 100.43 | 125.96 |
| C | Sutter (SV) | Winter | 2016 | 309.38             | 359.94 | 422.31 | 535.09 | 73.59                 | 86.63 | 100.48 | 126.25 |
| C | Sutter (SV) | Winter | 2017 | 309.47             | 359.72 | 422.17 | 535.69 | 73.62                 | 86.04 | 100.51 | 126.55 |
| C | Sutter (SV) | Winter | 2018 | 309.55             | 359.44 | 422.06 | 536.23 | 73.65                 | 85.42 | 100.55 | 126.82 |
| C | Sutter (SV) | Winter | 2019 | 309.43             | 359.22 | 421.72 | 536.32 | 73.68                 | 85.29 | 100.60 | 127.06 |
| C | Sutter (SV) | Winter | 2020 | 309.51             | 359.22 | 421.66 | 536.71 | 73.77                 | 85.28 | 100.67 | 127.27 |
| C | Sutter (SV) | Winter | 2021 | 309.58             | 359.34 | 421.61 | 537.00 | 73.84                 | 85.39 | 100.74 | 127.43 |
| C | Sutter (SV) | Winter | 2022 | 309.60             | 359.42 | 421.56 | 537.26 | 73.89                 | 85.49 | 100.80 | 127.58 |
| C | Sutter (SV) | Winter | 2023 | 309.59             | 359.48 | 421.50 | 537.45 | 73.92                 | 85.56 | 100.84 | 127.75 |
| C | Sutter (SV) | Winter | 2024 | 309.55             | 359.52 | 421.45 | 537.60 | 73.94                 | 85.63 | 100.88 | 127.90 |
| C | Sutter (SV) | Winter | 2025 | 309.55             | 359.57 | 421.41 | 537.75 | 73.96                 | 85.70 | 100.91 | 128.05 |
| C | Sutter (SV) | Winter | 2026 | 309.57             | 359.64 | 421.35 | 537.90 | 73.98                 | 85.76 | 100.93 | 128.18 |
| C | Sutter (SV) | Winter | 2027 | 309.57             | 359.69 | 421.30 | 538.05 | 73.99                 | 85.82 | 100.95 | 128.31 |
| C | Sutter (SV) | Winter | 2028 | 309.58             | 359.75 | 421.25 | 538.21 | 74.00                 | 85.87 | 100.96 | 128.42 |
| C | Sutter (SV) | Winter | 2029 | 309.57             | 359.81 | 421.19 | 538.36 | 74.01                 | 85.91 | 100.96 | 128.53 |
| C | Sutter (SV) | Winter | 2030 | 309.56             | 359.88 | 421.13 | 538.52 | 74.01                 | 85.96 | 100.96 | 128.63 |
| C | Sutter (SV) | Winter | 2031 | 309.56             | 359.94 | 421.10 | 538.69 | 74.02                 | 86.00 | 100.97 | 128.73 |
| C | Sutter (SV) | Winter | 2032 | 309.56             | 360.00 | 421.07 | 538.86 | 74.02                 | 86.04 | 100.97 | 128.83 |
| C | Sutter (SV) | Winter | 2033 | 309.56             | 360.05 | 421.04 | 539.01 | 74.03                 | 86.08 | 100.97 | 128.92 |
| C | Sutter (SV) | Winter | 2034 | 309.55             | 360.10 | 421.02 | 539.15 | 74.03                 | 86.11 | 100.98 | 129.00 |
| C | Sutter (SV) | Winter | 2035 | 309.55             | 360.14 | 421.00 | 539.27 | 74.03                 | 86.14 | 100.98 | 129.08 |
| C | Tehama (SV) | Annual | 2010 | 347.71             | 408.08 | 478.44 | 596.20 | 73.92                 | 97.65 | 101.75 | 125.26 |
| C | Tehama (SV) | Annual | 2011 | 347.75             | 407.21 | 477.63 | 596.79 | 73.75                 | 95.12 | 101.53 | 125.31 |
| C | Tehama (SV) | Annual | 2012 | 347.86             | 406.66 | 477.01 | 597.48 | 73.65                 | 93.32 | 101.40 | 125.42 |
| C | Tehama (SV) | Annual | 2013 | 347.97             | 406.10 | 476.53 | 598.29 | 73.54                 | 91.52 | 101.28 | 125.55 |
| C | Tehama (SV) | Annual | 2014 | 348.09             | 405.68 | 476.15 | 599.09 | 73.46                 | 90.11 | 101.17 | 125.71 |
| C | Tehama (SV) | Annual | 2015 | 348.24             | 405.38 | 475.85 | 599.96 | 73.44                 | 88.97 | 101.03 | 125.89 |
| C | Tehama (SV) | Annual | 2016 | 348.39             | 405.05 | 475.61 | 600.78 | 73.43                 | 87.78 | 100.95 | 126.12 |
| C | Tehama (SV) | Annual | 2017 | 348.50             | 404.72 | 475.41 | 601.55 | 73.42                 | 86.61 | 100.84 | 126.35 |
| C | Tehama (SV) | Annual | 2018 | 348.57             | 404.51 | 475.24 | 602.23 | 73.38                 | 85.79 | 100.77 | 126.58 |
| C | Tehama (SV) | Annual | 2019 | 348.67             | 404.46 | 475.11 | 602.83 | 73.42                 | 85.46 | 100.74 | 126.78 |
| C | Tehama (SV) | Annual | 2020 | 348.75             | 404.42 | 475.00 | 603.36 | 73.52                 | 85.32 | 100.77 | 126.99 |
| C | Tehama (SV) | Annual | 2021 | 348.82             | 404.51 | 474.91 | 603.73 | 73.60                 | 85.40 | 100.84 | 127.12 |
| C | Tehama (SV) | Annual | 2022 | 348.84             | 404.58 | 474.81 | 603.99 | 73.65                 | 85.48 | 100.88 | 127.15 |
| C | Tehama (SV) | Annual | 2023 | 348.83             | 404.65 | 474.72 | 604.17 | 73.68                 | 85.54 | 100.91 | 127.32 |
| C | Tehama (SV) | Annual | 2024 | 348.79             | 404.72 | 474.64 | 604.33 | 73.69                 | 85.61 | 100.94 | 127.48 |
| C | Tehama (SV) | Annual | 2025 | 348.78             | 404.78 | 474.58 | 604.54 | 73.71                 | 85.67 | 100.96 | 127.66 |
| C | Tehama (SV) | Annual | 2026 | 348.80             | 404.87 | 474.51 | 604.75 | 73.74                 | 85.74 | 100.98 | 127.82 |
| C | Tehama (SV) | Annual | 2027 | 348.82             | 404.95 | 474.43 | 604.97 | 73.75                 | 85.80 | 100.99 | 127.98 |
| C | Tehama (SV) | Annual | 2028 | 348.82             | 405.02 | 474.36 | 605.19 | 73.76                 | 85.86 | 100.99 | 128.12 |
| C | Tehama (SV) | Annual | 2029 | 348.82             | 405.11 | 474.28 | 605.40 | 73.77                 | 85.91 | 100.98 | 128.26 |
| C | Tehama (SV) | Annual | 2030 | 348.81             | 405.19 | 474.20 | 605.62 | 73.77                 | 85.96 | 100.97 | 128.38 |
| C | Tehama (SV) | Annual | 2031 | 348.81             | 405.27 | 474.16 | 605.87 | 73.78                 | 86.01 | 100.97 | 128.51 |
| C | Tehama (SV) | Annual | 2032 | 348.81             | 405.34 | 474.13 | 606.13 | 73.78                 | 86.06 | 100.97 | 128.63 |
| C | Tehama (SV) | Annual | 2033 | 348.80             | 405.40 | 474.10 | 606.35 | 73.79                 | 86.10 | 100.97 | 128.74 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location    | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |             |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Tehama (SV) | Annual | 2034 | 348.80             | 405.45 | 474.07 | 606.55 | 73.79                 | 86.14 | 100.97 | 128.85 |
| C | Tehama (SV) | Annual | 2035 | 348.79             | 405.50 | 474.05 | 606.73 | 73.80                 | 86.17 | 100.98 | 128.94 |
| C | Tehama (SV) | Summer | 2010 | 383.41             | 444.94 | 524.62 | 654.31 | 73.92                 | 97.65 | 101.75 | 125.26 |
| C | Tehama (SV) | Summer | 2011 | 383.77             | 445.00 | 524.52 | 654.97 | 73.75                 | 95.12 | 101.53 | 125.31 |
| C | Tehama (SV) | Summer | 2012 | 384.14             | 445.10 | 524.43 | 655.86 | 73.65                 | 93.32 | 101.40 | 125.42 |
| C | Tehama (SV) | Summer | 2013 | 384.45             | 445.13 | 524.35 | 656.99 | 73.54                 | 91.52 | 101.28 | 125.55 |
| C | Tehama (SV) | Summer | 2014 | 384.73             | 445.13 | 524.29 | 658.11 | 73.46                 | 90.11 | 101.17 | 125.71 |
| C | Tehama (SV) | Summer | 2015 | 385.00             | 445.18 | 524.25 | 659.39 | 73.44                 | 88.97 | 101.03 | 125.89 |
| C | Tehama (SV) | Summer | 2016 | 385.23             | 445.19 | 524.18 | 660.60 | 73.43                 | 87.78 | 100.95 | 126.12 |
| C | Tehama (SV) | Summer | 2017 | 385.39             | 445.19 | 524.07 | 661.71 | 73.42                 | 86.61 | 100.84 | 126.35 |
| C | Tehama (SV) | Summer | 2018 | 385.47             | 445.18 | 523.93 | 662.69 | 73.38                 | 85.79 | 100.77 | 126.58 |
| C | Tehama (SV) | Summer | 2019 | 385.58             | 445.24 | 523.81 | 663.55 | 73.42                 | 85.46 | 100.74 | 126.78 |
| C | Tehama (SV) | Summer | 2020 | 385.65             | 445.32 | 523.70 | 664.29 | 73.52                 | 85.32 | 100.77 | 126.99 |
| C | Tehama (SV) | Summer | 2021 | 385.70             | 445.43 | 523.58 | 664.83 | 73.60                 | 85.40 | 100.84 | 127.12 |
| C | Tehama (SV) | Summer | 2022 | 385.72             | 445.55 | 523.48 | 665.26 | 73.65                 | 85.48 | 100.88 | 127.15 |
| C | Tehama (SV) | Summer | 2023 | 385.71             | 445.67 | 523.40 | 665.55 | 73.68                 | 85.54 | 100.91 | 127.32 |
| C | Tehama (SV) | Summer | 2024 | 385.66             | 445.84 | 523.33 | 665.79 | 73.69                 | 85.61 | 100.94 | 127.48 |
| C | Tehama (SV) | Summer | 2025 | 385.66             | 445.99 | 523.29 | 666.03 | 73.71                 | 85.67 | 100.96 | 127.66 |
| C | Tehama (SV) | Summer | 2026 | 385.69             | 446.14 | 523.22 | 666.24 | 73.74                 | 85.74 | 100.98 | 127.82 |
| C | Tehama (SV) | Summer | 2027 | 385.72             | 446.27 | 523.16 | 666.46 | 73.75                 | 85.80 | 100.99 | 127.98 |
| C | Tehama (SV) | Summer | 2028 | 385.74             | 446.39 | 523.12 | 666.69 | 73.76                 | 85.86 | 100.99 | 128.12 |
| C | Tehama (SV) | Summer | 2029 | 385.76             | 446.52 | 523.06 | 666.94 | 73.77                 | 85.91 | 100.98 | 128.26 |
| C | Tehama (SV) | Summer | 2030 | 385.77             | 446.65 | 523.02 | 667.20 | 73.77                 | 85.96 | 100.97 | 128.38 |
| C | Tehama (SV) | Summer | 2031 | 385.77             | 446.77 | 523.01 | 667.51 | 73.78                 | 86.01 | 100.97 | 128.51 |
| C | Tehama (SV) | Summer | 2032 | 385.77             | 446.86 | 523.00 | 667.82 | 73.78                 | 86.06 | 100.97 | 128.63 |
| C | Tehama (SV) | Summer | 2033 | 385.77             | 446.94 | 522.99 | 668.11 | 73.79                 | 86.10 | 100.97 | 128.74 |
| C | Tehama (SV) | Summer | 2034 | 385.77             | 447.00 | 522.97 | 668.39 | 73.79                 | 86.14 | 100.97 | 128.85 |
| C | Tehama (SV) | Summer | 2035 | 385.76             | 447.05 | 522.96 | 668.63 | 73.80                 | 86.17 | 100.98 | 128.94 |
| C | Tehama (SV) | Winter | 2010 | 339.88             | 399.98 | 468.30 | 583.44 | 73.92                 | 97.65 | 101.75 | 125.26 |
| C | Tehama (SV) | Winter | 2011 | 339.84             | 398.91 | 467.33 | 584.01 | 73.75                 | 95.12 | 101.53 | 125.31 |
| C | Tehama (SV) | Winter | 2012 | 339.89             | 398.22 | 466.60 | 584.66 | 73.65                 | 93.32 | 101.40 | 125.42 |
| C | Tehama (SV) | Winter | 2013 | 339.96             | 397.53 | 466.03 | 585.41 | 73.54                 | 91.52 | 101.28 | 125.55 |
| C | Tehama (SV) | Winter | 2014 | 340.05             | 397.02 | 465.58 | 586.13 | 73.46                 | 90.11 | 101.17 | 125.71 |
| C | Tehama (SV) | Winter | 2015 | 340.18             | 396.64 | 465.23 | 586.91 | 73.44                 | 88.97 | 101.03 | 125.89 |
| C | Tehama (SV) | Winter | 2016 | 340.30             | 396.23 | 464.95 | 587.65 | 73.43                 | 87.78 | 100.95 | 126.12 |
| C | Tehama (SV) | Winter | 2017 | 340.40             | 395.84 | 464.72 | 588.34 | 73.42                 | 86.61 | 100.84 | 126.35 |
| C | Tehama (SV) | Winter | 2018 | 340.46             | 395.57 | 464.55 | 588.96 | 73.38                 | 85.79 | 100.77 | 126.58 |
| C | Tehama (SV) | Winter | 2019 | 340.57             | 395.50 | 464.42 | 589.50 | 73.42                 | 85.46 | 100.74 | 126.78 |
| C | Tehama (SV) | Winter | 2020 | 340.65             | 395.45 | 464.31 | 589.99 | 73.52                 | 85.32 | 100.77 | 126.99 |
| C | Tehama (SV) | Winter | 2021 | 340.72             | 395.53 | 464.22 | 590.32 | 73.60                 | 85.40 | 100.84 | 127.12 |
| C | Tehama (SV) | Winter | 2022 | 340.75             | 395.59 | 464.13 | 590.54 | 73.65                 | 85.48 | 100.88 | 127.15 |
| C | Tehama (SV) | Winter | 2023 | 340.74             | 395.64 | 464.04 | 590.70 | 73.68                 | 85.54 | 100.91 | 127.32 |
| C | Tehama (SV) | Winter | 2024 | 340.69             | 395.69 | 463.95 | 590.84 | 73.69                 | 85.61 | 100.94 | 127.48 |
| C | Tehama (SV) | Winter | 2025 | 340.69             | 395.73 | 463.89 | 591.04 | 73.71                 | 85.67 | 100.96 | 127.66 |
| C | Tehama (SV) | Winter | 2026 | 340.71             | 395.81 | 463.81 | 591.25 | 73.74                 | 85.74 | 100.98 | 127.82 |
| C | Tehama (SV) | Winter | 2027 | 340.72             | 395.87 | 463.73 | 591.47 | 73.75                 | 85.80 | 100.99 | 127.98 |
| C | Tehama (SV) | Winter | 2028 | 340.72             | 395.94 | 463.66 | 591.68 | 73.76                 | 85.86 | 100.99 | 128.12 |
| C | Tehama (SV) | Winter | 2029 | 340.71             | 396.01 | 463.57 | 591.89 | 73.77                 | 85.91 | 100.98 | 128.26 |
| C | Tehama (SV) | Winter | 2030 | 340.70             | 396.08 | 463.49 | 592.11 | 73.77                 | 85.96 | 100.97 | 128.38 |
| C | Tehama (SV) | Winter | 2031 | 340.69             | 396.15 | 463.44 | 592.34 | 73.78                 | 86.01 | 100.97 | 128.51 |
| C | Tehama (SV) | Winter | 2032 | 340.69             | 396.22 | 463.40 | 592.58 | 73.78                 | 86.06 | 100.97 | 128.63 |
| C | Tehama (SV) | Winter | 2033 | 340.69             | 396.28 | 463.36 | 592.79 | 73.79                 | 86.10 | 100.97 | 128.74 |
| C | Tehama (SV) | Winter | 2034 | 340.68             | 396.33 | 463.33 | 592.98 | 73.79                 | 86.14 | 100.97 | 128.85 |
| C | Tehama (SV) | Winter | 2035 | 340.68             | 396.38 | 463.31 | 593.14 | 73.80                 | 86.17 | 100.98 | 128.94 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Trinity (NC) | Annual | 2010 | 418.09             | 487.84 | 574.09 | 715.19 | 74.90                 | 92.99 | 102.21 | 125.69 |
| C | Trinity (NC) | Annual | 2011 | 417.85             | 486.98 | 572.91 | 715.90 | 74.77                 | 91.52 | 101.90 | 125.69 |
| C | Trinity (NC) | Annual | 2012 | 417.49             | 486.30 | 572.01 | 716.66 | 74.38                 | 90.31 | 101.80 | 125.77 |
| C | Trinity (NC) | Annual | 2013 | 417.29             | 485.72 | 571.27 | 717.54 | 74.11                 | 89.30 | 101.63 | 125.88 |
| C | Trinity (NC) | Annual | 2014 | 417.30             | 485.26 | 570.68 | 718.45 | 74.02                 | 88.48 | 101.43 | 125.98 |
| C | Trinity (NC) | Annual | 2015 | 417.20             | 484.84 | 570.20 | 719.31 | 73.81                 | 87.68 | 101.29 | 126.15 |
| C | Trinity (NC) | Annual | 2016 | 417.21             | 484.59 | 569.80 | 720.22 | 73.74                 | 87.14 | 101.13 | 126.34 |
| C | Trinity (NC) | Annual | 2017 | 417.18             | 484.28 | 569.49 | 721.03 | 73.63                 | 86.51 | 101.07 | 126.56 |
| C | Trinity (NC) | Annual | 2018 | 417.15             | 483.99 | 569.22 | 721.67 | 73.54                 | 85.93 | 100.99 | 126.78 |
| C | Trinity (NC) | Annual | 2019 | 417.05             | 483.85 | 568.99 | 722.23 | 73.40                 | 85.63 | 100.89 | 126.97 |
| C | Trinity (NC) | Annual | 2020 | 417.08             | 483.72 | 568.81 | 722.69 | 73.47                 | 85.48 | 100.93 | 127.16 |
| C | Trinity (NC) | Annual | 2021 | 417.02             | 483.56 | 568.64 | 722.95 | 73.51                 | 85.45 | 100.98 | 127.20 |
| C | Trinity (NC) | Annual | 2022 | 416.96             | 483.49 | 568.47 | 723.19 | 73.53                 | 85.47 | 101.00 | 127.30 |
| C | Trinity (NC) | Annual | 2023 | 416.81             | 483.40 | 568.28 | 723.33 | 73.52                 | 85.47 | 101.00 | 127.46 |
| C | Trinity (NC) | Annual | 2024 | 416.55             | 483.36 | 568.13 | 723.43 | 73.46                 | 85.51 | 101.02 | 127.61 |
| C | Trinity (NC) | Annual | 2025 | 416.37             | 483.39 | 568.02 | 723.46 | 73.44                 | 85.56 | 101.04 | 127.73 |
| C | Trinity (NC) | Annual | 2026 | 416.37             | 483.57 | 567.87 | 723.62 | 73.46                 | 85.66 | 101.04 | 127.88 |
| C | Trinity (NC) | Annual | 2027 | 416.36             | 483.73 | 567.74 | 723.82 | 73.47                 | 85.75 | 101.05 | 128.02 |
| C | Trinity (NC) | Annual | 2028 | 416.34             | 483.90 | 567.63 | 724.04 | 73.47                 | 85.83 | 101.05 | 128.17 |
| C | Trinity (NC) | Annual | 2029 | 416.30             | 484.08 | 567.45 | 724.24 | 73.47                 | 85.91 | 101.03 | 128.29 |
| C | Trinity (NC) | Annual | 2030 | 416.26             | 484.24 | 567.32 | 724.45 | 73.47                 | 85.98 | 101.01 | 128.41 |
| C | Trinity (NC) | Annual | 2031 | 416.26             | 484.41 | 567.24 | 724.73 | 73.48                 | 86.05 | 101.01 | 128.54 |
| C | Trinity (NC) | Annual | 2032 | 416.25             | 484.55 | 567.18 | 725.01 | 73.48                 | 86.12 | 101.01 | 128.66 |
| C | Trinity (NC) | Annual | 2033 | 416.24             | 484.67 | 567.13 | 725.26 | 73.49                 | 86.17 | 101.01 | 128.78 |
| C | Trinity (NC) | Annual | 2034 | 416.24             | 484.78 | 567.09 | 725.48 | 73.49                 | 86.23 | 101.01 | 128.88 |
| C | Trinity (NC) | Annual | 2035 | 416.23             | 484.86 | 567.05 | 725.68 | 73.50                 | 86.27 | 101.01 | 128.97 |
| C | Trinity (NC) | Summer | 2010 | 427.59             | 496.70 | 586.45 | 730.35 | 74.90                 | 92.99 | 102.21 | 125.69 |
| C | Trinity (NC) | Summer | 2011 | 427.49             | 496.26 | 585.45 | 731.14 | 74.77                 | 91.52 | 101.90 | 125.69 |
| C | Trinity (NC) | Summer | 2012 | 427.24             | 495.90 | 584.69 | 732.01 | 74.38                 | 90.31 | 101.80 | 125.77 |
| C | Trinity (NC) | Summer | 2013 | 427.13             | 495.58 | 584.07 | 733.04 | 74.11                 | 89.30 | 101.63 | 125.88 |
| C | Trinity (NC) | Summer | 2014 | 427.18             | 495.32 | 583.59 | 734.09 | 74.02                 | 88.48 | 101.43 | 125.98 |
| C | Trinity (NC) | Summer | 2015 | 427.12             | 495.08 | 583.19 | 735.09 | 73.81                 | 87.68 | 101.29 | 126.15 |
| C | Trinity (NC) | Summer | 2016 | 427.16             | 494.97 | 582.86 | 736.16 | 73.74                 | 87.14 | 101.13 | 126.34 |
| C | Trinity (NC) | Summer | 2017 | 427.13             | 494.79 | 582.58 | 737.09 | 73.63                 | 86.51 | 101.07 | 126.56 |
| C | Trinity (NC) | Summer | 2018 | 427.09             | 494.61 | 582.34 | 737.83 | 73.54                 | 85.93 | 100.99 | 126.78 |
| C | Trinity (NC) | Summer | 2019 | 426.99             | 494.56 | 582.13 | 738.48 | 73.40                 | 85.63 | 100.89 | 126.97 |
| C | Trinity (NC) | Summer | 2020 | 427.02             | 494.51 | 581.96 | 739.02 | 73.47                 | 85.48 | 100.93 | 127.16 |
| C | Trinity (NC) | Summer | 2021 | 426.96             | 494.42 | 581.80 | 739.36 | 73.51                 | 85.45 | 100.98 | 127.20 |
| C | Trinity (NC) | Summer | 2022 | 426.90             | 494.41 | 581.63 | 739.65 | 73.53                 | 85.47 | 101.00 | 127.30 |
| C | Trinity (NC) | Summer | 2023 | 426.75             | 494.37 | 581.45 | 739.84 | 73.52                 | 85.47 | 101.00 | 127.46 |
| C | Trinity (NC) | Summer | 2024 | 426.50             | 494.37 | 581.32 | 739.98 | 73.46                 | 85.51 | 101.02 | 127.61 |
| C | Trinity (NC) | Summer | 2025 | 426.32             | 494.44 | 581.21 | 740.06 | 73.44                 | 85.56 | 101.04 | 127.73 |
| C | Trinity (NC) | Summer | 2026 | 426.33             | 494.65 | 581.06 | 740.22 | 73.46                 | 85.66 | 101.04 | 127.88 |
| C | Trinity (NC) | Summer | 2027 | 426.33             | 494.84 | 580.95 | 740.44 | 73.47                 | 85.75 | 101.05 | 128.02 |
| C | Trinity (NC) | Summer | 2028 | 426.32             | 495.05 | 580.84 | 740.67 | 73.47                 | 85.83 | 101.05 | 128.17 |
| C | Trinity (NC) | Summer | 2029 | 426.29             | 495.26 | 580.68 | 740.90 | 73.47                 | 85.91 | 101.03 | 128.29 |
| C | Trinity (NC) | Summer | 2030 | 426.26             | 495.45 | 580.55 | 741.12 | 73.47                 | 85.98 | 101.01 | 128.41 |
| C | Trinity (NC) | Summer | 2031 | 426.26             | 495.65 | 580.49 | 741.43 | 73.48                 | 86.05 | 101.01 | 128.54 |
| C | Trinity (NC) | Summer | 2032 | 426.25             | 495.81 | 580.43 | 741.74 | 73.48                 | 86.12 | 101.01 | 128.66 |
| C | Trinity (NC) | Summer | 2033 | 426.25             | 495.94 | 580.39 | 742.01 | 73.49                 | 86.17 | 101.01 | 128.78 |
| C | Trinity (NC) | Summer | 2034 | 426.24             | 496.05 | 580.35 | 742.25 | 73.49                 | 86.23 | 101.01 | 128.88 |
| C | Trinity (NC) | Summer | 2035 | 426.23             | 496.13 | 580.31 | 742.47 | 73.50                 | 86.27 | 101.01 | 128.97 |
| C | Trinity (NC) | Winter | 2010 | 410.15             | 480.44 | 563.75 | 702.52 | 74.90                 | 92.99 | 102.21 | 125.69 |
| C | Trinity (NC) | Winter | 2011 | 409.80             | 479.23 | 562.42 | 703.15 | 74.77                 | 91.52 | 101.90 | 125.69 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location     | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|--------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |              |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Trinity (NC) | Winter | 2012 | 409.34             | 478.27 | 561.40 | 703.82 | 74.38                 | 90.31 | 101.80 | 125.77 |
| C | Trinity (NC) | Winter | 2013 | 409.07             | 477.47 | 560.57 | 704.58 | 74.11                 | 89.30 | 101.63 | 125.88 |
| C | Trinity (NC) | Winter | 2014 | 409.04             | 476.85 | 559.89 | 705.37 | 74.02                 | 88.48 | 101.43 | 125.98 |
| C | Trinity (NC) | Winter | 2015 | 408.90             | 476.28 | 559.34 | 706.11 | 73.81                 | 87.68 | 101.29 | 126.15 |
| C | Trinity (NC) | Winter | 2016 | 408.90             | 475.91 | 558.88 | 706.90 | 73.74                 | 87.14 | 101.13 | 126.34 |
| C | Trinity (NC) | Winter | 2017 | 408.86             | 475.49 | 558.54 | 707.60 | 73.63                 | 86.51 | 101.07 | 126.56 |
| C | Trinity (NC) | Winter | 2018 | 408.83             | 475.10 | 558.24 | 708.16 | 73.54                 | 85.93 | 100.99 | 126.78 |
| C | Trinity (NC) | Winter | 2019 | 408.73             | 474.90 | 557.99 | 708.64 | 73.40                 | 85.63 | 100.89 | 126.97 |
| C | Trinity (NC) | Winter | 2020 | 408.76             | 474.70 | 557.81 | 709.04 | 73.47                 | 85.48 | 100.93 | 127.16 |
| C | Trinity (NC) | Winter | 2021 | 408.71             | 474.47 | 557.65 | 709.23 | 73.51                 | 85.45 | 100.98 | 127.20 |
| C | Trinity (NC) | Winter | 2022 | 408.65             | 474.36 | 557.46 | 709.42 | 73.53                 | 85.47 | 101.00 | 127.30 |
| C | Trinity (NC) | Winter | 2023 | 408.50             | 474.23 | 557.26 | 709.52 | 73.52                 | 85.47 | 101.00 | 127.46 |
| C | Trinity (NC) | Winter | 2024 | 408.24             | 474.14 | 557.10 | 709.59 | 73.46                 | 85.51 | 101.02 | 127.61 |
| C | Trinity (NC) | Winter | 2025 | 408.05             | 474.15 | 556.99 | 709.59 | 73.44                 | 85.56 | 101.04 | 127.73 |
| C | Trinity (NC) | Winter | 2026 | 408.04             | 474.30 | 556.83 | 709.73 | 73.46                 | 85.66 | 101.04 | 127.88 |
| C | Trinity (NC) | Winter | 2027 | 408.03             | 474.43 | 556.70 | 709.93 | 73.47                 | 85.75 | 101.05 | 128.02 |
| C | Trinity (NC) | Winter | 2028 | 407.99             | 474.58 | 556.58 | 710.14 | 73.47                 | 85.83 | 101.05 | 128.17 |
| C | Trinity (NC) | Winter | 2029 | 407.95             | 474.73 | 556.39 | 710.32 | 73.47                 | 85.91 | 101.03 | 128.29 |
| C | Trinity (NC) | Winter | 2030 | 407.90             | 474.86 | 556.25 | 710.50 | 73.47                 | 85.98 | 101.01 | 128.41 |
| C | Trinity (NC) | Winter | 2031 | 407.89             | 475.01 | 556.16 | 710.77 | 73.48                 | 86.05 | 101.01 | 128.54 |
| C | Trinity (NC) | Winter | 2032 | 407.89             | 475.14 | 556.09 | 711.03 | 73.48                 | 86.12 | 101.01 | 128.66 |
| C | Trinity (NC) | Winter | 2033 | 407.88             | 475.25 | 556.04 | 711.25 | 73.49                 | 86.17 | 101.01 | 128.78 |
| C | Trinity (NC) | Winter | 2034 | 407.87             | 475.35 | 555.99 | 711.45 | 73.49                 | 86.23 | 101.01 | 128.88 |
| C | Trinity (NC) | Winter | 2035 | 407.86             | 475.43 | 555.96 | 711.63 | 73.50                 | 86.27 | 101.01 | 128.97 |
| C | Tulare (SJV) | Annual | 2010 | 336.36             | 385.47 | 460.79 | 577.56 | 73.50                 | 85.81 | 100.77 | 124.48 |
| C | Tulare (SJV) | Annual | 2011 | 336.57             | 386.30 | 460.48 | 578.46 | 73.48                 | 85.49 | 100.70 | 124.76 |
| C | Tulare (SJV) | Annual | 2012 | 336.33             | 386.39 | 459.69 | 578.44 | 73.48                 | 85.24 | 100.68 | 125.00 |
| C | Tulare (SJV) | Annual | 2013 | 335.07             | 385.21 | 457.53 | 576.70 | 73.50                 | 85.03 | 100.65 | 125.26 |
| C | Tulare (SJV) | Annual | 2014 | 335.24             | 385.64 | 457.39 | 577.46 | 73.52                 | 84.88 | 100.59 | 125.53 |
| C | Tulare (SJV) | Annual | 2015 | 332.48             | 382.78 | 453.30 | 573.37 | 73.54                 | 84.80 | 100.57 | 125.86 |
| C | Tulare (SJV) | Annual | 2016 | 332.66             | 383.22 | 453.22 | 574.24 | 73.60                 | 84.76 | 100.58 | 126.18 |
| C | Tulare (SJV) | Annual | 2017 | 332.78             | 383.58 | 453.15 | 575.03 | 73.62                 | 84.70 | 100.55 | 126.50 |
| C | Tulare (SJV) | Annual | 2018 | 330.99             | 381.76 | 450.54 | 572.51 | 73.64                 | 84.68 | 100.55 | 126.81 |
| C | Tulare (SJV) | Annual | 2019 | 331.07             | 382.11 | 450.49 | 573.12 | 73.68                 | 84.78 | 100.57 | 127.09 |
| C | Tulare (SJV) | Annual | 2020 | 331.14             | 382.41 | 450.44 | 573.65 | 73.77                 | 84.92 | 100.64 | 127.34 |
| C | Tulare (SJV) | Annual | 2021 | 332.08             | 383.64 | 451.61 | 575.50 | 73.83                 | 85.06 | 100.71 | 127.52 |
| C | Tulare (SJV) | Annual | 2022 | 332.08             | 383.82 | 451.55 | 575.74 | 73.88                 | 85.19 | 100.77 | 127.66 |
| C | Tulare (SJV) | Annual | 2023 | 332.06             | 383.97 | 451.49 | 575.93 | 73.91                 | 85.30 | 100.82 | 127.83 |
| C | Tulare (SJV) | Annual | 2024 | 331.57             | 383.61 | 450.80 | 575.35 | 73.92                 | 85.42 | 100.86 | 128.00 |
| C | Tulare (SJV) | Annual | 2025 | 331.58             | 383.79 | 450.78 | 575.58 | 73.94                 | 85.52 | 100.89 | 128.17 |
| C | Tulare (SJV) | Annual | 2026 | 328.97             | 380.93 | 447.18 | 571.21 | 73.96                 | 85.62 | 100.91 | 128.32 |
| C | Tulare (SJV) | Annual | 2027 | 328.98             | 381.09 | 447.14 | 571.39 | 73.98                 | 85.71 | 100.93 | 128.45 |
| C | Tulare (SJV) | Annual | 2028 | 328.99             | 381.26 | 447.12 | 571.56 | 73.99                 | 85.79 | 100.95 | 128.57 |
| C | Tulare (SJV) | Annual | 2029 | 328.99             | 381.42 | 447.08 | 571.73 | 73.99                 | 85.87 | 100.95 | 128.68 |
| C | Tulare (SJV) | Annual | 2030 | 328.99             | 381.57 | 447.05 | 571.90 | 73.99                 | 85.94 | 100.96 | 128.78 |
| C | Tulare (SJV) | Annual | 2031 | 328.99             | 381.72 | 447.04 | 572.06 | 74.00                 | 86.01 | 100.97 | 128.88 |
| C | Tulare (SJV) | Annual | 2032 | 328.98             | 381.84 | 447.02 | 572.22 | 74.00                 | 86.07 | 100.97 | 128.97 |
| C | Tulare (SJV) | Annual | 2033 | 328.98             | 381.96 | 447.00 | 572.37 | 74.01                 | 86.12 | 100.98 | 129.05 |
| C | Tulare (SJV) | Annual | 2034 | 328.98             | 382.05 | 446.99 | 572.50 | 74.01                 | 86.17 | 100.98 | 129.12 |
| C | Tulare (SJV) | Annual | 2035 | 328.97             | 382.13 | 446.97 | 572.62 | 74.01                 | 86.21 | 100.99 | 129.19 |
| C | Tulare (SJV) | Summer | 2010 | 370.07             | 419.00 | 504.64 | 633.62 | 73.50                 | 85.81 | 100.77 | 124.48 |
| C | Tulare (SJV) | Summer | 2011 | 370.60             | 420.85 | 504.80 | 634.63 | 73.48                 | 85.49 | 100.70 | 124.76 |
| C | Tulare (SJV) | Summer | 2012 | 370.51             | 421.55 | 504.22 | 634.57 | 73.48                 | 85.24 | 100.68 | 125.00 |
| C | Tulare (SJV) | Summer | 2013 | 369.24             | 420.74 | 502.10 | 632.71 | 73.50                 | 85.03 | 100.65 | 125.26 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Tulare (SJV)  | Summer | 2014 | 369.50              | 421.59 | 502.20 | 633.64 | 73.52                 | 84.88 | 100.59 | 125.53 |
| C | Tulare (SJV)  | Summer | 2015 | 366.59              | 418.86 | 497.98 | 629.41 | 73.54                 | 84.80 | 100.57 | 125.86 |
| C | Tulare (SJV)  | Summer | 2016 | 366.85              | 419.64 | 498.09 | 630.59 | 73.60                 | 84.76 | 100.58 | 126.18 |
| C | Tulare (SJV)  | Summer | 2017 | 367.01              | 420.29 | 498.14 | 631.63 | 73.62                 | 84.70 | 100.55 | 126.50 |
| C | Tulare (SJV)  | Summer | 2018 | 365.07              | 418.53 | 495.39 | 629.07 | 73.64                 | 84.68 | 100.55 | 126.81 |
| C | Tulare (SJV)  | Summer | 2019 | 365.18              | 419.08 | 495.40 | 629.88 | 73.68                 | 84.78 | 100.57 | 127.09 |
| C | Tulare (SJV)  | Summer | 2020 | 365.26              | 419.55 | 495.38 | 630.57 | 73.77                 | 84.92 | 100.64 | 127.34 |
| C | Tulare (SJV)  | Summer | 2021 | 366.23              | 420.93 | 496.59 | 632.55 | 73.83                 | 85.06 | 100.71 | 127.52 |
| C | Tulare (SJV)  | Summer | 2022 | 366.18              | 421.15 | 496.47 | 632.78 | 73.88                 | 85.19 | 100.77 | 127.66 |
| C | Tulare (SJV)  | Summer | 2023 | 366.13              | 421.35 | 496.36 | 632.94 | 73.91                 | 85.30 | 100.82 | 127.83 |
| C | Tulare (SJV)  | Summer | 2024 | 365.61              | 421.09 | 495.65 | 632.36 | 73.92                 | 85.42 | 100.86 | 128.00 |
| C | Tulare (SJV)  | Summer | 2025 | 365.65              | 421.39 | 495.65 | 632.65 | 73.94                 | 85.52 | 100.89 | 128.17 |
| C | Tulare (SJV)  | Summer | 2026 | 362.79              | 418.33 | 491.72 | 627.85 | 73.96                 | 85.62 | 100.91 | 128.32 |
| C | Tulare (SJV)  | Summer | 2027 | 362.81              | 418.59 | 491.69 | 628.03 | 73.98                 | 85.71 | 100.93 | 128.45 |
| C | Tulare (SJV)  | Summer | 2028 | 362.84              | 418.83 | 491.68 | 628.22 | 73.99                 | 85.79 | 100.95 | 128.57 |
| C | Tulare (SJV)  | Summer | 2029 | 362.86              | 419.09 | 491.67 | 628.41 | 73.99                 | 85.87 | 100.95 | 128.68 |
| C | Tulare (SJV)  | Summer | 2030 | 362.87              | 419.31 | 491.65 | 628.60 | 73.99                 | 85.94 | 100.96 | 128.78 |
| C | Tulare (SJV)  | Summer | 2031 | 362.87              | 419.53 | 491.64 | 628.76 | 74.00                 | 86.01 | 100.97 | 128.88 |
| C | Tulare (SJV)  | Summer | 2032 | 362.86              | 419.70 | 491.62 | 628.93 | 74.00                 | 86.07 | 100.97 | 128.97 |
| C | Tulare (SJV)  | Summer | 2033 | 362.85              | 419.85 | 491.61 | 629.09 | 74.01                 | 86.12 | 100.98 | 129.05 |
| C | Tulare (SJV)  | Summer | 2034 | 362.85              | 419.98 | 491.60 | 629.26 | 74.01                 | 86.17 | 100.98 | 129.12 |
| C | Tulare (SJV)  | Summer | 2035 | 362.84              | 420.07 | 491.58 | 629.40 | 74.01                 | 86.21 | 100.99 | 129.19 |
| C | Tulare (SJV)  | Winter | 2010 | 322.59              | 371.77 | 442.88 | 554.67 | 73.50                 | 85.81 | 100.77 | 124.48 |
| C | Tulare (SJV)  | Winter | 2011 | 322.67              | 372.19 | 442.39 | 555.52 | 73.48                 | 85.49 | 100.70 | 124.76 |
| C | Tulare (SJV)  | Winter | 2012 | 322.38              | 372.04 | 441.51 | 555.52 | 73.48                 | 85.24 | 100.68 | 125.00 |
| C | Tulare (SJV)  | Winter | 2013 | 321.12              | 370.70 | 439.32 | 553.83 | 73.50                 | 85.03 | 100.65 | 125.26 |
| C | Tulare (SJV)  | Winter | 2014 | 321.25              | 370.96 | 439.09 | 554.52 | 73.52                 | 84.88 | 100.59 | 125.53 |
| C | Tulare (SJV)  | Winter | 2015 | 318.55              | 368.04 | 435.04 | 550.47 | 73.54                 | 84.80 | 100.57 | 125.86 |
| C | Tulare (SJV)  | Winter | 2016 | 318.70              | 368.34 | 434.89 | 551.22 | 73.60                 | 84.76 | 100.58 | 126.18 |
| C | Tulare (SJV)  | Winter | 2017 | 318.79              | 368.59 | 434.76 | 551.90 | 73.62                 | 84.70 | 100.55 | 126.50 |
| C | Tulare (SJV)  | Winter | 2018 | 317.06              | 366.73 | 432.20 | 549.39 | 73.64                 | 84.68 | 100.55 | 126.81 |
| C | Tulare (SJV)  | Winter | 2019 | 317.13              | 366.99 | 432.13 | 549.92 | 73.68                 | 84.78 | 100.57 | 127.09 |
| C | Tulare (SJV)  | Winter | 2020 | 317.20              | 367.23 | 432.08 | 550.39 | 73.77                 | 84.92 | 100.64 | 127.34 |
| C | Tulare (SJV)  | Winter | 2021 | 318.13              | 368.41 | 433.22 | 552.19 | 73.83                 | 85.06 | 100.71 | 127.52 |
| C | Tulare (SJV)  | Winter | 2022 | 318.15              | 368.57 | 433.19 | 552.43 | 73.88                 | 85.19 | 100.77 | 127.66 |
| C | Tulare (SJV)  | Winter | 2023 | 318.14              | 368.69 | 433.15 | 552.63 | 73.91                 | 85.30 | 100.82 | 127.83 |
| C | Tulare (SJV)  | Winter | 2024 | 317.65              | 368.30 | 432.48 | 552.05 | 73.92                 | 85.42 | 100.86 | 128.00 |
| C | Tulare (SJV)  | Winter | 2025 | 317.66              | 368.42 | 432.44 | 552.26 | 73.94                 | 85.52 | 100.89 | 128.17 |
| C | Tulare (SJV)  | Winter | 2026 | 315.14              | 365.64 | 428.97 | 548.06 | 73.96                 | 85.62 | 100.91 | 128.32 |
| C | Tulare (SJV)  | Winter | 2027 | 315.15              | 365.77 | 428.93 | 548.23 | 73.98                 | 85.71 | 100.93 | 128.45 |
| C | Tulare (SJV)  | Winter | 2028 | 315.15              | 365.90 | 428.90 | 548.40 | 73.99                 | 85.79 | 100.95 | 128.57 |
| C | Tulare (SJV)  | Winter | 2029 | 315.14              | 366.02 | 428.86 | 548.56 | 73.99                 | 85.87 | 100.95 | 128.68 |
| C | Tulare (SJV)  | Winter | 2030 | 315.14              | 366.14 | 428.82 | 548.72 | 73.99                 | 85.94 | 100.96 | 128.78 |
| C | Tulare (SJV)  | Winter | 2031 | 315.14              | 366.26 | 428.80 | 548.88 | 74.00                 | 86.01 | 100.97 | 128.88 |
| C | Tulare (SJV)  | Winter | 2032 | 315.14              | 366.37 | 428.79 | 549.04 | 74.00                 | 86.07 | 100.97 | 128.97 |
| C | Tulare (SJV)  | Winter | 2033 | 315.13              | 366.46 | 428.77 | 549.17 | 74.01                 | 86.12 | 100.98 | 129.05 |
| C | Tulare (SJV)  | Winter | 2034 | 315.13              | 366.55 | 428.75 | 549.30 | 74.01                 | 86.17 | 100.98 | 129.12 |
| C | Tulare (SJV)  | Winter | 2035 | 315.13              | 366.62 | 428.73 | 549.40 | 74.01                 | 86.21 | 100.99 | 129.19 |
| C | Tuolumne (MC) | Annual | 2010 | 351.80              | 409.05 | 482.29 | 602.53 | 74.53                 | 90.23 | 101.65 | 124.41 |
| C | Tuolumne (MC) | Annual | 2011 | 351.82              | 408.95 | 481.75 | 603.20 | 74.32                 | 89.28 | 101.47 | 124.55 |
| C | Tuolumne (MC) | Annual | 2012 | 351.88              | 408.91 | 481.33 | 604.01 | 74.15                 | 88.59 | 101.37 | 124.74 |
| C | Tuolumne (MC) | Annual | 2013 | 351.99              | 408.83 | 480.99 | 604.89 | 74.02                 | 87.89 | 101.25 | 124.97 |
| C | Tuolumne (MC) | Annual | 2014 | 352.09              | 408.75 | 480.72 | 605.77 | 73.90                 | 87.27 | 101.07 | 125.20 |
| C | Tuolumne (MC) | Annual | 2015 | 352.23              | 408.71 | 480.51 | 606.66 | 73.86                 | 86.74 | 100.95 | 125.47 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Tuolumne (MC) | Annual | 2016 | 352.33             | 408.71 | 480.34 | 607.53 | 73.81                 | 86.35 | 100.89 | 125.75 |
| C | Tuolumne (MC) | Annual | 2017 | 352.40             | 408.66 | 480.19 | 608.32 | 73.73                 | 85.87 | 100.79 | 126.04 |
| C | Tuolumne (MC) | Annual | 2018 | 352.44             | 408.65 | 480.07 | 609.00 | 73.66                 | 85.55 | 100.74 | 126.32 |
| C | Tuolumne (MC) | Annual | 2019 | 352.50             | 408.66 | 479.98 | 609.60 | 73.64                 | 85.35 | 100.71 | 126.58 |
| C | Tuolumne (MC) | Annual | 2020 | 352.53             | 408.71 | 479.91 | 610.12 | 73.71                 | 85.33 | 100.75 | 126.82 |
| C | Tuolumne (MC) | Annual | 2021 | 352.52             | 408.72 | 479.81 | 610.51 | 73.75                 | 85.36 | 100.79 | 127.02 |
| C | Tuolumne (MC) | Annual | 2022 | 352.49             | 408.72 | 479.74 | 610.83 | 73.77                 | 85.39 | 100.83 | 127.18 |
| C | Tuolumne (MC) | Annual | 2023 | 352.42             | 408.71 | 479.67 | 611.05 | 73.77                 | 85.42 | 100.87 | 127.37 |
| C | Tuolumne (MC) | Annual | 2024 | 352.35             | 408.71 | 479.60 | 611.23 | 73.76                 | 85.46 | 100.89 | 127.55 |
| C | Tuolumne (MC) | Annual | 2025 | 352.30             | 408.78 | 479.56 | 611.41 | 73.76                 | 85.53 | 100.93 | 127.72 |
| C | Tuolumne (MC) | Annual | 2026 | 352.31             | 408.91 | 479.51 | 611.58 | 73.78                 | 85.63 | 100.95 | 127.88 |
| C | Tuolumne (MC) | Annual | 2027 | 352.31             | 409.03 | 479.46 | 611.78 | 73.79                 | 85.72 | 100.97 | 128.03 |
| C | Tuolumne (MC) | Annual | 2028 | 352.31             | 409.16 | 479.41 | 611.96 | 73.80                 | 85.80 | 100.98 | 128.17 |
| C | Tuolumne (MC) | Annual | 2029 | 352.30             | 409.28 | 479.35 | 612.15 | 73.80                 | 85.87 | 100.98 | 128.30 |
| C | Tuolumne (MC) | Annual | 2030 | 352.29             | 409.39 | 479.30 | 612.34 | 73.81                 | 85.94 | 100.98 | 128.42 |
| C | Tuolumne (MC) | Annual | 2031 | 352.28             | 409.51 | 479.27 | 612.58 | 73.81                 | 86.01 | 100.98 | 128.55 |
| C | Tuolumne (MC) | Annual | 2032 | 352.28             | 409.62 | 479.24 | 612.83 | 73.82                 | 86.08 | 100.98 | 128.67 |
| C | Tuolumne (MC) | Annual | 2033 | 352.28             | 409.71 | 479.22 | 613.04 | 73.82                 | 86.13 | 100.99 | 128.78 |
| C | Tuolumne (MC) | Annual | 2034 | 352.28             | 409.79 | 479.20 | 613.24 | 73.83                 | 86.19 | 100.99 | 128.88 |
| C | Tuolumne (MC) | Annual | 2035 | 352.27             | 409.86 | 479.19 | 613.41 | 73.83                 | 86.23 | 101.00 | 128.97 |
| C | Tuolumne (MC) | Summer | 2010 | 379.58             | 436.17 | 518.68 | 647.34 | 74.53                 | 90.23 | 101.65 | 124.41 |
| C | Tuolumne (MC) | Summer | 2011 | 379.89             | 437.05 | 518.44 | 648.13 | 74.32                 | 89.28 | 101.47 | 124.55 |
| C | Tuolumne (MC) | Summer | 2012 | 380.18             | 437.74 | 518.26 | 649.15 | 74.15                 | 88.59 | 101.37 | 124.74 |
| C | Tuolumne (MC) | Summer | 2013 | 380.45             | 438.26 | 518.15 | 650.32 | 74.02                 | 87.89 | 101.25 | 124.97 |
| C | Tuolumne (MC) | Summer | 2014 | 380.68             | 438.66 | 518.10 | 651.50 | 73.90                 | 87.27 | 101.07 | 125.20 |
| C | Tuolumne (MC) | Summer | 2015 | 380.90             | 439.01 | 518.08 | 652.73 | 73.86                 | 86.74 | 100.95 | 125.47 |
| C | Tuolumne (MC) | Summer | 2016 | 381.07             | 439.30 | 518.06 | 653.92 | 73.81                 | 86.35 | 100.89 | 125.75 |
| C | Tuolumne (MC) | Summer | 2017 | 381.16             | 439.53 | 518.01 | 654.99 | 73.73                 | 85.87 | 100.79 | 126.04 |
| C | Tuolumne (MC) | Summer | 2018 | 381.20             | 439.71 | 517.96 | 655.91 | 73.66                 | 85.55 | 100.74 | 126.32 |
| C | Tuolumne (MC) | Summer | 2019 | 381.25             | 439.89 | 517.91 | 656.72 | 73.64                 | 85.35 | 100.71 | 126.58 |
| C | Tuolumne (MC) | Summer | 2020 | 381.27             | 440.08 | 517.84 | 657.42 | 73.71                 | 85.33 | 100.75 | 126.82 |
| C | Tuolumne (MC) | Summer | 2021 | 381.25             | 440.21 | 517.77 | 657.94 | 73.75                 | 85.36 | 100.79 | 127.02 |
| C | Tuolumne (MC) | Summer | 2022 | 381.21             | 440.34 | 517.69 | 658.37 | 73.77                 | 85.39 | 100.83 | 127.18 |
| C | Tuolumne (MC) | Summer | 2023 | 381.14             | 440.44 | 517.62 | 658.69 | 73.77                 | 85.42 | 100.87 | 127.37 |
| C | Tuolumne (MC) | Summer | 2024 | 381.08             | 440.54 | 517.57 | 658.94 | 73.76                 | 85.46 | 100.89 | 127.55 |
| C | Tuolumne (MC) | Summer | 2025 | 381.03             | 440.66 | 517.52 | 659.17 | 73.76                 | 85.53 | 100.93 | 127.72 |
| C | Tuolumne (MC) | Summer | 2026 | 381.05             | 440.87 | 517.48 | 659.35 | 73.78                 | 85.63 | 100.95 | 127.88 |
| C | Tuolumne (MC) | Summer | 2027 | 381.07             | 441.05 | 517.44 | 659.54 | 73.79                 | 85.72 | 100.97 | 128.03 |
| C | Tuolumne (MC) | Summer | 2028 | 381.08             | 441.24 | 517.40 | 659.75 | 73.80                 | 85.80 | 100.98 | 128.17 |
| C | Tuolumne (MC) | Summer | 2029 | 381.09             | 441.43 | 517.36 | 659.96 | 73.80                 | 85.87 | 100.98 | 128.30 |
| C | Tuolumne (MC) | Summer | 2030 | 381.09             | 441.61 | 517.32 | 660.19 | 73.81                 | 85.94 | 100.98 | 128.42 |
| C | Tuolumne (MC) | Summer | 2031 | 381.10             | 441.78 | 517.30 | 660.50 | 73.81                 | 86.01 | 100.98 | 128.55 |
| C | Tuolumne (MC) | Summer | 2032 | 381.10             | 441.93 | 517.28 | 660.80 | 73.82                 | 86.08 | 100.98 | 128.67 |
| C | Tuolumne (MC) | Summer | 2033 | 381.09             | 442.04 | 517.26 | 661.07 | 73.82                 | 86.13 | 100.99 | 128.78 |
| C | Tuolumne (MC) | Summer | 2034 | 381.09             | 442.15 | 517.24 | 661.33 | 73.83                 | 86.19 | 100.99 | 128.88 |
| C | Tuolumne (MC) | Summer | 2035 | 381.08             | 442.22 | 517.22 | 661.55 | 73.83                 | 86.23 | 101.00 | 128.97 |
| C | Tuolumne (MC) | Winter | 2010 | 345.75             | 403.14 | 474.37 | 592.78 | 74.53                 | 90.23 | 101.65 | 124.41 |
| C | Tuolumne (MC) | Winter | 2011 | 345.71             | 402.84 | 473.77 | 593.43 | 74.32                 | 89.28 | 101.47 | 124.55 |
| C | Tuolumne (MC) | Winter | 2012 | 345.72             | 402.64 | 473.30 | 594.19 | 74.15                 | 88.59 | 101.37 | 124.74 |
| C | Tuolumne (MC) | Winter | 2013 | 345.79             | 402.42 | 472.91 | 595.00 | 74.02                 | 87.89 | 101.25 | 124.97 |
| C | Tuolumne (MC) | Winter | 2014 | 345.87             | 402.24 | 472.59 | 595.82 | 73.90                 | 87.27 | 101.07 | 125.20 |
| C | Tuolumne (MC) | Winter | 2015 | 345.99             | 402.12 | 472.33 | 596.64 | 73.86                 | 86.74 | 100.95 | 125.47 |
| C | Tuolumne (MC) | Winter | 2016 | 346.08             | 402.05 | 472.13 | 597.43 | 73.81                 | 86.35 | 100.89 | 125.75 |
| C | Tuolumne (MC) | Winter | 2017 | 346.14             | 401.95 | 471.96 | 598.16 | 73.73                 | 85.87 | 100.79 | 126.04 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Tuolumne (MC) | Winter | 2018 | 346.19             | 401.89 | 471.83 | 598.79 | 73.66                 | 85.55 | 100.74 | 126.32 |
| C | Tuolumne (MC) | Winter | 2019 | 346.24             | 401.87 | 471.73 | 599.34 | 73.64                 | 85.35 | 100.71 | 126.58 |
| C | Tuolumne (MC) | Winter | 2020 | 346.28             | 401.88 | 471.65 | 599.83 | 73.71                 | 85.33 | 100.75 | 126.82 |
| C | Tuolumne (MC) | Winter | 2021 | 346.27             | 401.86 | 471.55 | 600.19 | 73.75                 | 85.36 | 100.79 | 127.02 |
| C | Tuolumne (MC) | Winter | 2022 | 346.24             | 401.84 | 471.48 | 600.48 | 73.77                 | 85.39 | 100.83 | 127.18 |
| C | Tuolumne (MC) | Winter | 2023 | 346.16             | 401.81 | 471.41 | 600.69 | 73.77                 | 85.42 | 100.87 | 127.37 |
| C | Tuolumne (MC) | Winter | 2024 | 346.10             | 401.78 | 471.34 | 600.85 | 73.76                 | 85.46 | 100.89 | 127.55 |
| C | Tuolumne (MC) | Winter | 2025 | 346.04             | 401.84 | 471.30 | 601.01 | 73.76                 | 85.53 | 100.93 | 127.72 |
| C | Tuolumne (MC) | Winter | 2026 | 346.05             | 401.96 | 471.25 | 601.19 | 73.78                 | 85.63 | 100.95 | 127.88 |
| C | Tuolumne (MC) | Winter | 2027 | 346.05             | 402.06 | 471.20 | 601.38 | 73.79                 | 85.72 | 100.97 | 128.03 |
| C | Tuolumne (MC) | Winter | 2028 | 346.04             | 402.17 | 471.14 | 601.56 | 73.80                 | 85.80 | 100.98 | 128.17 |
| C | Tuolumne (MC) | Winter | 2029 | 346.03             | 402.28 | 471.08 | 601.74 | 73.80                 | 85.87 | 100.98 | 128.30 |
| C | Tuolumne (MC) | Winter | 2030 | 346.02             | 402.38 | 471.02 | 601.93 | 73.81                 | 85.94 | 100.98 | 128.42 |
| C | Tuolumne (MC) | Winter | 2031 | 346.01             | 402.49 | 470.99 | 602.16 | 73.81                 | 86.01 | 100.98 | 128.55 |
| C | Tuolumne (MC) | Winter | 2032 | 346.01             | 402.59 | 470.97 | 602.39 | 73.82                 | 86.08 | 100.98 | 128.67 |
| C | Tuolumne (MC) | Winter | 2033 | 346.01             | 402.67 | 470.95 | 602.59 | 73.82                 | 86.13 | 100.99 | 128.78 |
| C | Tuolumne (MC) | Winter | 2034 | 346.01             | 402.75 | 470.93 | 602.77 | 73.83                 | 86.19 | 100.99 | 128.88 |
| C | Tuolumne (MC) | Winter | 2035 | 346.00             | 402.81 | 470.91 | 602.93 | 73.83                 | 86.23 | 101.00 | 128.97 |
| C | Ventura (SCC) | Annual | 2010 | 333.21             | 383.06 | 456.23 | 576.41 | 73.39                 | 83.96 | 99.49  | 125.11 |
| C | Ventura (SCC) | Annual | 2011 | 334.06             | 384.40 | 457.06 | 578.10 | 73.37                 | 83.90 | 99.58  | 125.31 |
| C | Ventura (SCC) | Annual | 2012 | 334.23             | 384.93 | 456.97 | 578.64 | 73.35                 | 83.91 | 99.69  | 125.52 |
| C | Ventura (SCC) | Annual | 2013 | 334.46             | 385.44 | 456.97 | 579.27 | 73.37                 | 83.94 | 99.80  | 125.74 |
| C | Ventura (SCC) | Annual | 2014 | 334.61             | 385.87 | 456.92 | 579.81 | 73.35                 | 83.96 | 99.91  | 125.96 |
| C | Ventura (SCC) | Annual | 2015 | 336.96             | 388.79 | 459.88 | 584.16 | 73.37                 | 84.01 | 100.00 | 126.20 |
| C | Ventura (SCC) | Annual | 2016 | 337.13             | 389.18 | 459.85 | 584.69 | 73.42                 | 84.08 | 100.11 | 126.44 |
| C | Ventura (SCC) | Annual | 2017 | 337.26             | 389.54 | 459.83 | 585.20 | 73.44                 | 84.15 | 100.20 | 126.68 |
| C | Ventura (SCC) | Annual | 2018 | 337.37             | 389.86 | 459.82 | 585.65 | 73.47                 | 84.25 | 100.29 | 126.90 |
| C | Ventura (SCC) | Annual | 2019 | 338.59             | 391.47 | 461.34 | 587.98 | 73.51                 | 84.41 | 100.38 | 127.11 |
| C | Ventura (SCC) | Annual | 2020 | 338.68             | 391.75 | 461.34 | 588.35 | 73.61                 | 84.58 | 100.48 | 127.31 |
| C | Ventura (SCC) | Annual | 2021 | 340.62             | 394.18 | 463.90 | 591.89 | 73.68                 | 84.75 | 100.57 | 127.48 |
| C | Ventura (SCC) | Annual | 2022 | 340.66             | 394.41 | 463.89 | 592.14 | 73.73                 | 84.90 | 100.65 | 127.62 |
| C | Ventura (SCC) | Annual | 2023 | 340.67             | 394.58 | 463.88 | 592.33 | 73.77                 | 85.03 | 100.71 | 127.78 |
| C | Ventura (SCC) | Annual | 2024 | 342.13             | 396.43 | 465.87 | 595.04 | 73.79                 | 85.15 | 100.77 | 127.93 |
| C | Ventura (SCC) | Annual | 2025 | 342.13             | 396.57 | 465.87 | 595.19 | 73.81                 | 85.26 | 100.81 | 128.07 |
| C | Ventura (SCC) | Annual | 2026 | 342.15             | 396.72 | 465.85 | 595.36 | 73.83                 | 85.37 | 100.85 | 128.21 |
| C | Ventura (SCC) | Annual | 2027 | 342.16             | 396.87 | 465.84 | 595.51 | 73.84                 | 85.46 | 100.88 | 128.33 |
| C | Ventura (SCC) | Annual | 2028 | 342.17             | 397.01 | 465.82 | 595.67 | 73.85                 | 85.55 | 100.90 | 128.45 |
| C | Ventura (SCC) | Annual | 2029 | 342.17             | 397.16 | 465.80 | 595.81 | 73.86                 | 85.64 | 100.92 | 128.55 |
| C | Ventura (SCC) | Annual | 2030 | 342.17             | 397.31 | 465.79 | 595.97 | 73.86                 | 85.72 | 100.93 | 128.65 |
| C | Ventura (SCC) | Annual | 2031 | 343.80             | 399.36 | 468.01 | 598.97 | 73.87                 | 85.80 | 100.94 | 128.74 |
| C | Ventura (SCC) | Annual | 2032 | 343.79             | 399.50 | 468.00 | 599.13 | 73.88                 | 85.87 | 100.95 | 128.83 |
| C | Ventura (SCC) | Annual | 2033 | 343.79             | 399.63 | 467.99 | 599.27 | 73.88                 | 85.94 | 100.96 | 128.92 |
| C | Ventura (SCC) | Annual | 2034 | 343.79             | 399.74 | 467.98 | 599.40 | 73.88                 | 86.00 | 100.96 | 128.99 |
| C | Ventura (SCC) | Annual | 2035 | 343.79             | 399.84 | 467.97 | 599.52 | 73.89                 | 86.06 | 100.97 | 129.06 |
| C | Ventura (SCC) | Summer | 2010 | 347.83             | 398.15 | 475.58 | 600.79 | 73.39                 | 83.96 | 99.49  | 125.11 |
| C | Ventura (SCC) | Summer | 2011 | 348.77             | 399.76 | 476.48 | 602.48 | 73.37                 | 83.90 | 99.58  | 125.31 |
| C | Ventura (SCC) | Summer | 2012 | 348.98             | 400.46 | 476.42 | 602.99 | 73.35                 | 83.91 | 99.69  | 125.52 |
| C | Ventura (SCC) | Summer | 2013 | 349.27             | 401.14 | 476.48 | 603.66 | 73.37                 | 83.94 | 99.80  | 125.74 |
| C | Ventura (SCC) | Summer | 2014 | 349.45             | 401.68 | 476.48 | 604.24 | 73.35                 | 83.96 | 99.91  | 125.96 |
| C | Ventura (SCC) | Summer | 2015 | 351.94             | 404.82 | 479.63 | 608.85 | 73.37                 | 84.01 | 100.00 | 126.20 |
| C | Ventura (SCC) | Summer | 2016 | 352.14             | 405.30 | 479.65 | 609.45 | 73.42                 | 84.08 | 100.11 | 126.44 |
| C | Ventura (SCC) | Summer | 2017 | 352.28             | 405.73 | 479.66 | 610.04 | 73.44                 | 84.15 | 100.20 | 126.68 |
| C | Ventura (SCC) | Summer | 2018 | 352.41             | 406.11 | 479.66 | 610.55 | 73.47                 | 84.25 | 100.29 | 126.90 |
| C | Ventura (SCC) | Summer | 2019 | 353.67             | 407.82 | 481.25 | 613.02 | 73.51                 | 84.41 | 100.38 | 127.11 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location      | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|---------------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |               |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Ventura (SCC) | Summer | 2020 | 353.77             | 408.15 | 481.25 | 613.43 | 73.61                 | 84.58 | 100.48 | 127.31 |
| C | Ventura (SCC) | Summer | 2021 | 355.80             | 410.74 | 483.94 | 617.18 | 73.68                 | 84.75 | 100.57 | 127.48 |
| C | Ventura (SCC) | Summer | 2022 | 355.84             | 411.01 | 483.93 | 617.47 | 73.73                 | 84.90 | 100.65 | 127.62 |
| C | Ventura (SCC) | Summer | 2023 | 355.85             | 411.23 | 483.92 | 617.68 | 73.77                 | 85.03 | 100.71 | 127.78 |
| C | Ventura (SCC) | Summer | 2024 | 357.40             | 413.22 | 486.02 | 620.55 | 73.79                 | 85.15 | 100.77 | 127.93 |
| C | Ventura (SCC) | Summer | 2025 | 357.40             | 413.40 | 486.01 | 620.72 | 73.81                 | 85.26 | 100.81 | 128.07 |
| C | Ventura (SCC) | Summer | 2026 | 357.42             | 413.59 | 486.00 | 620.90 | 73.83                 | 85.37 | 100.85 | 128.21 |
| C | Ventura (SCC) | Summer | 2027 | 357.43             | 413.77 | 485.98 | 621.06 | 73.84                 | 85.46 | 100.88 | 128.33 |
| C | Ventura (SCC) | Summer | 2028 | 357.44             | 413.94 | 485.96 | 621.21 | 73.85                 | 85.55 | 100.90 | 128.45 |
| C | Ventura (SCC) | Summer | 2029 | 357.45             | 414.12 | 485.94 | 621.36 | 73.86                 | 85.64 | 100.92 | 128.55 |
| C | Ventura (SCC) | Summer | 2030 | 357.45             | 414.30 | 485.93 | 621.52 | 73.86                 | 85.72 | 100.93 | 128.65 |
| C | Ventura (SCC) | Summer | 2031 | 359.14             | 416.47 | 488.25 | 624.65 | 73.87                 | 85.80 | 100.94 | 128.74 |
| C | Ventura (SCC) | Summer | 2032 | 359.14             | 416.64 | 488.24 | 624.81 | 73.88                 | 85.87 | 100.95 | 128.83 |
| C | Ventura (SCC) | Summer | 2033 | 359.14             | 416.79 | 488.23 | 624.96 | 73.88                 | 85.94 | 100.96 | 128.92 |
| C | Ventura (SCC) | Summer | 2034 | 359.13             | 416.92 | 488.22 | 625.10 | 73.88                 | 86.00 | 100.96 | 128.99 |
| C | Ventura (SCC) | Summer | 2035 | 359.13             | 417.02 | 488.21 | 625.23 | 73.89                 | 86.06 | 100.97 | 129.06 |
| C | Ventura (SCC) | Winter | 2010 | 330.44             | 380.19 | 452.56 | 571.78 | 73.39                 | 83.96 | 99.49  | 125.11 |
| C | Ventura (SCC) | Winter | 2011 | 331.27             | 381.49 | 453.38 | 573.48 | 73.37                 | 83.90 | 99.58  | 125.31 |
| C | Ventura (SCC) | Winter | 2012 | 331.43             | 381.98 | 453.29 | 574.02 | 73.35                 | 83.91 | 99.69  | 125.52 |
| C | Ventura (SCC) | Winter | 2013 | 331.65             | 382.46 | 453.27 | 574.64 | 73.37                 | 83.94 | 99.80  | 125.74 |
| C | Ventura (SCC) | Winter | 2014 | 331.80             | 382.87 | 453.21 | 575.18 | 73.35                 | 83.96 | 99.91  | 125.96 |
| C | Ventura (SCC) | Winter | 2015 | 334.12             | 385.75 | 456.13 | 579.48 | 73.37                 | 84.01 | 100.00 | 126.20 |
| C | Ventura (SCC) | Winter | 2016 | 334.29             | 386.12 | 456.10 | 579.99 | 73.42                 | 84.08 | 100.11 | 126.44 |
| C | Ventura (SCC) | Winter | 2017 | 334.41             | 386.47 | 456.07 | 580.49 | 73.44                 | 84.15 | 100.20 | 126.68 |
| C | Ventura (SCC) | Winter | 2018 | 334.52             | 386.78 | 456.06 | 580.93 | 73.47                 | 84.25 | 100.29 | 126.90 |
| C | Ventura (SCC) | Winter | 2019 | 335.73             | 388.37 | 457.57 | 583.24 | 73.51                 | 84.41 | 100.38 | 127.11 |
| C | Ventura (SCC) | Winter | 2020 | 335.82             | 388.65 | 457.57 | 583.59 | 73.61                 | 84.58 | 100.48 | 127.31 |
| C | Ventura (SCC) | Winter | 2021 | 337.74             | 391.05 | 460.10 | 587.10 | 73.68                 | 84.75 | 100.57 | 127.48 |
| C | Ventura (SCC) | Winter | 2022 | 337.78             | 391.26 | 460.10 | 587.34 | 73.73                 | 84.90 | 100.65 | 127.62 |
| C | Ventura (SCC) | Winter | 2023 | 337.80             | 391.43 | 460.09 | 587.53 | 73.77                 | 85.03 | 100.71 | 127.78 |
| C | Ventura (SCC) | Winter | 2024 | 339.24             | 393.25 | 462.06 | 590.20 | 73.79                 | 85.15 | 100.77 | 127.93 |
| C | Ventura (SCC) | Winter | 2025 | 339.24             | 393.38 | 462.05 | 590.36 | 73.81                 | 85.26 | 100.81 | 128.07 |
| C | Ventura (SCC) | Winter | 2026 | 339.26             | 393.53 | 462.04 | 590.52 | 73.83                 | 85.37 | 100.85 | 128.21 |
| C | Ventura (SCC) | Winter | 2027 | 339.27             | 393.67 | 462.02 | 590.68 | 73.84                 | 85.46 | 100.88 | 128.33 |
| C | Ventura (SCC) | Winter | 2028 | 339.28             | 393.81 | 462.01 | 590.83 | 73.85                 | 85.55 | 100.90 | 128.45 |
| C | Ventura (SCC) | Winter | 2029 | 339.28             | 393.95 | 461.99 | 590.98 | 73.86                 | 85.64 | 100.92 | 128.55 |
| C | Ventura (SCC) | Winter | 2030 | 339.28             | 394.09 | 461.98 | 591.13 | 73.86                 | 85.72 | 100.93 | 128.65 |
| C | Ventura (SCC) | Winter | 2031 | 340.89             | 396.12 | 464.18 | 594.11 | 73.87                 | 85.80 | 100.94 | 128.74 |
| C | Ventura (SCC) | Winter | 2032 | 340.89             | 396.26 | 464.17 | 594.27 | 73.88                 | 85.87 | 100.95 | 128.83 |
| C | Ventura (SCC) | Winter | 2033 | 340.89             | 396.38 | 464.16 | 594.41 | 73.88                 | 85.94 | 100.96 | 128.92 |
| C | Ventura (SCC) | Winter | 2034 | 340.89             | 396.49 | 464.15 | 594.54 | 73.88                 | 86.00 | 100.96 | 128.99 |
| C | Ventura (SCC) | Winter | 2035 | 340.88             | 396.58 | 464.14 | 594.65 | 73.89                 | 86.06 | 100.97 | 129.06 |
| C | Yolo (SV)     | Annual | 2010 | 336.72             | 387.12 | 461.65 | 581.89 | 72.73                 | 85.31 | 99.86  | 124.93 |
| C | Yolo (SV)     | Annual | 2011 | 336.97             | 387.81 | 461.52 | 582.48 | 72.77                 | 85.00 | 99.91  | 125.14 |
| C | Yolo (SV)     | Annual | 2012 | 337.24             | 388.46 | 461.43 | 583.14 | 72.83                 | 84.86 | 99.98  | 125.38 |
| C | Yolo (SV)     | Annual | 2013 | 337.49             | 389.01 | 461.37 | 583.82 | 72.90                 | 84.70 | 100.04 | 125.63 |
| C | Yolo (SV)     | Annual | 2014 | 337.72             | 389.50 | 461.33 | 584.51 | 72.96                 | 84.61 | 100.12 | 125.89 |
| C | Yolo (SV)     | Annual | 2015 | 337.96             | 389.95 | 461.30 | 585.20 | 73.06                 | 84.57 | 100.16 | 126.15 |
| C | Yolo (SV)     | Annual | 2016 | 338.17             | 390.35 | 461.29 | 585.85 | 73.15                 | 84.56 | 100.24 | 126.41 |
| C | Yolo (SV)     | Annual | 2017 | 338.34             | 390.69 | 461.27 | 586.46 | 73.23                 | 84.51 | 100.28 | 126.67 |
| C | Yolo (SV)     | Annual | 2018 | 338.49             | 390.99 | 461.25 | 586.98 | 73.31                 | 84.52 | 100.34 | 126.91 |
| C | Yolo (SV)     | Annual | 2019 | 337.20             | 389.64 | 459.31 | 584.97 | 73.38                 | 84.60 | 100.41 | 127.12 |
| C | Yolo (SV)     | Annual | 2020 | 337.30             | 389.89 | 459.30 | 585.36 | 73.47                 | 84.72 | 100.49 | 127.33 |
| C | Yolo (SV)     | Annual | 2021 | 337.38             | 390.13 | 459.28 | 585.66 | 73.55                 | 84.88 | 100.58 | 127.49 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location  | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |           |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Yolo (SV) | Annual | 2022 | 337.43             | 390.34 | 459.26 | 585.92 | 73.61                 | 85.01 | 100.66 | 127.63 |
| C | Yolo (SV) | Annual | 2023 | 337.45             | 390.51 | 459.24 | 586.13 | 73.65                 | 85.13 | 100.72 | 127.79 |
| C | Yolo (SV) | Annual | 2024 | 337.46             | 390.65 | 459.23 | 586.27 | 73.67                 | 85.24 | 100.77 | 127.93 |
| C | Yolo (SV) | Annual | 2025 | 337.46             | 390.78 | 459.21 | 586.42 | 73.70                 | 85.33 | 100.81 | 128.07 |
| C | Yolo (SV) | Annual | 2026 | 337.48             | 390.92 | 459.20 | 586.59 | 73.72                 | 85.43 | 100.85 | 128.21 |
| C | Yolo (SV) | Annual | 2027 | 337.50             | 391.06 | 459.19 | 586.76 | 73.73                 | 85.51 | 100.88 | 128.33 |
| C | Yolo (SV) | Annual | 2028 | 337.51             | 391.21 | 459.18 | 586.92 | 73.74                 | 85.59 | 100.90 | 128.44 |
| C | Yolo (SV) | Annual | 2029 | 337.51             | 391.35 | 459.16 | 587.08 | 73.75                 | 85.67 | 100.92 | 128.55 |
| C | Yolo (SV) | Annual | 2030 | 337.52             | 391.49 | 459.15 | 587.25 | 73.75                 | 85.74 | 100.93 | 128.65 |
| C | Yolo (SV) | Annual | 2031 | 337.52             | 391.63 | 459.14 | 587.41 | 73.76                 | 85.81 | 100.94 | 128.74 |
| C | Yolo (SV) | Annual | 2032 | 337.52             | 391.76 | 459.13 | 587.58 | 73.77                 | 85.88 | 100.95 | 128.83 |
| C | Yolo (SV) | Annual | 2033 | 337.52             | 391.88 | 459.12 | 587.73 | 73.77                 | 85.94 | 100.95 | 128.92 |
| C | Yolo (SV) | Annual | 2034 | 337.52             | 391.98 | 459.11 | 587.88 | 73.77                 | 85.99 | 100.96 | 129.00 |
| C | Yolo (SV) | Annual | 2035 | 337.52             | 392.07 | 459.10 | 588.00 | 73.78                 | 86.04 | 100.96 | 129.07 |
| C | Yolo (SV) | Summer | 2010 | 372.26             | 423.83 | 508.64 | 641.11 | 72.73                 | 85.31 | 99.86  | 124.93 |
| C | Yolo (SV) | Summer | 2011 | 372.71             | 425.23 | 508.71 | 641.62 | 72.77                 | 85.00 | 99.91  | 125.14 |
| C | Yolo (SV) | Summer | 2012 | 373.13             | 426.43 | 508.79 | 642.30 | 72.83                 | 84.86 | 99.98  | 125.38 |
| C | Yolo (SV) | Summer | 2013 | 373.50             | 427.43 | 508.90 | 643.09 | 72.90                 | 84.70 | 100.04 | 125.63 |
| C | Yolo (SV) | Summer | 2014 | 373.83             | 428.27 | 509.03 | 643.94 | 72.96                 | 84.61 | 100.12 | 125.89 |
| C | Yolo (SV) | Summer | 2015 | 374.13             | 429.00 | 509.16 | 644.86 | 73.06                 | 84.57 | 100.16 | 126.15 |
| C | Yolo (SV) | Summer | 2016 | 374.39             | 429.62 | 509.25 | 645.72 | 73.15                 | 84.56 | 100.24 | 126.41 |
| C | Yolo (SV) | Summer | 2017 | 374.59             | 430.15 | 509.32 | 646.54 | 73.23                 | 84.51 | 100.28 | 126.67 |
| C | Yolo (SV) | Summer | 2018 | 374.75             | 430.58 | 509.32 | 647.21 | 73.31                 | 84.52 | 100.34 | 126.91 |
| C | Yolo (SV) | Summer | 2019 | 373.25             | 429.11 | 507.09 | 644.96 | 73.38                 | 84.60 | 100.41 | 127.12 |
| C | Yolo (SV) | Summer | 2020 | 373.34             | 429.45 | 507.05 | 645.44 | 73.47                 | 84.72 | 100.49 | 127.33 |
| C | Yolo (SV) | Summer | 2021 | 373.41             | 429.79 | 506.99 | 645.81 | 73.55                 | 84.88 | 100.58 | 127.49 |
| C | Yolo (SV) | Summer | 2022 | 373.45             | 430.08 | 506.94 | 646.13 | 73.61                 | 85.01 | 100.66 | 127.63 |
| C | Yolo (SV) | Summer | 2023 | 373.47             | 430.33 | 506.89 | 646.38 | 73.65                 | 85.13 | 100.72 | 127.79 |
| C | Yolo (SV) | Summer | 2024 | 373.48             | 430.55 | 506.85 | 646.54 | 73.67                 | 85.24 | 100.77 | 127.93 |
| C | Yolo (SV) | Summer | 2025 | 373.49             | 430.75 | 506.82 | 646.69 | 73.70                 | 85.33 | 100.81 | 128.07 |
| C | Yolo (SV) | Summer | 2026 | 373.51             | 430.95 | 506.82 | 646.89 | 73.72                 | 85.43 | 100.85 | 128.21 |
| C | Yolo (SV) | Summer | 2027 | 373.52             | 431.16 | 506.83 | 647.07 | 73.73                 | 85.51 | 100.88 | 128.33 |
| C | Yolo (SV) | Summer | 2028 | 373.54             | 431.36 | 506.84 | 647.25 | 73.74                 | 85.59 | 100.90 | 128.44 |
| C | Yolo (SV) | Summer | 2029 | 373.55             | 431.57 | 506.84 | 647.44 | 73.75                 | 85.67 | 100.92 | 128.55 |
| C | Yolo (SV) | Summer | 2030 | 373.55             | 431.77 | 506.84 | 647.62 | 73.75                 | 85.74 | 100.93 | 128.65 |
| C | Yolo (SV) | Summer | 2031 | 373.56             | 431.98 | 506.84 | 647.80 | 73.76                 | 85.81 | 100.94 | 128.74 |
| C | Yolo (SV) | Summer | 2032 | 373.57             | 432.16 | 506.83 | 647.98 | 73.77                 | 85.88 | 100.95 | 128.83 |
| C | Yolo (SV) | Summer | 2033 | 373.58             | 432.31 | 506.82 | 648.16 | 73.77                 | 85.94 | 100.95 | 128.92 |
| C | Yolo (SV) | Summer | 2034 | 373.58             | 432.44 | 506.81 | 648.34 | 73.77                 | 85.99 | 100.96 | 129.00 |
| C | Yolo (SV) | Summer | 2035 | 373.58             | 432.55 | 506.80 | 648.50 | 73.78                 | 86.04 | 100.96 | 129.07 |
| C | Yolo (SV) | Winter | 2010 | 327.05             | 377.13 | 448.86 | 565.78 | 72.73                 | 85.31 | 99.86  | 124.93 |
| C | Yolo (SV) | Winter | 2011 | 327.25             | 377.62 | 448.68 | 566.39 | 72.77                 | 85.00 | 99.91  | 125.14 |
| C | Yolo (SV) | Winter | 2012 | 327.47             | 378.13 | 448.54 | 567.03 | 72.83                 | 84.86 | 99.98  | 125.38 |
| C | Yolo (SV) | Winter | 2013 | 327.69             | 378.55 | 448.43 | 567.69 | 72.90                 | 84.70 | 100.04 | 125.63 |
| C | Yolo (SV) | Winter | 2014 | 327.89             | 378.94 | 448.35 | 568.33 | 72.96                 | 84.61 | 100.12 | 125.89 |
| C | Yolo (SV) | Winter | 2015 | 328.11             | 379.32 | 448.28 | 568.96 | 73.06                 | 84.57 | 100.16 | 126.15 |
| C | Yolo (SV) | Winter | 2016 | 328.31             | 379.66 | 448.23 | 569.55 | 73.15                 | 84.56 | 100.24 | 126.41 |
| C | Yolo (SV) | Winter | 2017 | 328.47             | 379.95 | 448.19 | 570.10 | 73.23                 | 84.51 | 100.28 | 126.67 |
| C | Yolo (SV) | Winter | 2018 | 328.62             | 380.21 | 448.17 | 570.58 | 73.31                 | 84.52 | 100.34 | 126.91 |
| C | Yolo (SV) | Winter | 2019 | 327.41             | 378.92 | 446.34 | 568.68 | 73.38                 | 84.60 | 100.41 | 127.12 |
| C | Yolo (SV) | Winter | 2020 | 327.51             | 379.14 | 446.33 | 569.04 | 73.47                 | 84.72 | 100.49 | 127.33 |
| C | Yolo (SV) | Winter | 2021 | 327.59             | 379.37 | 446.32 | 569.33 | 73.55                 | 84.88 | 100.58 | 127.49 |
| C | Yolo (SV) | Winter | 2022 | 327.64             | 379.55 | 446.32 | 569.57 | 73.61                 | 85.01 | 100.66 | 127.63 |
| C | Yolo (SV) | Winter | 2023 | 327.66             | 379.69 | 446.30 | 569.76 | 73.65                 | 85.13 | 100.72 | 127.79 |



Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location  | Season | Year | CO2 Running (g/VMt) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------|--------|------|---------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |           |        |      | LDA                 | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Yolo (SV) | Winter | 2024 | 327.67              | 379.81 | 446.29 | 569.90 | 73.67                 | 85.24 | 100.77 | 127.93 |
| C | Yolo (SV) | Winter | 2025 | 327.68              | 379.92 | 446.28 | 570.05 | 73.70                 | 85.33 | 100.81 | 128.07 |
| C | Yolo (SV) | Winter | 2026 | 327.70              | 380.05 | 446.27 | 570.22 | 73.72                 | 85.43 | 100.85 | 128.21 |
| C | Yolo (SV) | Winter | 2027 | 327.72              | 380.18 | 446.25 | 570.38 | 73.73                 | 85.51 | 100.88 | 128.33 |
| C | Yolo (SV) | Winter | 2028 | 327.73              | 380.30 | 446.23 | 570.54 | 73.74                 | 85.59 | 100.90 | 128.44 |
| C | Yolo (SV) | Winter | 2029 | 327.73              | 380.42 | 446.21 | 570.69 | 73.75                 | 85.67 | 100.92 | 128.55 |
| C | Yolo (SV) | Winter | 2030 | 327.73              | 380.55 | 446.20 | 570.85 | 73.75                 | 85.74 | 100.93 | 128.65 |
| C | Yolo (SV) | Winter | 2031 | 327.73              | 380.67 | 446.19 | 571.01 | 73.76                 | 85.81 | 100.94 | 128.74 |
| C | Yolo (SV) | Winter | 2032 | 327.73              | 380.79 | 446.18 | 571.17 | 73.77                 | 85.88 | 100.95 | 128.83 |
| C | Yolo (SV) | Winter | 2033 | 327.73              | 380.89 | 446.17 | 571.32 | 73.77                 | 85.94 | 100.95 | 128.92 |
| C | Yolo (SV) | Winter | 2034 | 327.73              | 380.99 | 446.16 | 571.45 | 73.77                 | 85.99 | 100.96 | 129.00 |
| C | Yolo (SV) | Winter | 2035 | 327.72              | 381.07 | 446.15 | 571.57 | 73.78                 | 86.04 | 100.96 | 129.07 |
| C | Yuba (SV) | Annual | 2010 | 331.71              | 387.20 | 455.73 | 569.14 | 73.59                 | 94.17 | 100.78 | 124.81 |
| C | Yuba (SV) | Annual | 2011 | 331.88              | 386.92 | 455.13 | 569.94 | 73.55                 | 92.48 | 100.68 | 124.98 |
| C | Yuba (SV) | Annual | 2012 | 332.08              | 386.74 | 454.68 | 570.82 | 73.57                 | 91.09 | 100.67 | 125.20 |
| C | Yuba (SV) | Annual | 2013 | 332.28              | 386.58 | 454.33 | 571.76 | 73.58                 | 89.86 | 100.67 | 125.45 |
| C | Yuba (SV) | Annual | 2014 | 332.43              | 386.50 | 454.06 | 572.63 | 73.55                 | 88.96 | 100.63 | 125.71 |
| C | Yuba (SV) | Annual | 2015 | 332.60              | 386.32 | 453.85 | 573.51 | 73.58                 | 87.83 | 100.63 | 125.99 |
| C | Yuba (SV) | Annual | 2016 | 332.76              | 386.25 | 453.68 | 574.33 | 73.63                 | 87.10 | 100.62 | 126.28 |
| C | Yuba (SV) | Annual | 2017 | 332.89              | 386.13 | 453.53 | 575.09 | 73.67                 | 86.26 | 100.64 | 126.56 |
| C | Yuba (SV) | Annual | 2018 | 332.95              | 386.05 | 453.40 | 575.74 | 73.66                 | 85.67 | 100.67 | 126.82 |
| C | Yuba (SV) | Annual | 2019 | 329.78              | 382.30 | 448.92 | 570.68 | 73.66                 | 85.36 | 100.69 | 127.05 |
| C | Yuba (SV) | Annual | 2020 | 329.83              | 382.32 | 448.84 | 571.12 | 73.74                 | 85.30 | 100.76 | 127.28 |
| C | Yuba (SV) | Annual | 2021 | 329.87              | 382.43 | 448.77 | 571.46 | 73.80                 | 85.40 | 100.82 | 127.44 |
| C | Yuba (SV) | Annual | 2022 | 329.88              | 382.52 | 448.70 | 571.71 | 73.85                 | 85.48 | 100.87 | 127.53 |
| C | Yuba (SV) | Annual | 2023 | 329.88              | 382.59 | 448.64 | 571.92 | 73.88                 | 85.55 | 100.91 | 127.71 |
| C | Yuba (SV) | Annual | 2024 | 329.85              | 382.67 | 448.59 | 572.07 | 73.89                 | 85.63 | 100.94 | 127.87 |
| C | Yuba (SV) | Annual | 2025 | 329.83              | 382.75 | 448.55 | 572.24 | 73.90                 | 85.70 | 100.96 | 128.02 |
| C | Yuba (SV) | Annual | 2026 | 329.85              | 382.83 | 448.50 | 572.40 | 73.92                 | 85.77 | 100.98 | 128.17 |
| C | Yuba (SV) | Annual | 2027 | 329.86              | 382.89 | 448.45 | 572.55 | 73.94                 | 85.83 | 100.99 | 128.30 |
| C | Yuba (SV) | Annual | 2028 | 329.87              | 382.96 | 448.40 | 572.72 | 73.95                 | 85.88 | 101.00 | 128.42 |
| C | Yuba (SV) | Annual | 2029 | 329.87              | 383.04 | 448.35 | 572.89 | 73.95                 | 85.93 | 101.00 | 128.53 |
| C | Yuba (SV) | Annual | 2030 | 329.86              | 383.11 | 448.30 | 573.07 | 73.96                 | 85.98 | 100.99 | 128.64 |
| C | Yuba (SV) | Annual | 2031 | 329.86              | 383.18 | 448.28 | 573.23 | 73.96                 | 86.03 | 100.99 | 128.74 |
| C | Yuba (SV) | Annual | 2032 | 329.86              | 383.24 | 448.26 | 573.41 | 73.96                 | 86.07 | 101.00 | 128.84 |
| C | Yuba (SV) | Annual | 2033 | 329.86              | 383.30 | 448.24 | 573.57 | 73.97                 | 86.11 | 101.00 | 128.93 |
| C | Yuba (SV) | Annual | 2034 | 329.86              | 383.35 | 448.22 | 573.72 | 73.97                 | 86.15 | 101.00 | 129.01 |
| C | Yuba (SV) | Annual | 2035 | 329.85              | 383.39 | 448.21 | 573.85 | 73.98                 | 86.18 | 101.00 | 129.08 |
| C | Yuba (SV) | Summer | 2010 | 368.33              | 425.28 | 503.39 | 628.81 | 73.59                 | 94.17 | 100.78 | 124.81 |
| C | Yuba (SV) | Summer | 2011 | 368.82              | 425.88 | 503.44 | 629.79 | 73.55                 | 92.48 | 100.68 | 124.98 |
| C | Yuba (SV) | Summer | 2012 | 369.28              | 426.40 | 503.45 | 630.96 | 73.57                 | 91.09 | 100.67 | 125.20 |
| C | Yuba (SV) | Summer | 2013 | 369.67              | 426.80 | 503.45 | 632.27 | 73.58                 | 89.86 | 100.67 | 125.45 |
| C | Yuba (SV) | Summer | 2014 | 369.96              | 427.10 | 503.47 | 633.51 | 73.55                 | 88.96 | 100.63 | 125.71 |
| C | Yuba (SV) | Summer | 2015 | 370.23              | 427.34 | 503.46 | 634.77 | 73.58                 | 87.83 | 100.63 | 125.99 |
| C | Yuba (SV) | Summer | 2016 | 370.46              | 427.52 | 503.42 | 635.97 | 73.63                 | 87.10 | 100.62 | 126.28 |
| C | Yuba (SV) | Summer | 2017 | 370.61              | 427.67 | 503.33 | 637.05 | 73.67                 | 86.26 | 100.64 | 126.56 |
| C | Yuba (SV) | Summer | 2018 | 370.68              | 427.77 | 503.20 | 637.94 | 73.66                 | 85.67 | 100.67 | 126.82 |
| C | Yuba (SV) | Summer | 2019 | 367.12              | 423.68 | 498.20 | 632.43 | 73.66                 | 85.36 | 100.69 | 127.05 |
| C | Yuba (SV) | Summer | 2020 | 367.15              | 423.74 | 498.07 | 632.99 | 73.74                 | 85.30 | 100.76 | 127.28 |
| C | Yuba (SV) | Summer | 2021 | 367.16              | 423.89 | 497.95 | 633.41 | 73.80                 | 85.40 | 100.82 | 127.44 |
| C | Yuba (SV) | Summer | 2022 | 367.15              | 424.03 | 497.86 | 633.76 | 73.85                 | 85.48 | 100.87 | 127.53 |
| C | Yuba (SV) | Summer | 2023 | 367.14              | 424.15 | 497.79 | 634.02 | 73.88                 | 85.55 | 100.91 | 127.71 |
| C | Yuba (SV) | Summer | 2024 | 367.11              | 424.30 | 497.73 | 634.20 | 73.89                 | 85.63 | 100.94 | 127.87 |
| C | Yuba (SV) | Summer | 2025 | 367.09              | 424.44 | 497.70 | 634.39 | 73.90                 | 85.70 | 100.96 | 128.02 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location  | Season | Year | CO2 Running (g/MT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|-----------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |           |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| C | Yuba (SV) | Summer | 2026 | 367.12             | 424.53 | 497.64 | 634.51 | 73.92                 | 85.77 | 100.98 | 128.17 |
| C | Yuba (SV) | Summer | 2027 | 367.15             | 424.62 | 497.59 | 634.66 | 73.94                 | 85.83 | 100.99 | 128.30 |
| C | Yuba (SV) | Summer | 2028 | 367.18             | 424.72 | 497.56 | 634.82 | 73.95                 | 85.88 | 101.00 | 128.42 |
| C | Yuba (SV) | Summer | 2029 | 367.20             | 424.83 | 497.53 | 635.01 | 73.95                 | 85.93 | 101.00 | 128.53 |
| C | Yuba (SV) | Summer | 2030 | 367.22             | 424.95 | 497.51 | 635.21 | 73.96                 | 85.98 | 100.99 | 128.64 |
| C | Yuba (SV) | Summer | 2031 | 367.22             | 425.04 | 497.51 | 635.38 | 73.96                 | 86.03 | 100.99 | 128.74 |
| C | Yuba (SV) | Summer | 2032 | 367.23             | 425.12 | 497.51 | 635.56 | 73.96                 | 86.07 | 101.00 | 128.84 |
| C | Yuba (SV) | Summer | 2033 | 367.23             | 425.19 | 497.51 | 635.76 | 73.97                 | 86.11 | 101.00 | 128.93 |
| C | Yuba (SV) | Summer | 2034 | 367.23             | 425.26 | 497.50 | 635.95 | 73.97                 | 86.15 | 101.00 | 129.01 |
| C | Yuba (SV) | Summer | 2035 | 367.22             | 425.31 | 497.50 | 636.13 | 73.98                 | 86.18 | 101.00 | 129.08 |
| C | Yuba (SV) | Winter | 2010 | 322.00             | 377.10 | 443.10 | 553.32 | 73.59                 | 94.17 | 100.78 | 124.81 |
| C | Yuba (SV) | Winter | 2011 | 322.08             | 376.59 | 442.32 | 554.07 | 73.55                 | 92.48 | 100.68 | 124.98 |
| C | Yuba (SV) | Winter | 2012 | 322.22             | 376.23 | 441.75 | 554.87 | 73.57                 | 91.09 | 100.67 | 125.20 |
| C | Yuba (SV) | Winter | 2013 | 322.37             | 375.91 | 441.30 | 555.71 | 73.58                 | 89.86 | 100.67 | 125.45 |
| C | Yuba (SV) | Winter | 2014 | 322.48             | 375.73 | 440.96 | 556.49 | 73.55                 | 88.96 | 100.63 | 125.71 |
| C | Yuba (SV) | Winter | 2015 | 322.62             | 375.45 | 440.69 | 557.26 | 73.58                 | 87.83 | 100.63 | 125.99 |
| C | Yuba (SV) | Winter | 2016 | 322.77             | 375.30 | 440.49 | 557.99 | 73.63                 | 87.10 | 100.62 | 126.28 |
| C | Yuba (SV) | Winter | 2017 | 322.88             | 375.11 | 440.32 | 558.67 | 73.67                 | 86.26 | 100.64 | 126.56 |
| C | Yuba (SV) | Winter | 2018 | 322.95             | 374.99 | 440.20 | 559.25 | 73.66                 | 85.67 | 100.67 | 126.82 |
| C | Yuba (SV) | Winter | 2019 | 319.88             | 371.33 | 435.86 | 554.31 | 73.66                 | 85.36 | 100.69 | 127.05 |
| C | Yuba (SV) | Winter | 2020 | 319.94             | 371.34 | 435.79 | 554.72 | 73.74                 | 85.30 | 100.76 | 127.28 |
| C | Yuba (SV) | Winter | 2021 | 319.98             | 371.44 | 435.73 | 555.03 | 73.80                 | 85.40 | 100.82 | 127.44 |
| C | Yuba (SV) | Winter | 2022 | 320.00             | 371.52 | 435.67 | 555.26 | 73.85                 | 85.48 | 100.87 | 127.53 |
| C | Yuba (SV) | Winter | 2023 | 320.00             | 371.57 | 435.61 | 555.46 | 73.88                 | 85.55 | 100.91 | 127.71 |
| C | Yuba (SV) | Winter | 2024 | 319.98             | 371.63 | 435.57 | 555.60 | 73.89                 | 85.63 | 100.94 | 127.87 |
| C | Yuba (SV) | Winter | 2025 | 319.96             | 371.70 | 435.52 | 555.77 | 73.90                 | 85.70 | 100.96 | 128.02 |
| C | Yuba (SV) | Winter | 2026 | 319.97             | 371.77 | 435.47 | 555.93 | 73.92                 | 85.77 | 100.98 | 128.17 |
| C | Yuba (SV) | Winter | 2027 | 319.97             | 371.83 | 435.42 | 556.09 | 73.94                 | 85.83 | 100.99 | 128.30 |
| C | Yuba (SV) | Winter | 2028 | 319.97             | 371.89 | 435.37 | 556.26 | 73.95                 | 85.88 | 101.00 | 128.42 |
| C | Yuba (SV) | Winter | 2029 | 319.97             | 371.96 | 435.31 | 556.42 | 73.95                 | 85.93 | 101.00 | 128.53 |
| C | Yuba (SV) | Winter | 2030 | 319.96             | 372.02 | 435.26 | 556.59 | 73.96                 | 85.98 | 100.99 | 128.64 |
| C | Yuba (SV) | Winter | 2031 | 319.96             | 372.08 | 435.22 | 556.76 | 73.96                 | 86.03 | 100.99 | 128.74 |
| C | Yuba (SV) | Winter | 2032 | 319.96             | 372.14 | 435.20 | 556.93 | 73.96                 | 86.07 | 101.00 | 128.84 |
| C | Yuba (SV) | Winter | 2033 | 319.95             | 372.19 | 435.18 | 557.08 | 73.97                 | 86.11 | 101.00 | 128.93 |
| C | Yuba (SV) | Winter | 2034 | 319.95             | 372.24 | 435.15 | 557.22 | 73.97                 | 86.15 | 101.00 | 129.01 |
| C | Yuba (SV) | Winter | 2035 | 319.95             | 372.27 | 435.14 | 557.34 | 73.98                 | 86.18 | 101.00 | 129.08 |
| S | State     | Annual | 2010 | 348.30             | 399.84 | 476.00 | 599.04 | 73.17                 | 84.92 | 99.67  | 124.99 |
| S | State     | Annual | 2011 | 348.67             | 400.62 | 476.13 | 599.97 | 73.18                 | 84.72 | 99.73  | 125.19 |
| S | State     | Annual | 2012 | 348.78             | 401.01 | 475.89 | 600.42 | 73.21                 | 84.60 | 99.83  | 125.41 |
| S | State     | Annual | 2013 | 348.91             | 401.36 | 475.66 | 600.88 | 73.26                 | 84.51 | 99.92  | 125.64 |
| S | State     | Annual | 2014 | 349.03             | 401.70 | 475.49 | 601.40 | 73.30                 | 84.45 | 100.01 | 125.88 |
| S | State     | Annual | 2015 | 349.34             | 402.17 | 475.56 | 602.18 | 73.36                 | 84.42 | 100.10 | 126.13 |
| S | State     | Annual | 2016 | 349.52             | 402.53 | 475.51 | 602.82 | 73.43                 | 84.42 | 100.19 | 126.39 |
| S | State     | Annual | 2017 | 349.60             | 402.79 | 475.40 | 603.33 | 73.48                 | 84.43 | 100.27 | 126.64 |
| S | State     | Annual | 2018 | 349.73             | 403.11 | 475.42 | 603.91 | 73.51                 | 84.45 | 100.34 | 126.88 |
| S | State     | Annual | 2019 | 349.43             | 402.96 | 474.90 | 603.76 | 73.56                 | 84.57 | 100.42 | 127.10 |
| S | State     | Annual | 2020 | 349.47             | 403.17 | 474.82 | 604.08 | 73.66                 | 84.72 | 100.51 | 127.31 |
| S | State     | Annual | 2021 | 349.92             | 403.86 | 475.37 | 605.14 | 73.73                 | 84.88 | 100.60 | 127.48 |
| S | State     | Annual | 2022 | 349.89             | 404.04 | 475.31 | 605.39 | 73.78                 | 85.02 | 100.68 | 127.63 |
| S | State     | Annual | 2023 | 349.84             | 404.17 | 475.26 | 605.57 | 73.81                 | 85.14 | 100.74 | 127.79 |
| S | State     | Annual | 2024 | 350.69             | 405.29 | 476.43 | 607.26 | 73.83                 | 85.25 | 100.79 | 127.94 |
| S | State     | Annual | 2025 | 350.63             | 405.38 | 476.38 | 607.40 | 73.85                 | 85.35 | 100.83 | 128.09 |
| S | State     | Annual | 2026 | 350.65             | 405.61 | 476.40 | 607.67 | 73.86                 | 85.45 | 100.87 | 128.23 |
| S | State     | Annual | 2027 | 350.61             | 405.72 | 476.34 | 607.80 | 73.88                 | 85.54 | 100.89 | 128.35 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location | Season | Year | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |          |        |      | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| S | State    | Annual | 2028 | 350.56             | 405.84 | 476.28 | 607.92 | 73.89                 | 85.62 | 100.91 | 128.46 |
| S | State    | Annual | 2029 | 350.51             | 405.95 | 476.21 | 608.04 | 73.90                 | 85.70 | 100.93 | 128.57 |
| S | State    | Annual | 2030 | 350.45             | 406.07 | 476.14 | 608.17 | 73.90                 | 85.77 | 100.94 | 128.66 |
| S | State    | Annual | 2031 | 350.80             | 406.69 | 476.65 | 609.06 | 73.90                 | 85.85 | 100.95 | 128.76 |
| S | State    | Annual | 2032 | 350.74             | 406.81 | 476.61 | 609.20 | 73.91                 | 85.92 | 100.95 | 128.85 |
| S | State    | Annual | 2033 | 350.68             | 406.91 | 476.58 | 609.32 | 73.91                 | 85.98 | 100.96 | 128.93 |
| S | State    | Annual | 2034 | 350.62             | 407.00 | 476.54 | 609.43 | 73.92                 | 86.04 | 100.97 | 129.01 |
| S | State    | Annual | 2035 | 350.56             | 407.07 | 476.50 | 609.52 | 73.92                 | 86.09 | 100.97 | 129.08 |
| S | State    | Summer | 2010 | 371.32             | 424.00 | 506.45 | 638.85 | 73.17                 | 84.92 | 99.67  | 124.99 |
| S | State    | Summer | 2011 | 371.88             | 425.31 | 506.78 | 639.81 | 73.18                 | 84.72 | 99.73  | 125.19 |
| S | State    | Summer | 2012 | 372.11             | 426.09 | 506.67 | 640.31 | 73.21                 | 84.60 | 99.83  | 125.41 |
| S | State    | Summer | 2013 | 372.33             | 426.77 | 506.57 | 640.88 | 73.26                 | 84.51 | 99.92  | 125.64 |
| S | State    | Summer | 2014 | 372.54             | 427.37 | 506.54 | 641.54 | 73.30                 | 84.45 | 100.01 | 125.88 |
| S | State    | Summer | 2015 | 372.93             | 428.07 | 506.76 | 642.54 | 73.36                 | 84.42 | 100.10 | 126.13 |
| S | State    | Summer | 2016 | 373.17             | 428.62 | 506.84 | 643.39 | 73.43                 | 84.42 | 100.19 | 126.39 |
| S | State    | Summer | 2017 | 373.29             | 429.04 | 506.82 | 644.08 | 73.48                 | 84.43 | 100.27 | 126.64 |
| S | State    | Summer | 2018 | 373.45             | 429.51 | 506.92 | 644.85 | 73.51                 | 84.45 | 100.34 | 126.88 |
| S | State    | Summer | 2019 | 373.16             | 429.45 | 506.41 | 644.82 | 73.56                 | 84.57 | 100.42 | 127.10 |
| S | State    | Summer | 2020 | 373.22             | 429.77 | 506.36 | 645.28 | 73.66                 | 84.72 | 100.51 | 127.31 |
| S | State    | Summer | 2021 | 373.74             | 430.59 | 506.97 | 646.50 | 73.73                 | 84.88 | 100.60 | 127.48 |
| S | State    | Summer | 2022 | 373.76             | 430.86 | 506.93 | 646.85 | 73.78                 | 85.02 | 100.68 | 127.63 |
| S | State    | Summer | 2023 | 373.74             | 431.08 | 506.89 | 647.10 | 73.81                 | 85.14 | 100.74 | 127.79 |
| S | State    | Summer | 2024 | 374.69             | 432.36 | 508.16 | 648.94 | 73.83                 | 85.25 | 100.79 | 127.94 |
| S | State    | Summer | 2025 | 374.66             | 432.54 | 508.13 | 649.13 | 73.85                 | 85.35 | 100.83 | 128.09 |
| S | State    | Summer | 2026 | 374.72             | 432.85 | 508.19 | 649.44 | 73.87                 | 85.45 | 100.87 | 128.23 |
| S | State    | Summer | 2027 | 374.71             | 433.04 | 508.16 | 649.59 | 73.88                 | 85.54 | 100.89 | 128.35 |
| S | State    | Summer | 2028 | 374.70             | 433.23 | 508.13 | 649.75 | 73.89                 | 85.62 | 100.91 | 128.46 |
| S | State    | Summer | 2029 | 374.69             | 433.42 | 508.10 | 649.90 | 73.90                 | 85.70 | 100.93 | 128.57 |
| S | State    | Summer | 2030 | 374.67             | 433.61 | 508.07 | 650.06 | 73.90                 | 85.77 | 100.94 | 128.66 |
| S | State    | Summer | 2031 | 375.08             | 434.34 | 508.64 | 651.05 | 73.90                 | 85.85 | 100.95 | 128.76 |
| S | State    | Summer | 2032 | 375.06             | 434.52 | 508.63 | 651.23 | 73.91                 | 85.92 | 100.95 | 128.85 |
| S | State    | Summer | 2033 | 375.04             | 434.68 | 508.63 | 651.41 | 73.91                 | 85.98 | 100.96 | 128.93 |
| S | State    | Summer | 2034 | 375.02             | 434.82 | 508.62 | 651.57 | 73.92                 | 86.04 | 100.97 | 129.01 |
| S | State    | Summer | 2035 | 375.00             | 434.92 | 508.61 | 651.72 | 73.92                 | 86.09 | 100.97 | 129.08 |
| S | State    | Winter | 2010 | 342.17             | 393.38 | 467.85 | 587.98 | 73.17                 | 84.92 | 99.67  | 124.99 |
| S | State    | Winter | 2011 | 342.48             | 393.99 | 467.91 | 588.87 | 73.18                 | 84.72 | 99.73  | 125.19 |
| S | State    | Winter | 2012 | 342.55             | 394.26 | 467.62 | 589.31 | 73.21                 | 84.60 | 99.83  | 125.41 |
| S | State    | Winter | 2013 | 342.64             | 394.51 | 467.33 | 589.70 | 73.26                 | 84.51 | 99.92  | 125.64 |
| S | State    | Winter | 2014 | 342.74             | 394.76 | 467.11 | 590.16 | 73.30                 | 84.45 | 100.01 | 125.88 |
| S | State    | Winter | 2015 | 343.01             | 395.15 | 467.12 | 590.86 | 73.36                 | 84.42 | 100.10 | 126.13 |
| S | State    | Winter | 2016 | 343.16             | 395.44 | 467.02 | 591.41 | 73.43                 | 84.42 | 100.19 | 126.39 |
| S | State    | Winter | 2017 | 343.21             | 395.64 | 466.87 | 591.83 | 73.48                 | 84.43 | 100.27 | 126.64 |
| S | State    | Winter | 2018 | 343.32             | 395.91 | 466.84 | 592.33 | 73.51                 | 84.45 | 100.34 | 126.88 |
| S | State    | Winter | 2019 | 343.00             | 395.72 | 466.30 | 592.12 | 73.56                 | 84.57 | 100.42 | 127.10 |
| S | State    | Winter | 2020 | 343.02             | 395.88 | 466.18 | 592.37 | 73.66                 | 84.72 | 100.51 | 127.31 |
| S | State    | Winter | 2021 | 343.45             | 396.53 | 466.70 | 593.35 | 73.73                 | 84.88 | 100.60 | 127.48 |
| S | State    | Winter | 2022 | 343.41             | 396.67 | 466.63 | 593.54 | 73.78                 | 85.02 | 100.68 | 127.63 |
| S | State    | Winter | 2023 | 343.34             | 396.76 | 466.55 | 593.67 | 73.81                 | 85.14 | 100.74 | 127.79 |
| S | State    | Winter | 2024 | 344.14             | 397.81 | 467.67 | 595.27 | 73.83                 | 85.25 | 100.79 | 127.94 |
| S | State    | Winter | 2025 | 344.06             | 397.86 | 467.59 | 595.37 | 73.85                 | 85.35 | 100.83 | 128.09 |
| S | State    | Winter | 2026 | 344.06             | 398.05 | 467.58 | 595.60 | 73.87                 | 85.45 | 100.87 | 128.23 |
| S | State    | Winter | 2027 | 344.00             | 398.13 | 467.50 | 595.70 | 73.88                 | 85.54 | 100.89 | 128.35 |
| S | State    | Winter | 2028 | 343.93             | 398.21 | 467.41 | 595.79 | 73.89                 | 85.62 | 100.91 | 128.46 |
| S | State    | Winter | 2029 | 343.86             | 398.30 | 467.32 | 595.88 | 73.90                 | 85.70 | 100.93 | 128.57 |

Table 4.4 Alternative CO2 Emission Factors (Non-Pavley)

|   | Location |        |      | CO2 Running (g/VT) |        |        |        | CO2 Starting (g/trip) |       |        |        |
|---|----------|--------|------|--------------------|--------|--------|--------|-----------------------|-------|--------|--------|
|   |          | Season | Year | LDA                | LDT1   | LDT2   | MDV    | LDA                   | LDT1  | LDT2   | MDV    |
| S | State    | Winter | 2030 | 343.78             | 398.37 | 467.23 | 595.97 | 73.90                 | 85.77 | 100.94 | 128.66 |
| S | State    | Winter | 2031 | 344.10             | 398.94 | 467.69 | 596.80 | 73.90                 | 85.85 | 100.95 | 128.76 |
| S | State    | Winter | 2032 | 344.02             | 399.03 | 467.63 | 596.90 | 73.91                 | 85.92 | 100.95 | 128.85 |
| S | State    | Winter | 2033 | 343.95             | 399.11 | 467.57 | 596.99 | 73.91                 | 85.98 | 100.96 | 128.93 |
| S | State    | Winter | 2034 | 343.87             | 399.17 | 467.51 | 597.06 | 73.92                 | 86.04 | 100.97 | 129.01 |
| S | State    | Winter | 2035 | 343.80             | 399.21 | 467.44 | 597.12 | 73.92                 | 86.09 | 100.97 | 129.08 |

Table 5.1 Hearth Usage

| Name                      | Multi or Single Family Home | Wood Hearth % | Natural Gas % | Propane % | No Hearth % | Wood Mass Fireplace | Hours/day Fireplace | Day/year Fireplace | Wood Stove Conventional % | Wood Stove Catalytic % | WoodStove NonCatalytic % | Wood Stove Pellet % | Wood mass Stove | Hours/day Stove | Hours/year Stove | Days/Year Stove |
|---------------------------|-----------------------------|---------------|---------------|-----------|-------------|---------------------|---------------------|--------------------|---------------------------|------------------------|--------------------------|---------------------|-----------------|-----------------|------------------|-----------------|
| Alameda                   | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 0.5                    | 0.5                      | 0                   | 954.8           | 8.5             | 92               | 11              |
| Alameda                   | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| Alpine                    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Alpine                    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Amador                    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Amador                    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Amador County APCD        | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Amador County APCD        | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Antelope Valley APCD      | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Antelope Valley APCD      | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Bay Area AQMD             | MFH                         | 14            | 55            | 0         | 1           | 92.4                | 3.5                 | 4.3                | 0                         | 2                      | 2                        | 0                   | 954.8           | 8.5             | 22               | 3               |
| Bay Area AQMD             | SFH                         | 50            | 55            | 0         | 7           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| Butte                     | MFH                         | 39            | 43            | 0         | 18          | 5158.4              | 3.7                 | 150.0              | 0                         | 9                      | 9                        | 0                   | 3019.2          | 7.3             | 1100             | 150             |
| Butte                     | SFH                         | 39            | 43            | 0         | 18          | 5158.4              | 3.7                 | 150.0              | 0                         | 9                      | 9                        | 0                   | 3019.2          | 7.3             | 1100             | 150             |
| Butte County AQMD         | MFH                         | 39            | 43            | 0         | 18          | 5158.4              | 3.7                 | 150.0              | 0                         | 9                      | 9                        | 0                   | 3019.2          | 7.3             | 1100             | 150             |
| Butte County AQMD         | SFH                         | 39            | 43            | 0         | 18          | 5158.4              | 3.7                 | 150.0              | 0                         | 9                      | 9                        | 0                   | 3019.2          | 7.3             | 1100             | 150             |
| Calaveras                 | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Calaveras                 | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Calaveras County AQMD     | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Calaveras County AQMD     | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Colusa                    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Colusa                    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Colusa County APCD        | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Colusa County APCD        | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Contra Costa              | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 0.5                    | 0.5                      | 0                   | 954.8           | 8.5             | 92               | 11              |
| Contra Costa              | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| Del Norte                 | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Del Norte                 | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| El Dorado County APCD     | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| El Dorado County APCD     | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| El Dorado-Lake Tahoe      | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| El Dorado-Lake Tahoe      | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| El Dorado-Mountain County | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| El Dorado-Mountain County | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Feather River AQMD        | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Feather River AQMD        | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Fresno                    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Fresno                    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Glenn                     | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Glenn                     | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Glenn County APCD         | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Glenn County APCD         | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Great Basin UAPCD         | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Great Basin UAPCD         | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Great Basin Valleys       | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Great Basin Valleys       | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Humboldt                  | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Humboldt                  | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Imperial County APCD      | MFH                         | 0             | 100           | 0         | 0           | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 0.0             | 0.0             | 0                | 0               |
| Imperial County APCD      | SFH                         | 10            | 85            | 0         | 5           | 862.4               | 3.0                 | 82.0               | 0                         | 2.5                    | 2.5                      | 0                   | 1509.2          | 3.0             | 246              | 82              |
| Imperial                  | MFH                         | 0             | 100           | 0         | 0           | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 0.0             | 0.0             | 0                | 0               |
| Imperial                  | SFH                         | 10            | 85            | 0         | 5           | 862.4               | 3.0                 | 82.0               | 0                         | 2.5                    | 2.5                      | 0                   | 1509.2          | 3.0             | 246              | 82              |
| Inyo                      | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Inyo                      | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Kern County APCD          | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Kern County APCD          | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Kern-Mojave Desert        | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |

Table 5.1 Hearth Usage

| Name                         | Multi or Single Family Home | Wood Hearth % | Natural Gas % | Propane % | No Hearth % | Wood Mass Fireplace | Hours/day Fireplace | Day/year Fireplace | Wood Stove Conventional % | Wood Stove Catalytic % | WoodStove NonCatalytic % | Wood Stove Pellet % | Wood mass Stove | Hours/day Stove | Hours/year Stove | Days/Year Stove |
|------------------------------|-----------------------------|---------------|---------------|-----------|-------------|---------------------|---------------------|--------------------|---------------------------|------------------------|--------------------------|---------------------|-----------------|-----------------|------------------|-----------------|
| Kern-Mojave Desert           | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Kern-San Joaquin             | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Kern-San Joaquin             | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Kings                        | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Kings                        | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lake                         | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lake                         | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lake County                  | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lake County                  | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lake County AQMD             | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lake County AQMD             | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lake Tahoe                   | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lake Tahoe                   | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lassen                       | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lassen                       | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lassen County APCD           | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Lassen County APCD           | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Los Angeles-Mojave Desert    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Los Angeles-Mojave Desert    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Los Angeles-South Coast      | MFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| Los Angeles-South Coast      | SFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| Madera                       | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Madera                       | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Marin                        | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 0.5                    | 0.5                      | 0                   | 954.8           | 8.5             | 92               | 11              |
| Marin                        | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| Mariposa                     | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mariposa                     | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mariposa County APCD         | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mariposa County APCD         | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mendocino County AQMD        | MFH                         | 5             | 5             | 0         | 90          | 4992                | 3.0                 | 116.7              | 0                         | 20                     | 20                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino County AQMD        | SFH                         | 35            | 30            | 0         | 35          | 4992                | 3.0                 | 116.7              | 0                         | 40                     | 40                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino-Coastal            | MFH                         | 5             | 5             | 0         | 90          | 4992                | 3.0                 | 116.7              | 0                         | 20                     | 20                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino-Coastal            | SFH                         | 35            | 30            | 0         | 35          | 4992                | 3.0                 | 116.7              | 0                         | 40                     | 40                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino-Inland             | MFH                         | 5             | 5             | 0         | 90          | 4992                | 3.0                 | 116.7              | 0                         | 20                     | 20                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino-Inland             | SFH                         | 35            | 30            | 0         | 35          | 4992                | 3.0                 | 116.7              | 0                         | 40                     | 40                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino-Rural Inland North | MFH                         | 5             | 5             | 0         | 90          | 4992                | 3.0                 | 116.7              | 0                         | 20                     | 20                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino-Rural Inland North | SFH                         | 35            | 30            | 0         | 35          | 4992                | 3.0                 | 116.7              | 0                         | 40                     | 40                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino-Rural Inland South | MFH                         | 5             | 5             | 0         | 90          | 4992                | 3.0                 | 116.7              | 0                         | 20                     | 20                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Mendocino-Rural Inland South | SFH                         | 35            | 30            | 0         | 35          | 4992                | 3.0                 | 116.7              | 0                         | 40                     | 40                       | 0                   | 4896.0          | 3.0             | 350              | 117             |
| Merced                       | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Merced                       | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Modoc                        | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Modoc                        | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Modoc County APCD            | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Modoc County APCD            | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mojave Desert                | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mojave Desert                | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mojave Desert AQMD           | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mojave Desert AQMD           | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mono                         | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mono                         | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Monterey                     | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Monterey                     | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Monterey Bay Unified APCD    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Monterey Bay Unified APCD    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mountain Counties            | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Mountain Counties            | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |

Table 5.1 Hearth Usage

| Name                           | Multi or Single Family Home | Wood Hearth % | Natural Gas % | Propane % | No Hearth % | Wood Mass Fireplace | Hours/day Fireplace | Day/year Fireplace | Wood Stove Conventional % | Wood Stove Catalytic % | WoodStove NonCatalytic % | Wood Stove Pellet % | Wood mass Stove | Hours/day Stove | Hours/year Stove | Days/Year Stove |
|--------------------------------|-----------------------------|---------------|---------------|-----------|-------------|---------------------|---------------------|--------------------|---------------------------|------------------------|--------------------------|---------------------|-----------------|-----------------|------------------|-----------------|
| Napa                           | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 2                      | 2                        | 0                   | 954.8           | 8.5             | 92               | 11              |
| Napa                           | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| Nevada                         | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Nevada                         | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| North Central Coast            | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| North Central Coast            | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| #N/A                           | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| #N/A                           | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| North Coast Unified APCD       | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| North Coast Unified APCD       | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Northeast Plateau              | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Northeast Plateau              | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Northern Sierra AQMD           | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Northern Sierra AQMD           | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Northern Sonoma County APCD    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Northern Sonoma County APCD    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Orange                         | MFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| Orange                         | SFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| Placer County APCD             | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Placer County APCD             | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Placer-Lake Tahoe              | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Placer-Lake Tahoe              | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Placer-Mountain Counties       | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Placer-Mountain Counties       | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Placer-Sacramento              | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Placer-Sacramento              | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Plumas                         | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Plumas                         | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Riverside-Mojave Desert MDAQMD | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Riverside-Mojave Desert MDAQMD | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Riverside-Mojave Desert SCAQMD | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Riverside-Mojave Desert SCAQMD | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Riverside-Salton Sea           | MFH                         | 10            | 80            | 0         | 10          | 457.6               | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 246              | 82              |
| Riverside-Salton Sea           | SFH                         | 10            | 80            | 0         | 10          | 457.6               | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 246              | 82              |
| Riverside-South Coast          | MFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| Riverside-South Coast          | SFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| Sacramento                     | MFH                         | 0             | 0             | 0         | 100         | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 0.0             | 0.0             | 0                | 0               |
| Sacramento                     | SFH                         | 0             | 0             | 0         | 100         | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 0.0             | 0.0             | 0                | 0               |
| Sacramento Metropolitan AQMD   | MFH                         | 0             | 0             | 0         | 100         | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 0.0             | 0.0             | 0                | 0               |
| Sacramento Metropolitan AQMD   | SFH                         | 0             | 0             | 0         | 100         | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 0.0             | 0.0             | 0                | 0               |
| Sacramento Valley              | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Sacramento Valley              | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Salton Sea                     | MFH                         | 0             | 100           | 0         | 0           | 457.6               | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 246              | 82              |
| Salton Sea                     | SFH                         | 10            | 85            | 0         | 5           | 457.6               | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 246              | 82              |
| San Benito                     | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Benito                     | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Bernardino-Mojave Desert   | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Bernardino-Mojave Desert   | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Bernardino-South Coast     | MFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| San Bernardino-South Coast     | SFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| San Diego                      | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Diego                      | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Diego                      | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Diego                      | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Diego County APCD          | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Diego County APCD          | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| #N/A                           | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 0.5                    | 0.5                      | 0                   | 954.8           | 8.5             | 92               | 11              |

Table 5.1 Hearth Usage

| Name                                    | Multi or Single Family Home | Wood Hearth % | Natural Gas % | Propane % | No Hearth % | Wood Mass Fireplace | Hours/day Fireplace | Day/year Fireplace | Wood Stove Conventional % | Wood Stove Catalytic % | WoodStove NonCatalytic % | Wood Stove Pellet % | Wood mass Stove | Hours/day Stove | Hours/year Stove | Days/Year Stove |
|-----------------------------------------|-----------------------------|---------------|---------------|-----------|-------------|---------------------|---------------------|--------------------|---------------------------|------------------------|--------------------------|---------------------|-----------------|-----------------|------------------|-----------------|
| #N/A                                    | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| San Francisco Bay Area                  | MFH                         | 14            | 55            | 0         | 1           | 92.4                | 3.5                 | 4.3                | 0                         | 2                      | 2                        | 0                   | 954.8           | 8.5             | 22               | 3               |
| San Francisco Bay Area                  | SFH                         | 50            | 55            | 0         | 7           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| San Joaquin                             | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Joaquin                             | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Joaquin Valley                      | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Joaquin Valley                      | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Joaquin Valley Unified APCD         | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| San Joaquin Valley Unified APCD         | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| #N/A                                    | MFH                         | 0             | 0             | 0         | 0           | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 2016.5          | 3.0             | 180              | 60              |
| #N/A                                    | SFH                         | 0             | 0             | 0         | 0           | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 2016.5          | 3.0             | 180              | 60              |
| San Luis Obispo County APCD             | MFH                         | 0             | 0             | 0         | 0           | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 2016.5          | 3.0             | 180              | 60              |
| San Luis Obispo County APCD             | SFH                         | 0             | 0             | 0         | 0           | 0                   | 0.0                 | 0.0                | 0                         | 0                      | 0                        | 0                   | 2016.5          | 3.0             | 180              | 60              |
| #N/A                                    | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 0.5                    | 0.5                      | 0                   | 954.8           | 8.5             | 92               | 11              |
| #N/A                                    | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| Santa Barbara County APCD               | MFH                         | 0             | 0             | 0         | 100         | 0                   | 3.0                 | 82.0               | 0                         | 0                      | 0                        | 0                   | 0.0             | 3.0             | 246              | 82              |
| Santa Barbara County APCD               | SFH                         | 0             | 0             | 0         | 100         | 0                   | 3.0                 | 82.0               | 0                         | 0                      | 0                        | 0                   | 0.0             | 3.0             | 246              | 82              |
| Santa Barbara-North of Santa Ynez       | MFH                         | 0             | 0             | 0         | 100         | 0                   | 3.0                 | 82.0               | 0                         | 0                      | 0                        | 0                   | 0.0             | 3.0             | 246              | 82              |
| Santa Barbara-North of Santa Ynez       | SFH                         | 0             | 0             | 0         | 100         | 0                   | 3.0                 | 82.0               | 0                         | 0                      | 0                        | 0                   | 0.0             | 3.0             | 246              | 82              |
| Santa Barbara-South of Santa Ynez Range | MFH                         | 0             | 0             | 0         | 100         | 0                   | 3.0                 | 82.0               | 0                         | 0                      | 0                        | 0                   | 0.0             | 3.0             | 246              | 82              |
| Santa Barbara-South of Santa Ynez Range | SFH                         | 0             | 0             | 0         | 100         | 0                   | 3.0                 | 82.0               | 0                         | 0                      | 0                        | 0                   | 0.0             | 3.0             | 246              | 82              |
| Santa Clara                             | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 0.5                    | 0.5                      | 0                   | 954.8           | 8.5             | 92               | 11              |
| Santa Clara                             | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| Santa Cruz                              | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Santa Cruz                              | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| #N/A                                    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| #N/A                                    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Shasta County AQMD                      | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Shasta County AQMD                      | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Sierra                                  | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Sierra                                  | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Siskiyou                                | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Siskiyou                                | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Siskiyou County APCD                    | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Siskiyou County APCD                    | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Solano-San Francisco                    | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 0.5                    | 0.5                      | 0                   | 954.8           | 8.5             | 92               | 11              |
| Solano-San Francisco                    | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| Solano-San Joaquin                      | MFH                         | 35            | 55            | 0         | 10          | 4558.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 4558.4          | 3.0             | 246              | 82              |
| Solano-San Joaquin                      | SFH                         | 31            |               | 0         | 69          | 770                 | 3.0                 | 82.0               | 0                         | 2.5                    | 2.5                      | 0                   | 4620.0          | 3.0             | 246              | 82              |
| Sonoma-North Coast                      | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Sonoma-North Coast                      | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Sonoma-San Francisco                    | MFH                         | 14            | 55            | 0         | 31          | 92.4                | 3.5                 | 4.3                | 0                         | 0.5                    | 0.5                      | 0                   | 954.8           | 8.5             | 92               | 11              |
| Sonoma-San Francisco                    | SFH                         | 45            | 55            | 0         | 0           | 215.6               | 3.5                 | 6.3                | 0                         | 3.5                    | 3.5                      | 0                   | 1355.2          | 8.5             | 223              | 26              |
| South Central Coast                     | MFH                         | 0             | 0             | 0         | 0           | 3078.4              | 3.0                 | 82.0               | 0                         | 0                      | 0                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| South Central Coast                     | SFH                         | 0             | 0             | 0         | 0           | 3078.4              | 3.0                 | 82.0               | 0                         | 0                      | 0                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| South Coast                             | MFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| South Coast                             | SFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| South Coast AQMD                        | MFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| South Coast AQMD                        | SFH                         | 5             | 85            | 0         | 10          | 1019.2              | 3.0                 | 25.0               | 0                         | 5                      | 5                        | 0                   | 999.6           | 3.0             | 75               | 25              |
| Stanislaus                              | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Stanislaus                              | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Statewide                               | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Statewide                               | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Sutter                                  | MFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| Sutter                                  | SFH                         | 35            | 55            | 0         | 10          | 3078.4              | 3.0                 | 82.0               | 0                         | 5                      | 5                        | 0                   | 3019.2          | 3.0             | 246              | 82              |
| #N/A                                    | MFH                         | 20            | 20            | 0         | 60          | 4558.4              | 3.0                 | 82.0               | 0                         | 30                     | 30                       | 0                   | 4558.4          | 3.0             | 246              | 82              |
| #N/A                                    | SFH                         | 20            | 20            | 0         | 60          | 4558.4              | 3.0                 | 82.0               | 0                         | 30                     | 30                       | 0                   | 4558.4          | 3.0             | 246              | 82              |



Table 5.1 Hearth Usage

| Name                 | Multi or<br>Single<br>Family<br>Home | Wood<br>Hearth<br>% | Natural<br>Gas % | Propane<br>% | No<br>Hearth<br>% | Wood<br>Mass<br>Fireplace | Hours/day<br>Fireplace | Day/year<br>Fireplace | Wood Stove<br>Conventional<br>% | Wood Stove<br>Catalytic % | WoodStove<br>NonCatalytic % | Wood Stove<br>Pellet % | Wood<br>mass<br>Stove | Hours/day<br>Stove | Hours/year<br>Stove | Days/Year<br>Stove |
|----------------------|--------------------------------------|---------------------|------------------|--------------|-------------------|---------------------------|------------------------|-----------------------|---------------------------------|---------------------------|-----------------------------|------------------------|-----------------------|--------------------|---------------------|--------------------|
| Tehama County APCD   | MFH                                  | 20                  | 20               | 0            | 60                | 4558.4                    | 3.0                    | 82.0                  | 0                               | 30                        | 30                          | 0                      | 4558.4                | 3.0                | 246                 | 82                 |
| Tehama County APCD   | SFH                                  | 20                  | 20               | 0            | 60                | 4558.4                    | 3.0                    | 82.0                  | 0                               | 30                        | 30                          | 0                      | 4558.4                | 3.0                | 246                 | 82                 |
| Trinity              | MFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| Trinity              | SFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| #N/A                 | MFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| #N/A                 | SFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| Tuolumne             | MFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| Tuolumne             | SFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| Tuolumne County APCD | MFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| Tuolumne County APCD | SFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| Ventura              | MFH                                  | 0                   | 0                | 0            | 100               | 0                         | 0.0                    | 0.0                   | 0                               | 0                         | 0                           | 0                      | 0.0                   | 0.0                | 0                   | 0                  |
| Ventura              | SFH                                  | 0                   | 0                | 0            | 100               | 0                         | 0.0                    | 0.0                   | 0                               | 0                         | 0                           | 0                      | 0.0                   | 0.0                | 0                   | 0                  |
| Ventura County APCD  | MFH                                  | 0                   | 0                | 0            | 100               | 0                         | 0.0                    | 0.0                   | 0                               | 0                         | 0                           | 0                      | 0.0                   | 0.0                | 0                   | 0                  |
| Ventura County APCD  | SFH                                  | 0                   | 0                | 0            | 100               | 0                         | 0.0                    | 0.0                   | 0                               | 0                         | 0                           | 0                      | 0.0                   | 0.0                | 0                   | 0                  |
| Yolo                 | MFH                                  | 35                  | 55               | 0            | 10                | 4558.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 4558.4                | 3.0                | 246                 | 82                 |
| Yolo                 | SFH                                  | 31                  |                  | 0            | 69                | 770                       | 3.0                    | 82.0                  | 0                               | 2.5                       | 2.5                         | 0                      | 4620.0                | 3.0                | 246                 | 82                 |
| Yolo/Solano AQMD     | MFH                                  | 35                  | 55               | 0            | 10                | 4558.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 4558.4                | 3.0                | 246                 | 82                 |
| Yolo/Solano AQMD     | SFH                                  | 31                  |                  | 0            | 69                | 770                       | 3.0                    | 82.0                  | 0                               | 2.5                       | 2.5                         | 0                      | 4620.0                | 3.0                | 246                 | 82                 |
| Yuba                 | MFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |
| Yuba                 | SFH                                  | 35                  | 55               | 0            | 10                | 3078.4                    | 3.0                    | 82.0                  | 0                               | 5                         | 5                           | 0                      | 3019.2                | 3.0                | 246                 | 82                 |

**Table 5.2 Hearth Emission Factors**

| Hearth Type             | TOG, lb/ton<br>of dry wood<br>burned | ROG, lb/ton<br>of dry wood<br>burned | CO, lb/ton<br>of dry wood<br>burned | SO <sub>2</sub> , lb/ton<br>of dry wood<br>burned | NO <sub>X</sub> , lb/ton<br>of dry wood<br>burned | PM <sub>10</sub> ,<br>lb/ton of dry<br>wood<br>burned | PM <sub>2.5</sub> ,<br>lb/ton of dry<br>wood<br>burned | PB, lb/ton<br>of dry wood<br>burned | CO <sub>2</sub> -DIO,<br>lb/ton of dry<br>wood<br>burned | CO <sub>2</sub> -NDIO,<br>lb/ton of dry<br>wood<br>burned | CH <sub>4</sub> , lb/ton<br>of dry wood<br>burned | N <sub>2</sub> O, lb/ton<br>of dry wood<br>burned |
|-------------------------|--------------------------------------|--------------------------------------|-------------------------------------|---------------------------------------------------|---------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------|-------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| Woodstoves Conventional | 83                                   | 53                                   | 230.8                               | 0.4                                               | 2.8                                               | 30.6                                                  | 30.6                                                   | 0                                   | 2952                                                     | 0                                                         | 30                                                | 0                                                 |
| Woodstoves Catalytic    | 26.6                                 | 15                                   | 104.4                               | 0.4                                               | 2                                                 | 20.4                                                  | 20.4                                                   | 0                                   | 2952                                                     | 0                                                         | 11.6                                              | 0                                                 |
| Woodstoves Noncatalytic | 28                                   | 12                                   | 140.8                               | 0.4                                               | 2                                                 | 19.6                                                  | 19.6                                                   | 0                                   | 2952                                                     | 0                                                         | 16                                                | 0                                                 |
| Woodstoves Pellet       | 28                                   | 15                                   | 39.4                                | 0.4                                               | 13.8                                              | 4.2                                                   | 4.2                                                    | 0                                   | 2952                                                     | 0                                                         | 16                                                | 0                                                 |
| Wood Fireplace          | 229                                  | 229                                  | 252.6                               | 0.4                                               | 2.6                                               | 34.6                                                  | 34.6                                                   | 0                                   | 3400                                                     | 0                                                         | 0                                                 | 0.3                                               |
| Natural Gas             | 0.01078431                           | 0.01078431                           | 0.00058824                          | 0.09215686                                        | 4.902E-07                                         | 0.00745098                                            | 0.00737255                                             | 0.03921569                          | 0                                                        | 117.647059                                                | 0.0022549                                         | 0.00215686                                        |
| Propane                 | 0.01092896                           | 0.01092896                           | 0.08196721                          |                                                   | 0.1420765                                         | 0.00765027                                            | 0.00765027                                             | 0                                   | 0                                                        | 136.612022                                                | 0.00218579                                        | 0.00983607                                        |
| No Fireplace            | 0                                    | 0                                    | 0                                   | 0                                                 | 0                                                 | 0                                                     | 0                                                      | 0                                   | 0                                                        | 0                                                         | 0                                                 | 0                                                 |

Notes:

1. Values are based on AP-42 emission factors.

itectural Coating Emission Factors

| Location Type | Name                   | CoatingType             | Start Date | End Date   | ROG,<br>g/L | Rule Name | Amended Date |
|---------------|------------------------|-------------------------|------------|------------|-------------|-----------|--------------|
| Air Basin     | Great Basin Valleys    | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Great Basin Valleys    | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Great Basin Valleys    | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Great Basin Valleys    | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake County            | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake County            | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake County            | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake County            | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake Tahoe             | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake Tahoe             | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake Tahoe             | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake Tahoe             | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mojave Desert          | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mojave Desert          | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mojave Desert          | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mojave Desert          | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mountain Counties      | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mountain Counties      | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mountain Counties      | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mountain Counties      | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Central Coast    | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Central Coast    | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Central Coast    | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Central Coast    | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Coast            | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Coast            | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Coast            | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Coast            | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northeast Plateau      | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northeast Plateau      | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northeast Plateau      | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northeast Plateau      | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sacramento Valley      | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sacramento Valley      | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sacramento Valley      | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sacramento Valley      | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Salton Sea             | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Salton Sea             | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Salton Sea             | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Salton Sea             | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Francisco Bay Area | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Francisco Bay Area | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Francisco Bay Area | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Francisco Bay Area | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Joaquin Valley     | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | San Joaquin Valley     | Nonresidential Exterior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | San Joaquin Valley     | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | San Joaquin Valley     | Nonresidential Interior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | San Joaquin Valley     | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | San Joaquin Valley     | Residential Exterior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | San Joaquin Valley     | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | San Joaquin Valley     | Residential Interior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | South Central Coast    | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | South Central Coast    | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | South Central Coast    | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | South Central Coast    | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | South Coast            | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | South Coast            | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | South Coast            | Residential Exterior    | 1/1/1900   | 6/30/2008  | 250         | 1113      |              |
|               | South Coast            | Residential Exterior    | 7/1/2008   | 12/31/3000 | 100         | 1113      |              |
|               | South Coast            | Residential Interior    | 1/1/1900   | 6/30/2008  | 100         | 1113      |              |
|               | South Coast            | Residential Interior    | 7/1/2008   | 12/31/3000 | 50          | 1113      |              |
|               | Amador County APCD     | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Amador County APCD     | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Amador County APCD     | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Amador County APCD     | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Antelope Valley APCD   | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Antelope Valley APCD   | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Antelope Valley APCD   | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Antelope Valley APCD   | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Bay Area AQMD          | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Bay Area AQMD          | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Bay Area AQMD          | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Bay Area AQMD          | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Bay Area AQMD          | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Bay Area AQMD          | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Bay Area AQMD          | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Bay Area AQMD          | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Butte County AQMD      | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Butte County AQMD      | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Butte County AQMD      | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Butte County AQMD      | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Calaveras County AQMD  | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Calaveras County AQMD  | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Calaveras County AQMD  | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Calaveras County AQMD  | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |

itectural Coating Emission Factors

| Location Type | Name                            | CoatingType             | Start Date | End Date   | ROG,<br>g/L | Rule Name | Amended Date |
|---------------|---------------------------------|-------------------------|------------|------------|-------------|-----------|--------------|
| Air District  | Colusa County APCD              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Colusa County APCD              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Colusa County APCD              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Colusa County APCD              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado County APCD           | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado County APCD           | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado County APCD           | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado County APCD           | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Feather River AQMD              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Feather River AQMD              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Feather River AQMD              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Feather River AQMD              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Glenn County APCD               | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Glenn County APCD               | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Glenn County APCD               | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Glenn County APCD               | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Great Basin UAPCD               | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Great Basin UAPCD               | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Great Basin UAPCD               | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Great Basin UAPCD               | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Imperial County APCD            | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | Default   |              |
|               | Imperial County APCD            | Nonresidential Exterior | 1/1/2011   | 12/31/2040 | 150         | R424      | 40232        |
|               | Imperial County APCD            | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | Default   |              |
|               | Imperial County APCD            | Nonresidential Interior | 1/1/2011   | 12/31/2040 | 150         | R424      | 40232        |
|               | Imperial County APCD            | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | Default   |              |
|               | Imperial County APCD            | Residential Exterior    | 1/1/2011   | 12/31/2040 | 100         | R424      | 40232        |
|               | Imperial County APCD            | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | Default   |              |
|               | Imperial County APCD            | Residential Interior    | 1/1/2011   | 12/31/2040 | 100         | R424      | 40232        |
|               | Kern County APCD                | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Kern County APCD                | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Kern County APCD                | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Kern County APCD                | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake County AQMD                | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake County AQMD                | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake County AQMD                | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake County AQMD                | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lassen County APCD              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lassen County APCD              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lassen County APCD              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lassen County APCD              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mariposa County APCD            | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mariposa County APCD            | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mariposa County APCD            | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mariposa County APCD            | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino County AQMD           | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino County AQMD           | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino County AQMD           | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino County AQMD           | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Modoc County APCD               | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Modoc County APCD               | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Modoc County APCD               | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Modoc County APCD               | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mojave Desert AQMD              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mojave Desert AQMD              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mojave Desert AQMD              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mojave Desert AQMD              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Monterey Bay Unified APCD       | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Monterey Bay Unified APCD       | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Monterey Bay Unified APCD       | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Monterey Bay Unified APCD       | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Coast Unified APCD        | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Coast Unified APCD        | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Coast Unified APCD        | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | North Coast Unified APCD        | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northern Sierra AQMD            | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northern Sierra AQMD            | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northern Sierra AQMD            | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northern Sierra AQMD            | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northern Sonoma County APCD     | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northern Sonoma County APCD     | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northern Sonoma County APCD     | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Northern Sonoma County APCD     | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer County APCD              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer County APCD              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer County APCD              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer County APCD              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sacramento Metropolitan AQMD    | Nonresidential Exterior | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Sacramento Metropolitan AQMD    | Nonresidential Exterior | 1/1/2003   | 12/31/2040 | 150         | R442      | 5/24/2001    |
|               | Sacramento Metropolitan AQMD    | Nonresidential Interior | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Sacramento Metropolitan AQMD    | Nonresidential Interior | 1/1/2003   | 12/31/2040 | 150         | R442      | 5/24/2001    |
|               | Sacramento Metropolitan AQMD    | Residential Exterior    | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Sacramento Metropolitan AQMD    | Residential Exterior    | 1/1/2003   | 12/31/2040 | 100         | R442      | 5/24/2001    |
|               | Sacramento Metropolitan AQMD    | Residential Interior    | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Sacramento Metropolitan AQMD    | Residential Interior    | 1/1/2003   | 12/31/2040 | 100         | R442      | 5/24/2001    |
|               | San Diego County APCD           | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego County APCD           | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego County APCD           | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Diego County APCD           | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Joaquin Valley Unified APCD | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | San Joaquin Valley Unified APCD | Nonresidential Exterior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | San Joaquin Valley Unified APCD | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | San Joaquin Valley Unified APCD | Nonresidential Interior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | San Joaquin Valley Unified APCD | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | San Joaquin Valley Unified APCD | Residential Exterior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |

itectural Coating Emission Factors

| Location Type | Name                            | CoatingType             | Start Date | End Date   | ROG,<br>g/L | Rule Name | Amended Date |
|---------------|---------------------------------|-------------------------|------------|------------|-------------|-----------|--------------|
|               | San Joaquin Valley Unified APCD | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | San Joaquin Valley Unified APCD | Residential Interior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | San Luis Obispo County APCD     | Nonresidential Exterior | 1/1/1900   | 12/31/2040 | 250         | R433      | 37341        |
|               | San Luis Obispo County APCD     | Nonresidential Interior | 1/1/1900   | 12/31/2040 | 250         | R433      | 37341        |
|               | San Luis Obispo County APCD     | Residential Exterior    | 1/1/1900   | 12/31/2040 | 250         | R433      | 37341        |
|               | San Luis Obispo County APCD     | Residential Interior    | 1/1/1900   | 12/31/2040 | 250         | R433      | 37341        |
|               | Santa Barbara County APCD       | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 37210        |
|               | Santa Barbara County APCD       | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 37210        |
|               | Santa Barbara County APCD       | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 37210        |
|               | Santa Barbara County APCD       | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 37210        |
|               | Shasta County AQMD              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Shasta County AQMD              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Shasta County AQMD              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Shasta County AQMD              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Siskiyou County APCD            | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Siskiyou County APCD            | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Siskiyou County APCD            | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Siskiyou County APCD            | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | South Coast AQMD                | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | South Coast AQMD                | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | South Coast AQMD                | Residential Exterior    | 1/1/1900   | 6/30/2008  | 250         | 1113      |              |
|               | South Coast AQMD                | Residential Exterior    | 7/1/2008   | 12/31/3000 | 100         | 1113      |              |
|               | South Coast AQMD                | Residential Interior    | 1/1/1900   | 6/30/2008  | 100         | 1113      |              |
|               | South Coast AQMD                | Residential Interior    | 7/1/2008   | 12/31/3000 | 50          | 1113      |              |
|               | Tehama County APCD              | Nonresidential Exterior | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Tehama County APCD              | Nonresidential Exterior | 1/1/2003   | 12/31/2040 | 150         | R4.39     | 37488        |
|               | Tehama County APCD              | Nonresidential Interior | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Tehama County APCD              | Nonresidential Interior | 1/1/2003   | 12/31/2040 | 150         | R4.39     | 37488        |
|               | Tehama County APCD              | Residential Exterior    | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Tehama County APCD              | Residential Exterior    | 1/1/2003   | 12/31/2040 | 100         | R4.39     | 37488        |
|               | Tehama County APCD              | Residential Interior    | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Tehama County APCD              | Residential Interior    | 1/1/2003   | 12/31/2040 | 100         | R4.39     | 37488        |
|               | Tuolumne County APCD            | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Tuolumne County APCD            | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Tuolumne County APCD            | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Tuolumne County APCD            | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Ventura County APCD             | Nonresidential Exterior | 1/1/1900   | 12/31/2003 | 250         | Default   |              |
|               | Ventura County APCD             | Nonresidential Exterior | 1/1/2004   | 1/11/2010  | 150         | R74.2     | 40190        |
|               | Ventura County APCD             | Nonresidential Exterior | 1/12/2010  | 12/31/3000 | 250         | R74.2     | 40190        |
|               | Ventura County APCD             | Nonresidential Interior | 1/1/1900   | 12/31/2003 | 250         | Default   |              |
|               | Ventura County APCD             | Nonresidential Interior | 1/1/2004   | 1/11/2010  | 150         | R74.2     | 40190        |
|               | Ventura County APCD             | Nonresidential Interior | 1/12/2010  | 12/31/3000 | 250         | R74.2     | 40190        |
|               | Ventura County APCD             | Residential Exterior    | 1/1/1900   | 12/31/2003 | 250         | Default   |              |
|               | Ventura County APCD             | Residential Exterior    | 1/1/2004   | 1/11/2010  | 100         | R74.2     | 40190        |
|               | Ventura County APCD             | Residential Exterior    | 1/12/2010  | 12/31/3000 | 100         | R74.2     | 40190        |
|               | Ventura County APCD             | Residential Interior    | 1/1/1900   | 12/31/2003 | 250         | Default   |              |
|               | Ventura County APCD             | Residential Interior    | 1/1/2004   | 1/11/2010  | 100         | R74.2     | 40190        |
|               | Ventura County APCD             | Residential Interior    | 1/12/2010  | 12/31/3000 | 75          | R74.2     | 40190        |
|               | Yolo/Solano AQMD                | Nonresidential Exterior | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Yolo/Solano AQMD                | Nonresidential Exterior | 1/1/2003   | 12/31/2040 | 150         | R2-14     | 37209        |
|               | Yolo/Solano AQMD                | Nonresidential Interior | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Yolo/Solano AQMD                | Nonresidential Interior | 1/1/2003   | 12/31/2040 | 150         | R2-14     | 37209        |
|               | Yolo/Solano AQMD                | Residential Exterior    | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Yolo/Solano AQMD                | Residential Exterior    | 1/1/2003   | 12/31/2040 | 100         | R2-14     | 37209        |
|               | Yolo/Solano AQMD                | Residential Interior    | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Yolo/Solano AQMD                | Residential Interior    | 1/1/2003   | 12/31/2040 | 100         | R2-14     | 37209        |
|               | Alameda                         | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Alameda                         | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Alameda                         | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Alameda                         | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Alameda                         | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Alameda                         | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Alameda                         | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Alameda                         | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Alpine                          | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Alpine                          | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Alpine                          | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Alpine                          | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Amador                          | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Amador                          | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Amador                          | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Amador                          | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Butte                           | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Butte                           | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Butte                           | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Butte                           | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Calaveras                       | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Calaveras                       | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Calaveras                       | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Calaveras                       | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Colusa                          | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Colusa                          | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Colusa                          | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Colusa                          | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Contra Costa                    | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Contra Costa                    | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 7/1/2009     |
|               | Contra Costa                    | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Contra Costa                    | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 7/1/2009     |
|               | Contra Costa                    | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Contra Costa                    | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 7/1/2009     |
|               | Contra Costa                    | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Contra Costa                    | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 7/1/2009     |
|               | Del Norte                       | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Del Norte                       | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |

itectural Coating Emission Factors

| Location Type | Name                      | CoatingType             | Start Date | End Date   | ROG,<br>g/L | Rule Name | Amended Date |
|---------------|---------------------------|-------------------------|------------|------------|-------------|-----------|--------------|
|               | Del Norte                 | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Del Norte                 | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado-Lake Tahoe      | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado-Lake Tahoe      | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado-Lake Tahoe      | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado-Lake Tahoe      | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado-Mountain County | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado-Mountain County | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado-Mountain County | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | El Dorado-Mountain County | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Fresno                    | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Fresno                    | Nonresidential Exterior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Fresno                    | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Fresno                    | Nonresidential Interior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Fresno                    | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Fresno                    | Residential Exterior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Fresno                    | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Fresno                    | Residential Interior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Glenn                     | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Glenn                     | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Glenn                     | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Glenn                     | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Humboldt                  | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Humboldt                  | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Humboldt                  | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Humboldt                  | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Imperial                  | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | Default   |              |
|               | Imperial                  | Nonresidential Exterior | 1/1/2011   | 12/31/2040 | 150         | R424      | 40232        |
|               | Imperial                  | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | Default   |              |
|               | Imperial                  | Nonresidential Interior | 1/1/2011   | 12/31/2040 | 150         | R424      | 40232        |
|               | Imperial                  | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | Default   |              |
|               | Imperial                  | Residential Exterior    | 1/1/2011   | 12/31/2040 | 100         | R424      | 40232        |
|               | Imperial                  | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | Default   |              |
|               | Imperial                  | Residential Interior    | 1/1/2011   | 12/31/2040 | 100         | R424      | 40232        |
|               | Inyo                      | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Inyo                      | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Inyo                      | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Inyo                      | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Kern-Mojave Desert        | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Kern-Mojave Desert        | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Kern-Mojave Desert        | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Kern-Mojave Desert        | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Kern-San Joaquin          | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Kern-San Joaquin          | Nonresidential Exterior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Kern-San Joaquin          | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Kern-San Joaquin          | Nonresidential Interior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Kern-San Joaquin          | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Kern-San Joaquin          | Residential Exterior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Kern-San Joaquin          | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Kern-San Joaquin          | Residential Interior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Kings                     | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Kings                     | Nonresidential Exterior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Kings                     | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Kings                     | Nonresidential Interior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Kings                     | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Kings                     | Residential Exterior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Kings                     | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Kings                     | Residential Interior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Lake                      | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake                      | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake                      | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lake                      | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lassen                    | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lassen                    | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lassen                    | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Lassen                    | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Los Angeles-Mojave Desert | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Los Angeles-Mojave Desert | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Los Angeles-Mojave Desert | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Los Angeles-Mojave Desert | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Los Angeles-South Coast   | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | Los Angeles-South Coast   | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | Los Angeles-South Coast   | Residential Exterior    | 1/1/1900   | 6/30/2008  | 250         | 1113      |              |
|               | Los Angeles-South Coast   | Residential Exterior    | 7/1/2008   | 12/31/3000 | 100         | 1113      |              |
|               | Los Angeles-South Coast   | Residential Interior    | 1/1/1900   | 6/30/2008  | 100         | 1113      |              |
|               | Los Angeles-South Coast   | Residential Interior    | 7/1/2008   | 12/31/3000 | 50          | 1113      |              |
|               | Madera                    | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Madera                    | Nonresidential Exterior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Madera                    | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 12/17/2009   |
|               | Madera                    | Nonresidential Interior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 12/17/2009   |
|               | Madera                    | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Madera                    | Residential Exterior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Madera                    | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Madera                    | Residential Interior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Marin                     | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Marin                     | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Marin                     | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Marin                     | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Marin                     | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Marin                     | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Marin                     | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Marin                     | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Mariposa                  | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mariposa                  | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |

itectural Coating Emission Factors

| Location Type | Name                           | CoatingType             | Start Date | End Date   | ROG,<br>g/L | Rule Name | Amended Date |
|---------------|--------------------------------|-------------------------|------------|------------|-------------|-----------|--------------|
| Counties      | Mariposa                       | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mariposa                       | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Coastal              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Coastal              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Coastal              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Coastal              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Inland               | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Inland               | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Inland               | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Inland               | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Rural Inland North   | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Rural Inland North   | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Rural Inland North   | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Rural Inland North   | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Rural Inland South   | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Rural Inland South   | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Rural Inland South   | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mendocino-Rural Inland South   | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Merced                         | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Merced                         | Nonresidential Exterior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Merced                         | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Merced                         | Nonresidential Interior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Merced                         | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Merced                         | Residential Exterior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Merced                         | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | Merced                         | Residential Interior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | Modoc                          | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Modoc                          | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Modoc                          | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Modoc                          | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mono                           | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mono                           | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mono                           | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Mono                           | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Monterey                       | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Monterey                       | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Monterey                       | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Monterey                       | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Napa                           | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Napa                           | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Napa                           | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Napa                           | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Napa                           | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Napa                           | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Napa                           | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Napa                           | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Nevada                         | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Nevada                         | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Nevada                         | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Nevada                         | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Orange                         | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | Orange                         | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | Orange                         | Residential Exterior    | 1/1/1900   | 6/30/2008  | 250         | 1113      |              |
|               | Orange                         | Residential Exterior    | 7/1/2008   | 12/31/3000 | 100         | 1113      |              |
|               | Orange                         | Residential Interior    | 1/1/1900   | 6/30/2008  | 100         | 1113      |              |
|               | Orange                         | Residential Interior    | 7/1/2008   | 12/31/3000 | 50          | 1113      |              |
|               | Placer-Lake Tahoe              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Lake Tahoe              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Lake Tahoe              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Lake Tahoe              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Mountain Counties       | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Mountain Counties       | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Mountain Counties       | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Mountain Counties       | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Sacramento              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Sacramento              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Sacramento              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Placer-Sacramento              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Plumas                         | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Plumas                         | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Plumas                         | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Plumas                         | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-Mojave Desert MDAQMD | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-Mojave Desert MDAQMD | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-Mojave Desert MDAQMD | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-Mojave Desert MDAQMD | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-Mojave Desert SCAQMD | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | Riverside-Mojave Desert SCAQMD | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | Riverside-Mojave Desert SCAQMD | Residential Exterior    | 1/1/1900   | 6/30/2008  | 250         | 1113      |              |
|               | Riverside-Mojave Desert SCAQMD | Residential Exterior    | 7/1/2008   | 12/31/3000 | 100         | 1113      |              |
|               | Riverside-Mojave Desert SCAQMD | Residential Interior    | 1/1/1900   | 6/30/2008  | 100         | 1113      |              |
|               | Riverside-Mojave Desert SCAQMD | Residential Interior    | 7/1/2008   | 12/31/3000 | 50          | 1113      |              |
|               | Riverside-Salton Sea           | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-Salton Sea           | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-Salton Sea           | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-Salton Sea           | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Riverside-South Coast          | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | Riverside-South Coast          | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | Riverside-South Coast          | Residential Exterior    | 1/1/1900   | 6/30/2008  | 250         | 1113      |              |
|               | Riverside-South Coast          | Residential Exterior    | 7/1/2008   | 12/31/3000 | 100         | 1113      |              |
|               | Riverside-South Coast          | Residential Interior    | 1/1/1900   | 6/30/2008  | 100         | 1113      |              |
|               | Riverside-South Coast          | Residential Interior    | 7/1/2008   | 12/31/3000 | 50          | 1113      |              |
|               | Sacramento                     | Nonresidential Exterior | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Sacramento                     | Nonresidential Exterior | 1/1/2003   | 12/31/2040 | 150         | R442      | 5/24/2001    |

itectural Coating Emission Factors

| Location Type | Name                                    | CoatingType             | Start Date | End Date   | ROG,<br>g/L | Rule Name | Amended Date |
|---------------|-----------------------------------------|-------------------------|------------|------------|-------------|-----------|--------------|
|               | Sacramento                              | Nonresidential Interior | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Sacramento                              | Nonresidential Interior | 1/1/2003   | 12/31/2040 | 150         | R442      | 5/24/2001    |
|               | Sacramento                              | Residential Exterior    | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Sacramento                              | Residential Exterior    | 1/1/2003   | 12/31/2040 | 100         | R442      | 5/24/2001    |
|               | Sacramento                              | Residential Interior    | 1/1/1900   | 12/31/2002 | 250         | Default   |              |
|               | Sacramento                              | Residential Interior    | 1/1/2003   | 12/31/2040 | 100         | R442      | 37035        |
|               | San Benito                              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Benito                              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Benito                              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Benito                              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Bernardino-Mojave Desert            | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Bernardino-Mojave Desert            | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Bernardino-Mojave Desert            | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Bernardino-Mojave Desert            | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | San Bernardino-South Coast              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | San Bernardino-South Coast              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | 1113      |              |
|               | San Bernardino-South Coast              | Residential Exterior    | 1/1/1900   | 6/30/2008  | 250         | 1113      |              |
|               | San Bernardino-South Coast              | Residential Exterior    | 7/1/2008   | 12/31/3000 | 100         | 1113      |              |
|               | San Bernardino-South Coast              | Residential Interior    | 1/1/1900   | 6/30/2008  | 100         | 1113      |              |
|               | San Bernardino-South Coast              | Residential Interior    | 7/1/2008   | 12/31/3000 | 50          | 1113      |              |
|               | San Francisco                           | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | San Francisco                           | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | San Francisco                           | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | San Francisco                           | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | San Francisco                           | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | San Francisco                           | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | San Francisco                           | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | San Francisco                           | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | San Joaquin                             | Nonresidential Exterior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | San Joaquin                             | Nonresidential Exterior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | San Joaquin                             | Nonresidential Interior | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | San Joaquin                             | Nonresidential Interior | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | San Joaquin                             | Residential Exterior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | San Joaquin                             | Residential Exterior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | San Joaquin                             | Residential Interior    | 1/1/1900   | 12/31/2010 | 250         | R4601     | 40164        |
|               | San Joaquin                             | Residential Interior    | 1/1/2011   | 12/31/3000 | 150         | R4601     | 40164        |
|               | San Joaquin                             | Nonresidential Exterior | 1/1/1900   | 12/31/2040 | 250         | R433      | 37341        |
|               | San Joaquin                             | Nonresidential Interior | 1/1/1900   | 12/31/2040 | 250         | R433      | 37341        |
|               | San Joaquin                             | Residential Exterior    | 1/1/1900   | 12/31/2040 | 250         | R433      | 37341        |
|               | San Joaquin                             | Residential Interior    | 1/1/1900   | 12/31/2040 | 250         | R433      | 37341        |
|               | San Joaquin                             | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | San Joaquin                             | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 7/1/2009     |
|               | San Joaquin                             | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | San Joaquin                             | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 7/1/2009     |
|               | San Joaquin                             | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | San Joaquin                             | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 7/1/2009     |
|               | San Joaquin                             | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | San Joaquin                             | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 7/1/2009     |
|               | Santa Barbara-North of Santa Ynez       | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 37210        |
|               | Santa Barbara-North of Santa Ynez       | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 37210        |
|               | Santa Barbara-North of Santa Ynez       | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 37210        |
|               | Santa Barbara-North of Santa Ynez       | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 37210        |
|               | Santa Barbara-South of Santa Ynez Range | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 11/15/2001   |
|               | Santa Barbara-South of Santa Ynez Range | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 11/15/2001   |
|               | Santa Barbara-South of Santa Ynez Range | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 11/15/2001   |
|               | Santa Barbara-South of Santa Ynez Range | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Rule 323  | 11/15/2001   |
|               | Santa Clara                             | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Santa Clara                             | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Santa Clara                             | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Santa Clara                             | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Santa Clara                             | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Santa Clara                             | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 7/1/2009     |
|               | Santa Clara                             | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Santa Clara                             | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 7/1/2009     |
|               | Santa Cruz                              | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Santa Cruz                              | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Santa Cruz                              | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Santa Cruz                              | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Shasta                                  | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Shasta                                  | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Shasta                                  | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Shasta                                  | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sierra                                  | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sierra                                  | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sierra                                  | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Sierra                                  | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Siskiyou                                | Nonresidential Exterior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Siskiyou                                | Nonresidential Interior | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Siskiyou                                | Residential Exterior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Siskiyou                                | Residential Interior    | 1/1/1900   | 12/31/3000 | 250         | Default   |              |
|               | Solano-San Francisco                    | Nonresidential Exterior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Solano-San Francisco                    | Nonresidential Exterior | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Solano-San Francisco                    | Nonresidential Interior | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Solano-San Francisco                    | Nonresidential Interior | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Solano-San Francisco                    | Residential Exterior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Solano-San Francisco                    | Residential Exterior    | 1/1/2012   | 12/31/2040 | 150         | REG8.3    | 39995        |
|               | Solano-San Francisco                    | Residential Interior    | 1/1/1900   | 12/31/2011 | 250         | Default   |              |
|               | Solano-San Francisco                    | Residential Interior    | 1/1/2012   | 12/31/2040 | 100         | REG8.3    | 39995        |
|               | Solano-San Joaquin                      | Nonresidential Exterior | 1          | 37621      | 250         | Default   |              |
|               | Solano-San Joaquin                      | Nonresidential Exterior | 37622      | 51501      | 150         | R2-14     | 37209        |
|               | Solano-San Joaquin                      | Nonresidential Interior | 1          | 37621      | 250         | Default   |              |
|               | Solano-San Joaquin                      | Nonresidential Interior | 37622      | 51501      | 150         | R2-14     | 37209        |
|               | Solano-San Joaquin                      | Residential Exterior    | 1          | 37621      | 250         | Default   |              |
|               | Solano-San Joaquin                      | Residential Exterior    | 37622      | 51501      | 100         | R2-14     | 37209        |



itectural Coating Emission Factors

| Location Type | Name                 | CoatingType             | Start Date | End Date | ROG,<br>g/L | Rule Name | Amended Date |
|---------------|----------------------|-------------------------|------------|----------|-------------|-----------|--------------|
|               | Solano-San Joaquin   | Residential Interior    | 1          | 37621    | 250         | Default   |              |
|               | Solano-San Joaquin   | Residential Interior    | 37622      | 51501    | 100         | R2-14     | 37209        |
|               | Sonoma-North Coast   | Nonresidential Exterior | 1          | 402133   | 250         | Default   |              |
|               | Sonoma-North Coast   | Nonresidential Interior | 1          | 402133   | 250         | Default   |              |
|               | Sonoma-North Coast   | Residential Exterior    | 1          | 402133   | 250         | Default   |              |
|               | Sonoma-North Coast   | Residential Interior    | 1          | 402133   | 250         | Default   |              |
|               | Sonoma-San Francisco | Nonresidential Exterior | 1          | 40908    | 250         | Default   |              |
|               | Sonoma-San Francisco | Nonresidential Exterior | 40909      | 51501    | 150         | REG8.3    | 39995        |
|               | Sonoma-San Francisco | Nonresidential Interior | 1          | 40908    | 250         | Default   |              |
|               | Sonoma-San Francisco | Nonresidential Interior | 40909      | 51501    | 100         | REG8.3    | 39995        |
|               | Sonoma-San Francisco | Residential Exterior    | 1          | 40908    | 250         | Default   |              |
|               | Sonoma-San Francisco | Residential Exterior    | 40909      | 51501    | 150         | REG8.3    | 39995        |
|               | Sonoma-San Francisco | Residential Interior    | 1          | 40908    | 250         | Default   |              |
|               | Sonoma-San Francisco | Residential Interior    | 40909      | 51501    | 100         | REG8.3    | 39995        |
|               | Stanislaus           | Nonresidential Exterior | 1          | 40543    | 250         | R4601     | 40164        |
|               | Stanislaus           | Nonresidential Exterior | 40544      | 402133   | 150         | R4601     | 40164        |
|               | Stanislaus           | Nonresidential Interior | 1          | 40543    | 250         | R4601     | 40164        |
|               | Stanislaus           | Nonresidential Interior | 40544      | 402133   | 150         | R4601     | 40164        |
|               | Stanislaus           | Residential Exterior    | 1          | 40543    | 250         | R4601     | 40164        |
|               | Stanislaus           | Residential Exterior    | 40544      | 402133   | 150         | R4601     | 40164        |
|               | Stanislaus           | Residential Interior    | 1          | 40543    | 250         | R4601     | 40164        |
|               | Stanislaus           | Residential Interior    | 40544      | 402133   | 150         | R4601     | 40164        |
|               | Sutter               | Nonresidential Exterior | 1          | 402133   | 250         | Default   |              |
|               | Sutter               | Nonresidential Interior | 1          | 402133   | 250         | Default   |              |
|               | Sutter               | Residential Exterior    | 1          | 402133   | 250         | Default   |              |
|               | Sutter               | Residential Interior    | 1          | 402133   | 250         | Default   |              |
|               | Tehama               | Nonresidential Exterior | 1          | 37621    | 250         | Default   |              |
|               | Tehama               | Nonresidential Exterior | 37622      | 51501    | 150         | R4.39     | 37488        |
|               | Tehama               | Nonresidential Interior | 1          | 37621    | 250         | Default   |              |
|               | Tehama               | Nonresidential Interior | 37622      | 51501    | 150         | R4.39     | 37488        |
|               | Tehama               | Residential Exterior    | 1          | 37621    | 250         | Default   |              |
|               | Tehama               | Residential Exterior    | 37622      | 51501    | 100         | R4.39     | 37488        |
|               | Tehama               | Residential Interior    | 1          | 37621    | 250         | Default   |              |
|               | Tehama               | Residential Interior    | 37622      | 51501    | 100         | R4.39     | 37488        |
|               | Trinity              | Nonresidential Exterior | 1          | 402133   | 250         | Default   |              |
|               | Trinity              | Nonresidential Interior | 1          | 402133   | 250         | Default   |              |
|               | Trinity              | Residential Exterior    | 1          | 402133   | 250         | Default   |              |
|               | Trinity              | Residential Interior    | 1          | 402133   | 250         | Default   |              |
|               | Tulare               | Nonresidential Exterior | 1          | 40543    | 250         | R4601     | 40164        |
|               | Tulare               | Nonresidential Exterior | 40544      | 402133   | 150         | R4601     | 40164        |
|               | Tulare               | Nonresidential Interior | 1          | 40543    | 250         | R4601     | 40164        |
|               | Tulare               | Nonresidential Interior | 40544      | 402133   | 150         | R4601     | 40164        |
|               | Tulare               | Residential Exterior    | 1          | 40543    | 250         | R4601     | 40164        |
|               | Tulare               | Residential Exterior    | 40544      | 402133   | 150         | R4601     | 40164        |
|               | Tulare               | Residential Interior    | 1          | 40543    | 250         | R4601     | 40164        |
|               | Tulare               | Residential Interior    | 40544      | 402133   | 150         | R4601     | 40164        |
|               | Tuolumne             | Nonresidential Exterior | 1          | 402133   | 250         | Default   |              |
|               | Tuolumne             | Nonresidential Interior | 1          | 402133   | 250         | Default   |              |
|               | Tuolumne             | Residential Exterior    | 1          | 402133   | 250         | Default   |              |
|               | Tuolumne             | Residential Interior    | 1          | 402133   | 250         | Default   |              |
|               | Ventura              | Nonresidential Exterior | 1          | 37986    | 250         | Default   |              |
|               | Ventura              | Nonresidential Exterior | 37987      | 40189    | 150         | R74.2     | 40190        |
|               | Ventura              | Nonresidential Exterior | 40190      | 402133   | 250         | R74.2     | 40190        |
|               | Ventura              | Nonresidential Interior | 1          | 37986    | 250         | Default   |              |
|               | Ventura              | Nonresidential Interior | 37987      | 40189    | 150         | R74.2     | 40190        |
|               | Ventura              | Nonresidential Interior | 40190      | 402133   | 250         | R74.2     | 40190        |
|               | Ventura              | Residential Exterior    | 1          | 37986    | 250         | Default   |              |
|               | Ventura              | Residential Exterior    | 37987      | 40189    | 100         | R74.2     | 40190        |
|               | Ventura              | Residential Exterior    | 40190      | 402133   | 100         | R74.2     | 40190        |
|               | Ventura              | Residential Interior    | 1          | 37986    | 250         | Default   |              |
|               | Ventura              | Residential Interior    | 37987      | 40189    | 100         | R74.2     | 40190        |
|               | Ventura              | Residential Interior    | 40190      | 402133   | 75          | R74.2     | 40190        |
|               | Yolo                 | Nonresidential Exterior | 1          | 37621    | 250         | Default   |              |
|               | Yolo                 | Nonresidential Exterior | 37622      | 51501    | 150         | R2-14     | 37209        |
|               | Yolo                 | Nonresidential Interior | 1          | 37621    | 250         | Default   |              |
|               | Yolo                 | Nonresidential Interior | 37622      | 51501    | 150         | R2-14     | 37209        |
|               | Yolo                 | Residential Exterior    | 1          | 37621    | 250         | Default   |              |
|               | Yolo                 | Residential Exterior    | 37622      | 51501    | 100         | R2-14     | 37209        |
|               | Yolo                 | Residential Interior    | 1          | 37621    | 250         | Default   |              |
|               | Yolo                 | Residential Interior    | 37622      | 51501    | 100         | R2-14     | 37209        |
|               | Yuba                 | Nonresidential Exterior | 1          | 402133   | 250         | Default   |              |
|               | Yuba                 | Nonresidential Interior | 1          | 402133   | 250         | Default   |              |
|               | Yuba                 | Residential Exterior    | 1          | 402133   | 250         | Default   |              |
|               | Yuba                 | Residential Interior    | 1          | 402133   | 250         | Default   |              |
| Statewide     | Statewide            | Nonresidential Exterior | 1          | 402133   | 250         | Default   |              |
|               | Statewide            | Nonresidential Interior | 1          | 402133   | 250         | Default   |              |
|               | Statewide            | Residential Exterior    | 1          | 402133   | 250         | Default   |              |
|               | Statewide            | Residential Interior    | 1          | 402133   | 250         | Default   |              |

**Table 7.1 Number of Snow and Summer Days**  
Default: 0 Snow Days and 180 Summer Days

| Location Type | Name                            | Number<br>Snow<br>Days | Number<br>Summer<br>Days |
|---------------|---------------------------------|------------------------|--------------------------|
| Air Basin     | Great Basin Valleys             | 0                      | 180                      |
|               | Lake County                     | 0                      | 180                      |
|               | Lake Tahoe                      | 0                      | 180                      |
|               | Mojave Desert                   | 0                      | 180                      |
|               | Mountain Counties               | 0                      | 180                      |
|               | North Central Coast             | 0                      | 180                      |
|               | North Coast                     | 0                      | 180                      |
|               | Northeast Plateau               | 0                      | 180                      |
|               | Sacramento Valley               | 0                      | 180                      |
|               | Salton Sea                      | 0                      | 180                      |
|               | San Diego                       | 0                      | 180                      |
|               | San Francisco Bay Area          | 0                      | 180                      |
|               | San Joaquin Valley              | 0                      | 180                      |
|               | South Central Coast             | 0                      | 180                      |
|               | South Coast                     | 0                      | 365                      |
| Air District  | Amador County APCD              | 0                      | 180                      |
|               | Antelope Valley APCD            | 0                      | 180                      |
|               | Bay Area AQMD                   | 0                      | 180                      |
|               | Butte County AQMD               | 0                      | 180                      |
|               | Calaveras County AQMD           | 0                      | 180                      |
|               | Colusa County APCD              | 0                      | 180                      |
|               | El Dorado County APCD           | 0                      | 180                      |
|               | Feather River AQMD              | 0                      | 180                      |
|               | Glenn County APCD               | 0                      | 180                      |
|               | Great Basin UAPCD               | 0                      | 180                      |
|               | Imperial County APCD            | 0                      | 180                      |
|               | Kern County APCD                | 0                      | 180                      |
|               | Lake County AQMD                | 0                      | 180                      |
|               | Lassen County APCD              | 0                      | 180                      |
|               | Mariposa County APCD            | 0                      | 180                      |
|               | Mendocino County AQMD           | 0                      | 180                      |
|               | Modoc County APCD               | 0                      | 180                      |
|               | Mojave Desert AQMD              | 0                      | 180                      |
|               | Monterey Bay Unified APCD       | 0                      | 180                      |
|               | North Coast Unified APCD        | 0                      | 180                      |
|               | Northern Sierra AQMD            | 0                      | 180                      |
|               | Northern Sonoma County APCD     | 0                      | 180                      |
|               | Placer County APCD              | 0                      | 180                      |
|               | Sacramento Metropolitan AQMD    | 0                      | 180                      |
|               | San Diego County APCD           | 0                      | 180                      |
|               | San Joaquin Valley Unified APCD | 0                      | 180                      |
|               | San Luis Obispo County APCD     | 0                      | 330                      |
|               | Santa Barbara County APCD       | 0                      | 180                      |
|               | Shasta County AQMD              | 0                      | 180                      |
|               | Siskiyou County APCD            | 0                      | 180                      |
|               | South Coast AQMD                | 0                      | 365                      |
|               | Tehama County APCD              | 0                      | 180                      |
|               | Tuolumne County APCD            | 0                      | 180                      |
|               | Ventura County APCD             | 0                      | 180                      |
|               | Yolo/Solano AQMD                | 0                      | 180                      |
|               | Alameda                         | 0                      | 180                      |
|               | Alpine                          | 0                      | 180                      |
|               | Amador                          | 0                      | 180                      |
|               | Butte                           | 0                      | 180                      |
|               | Calaveras                       | 0                      | 180                      |
|               | Colusa                          | 0                      | 180                      |
|               | Contra Costa                    | 0                      | 180                      |
|               | Del Norte                       | 0                      | 180                      |
|               | El Dorado-Lake Tahoe            | 0                      | 180                      |
|               | El Dorado-Mountain County       | 0                      | 180                      |
|               | Fresno                          | 0                      | 180                      |
|               | Glenn                           | 0                      | 180                      |
|               | Humboldt                        | 0                      | 180                      |
|               | Imperial                        | 0                      | 180                      |
|               | Inyo                            | 0                      | 180                      |

**Table 7.1 Number of Snow and Summer Days**  
Default: 0 Snow Days and 180 Summer Days

| Location Type | Name                                    | Number<br>Snow<br>Days | Number<br>Summer Days |
|---------------|-----------------------------------------|------------------------|-----------------------|
| Counties      | Kern-Mojave Desert                      | 0                      | 180                   |
|               | Kern-San Joaquin                        | 0                      | 180                   |
|               | Kings                                   | 0                      | 180                   |
|               | Lake                                    | 0                      | 180                   |
|               | Lassen                                  | 0                      | 180                   |
|               | Los Angeles-Mojave Desert               | 0                      | 180                   |
|               | Los Angeles-South Coast                 | 0                      | 365                   |
|               | Madera                                  | 0                      | 180                   |
|               | Marin                                   | 0                      | 180                   |
|               | Mariposa                                | 0                      | 180                   |
|               | Mendocino-Coastal                       | 0                      | 180                   |
|               | Mendocino-Inland                        | 0                      | 180                   |
|               | Mendocino-Rural Inland North            | 0                      | 180                   |
|               | Mendocino-Rural Inland South            | 0                      | 180                   |
|               | Merced                                  | 0                      | 180                   |
|               | Modoc                                   | 0                      | 180                   |
|               | Mono                                    | 0                      | 180                   |
|               | Monterey                                | 0                      | 180                   |
|               | Napa                                    | 0                      | 180                   |
|               | Nevada                                  | 0                      | 180                   |
|               | Orange                                  | 0                      | 365                   |
|               | Placer-Lake Tahoe                       | 0                      | 180                   |
|               | Placer-Mountain Counties                | 0                      | 180                   |
|               | Placer-San Joaquin                      | 0                      | 180                   |
|               | Plumas                                  | 0                      | 180                   |
|               | Riverside-Mojave Desert MDAQMD          | 0                      | 180                   |
|               | Riverside-Mojave Desert SCAQMD          | 0                      | 365                   |
|               | Riverside-Salton Sea                    | 0                      | 180                   |
|               | Riverside-South Coast                   | 0                      | 365                   |
|               | Sacramento                              | 0                      | 180                   |
|               | San Benito                              | 0                      | 180                   |
|               | San Bernardino-Mojave Desert            | 0                      | 180                   |
|               | San Bernardino-South Coast              | 0                      | 365                   |
|               | San Diego                               | 0                      | 180                   |
|               | San Francisco                           | 0                      | 180                   |
|               | San Joaquin                             | 0                      | 180                   |
|               | San Luis Obispo                         | 0                      | 330                   |
|               | San Mateo                               | 0                      | 180                   |
|               | Santa Barbara-North of Santa Ynez       | 0                      | 180                   |
|               | Santa Barbara-South of Santa Ynez Range | 0                      | 180                   |
|               | Santa Clara                             | 0                      | 180                   |
|               | Santa Cruz                              | 0                      | 180                   |
|               | Shasta                                  | 0                      | 180                   |
|               | Sierra                                  | 0                      | 180                   |
|               | Siskiyou                                | 0                      | 180                   |
|               | Solano-San Francisco                    | 0                      | 180                   |
|               | Solano-San Joaquin                      | 0                      | 180                   |
|               | Sonoma-North Coast                      | 0                      | 180                   |
|               | Sonoma-San Francisco                    | 0                      | 180                   |
|               | Stanislaus                              | 0                      | 180                   |
|               | Sutter                                  | 0                      | 180                   |
|               | Tehama                                  | 0                      | 180                   |
|               | Trinity                                 | 0                      | 180                   |
|               | Tulare                                  | 0                      | 180                   |
|               | Tuolumne                                | 0                      | 180                   |
|               | Ventura                                 | 0                      | 180                   |
|               | Yolo                                    | 0                      | 180                   |
|               | Yuba                                    | 0                      | 180                   |
| Statewide     | Statewide                               | 0                      | 180                   |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|----------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Chainsaws      | 1990 | G2          | C                         | 0      | 2       | 430.1           | 1525.141        | 2.131            | 0.534            | 7.415             | 7.415              | 884.646          | 36.68            |
| Chainsaws      | 1990 | G2          | C                         | 6      | 15      | 1449.037        | 5141.698        | 9.226            | 2.555            | 35.657            | 35.657             | 4229.983         | 123.578          |
| Chainsaws      | 1990 | G2          | R                         | 0      | 2       | 430.1           | 1525.141        | 2.131            | 0.534            | 7.415             | 7.415              | 884.646          | 36.68            |
| Chainsaws      | 1990 | G2          | R                         | 6      | 15      | 1449.037        | 5141.698        | 9.226            | 2.555            | 35.657            | 35.657             | 4229.983         | 123.578          |
| Chainsaws      | 2000 | G2          | C                         | 0      | 2       | 270.428         | 649.378         | 3.049            | 0.051            | 4.093             | 4.093              | 884.645          | 16.368           |
| Chainsaws      | 2000 | G2          | C                         | 6      | 15      | 1266.497        | 2726.472        | 9.823            | 0.252            | 7.183             | 7.183              | 4229.982         | 76.657           |
| Chainsaws      | 2000 | G2          | R                         | 0      | 2       | 270.428         | 649.378         | 3.049            | 0.051            | 4.093             | 4.093              | 884.645          | 16.368           |
| Chainsaws      | 2000 | G2          | R                         | 6      | 15      | 1266.497        | 2726.472        | 9.823            | 0.252            | 7.183             | 7.183              | 4229.982         | 76.657           |
| Chainsaws      | 2005 | G2          | C                         | 0      | 2       | 207.911         | 510.872         | 2.825            | 0.036            | 2.641             | 2.641              | 884.646          | 12.922           |
| Chainsaws      | 2005 | G2          | C                         | 6      | 15      | 848.205         | 2184.762        | 13.204           | 0.174            | 5.288             | 5.288              | 4229.983         | 52.72            |
| Chainsaws      | 2005 | G2          | R                         | 0      | 2       | 207.911         | 510.872         | 2.825            | 0.036            | 2.641             | 2.641              | 884.646          | 12.922           |
| Chainsaws      | 2005 | G2          | R                         | 6      | 15      | 848.205         | 2184.762        | 13.204           | 0.174            | 5.288             | 5.288              | 4229.983         | 52.72            |
| Chainsaws      | 2010 | G2          | C                         | 0      | 2       | 162.731         | 408.317         | 2.858            | 0.036            | 1.705             | 1.705              | 884.645          | 10.114           |
| Chainsaws      | 2010 | G2          | C                         | 6      | 15      | 766.506         | 1633.987        | 13.859           | 0.174            | 4.103             | 4.103              | 4229.983         | 47.642           |
| Chainsaws      | 2010 | G2          | R                         | 0      | 2       | 162.731         | 408.317         | 2.858            | 0.036            | 1.705             | 1.705              | 884.645          | 10.114           |
| Chainsaws      | 2010 | G2          | R                         | 6      | 15      | 766.506         | 1633.987        | 13.859           | 0.174            | 4.103             | 4.103              | 4229.983         | 47.642           |
| Chainsaws      | 2011 | G2          | C                         | 0      | 2       | 155.394         | 394.431         | 2.878            | 0.036            | 1.522             | 1.522              | 884.646          | 9.658            |
| Chainsaws      | 2011 | G2          | C                         | 6      | 15      | 759.657         | 1622.962        | 13.892           | 0.174            | 3.856             | 3.856              | 4229.983         | 47.216           |
| Chainsaws      | 2011 | G2          | R                         | 0      | 2       | 155.394         | 394.431         | 2.878            | 0.036            | 1.522             | 1.522              | 884.646          | 9.658            |
| Chainsaws      | 2011 | G2          | R                         | 6      | 15      | 759.657         | 1622.962        | 13.892           | 0.174            | 3.856             | 3.856              | 4229.983         | 47.216           |
| Chainsaws      | 2012 | G2          | C                         | 0      | 2       | 149.004         | 383.549         | 2.895            | 0.036            | 1.353             | 1.353              | 884.646          | 9.261            |
| Chainsaws      | 2012 | G2          | C                         | 6      | 15      | 753.368         | 1613.589        | 13.92            | 0.174            | 3.622             | 3.622              | 4229.982         | 46.825           |
| Chainsaws      | 2012 | G2          | R                         | 0      | 2       | 149.004         | 383.549         | 2.895            | 0.036            | 1.353             | 1.353              | 884.646          | 9.261            |
| Chainsaws      | 2012 | G2          | R                         | 6      | 15      | 753.368         | 1613.589        | 13.92            | 0.174            | 3.622             | 3.622              | 4229.982         | 46.825           |
| Chainsaws      | 2013 | G2          | C                         | 0      | 2       | 142.978         | 373.417         | 2.911            | 0.036            | 1.193             | 1.193              | 884.646          | 8.886            |
| Chainsaws      | 2013 | G2          | C                         | 6      | 15      | 747.326         | 1604.617        | 13.946           | 0.174            | 3.399             | 3.399              | 4229.981         | 46.449           |
| Chainsaws      | 2013 | G2          | R                         | 0      | 2       | 142.978         | 373.417         | 2.911            | 0.036            | 1.193             | 1.193              | 884.646          | 8.886            |
| Chainsaws      | 2013 | G2          | R                         | 6      | 15      | 747.326         | 1604.617        | 13.946           | 0.174            | 3.399             | 3.399              | 4229.981         | 46.449           |
| Chainsaws      | 2014 | G2          | C                         | 0      | 2       | 137.47          | 364.196         | 2.923            | 0.036            | 1.045             | 1.045              | 884.646          | 8.544            |
| Chainsaws      | 2014 | G2          | C                         | 6      | 15      | 741.798         | 1596.381        | 13.968           | 0.174            | 3.192             | 3.192              | 4229.983         | 46.106           |
| Chainsaws      | 2014 | G2          | R                         | 0      | 2       | 137.47          | 364.196         | 2.923            | 0.036            | 1.045             | 1.045              | 884.646          | 8.544            |
| Chainsaws      | 2014 | G2          | R                         | 6      | 15      | 741.798         | 1596.381        | 13.968           | 0.174            | 3.192             | 3.192              | 4229.983         | 46.106           |
| Chainsaws      | 2015 | G2          | C                         | 0      | 2       | 132.537         | 355.824         | 2.932            | 0.036            | 0.913             | 0.913              | 884.646          | 8.237            |
| Chainsaws      | 2015 | G2          | C                         | 6      | 15      | 736.856         | 1588.938        | 13.984           | 0.174            | 3.007             | 3.007              | 4229.983         | 45.799           |
| Chainsaws      | 2015 | G2          | R                         | 0      | 2       | 132.537         | 355.824         | 2.932            | 0.036            | 0.913             | 0.913              | 884.646          | 8.237            |
| Chainsaws      | 2015 | G2          | R                         | 6      | 15      | 736.856         | 1588.938        | 13.984           | 0.174            | 3.007             | 3.007              | 4229.983         | 45.799           |
| Chainsaws      | 2016 | G2          | C                         | 0      | 2       | 129.473         | 350.338         | 2.924            | 0.036            | 0.836             | 0.836              | 884.646          | 8.047            |
| Chainsaws      | 2016 | G2          | C                         | 6      | 15      | 733.89          | 1584.315        | 13.978           | 0.174            | 2.902             | 2.902              | 4229.984         | 45.614           |
| Chainsaws      | 2016 | G2          | R                         | 0      | 2       | 129.473         | 350.338         | 2.924            | 0.036            | 0.836             | 0.836              | 884.646          | 8.047            |
| Chainsaws      | 2016 | G2          | R                         | 6      | 15      | 733.89          | 1584.315        | 13.978           | 0.174            | 2.902             | 2.902              | 4229.984         | 45.614           |
| Chainsaws      | 2017 | G2          | C                         | 0      | 2       | 127.281         | 346.187         | 2.909            | 0.036            | 0.785             | 0.785              | 884.646          | 7.911            |
| Chainsaws      | 2017 | G2          | C                         | 6      | 15      | 731.828         | 1580.963        | 13.963           | 0.174            | 2.834             | 2.834              | 4229.982         | 45.486           |
| Chainsaws      | 2017 | G2          | R                         | 0      | 2       | 127.281         | 346.187         | 2.909            | 0.036            | 0.785             | 0.785              | 884.646          | 7.911            |
| Chainsaws      | 2017 | G2          | R                         | 6      | 15      | 731.828         | 1580.963        | 13.963           | 0.174            | 2.834             | 2.834              | 4229.982         | 45.486           |
| Chainsaws      | 2018 | G2          | C                         | 0      | 2       | 125.383         | 342.558         | 2.894            | 0.036            | 0.741             | 0.741              | 884.646          | 7.793            |
| Chainsaws      | 2018 | G2          | C                         | 6      | 15      | 730.055         | 1578.05         | 13.946           | 0.174            | 2.775             | 2.775              | 4229.982         | 45.376           |
| Chainsaws      | 2018 | G2          | R                         | 0      | 2       | 125.383         | 342.558         | 2.894            | 0.036            | 0.741             | 0.741              | 884.646          | 7.793            |
| Chainsaws      | 2018 | G2          | R                         | 6      | 15      | 730.055         | 1578.05         | 13.946           | 0.174            | 2.775             | 2.775              | 4229.982         | 45.376           |
| Chainsaws      | 2019 | G2          | C                         | 0      | 2       | 123.704         | 339.377         | 2.879            | 0.036            | 0.702             | 0.702              | 884.646          | 7.688            |
| Chainsaws      | 2019 | G2          | C                         | 6      | 15      | 728.478         | 1575.487        | 13.93            | 0.174            | 2.723             | 2.723              | 4229.983         | 45.278           |
| Chainsaws      | 2019 | G2          | R                         | 0      | 2       | 123.704         | 339.377         | 2.879            | 0.036            | 0.702             | 0.702              | 884.646          | 7.688            |
| Chainsaws      | 2019 | G2          | R                         | 6      | 15      | 728.478         | 1575.487        | 13.93            | 0.174            | 2.723             | 2.723              | 4229.983         | 45.278           |
| Chainsaws      | 2020 | G2          | C                         | 0      | 2       | 122.245         | 336.69          | 2.866            | 0.036            | 0.667             | 0.667              | 884.645          | 7.598            |
| Chainsaws      | 2020 | G2          | C                         | 6      | 15      | 727.09          | 1573.283        | 13.915           | 0.174            | 2.675             | 2.675              | 4229.983         | 45.192           |
| Chainsaws      | 2020 | G2          | R                         | 0      | 2       | 122.245         | 336.69          | 2.866            | 0.036            | 0.667             | 0.667              | 884.645          | 7.598            |
| Chainsaws      | 2020 | G2          | R                         | 6      | 15      | 727.09          | 1573.283        | 13.915           | 0.174            | 2.675             | 2.675              | 4229.983         | 45.192           |
| Chainsaws      | 2021 | G2          | C                         | 0      | 2       | 121.003         | 334.39          | 2.861            | 0.036            | 0.636             | 0.636              | 884.646          | 7.52             |
| Chainsaws      | 2021 | G2          | C                         | 6      | 15      | 725.905         | 1571.385        | 13.911           | 0.174            | 2.633             | 2.633              | 4229.982         | 45.118           |
| Chainsaws      | 2021 | G2          | R                         | 0      | 2       | 121.003         | 334.39          | 2.861            | 0.036            | 0.636             | 0.636              | 884.646          | 7.52             |
| Chainsaws      | 2021 | G2          | R                         | 6      | 15      | 725.905         | 1571.385        | 13.911           | 0.174            | 2.633             | 2.633              | 4229.982         | 45.118           |
| Chainsaws      | 2022 | G2          | C                         | 0      | 2       | 120.084         | 332.625         | 2.86             | 0.036            | 0.61              | 0.61               | 884.646          | 7.463            |
| Chainsaws      | 2022 | G2          | C                         | 6      | 15      | 725.029         | 1569.887        | 13.911           | 0.174            | 2.597             | 2.597              | 4229.982         | 45.064           |
| Chainsaws      | 2022 | G2          | R                         | 0      | 2       | 120.084         | 332.625         | 2.86             | 0.036            | 0.61              | 0.61               | 884.646          | 7.463            |
| Chainsaws      | 2022 | G2          | R                         | 6      | 15      | 725.029         | 1569.887        | 13.911           | 0.174            | 2.597             | 2.597              | 4229.982         | 45.064           |
| Chainsaws      | 2023 | G2          | C                         | 0      | 2       | 119.275         | 331.06          | 2.859            | 0.036            | 0.587             | 0.587              | 884.645          | 7.413            |
| Chainsaws      | 2023 | G2          | C                         | 6      | 15      | 724.255         | 1568.544        | 13.911           | 0.174            | 2.566             | 2.566              | 4229.982         | 45.015           |
| Chainsaws      | 2023 | G2          | R                         | 0      | 2       | 119.275         | 331.06          | 2.859            | 0.036            | 0.587             | 0.587              | 884.645          | 7.413            |
| Chainsaws      | 2023 | G2          | R                         | 6      | 15      | 724.255         | 1568.544        | 13.911           | 0.174            | 2.566             | 2.566              | 4229.982         | 45.015           |
| Chainsaws      | 2024 | G2          | C                         | 0      | 2       | 118.594         | 329.785         | 2.858            | 0.036            | 0.567             | 0.567              | 884.646          | 7.371            |
| Chainsaws      | 2024 | G2          | C                         | 6      | 15      | 723.595         | 1567.432        | 13.91            | 0.174            | 2.538             | 2.538              | 4229.983         | 44.974           |
| Chainsaws      | 2024 | G2          | R                         | 0      | 2       | 118.594         | 329.785         | 2.858            | 0.036            | 0.567             | 0.567              | 884.646          | 7.371            |
| Chainsaws      | 2024 | G2          | R                         | 6      | 15      | 723.595         | 1567.432        | 13.91            | 0.174            | 2.538             | 2.538              | 4229.983         | 44.974           |
| Chainsaws      | 2025 | G2          | C                         | 0      | 2       | 118.058         | 328.877         | 2.857            | 0.036            | 0.551             | 0.551              | 884.646          | 7.337            |
| Chainsaws      | 2025 | G2          | C                         | 6      | 15      | 723.056         | 1566.61         | 13.909           | 0.174            | 2.515             | 2.515              | 4229.983         | 44.941           |
| Chainsaws      | 2025 | G2          | R                         | 0      | 2       | 118.058         | 328.877         | 2.857            | 0.036            | 0.551             | 0.551              | 884.646          | 7.337            |
| Chainsaws      | 2025 | G2          | R                         | 6      | 15      | 723.056         | 1566.61         | 13.909           | 0.174            | 2.515             | 2.515              | 4229.983         | 44.941           |
| Chainsaws      | 2030 | G2          | C                         | 0      | 2       | 116.821         | 327.327         | 2.847            | 0.036            | 0.515             | 0.515              | 884.646          | 7.261            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type          | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG g/bhp-hr | CO, g/bhp-hr | NOX, g/bhp-hr | SO2, g/bhp-hr | PM10, g/bhp-hr | PM2.5, g/bhp-hr | CO2, g/bhp-hr | CH4, g/bhp-hr |
|-------------------------|------|-------------|---------------------------|--------|---------|--------------|--------------|---------------|---------------|----------------|-----------------|---------------|---------------|
| Chainsaws               | 2030 | G2          | C                         | 6      | 15      | 721.699      | 1565.005     | 13.9          | 0.174         | 2.463          | 2.463           | 4229.983      | 44.857        |
| Chainsaws               | 2030 | G2          | R                         | 0      | 2       | 116.821      | 327.327      | 2.847         | 0.036         | 0.515          | 0.515           | 884.646       | 7.261         |
| Chainsaws               | 2030 | G2          | R                         | 6      | 15      | 721.699      | 1565.005     | 13.9          | 0.174         | 2.463          | 2.463           | 4229.983      | 44.857        |
| Chainsaws               | 2035 | G2          | C                         | 0      | 2       | 116.745      | 327.292      | 2.841         | 0.036         | 0.514          | 0.514           | 884.646       | 7.256         |
| Chainsaws               | 2035 | G2          | C                         | 6      | 15      | 721.61       | 1564.967     | 13.892        | 0.174         | 2.462          | 2.462           | 4229.983      | 44.851        |
| Chainsaws               | 2035 | G2          | R                         | 0      | 2       | 116.745      | 327.292      | 2.841         | 0.036         | 0.514          | 0.514           | 884.646       | 7.256         |
| Chainsaws               | 2035 | G2          | R                         | 6      | 15      | 721.61       | 1564.967     | 13.892        | 0.174         | 2.462          | 2.462           | 4229.983      | 44.851        |
| Chainsaws               | 2040 | G2          | C                         | 0      | 2       | 116.734      | 327.292      | 2.841         | 0.036         | 0.514          | 0.514           | 884.646       | 7.255         |
| Chainsaws               | 2040 | G2          | C                         | 6      | 15      | 721.596      | 1564.968     | 13.892        | 0.174         | 2.462          | 2.462           | 4229.983      | 44.85         |
| Chainsaws               | 2040 | G2          | R                         | 0      | 2       | 116.734      | 327.292      | 2.841         | 0.036         | 0.514          | 0.514           | 884.646       | 7.255         |
| Chainsaws               | 2040 | G2          | R                         | 6      | 15      | 721.596      | 1564.968     | 13.892        | 0.174         | 2.462          | 2.462           | 4229.983      | 44.85         |
| Chainsaws Preempt       | 1990 | G2          | C                         | 6      | 15      | 366.304      | 1299.779     | 2.281         | 0.645         | 9.013          | 9.013           | 1069.305      | 31.239        |
| Chainsaws Preempt       | 1990 | G2          | R                         | 6      | 15      | 366.304      | 1299.779     | 2.281         | 0.645         | 9.013          | 9.013           | 1069.305      | 31.239        |
| Chainsaws Preempt       | 2000 | G2          | C                         | 6      | 15      | 338.395      | 831.071      | 2.059         | 0.061         | 3.653          | 3.653           | 1069.305      | 20.482        |
| Chainsaws Preempt       | 2000 | G2          | R                         | 6      | 15      | 338.395      | 831.071      | 2.059         | 0.061         | 3.653          | 3.653           | 1069.305      | 20.482        |
| Chainsaws Preempt       | 2005 | G2          | C                         | 6      | 15      | 254.318      | 635.617      | 2.838         | 0.044         | 2.464          | 2.464           | 1069.305      | 15.807        |
| Chainsaws Preempt       | 2005 | G2          | R                         | 6      | 15      | 254.318      | 635.617      | 2.838         | 0.044         | 2.464          | 2.464           | 1069.305      | 15.807        |
| Chainsaws Preempt       | 2010 | G2          | C                         | 6      | 15      | 209.644      | 529.056      | 3.069         | 0.044         | 1.449          | 1.449           | 1069.305      | 13.03         |
| Chainsaws Preempt       | 2010 | G2          | R                         | 6      | 15      | 209.644      | 529.056      | 3.069         | 0.044         | 1.449          | 1.449           | 1069.305      | 13.03         |
| Chainsaws Preempt       | 2011 | G2          | C                         | 6      | 15      | 201.143      | 511.177      | 3.112         | 0.044         | 1.257          | 1.257           | 1069.305      | 12.502        |
| Chainsaws Preempt       | 2011 | G2          | R                         | 6      | 15      | 201.143      | 511.177      | 3.112         | 0.044         | 1.257          | 1.257           | 1069.305      | 12.502        |
| Chainsaws Preempt       | 2012 | G2          | C                         | 6      | 15      | 193.093      | 493.759      | 3.149         | 0.044         | 1.096          | 1.096           | 1069.305      | 12.001        |
| Chainsaws Preempt       | 2012 | G2          | R                         | 6      | 15      | 193.093      | 493.759      | 3.149         | 0.044         | 1.096          | 1.096           | 1069.305      | 12.001        |
| Chainsaws Preempt       | 2013 | G2          | C                         | 6      | 15      | 185.768      | 480.558      | 3.186         | 0.044         | 1.004          | 1.004           | 1069.305      | 11.546        |
| Chainsaws Preempt       | 2013 | G2          | R                         | 6      | 15      | 185.768      | 480.558      | 3.186         | 0.044         | 1.004          | 1.004           | 1069.305      | 11.546        |
| Chainsaws Preempt       | 2014 | G2          | C                         | 6      | 15      | 178.982      | 469.597      | 3.222         | 0.044         | 0.944          | 0.944           | 1069.305      | 11.124        |
| Chainsaws Preempt       | 2014 | G2          | R                         | 6      | 15      | 178.982      | 469.597      | 3.222         | 0.044         | 0.944          | 0.944           | 1069.305      | 11.124        |
| Chainsaws Preempt       | 2015 | G2          | C                         | 6      | 15      | 172.536      | 459.286      | 3.257         | 0.044         | 0.892          | 0.892           | 1069.305      | 10.723        |
| Chainsaws Preempt       | 2015 | G2          | R                         | 6      | 15      | 172.536      | 459.286      | 3.257         | 0.044         | 0.892          | 0.892           | 1069.305      | 10.723        |
| Chainsaws Preempt       | 2016 | G2          | C                         | 6      | 15      | 166.528      | 449.661      | 3.289         | 0.044         | 0.846          | 0.846           | 1069.305      | 10.35         |
| Chainsaws Preempt       | 2016 | G2          | R                         | 6      | 15      | 166.528      | 449.661      | 3.289         | 0.044         | 0.846          | 0.846           | 1069.305      | 10.35         |
| Chainsaws Preempt       | 2017 | G2          | C                         | 6      | 15      | 161.095      | 440.508      | 3.319         | 0.044         | 0.805          | 0.805           | 1069.305      | 10.012        |
| Chainsaws Preempt       | 2017 | G2          | R                         | 6      | 15      | 161.095      | 440.508      | 3.319         | 0.044         | 0.805          | 0.805           | 1069.305      | 10.012        |
| Chainsaws Preempt       | 2018 | G2          | C                         | 6      | 15      | 156.8        | 432.052      | 3.343         | 0.044         | 0.77           | 0.77            | 1069.305      | 9.745         |
| Chainsaws Preempt       | 2018 | G2          | R                         | 6      | 15      | 156.8        | 432.052      | 3.343         | 0.044         | 0.77           | 0.77            | 1069.305      | 9.745         |
| Chainsaws Preempt       | 2019 | G2          | C                         | 6      | 15      | 153.482      | 424.251      | 3.361         | 0.044         | 0.739          | 0.739           | 1069.305      | 9.539         |
| Chainsaws Preempt       | 2019 | G2          | R                         | 6      | 15      | 153.482      | 424.251      | 3.361         | 0.044         | 0.739          | 0.739           | 1069.305      | 9.539         |
| Chainsaws Preempt       | 2020 | G2          | C                         | 6      | 15      | 150.987      | 417.321      | 3.376         | 0.044         | 0.711          | 0.711           | 1069.305      | 9.384         |
| Chainsaws Preempt       | 2020 | G2          | R                         | 6      | 15      | 150.987      | 417.321      | 3.376         | 0.044         | 0.711          | 0.711           | 1069.305      | 9.384         |
| Chainsaws Preempt       | 2021 | G2          | C                         | 6      | 15      | 149.069      | 412.763      | 3.386         | 0.044         | 0.687          | 0.687           | 1069.305      | 9.265         |
| Chainsaws Preempt       | 2021 | G2          | R                         | 6      | 15      | 149.069      | 412.763      | 3.386         | 0.044         | 0.687          | 0.687           | 1069.305      | 9.265         |
| Chainsaws Preempt       | 2022 | G2          | C                         | 6      | 15      | 147.64       | 409.646      | 3.395         | 0.044         | 0.669          | 0.669           | 1069.305      | 9.176         |
| Chainsaws Preempt       | 2022 | G2          | R                         | 6      | 15      | 147.64       | 409.646      | 3.395         | 0.044         | 0.669          | 0.669           | 1069.305      | 9.176         |
| Chainsaws Preempt       | 2023 | G2          | C                         | 6      | 15      | 146.402      | 406.95       | 3.402         | 0.044         | 0.654          | 0.654           | 1069.305      | 9.099         |
| Chainsaws Preempt       | 2023 | G2          | R                         | 6      | 15      | 146.402      | 406.95       | 3.402         | 0.044         | 0.654          | 0.654           | 1069.305      | 9.099         |
| Chainsaws Preempt       | 2024 | G2          | C                         | 6      | 15      | 145.326      | 404.662      | 3.408         | 0.044         | 0.642          | 0.642           | 1069.305      | 9.032         |
| Chainsaws Preempt       | 2024 | G2          | R                         | 6      | 15      | 145.326      | 404.662      | 3.408         | 0.044         | 0.642          | 0.642           | 1069.305      | 9.032         |
| Chainsaws Preempt       | 2025 | G2          | C                         | 6      | 15      | 144.382      | 402.632      | 3.414         | 0.044         | 0.633          | 0.633           | 1069.305      | 8.974         |
| Chainsaws Preempt       | 2025 | G2          | R                         | 6      | 15      | 144.382      | 402.632      | 3.414         | 0.044         | 0.633          | 0.633           | 1069.305      | 8.974         |
| Chainsaws Preempt       | 2030 | G2          | C                         | 6      | 15      | 141.634      | 397.139      | 3.43          | 0.044         | 0.622          | 0.622           | 1069.305      | 8.803         |
| Chainsaws Preempt       | 2030 | G2          | R                         | 6      | 15      | 141.634      | 397.139      | 3.43          | 0.044         | 0.622          | 0.622           | 1069.305      | 8.803         |
| Chainsaws Preempt       | 2035 | G2          | C                         | 6      | 15      | 141.117      | 395.646      | 3.434         | 0.044         | 0.622          | 0.622           | 1069.305      | 8.771         |
| Chainsaws Preempt       | 2035 | G2          | R                         | 6      | 15      | 141.117      | 395.646      | 3.434         | 0.044         | 0.622          | 0.622           | 1069.305      | 8.771         |
| Chainsaws Preempt       | 2040 | G2          | C                         | 6      | 15      | 141.101      | 395.611      | 3.434         | 0.044         | 0.622          | 0.622           | 1069.305      | 8.77          |
| Chainsaws Preempt       | 2040 | G2          | R                         | 6      | 15      | 141.101      | 395.611      | 3.434         | 0.044         | 0.622          | 0.622           | 1069.305      | 8.77          |
| Chippers/Stump Grinders | 1990 | G4          | C                         | 6      | 15      | 26.78        | 933.58       | 8.955         | 0.359         | 0.28           | 0.28            | 858.879       | 3.132         |
| Chippers/Stump Grinders | 1990 | G4          | C                         | 16     | 25      | 24.322       | 928.906      | 8.774         | 0.319         | 0.279          | 0.279           | 858.879       | 2.845         |
| Chippers/Stump Grinders | 1990 | G4          | R                         | 6      | 15      | 26.78        | 933.58       | 8.955         | 0.359         | 0.28           | 0.28            | 858.879       | 3.132         |
| Chippers/Stump Grinders | 1990 | G4          | R                         | 16     | 25      | 24.322       | 928.906      | 8.774         | 0.319         | 0.279          | 0.279           | 858.879       | 2.845         |
| Chippers/Stump Grinders | 2000 | G4          | C                         | 6      | 15      | 26.135       | 723.135      | 6.901         | 0.034         | 4.7            | 4.7             | 858.879       | 1.413         |
| Chippers/Stump Grinders | 2000 | G4          | C                         | 16     | 25      | 23.07        | 704.371      | 6.107         | 0.03          | 4.7            | 4.7             | 858.879       | 1.248         |
| Chippers/Stump Grinders | 2000 | G4          | R                         | 6      | 15      | 26.135       | 723.135      | 6.901         | 0.034         | 4.7            | 4.7             | 858.879       | 1.413         |
| Chippers/Stump Grinders | 2000 | G4          | R                         | 16     | 25      | 23.07        | 704.371      | 6.107         | 0.03          | 4.7            | 4.7             | 858.879       | 1.248         |
| Chippers/Stump Grinders | 2005 | G4          | C                         | 6      | 15      | 15.976       | 594.637      | 8.627         | 0.024         | 5.68           | 5.68            | 858.879       | 0.89          |
| Chippers/Stump Grinders | 2005 | G4          | C                         | 16     | 25      | 15.751       | 614.099      | 7.946         | 0.021         | 5.68           | 5.68            | 858.879       | 0.877         |
| Chippers/Stump Grinders | 2005 | G4          | R                         | 6      | 15      | 15.976       | 594.637      | 8.627         | 0.024         | 5.68           | 5.68            | 858.879       | 0.89          |
| Chippers/Stump Grinders | 2005 | G4          | R                         | 16     | 25      | 15.751       | 614.099      | 7.946         | 0.021         | 5.68           | 5.68            | 858.879       | 0.877         |
| Chippers/Stump Grinders | 2010 | G4          | C                         | 6      | 15      | 14.871       | 564.601      | 8.667         | 0.024         | 6.518          | 6.518           | 858.879       | 0.829         |
| Chippers/Stump Grinders | 2010 | G4          | C                         | 16     | 25      | 14.869       | 587.924      | 7.952         | 0.021         | 6.518          | 6.518           | 858.879       | 0.828         |
| Chippers/Stump Grinders | 2010 | G4          | R                         | 6      | 15      | 14.871       | 564.601      | 8.667         | 0.024         | 6.518          | 6.518           | 858.879       | 0.829         |
| Chippers/Stump Grinders | 2010 | G4          | R                         | 16     | 25      | 14.869       | 587.924      | 7.952         | 0.021         | 6.518          | 6.518           | 858.879       | 0.828         |
| Chippers/Stump Grinders | 2011 | G4          | C                         | 6      | 15      | 14.631       | 558.807      | 8.673         | 0.024         | 6.676          | 6.676           | 858.879       | 0.815         |
| Chippers/Stump Grinders | 2011 | G4          | C                         | 16     | 25      | 14.678       | 582.832      | 7.951         | 0.021         | 6.676          | 6.676           | 858.879       | 0.817         |
| Chippers/Stump Grinders | 2011 | G4          | R                         | 6      | 15      | 14.631       | 558.807      | 8.673         | 0.024         | 6.676          | 6.676           | 858.879       | 0.815         |
| Chippers/Stump Grinders | 2011 | G4          | R                         | 16     | 25      | 14.678       | 582.832      | 7.951         | 0.021         | 6.676          | 6.676           | 858.879       | 0.817         |
| Chippers/Stump Grinders | 2012 | G4          | C                         | 6      | 15      | 14.382       | 552.474      | 8.678         | 0.024         | 6.808          | 6.808           | 858.879       | 0.801         |
| Chippers/Stump Grinders | 2012 | G4          | C                         | 16     | 25      | 14.48        | 577.17       | 7.952         | 0.021         | 6.808          | 6.808           | 858.879       | 0.806         |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type            | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG g/bhp-hr | CO, g/bhp-hr | NOX, g/bhp-hr | SO2, g/bhp-hr | PM10, g/bhp-hr | PM2.5, g/bhp-hr | CO2, g/bhp-hr | CH4, g/bhp-hr |
|---------------------------|------|-------------|---------------------------|--------|---------|--------------|--------------|---------------|---------------|----------------|-----------------|---------------|---------------|
| Chippers/Stump Grinders   | 2012 | G4          | R                         | 6      | 15      | 14.382       | 552.474      | 8.678         | 0.024         | 6.808          | 6.808           | 858.879       | 0.801         |
| Chippers/Stump Grinders   | 2012 | G4          | R                         | 16     | 25      | 14.48        | 577.17       | 7.952         | 0.021         | 6.808          | 6.808           | 858.879       | 0.806         |
| Chippers/Stump Grinders   | 2013 | G4          | C                         | 6      | 15      | 14.151       | 547.979      | 8.7           | 0.024         | 6.884          | 6.884           | 858.879       | 0.788         |
| Chippers/Stump Grinders   | 2013 | G4          | C                         | 16     | 25      | 14.308       | 573.422      | 7.978         | 0.021         | 6.884          | 6.884           | 858.879       | 0.797         |
| Chippers/Stump Grinders   | 2013 | G4          | R                         | 6      | 15      | 14.151       | 547.979      | 8.7           | 0.024         | 6.884          | 6.884           | 858.879       | 0.788         |
| Chippers/Stump Grinders   | 2013 | G4          | R                         | 16     | 25      | 14.308       | 573.422      | 7.978         | 0.021         | 6.884          | 6.884           | 858.879       | 0.797         |
| Chippers/Stump Grinders   | 2014 | G4          | C                         | 6      | 15      | 13.931       | 543.899      | 8.73          | 0.024         | 6.934          | 6.934           | 858.879       | 0.776         |
| Chippers/Stump Grinders   | 2014 | G4          | C                         | 16     | 25      | 14.149       | 570.105      | 8.014         | 0.021         | 6.934          | 6.934           | 858.879       | 0.788         |
| Chippers/Stump Grinders   | 2014 | G4          | R                         | 6      | 15      | 13.931       | 543.899      | 8.73          | 0.024         | 6.934          | 6.934           | 858.879       | 0.776         |
| Chippers/Stump Grinders   | 2014 | G4          | R                         | 16     | 25      | 14.149       | 570.105      | 8.014         | 0.021         | 6.934          | 6.934           | 858.879       | 0.788         |
| Chippers/Stump Grinders   | 2015 | G4          | C                         | 6      | 15      | 13.705       | 539.742      | 8.763         | 0.024         | 6.977          | 6.977           | 858.879       | 0.763         |
| Chippers/Stump Grinders   | 2015 | G4          | C                         | 16     | 25      | 13.986       | 566.728      | 8.054         | 0.021         | 6.977          | 6.977           | 858.879       | 0.779         |
| Chippers/Stump Grinders   | 2015 | G4          | R                         | 6      | 15      | 13.705       | 539.742      | 8.763         | 0.024         | 6.977          | 6.977           | 858.879       | 0.763         |
| Chippers/Stump Grinders   | 2015 | G4          | R                         | 16     | 25      | 13.986       | 566.728      | 8.054         | 0.021         | 6.977          | 6.977           | 858.879       | 0.779         |
| Chippers/Stump Grinders   | 2016 | G4          | C                         | 6      | 15      | 13.477       | 535.731      | 8.798         | 0.024         | 7.015          | 7.015           | 858.879       | 0.751         |
| Chippers/Stump Grinders   | 2016 | G4          | C                         | 16     | 25      | 13.824       | 563.501      | 8.096         | 0.021         | 7.015          | 7.015           | 858.879       | 0.77          |
| Chippers/Stump Grinders   | 2016 | G4          | R                         | 6      | 15      | 13.477       | 535.731      | 8.798         | 0.024         | 7.015          | 7.015           | 858.879       | 0.751         |
| Chippers/Stump Grinders   | 2016 | G4          | R                         | 16     | 25      | 13.824       | 563.501      | 8.096         | 0.021         | 7.015          | 7.015           | 858.879       | 0.77          |
| Chippers/Stump Grinders   | 2017 | G4          | C                         | 6      | 15      | 13.257       | 531.934      | 8.832         | 0.024         | 7.049          | 7.049           | 858.88        | 0.738         |
| Chippers/Stump Grinders   | 2017 | G4          | C                         | 16     | 25      | 13.666       | 560.455      | 8.137         | 0.021         | 7.049          | 7.049           | 858.879       | 0.761         |
| Chippers/Stump Grinders   | 2017 | G4          | R                         | 6      | 15      | 13.257       | 531.934      | 8.832         | 0.024         | 7.049          | 7.049           | 858.88        | 0.738         |
| Chippers/Stump Grinders   | 2017 | G4          | R                         | 16     | 25      | 13.666       | 560.455      | 8.137         | 0.021         | 7.049          | 7.049           | 858.879       | 0.761         |
| Chippers/Stump Grinders   | 2018 | G4          | C                         | 6      | 15      | 13.054       | 528.594      | 8.866         | 0.024         | 7.078          | 7.078           | 858.879       | 0.727         |
| Chippers/Stump Grinders   | 2018 | G4          | C                         | 16     | 25      | 13.521       | 557.812      | 8.176         | 0.021         | 7.078          | 7.078           | 858.879       | 0.753         |
| Chippers/Stump Grinders   | 2018 | G4          | R                         | 6      | 15      | 13.054       | 528.594      | 8.866         | 0.024         | 7.078          | 7.078           | 858.879       | 0.727         |
| Chippers/Stump Grinders   | 2018 | G4          | R                         | 16     | 25      | 13.521       | 557.812      | 8.176         | 0.021         | 7.078          | 7.078           | 858.879       | 0.753         |
| Chippers/Stump Grinders   | 2019 | G4          | C                         | 6      | 15      | 12.927       | 526.488      | 8.885         | 0.024         | 7.103          | 7.103           | 858.879       | 0.72          |
| Chippers/Stump Grinders   | 2019 | G4          | C                         | 16     | 25      | 13.43        | 556.111      | 8.197         | 0.021         | 7.103          | 7.103           | 858.879       | 0.748         |
| Chippers/Stump Grinders   | 2019 | G4          | R                         | 6      | 15      | 12.927       | 526.488      | 8.885         | 0.024         | 7.103          | 7.103           | 858.879       | 0.72          |
| Chippers/Stump Grinders   | 2019 | G4          | R                         | 16     | 25      | 13.43        | 556.111      | 8.197         | 0.021         | 7.103          | 7.103           | 858.879       | 0.748         |
| Chippers/Stump Grinders   | 2020 | G4          | C                         | 6      | 15      | 12.837       | 524.97       | 8.898         | 0.024         | 7.126          | 7.126           | 858.879       | 0.715         |
| Chippers/Stump Grinders   | 2020 | G4          | C                         | 16     | 25      | 13.364       | 554.86       | 8.21          | 0.021         | 7.126          | 7.126           | 858.879       | 0.744         |
| Chippers/Stump Grinders   | 2020 | G4          | R                         | 6      | 15      | 12.837       | 524.97       | 8.898         | 0.024         | 7.126          | 7.126           | 858.879       | 0.715         |
| Chippers/Stump Grinders   | 2020 | G4          | R                         | 16     | 25      | 13.364       | 554.86       | 8.21          | 0.021         | 7.126          | 7.126           | 858.879       | 0.744         |
| Chippers/Stump Grinders   | 2021 | G4          | C                         | 6      | 15      | 12.749       | 523.609      | 8.907         | 0.024         | 7.146          | 7.146           | 858.879       | 0.71          |
| Chippers/Stump Grinders   | 2021 | G4          | C                         | 16     | 25      | 13.299       | 553.749      | 8.22          | 0.021         | 7.146          | 7.146           | 858.879       | 0.741         |
| Chippers/Stump Grinders   | 2021 | G4          | R                         | 6      | 15      | 12.749       | 523.609      | 8.907         | 0.024         | 7.146          | 7.146           | 858.879       | 0.71          |
| Chippers/Stump Grinders   | 2021 | G4          | R                         | 16     | 25      | 13.299       | 553.749      | 8.22          | 0.021         | 7.146          | 7.146           | 858.879       | 0.741         |
| Chippers/Stump Grinders   | 2022 | G4          | C                         | 6      | 15      | 12.676       | 522.437      | 8.918         | 0.024         | 7.161          | 7.161           | 858.879       | 0.706         |
| Chippers/Stump Grinders   | 2022 | G4          | C                         | 16     | 25      | 13.245       | 552.799      | 8.232         | 0.021         | 7.161          | 7.161           | 858.88        | 0.738         |
| Chippers/Stump Grinders   | 2022 | G4          | R                         | 6      | 15      | 12.676       | 522.437      | 8.918         | 0.024         | 7.161          | 7.161           | 858.879       | 0.706         |
| Chippers/Stump Grinders   | 2022 | G4          | R                         | 16     | 25      | 13.245       | 552.799      | 8.232         | 0.021         | 7.161          | 7.161           | 858.88        | 0.738         |
| Chippers/Stump Grinders   | 2023 | G4          | C                         | 6      | 15      | 12.604       | 521.328      | 8.93          | 0.024         | 7.173          | 7.173           | 858.879       | 0.702         |
| Chippers/Stump Grinders   | 2023 | G4          | C                         | 16     | 25      | 13.193       | 551.905      | 8.244         | 0.021         | 7.173          | 7.173           | 858.879       | 0.735         |
| Chippers/Stump Grinders   | 2023 | G4          | R                         | 6      | 15      | 12.604       | 521.328      | 8.93          | 0.024         | 7.173          | 7.173           | 858.879       | 0.702         |
| Chippers/Stump Grinders   | 2023 | G4          | R                         | 16     | 25      | 13.193       | 551.905      | 8.244         | 0.021         | 7.173          | 7.173           | 858.879       | 0.735         |
| Chippers/Stump Grinders   | 2024 | G4          | C                         | 6      | 15      | 12.541       | 520.397      | 8.94          | 0.024         | 7.183          | 7.183           | 858.879       | 0.699         |
| Chippers/Stump Grinders   | 2024 | G4          | C                         | 16     | 25      | 13.147       | 551.168      | 8.255         | 0.021         | 7.183          | 7.183           | 858.879       | 0.733         |
| Chippers/Stump Grinders   | 2024 | G4          | R                         | 6      | 15      | 12.541       | 520.397      | 8.94          | 0.024         | 7.183          | 7.183           | 858.879       | 0.699         |
| Chippers/Stump Grinders   | 2024 | G4          | R                         | 16     | 25      | 13.147       | 551.168      | 8.255         | 0.021         | 7.183          | 7.183           | 858.879       | 0.733         |
| Chippers/Stump Grinders   | 2025 | G4          | C                         | 6      | 15      | 12.482       | 519.536      | 8.949         | 0.024         | 7.191          | 7.191           | 858.879       | 0.696         |
| Chippers/Stump Grinders   | 2025 | G4          | C                         | 16     | 25      | 13.104       | 550.485      | 8.265         | 0.021         | 7.191          | 7.191           | 858.879       | 0.73          |
| Chippers/Stump Grinders   | 2025 | G4          | R                         | 6      | 15      | 12.482       | 519.536      | 8.949         | 0.024         | 7.191          | 7.191           | 858.879       | 0.696         |
| Chippers/Stump Grinders   | 2025 | G4          | R                         | 16     | 25      | 13.104       | 550.485      | 8.265         | 0.021         | 7.191          | 7.191           | 858.879       | 0.73          |
| Chippers/Stump Grinders   | 2030 | G4          | C                         | 6      | 15      | 12.282       | 516.861      | 8.977         | 0.024         | 7.199          | 7.199           | 858.879       | 0.685         |
| Chippers/Stump Grinders   | 2030 | G4          | C                         | 16     | 25      | 12.957       | 548.436      | 8.297         | 0.021         | 7.199          | 7.199           | 858.879       | 0.722         |
| Chippers/Stump Grinders   | 2030 | G4          | R                         | 6      | 15      | 12.282       | 516.861      | 8.977         | 0.024         | 7.199          | 7.199           | 858.879       | 0.685         |
| Chippers/Stump Grinders   | 2030 | G4          | R                         | 16     | 25      | 12.957       | 548.436      | 8.297         | 0.021         | 7.199          | 7.199           | 858.879       | 0.722         |
| Chippers/Stump Grinders   | 2035 | G4          | C                         | 6      | 15      | 12.235       | 516.011      | 8.982         | 0.024         | 7.199          | 7.199           | 858.879       | 0.683         |
| Chippers/Stump Grinders   | 2035 | G4          | C                         | 16     | 25      | 12.921       | 547.707      | 8.303         | 0.021         | 7.199          | 7.199           | 858.879       | 0.721         |
| Chippers/Stump Grinders   | 2035 | G4          | R                         | 6      | 15      | 12.235       | 516.011      | 8.982         | 0.024         | 7.199          | 7.199           | 858.879       | 0.683         |
| Chippers/Stump Grinders   | 2035 | G4          | R                         | 16     | 25      | 12.921       | 547.707      | 8.303         | 0.021         | 7.199          | 7.199           | 858.879       | 0.721         |
| Chippers/Stump Grinders   | 2040 | G4          | C                         | 6      | 15      | 12.225       | 515.57       | 8.979         | 0.024         | 7.199          | 7.199           | 858.879       | 0.682         |
| Chippers/Stump Grinders   | 2040 | G4          | C                         | 16     | 25      | 12.912       | 547.24       | 8.3           | 0.021         | 7.199          | 7.199           | 858.879       | 0.721         |
| Chippers/Stump Grinders   | 2040 | G4          | R                         | 6      | 15      | 12.225       | 515.57       | 8.979         | 0.024         | 7.199          | 7.199           | 858.879       | 0.682         |
| Chippers/Stump Grinders   | 2040 | G4          | R                         | 16     | 25      | 12.912       | 547.24       | 8.3           | 0.021         | 7.199          | 7.199           | 858.879       | 0.721         |
| Commercial Turf Equipment | 1990 | G2          | C                         | 6      | 15      | 191.758      | 485.999      | 0.312         | 0.259         | 7.699          | 7.699           | 429.44        | 16.353        |
| Commercial Turf Equipment | 1990 | G2          | C                         | 16     | 25      | 191.758      | 485.999      | 0.312         | 0.259         | 7.699          | 7.699           | 429.439       | 16.353        |
| Commercial Turf Equipment | 1990 | G4          | C                         | 6      | 15      | 16.379       | 472.617      | 4.731         | 0.179         | 0.239          | 0.239           | 429.439       | 1.921         |
| Commercial Turf Equipment | 1990 | G4          | C                         | 16     | 25      | 14.527       | 469.101      | 4.594         | 0.159         | 0.24           | 0.24            | 429.439       | 1.704         |
| Commercial Turf Equipment | 2000 | G2          | C                         | 6      | 15      | 14.782       | 299.417      | 2.985         | 0.024         | 0.377          | 0.377           | 429.439       | 0.894         |
| Commercial Turf Equipment | 2000 | G2          | C                         | 16     | 25      | 13.439       | 293.136      | 2.439         | 0.024         | 0.377          | 0.377           | 429.44        | 0.813         |
| Commercial Turf Equipment | 2000 | G4          | C                         | 6      | 15      | 16.668       | 363.292      | 3.251         | 0.017         | 0.239          | 0.239           | 429.439       | 0.904         |
| Commercial Turf Equipment | 2000 | G4          | C                         | 16     | 25      | 14.233       | 343.703      | 2.671         | 0.015         | 0.239          | 0.239           | 429.439       | 0.772         |
| Commercial Turf Equipment | 2005 | G2          | C                         | 6      | 15      | 6.003        | 233.321      | 4.02          | 0.017         | 0.199          | 0.199           | 429.439       | 0.373         |
| Commercial Turf Equipment | 2005 | G2          | C                         | 16     | 25      | 6.112        | 244.809      | 3.679         | 0.017         | 0.199          | 0.199           | 429.439       | 0.379         |
| Commercial Turf Equipment | 2005 | G4          | C                         | 6      | 15      | 8.16         | 270.992      | 4.937         | 0.012         | 0.239          | 0.239           | 429.439       | 0.455         |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type            | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|---------------------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Commercial Turf Equipment | 2005 | G4          | C                         | 16     | 25      | 8.228           | 282.77          | 4.525            | 0.01             | 0.239             | 0.239              | 429.439          | 0.458            |
| Commercial Turf Equipment | 2010 | G2          | C                         | 6      | 15      | 4.216           | 224.659         | 3.203            | 0.017            | 0.2               | 0.2                | 429.439          | 0.262            |
| Commercial Turf Equipment | 2010 | G2          | C                         | 16     | 25      | 4.288           | 238.459         | 3.13             | 0.017            | 0.199             | 0.199              | 429.439          | 0.266            |
| Commercial Turf Equipment | 2010 | G4          | C                         | 6      | 15      | 5.626           | 258.52          | 4.031            | 0.012            | 0.239             | 0.239              | 429.439          | 0.313            |
| Commercial Turf Equipment | 2010 | G4          | C                         | 16     | 25      | 5.642           | 274.4           | 4.03             | 0.01             | 0.239             | 0.239              | 429.439          | 0.314            |
| Commercial Turf Equipment | 2011 | G2          | C                         | 6      | 15      | 3.91            | 224.659         | 2.951            | 0.017            | 0.199             | 0.199              | 429.439          | 0.243            |
| Commercial Turf Equipment | 2011 | G2          | C                         | 16     | 25      | 3.921           | 238.46          | 2.943            | 0.017            | 0.2               | 0.2                | 429.44           | 0.243            |
| Commercial Turf Equipment | 2011 | G4          | C                         | 6      | 15      | 5.25            | 258.5           | 3.73             | 0.012            | 0.24              | 0.24               | 429.439          | 0.293            |
| Commercial Turf Equipment | 2011 | G4          | C                         | 16     | 25      | 5.166           | 274.379         | 3.833            | 0.01             | 0.239             | 0.239              | 429.439          | 0.288            |
| Commercial Turf Equipment | 2012 | G2          | C                         | 6      | 15      | 3.813           | 224.659         | 2.872            | 0.017            | 0.199             | 0.199              | 429.439          | 0.237            |
| Commercial Turf Equipment | 2012 | G2          | C                         | 16     | 25      | 3.806           | 238.459         | 2.884            | 0.017            | 0.199             | 0.199              | 429.439          | 0.236            |
| Commercial Turf Equipment | 2012 | G4          | C                         | 6      | 15      | 5.132           | 258.463         | 3.636            | 0.012            | 0.239             | 0.239              | 429.439          | 0.286            |
| Commercial Turf Equipment | 2012 | G4          | C                         | 16     | 25      | 5.016           | 274.34          | 3.771            | 0.01             | 0.24              | 0.24               | 429.439          | 0.279            |
| Commercial Turf Equipment | 2013 | G2          | C                         | 6      | 15      | 3.755           | 224.659         | 2.824            | 0.017            | 0.199             | 0.199              | 429.439          | 0.233            |
| Commercial Turf Equipment | 2013 | G2          | C                         | 16     | 25      | 3.736           | 238.459         | 2.848            | 0.017            | 0.199             | 0.199              | 429.439          | 0.232            |
| Commercial Turf Equipment | 2013 | G4          | C                         | 6      | 15      | 5.06            | 258.427         | 3.579            | 0.012            | 0.239             | 0.239              | 429.439          | 0.282            |
| Commercial Turf Equipment | 2013 | G4          | C                         | 16     | 25      | 4.926           | 274.302         | 3.733            | 0.01             | 0.239             | 0.239              | 429.439          | 0.274            |
| Commercial Turf Equipment | 2014 | G2          | C                         | 6      | 15      | 3.726           | 224.659         | 2.8              | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2014 | G2          | C                         | 16     | 25      | 3.701           | 238.46          | 2.83             | 0.017            | 0.199             | 0.199              | 429.439          | 0.23             |
| Commercial Turf Equipment | 2014 | G4          | C                         | 6      | 15      | 5.024           | 258.392         | 3.55             | 0.012            | 0.239             | 0.239              | 429.439          | 0.28             |
| Commercial Turf Equipment | 2014 | G4          | C                         | 16     | 25      | 4.88            | 274.264         | 3.714            | 0.01             | 0.24              | 0.24               | 429.439          | 0.272            |
| Commercial Turf Equipment | 2015 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2015 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.825            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2015 | G4          | C                         | 6      | 15      | 5.014           | 258.358         | 3.542            | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2015 | G4          | C                         | 16     | 25      | 4.867           | 274.228         | 3.709            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |
| Commercial Turf Equipment | 2016 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.2               | 0.2                | 429.439          | 0.231            |
| Commercial Turf Equipment | 2016 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.825            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2016 | G4          | C                         | 6      | 15      | 5.013           | 258.32          | 3.542            | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2016 | G4          | C                         | 16     | 25      | 4.867           | 274.187         | 3.709            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |
| Commercial Turf Equipment | 2017 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2017 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.825            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2017 | G4          | C                         | 6      | 15      | 5.013           | 258.283         | 3.541            | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2017 | G4          | C                         | 16     | 25      | 4.866           | 274.148         | 3.709            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |
| Commercial Turf Equipment | 2018 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2018 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.825            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2018 | G4          | C                         | 6      | 15      | 5.012           | 258.247         | 3.541            | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2018 | G4          | C                         | 16     | 25      | 4.866           | 274.11          | 3.708            | 0.01             | 0.24              | 0.24               | 429.439          | 0.271            |
| Commercial Turf Equipment | 2019 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.2               | 0.2                | 429.439          | 0.231            |
| Commercial Turf Equipment | 2019 | G2          | C                         | 16     | 25      | 3.692           | 238.46          | 2.825            | 0.017            | 0.2               | 0.2                | 429.44           | 0.229            |
| Commercial Turf Equipment | 2019 | G4          | C                         | 6      | 15      | 5.012           | 258.211         | 3.541            | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2019 | G4          | C                         | 16     | 25      | 4.865           | 274.072         | 3.708            | 0.01             | 0.24              | 0.24               | 429.44           | 0.271            |
| Commercial Turf Equipment | 2020 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2020 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.825            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2020 | G4          | C                         | 6      | 15      | 5.011           | 258.176         | 3.541            | 0.012            | 0.24              | 0.24               | 429.44           | 0.279            |
| Commercial Turf Equipment | 2020 | G4          | C                         | 16     | 25      | 4.865           | 274.034         | 3.708            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |
| Commercial Turf Equipment | 2021 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2021 | G2          | C                         | 16     | 25      | 3.692           | 238.46          | 2.825            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2021 | G4          | C                         | 6      | 15      | 5.011           | 258.15          | 3.541            | 0.012            | 0.24              | 0.24               | 429.439          | 0.279            |
| Commercial Turf Equipment | 2021 | G4          | C                         | 16     | 25      | 4.864           | 274.007         | 3.708            | 0.01             | 0.24              | 0.24               | 429.44           | 0.271            |
| Commercial Turf Equipment | 2022 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.2               | 0.2                | 429.439          | 0.231            |
| Commercial Turf Equipment | 2022 | G2          | C                         | 16     | 25      | 3.692           | 238.46          | 2.825            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2022 | G4          | C                         | 6      | 15      | 5.01            | 258.115         | 3.54             | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2022 | G4          | C                         | 16     | 25      | 4.864           | 273.97          | 3.707            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |
| Commercial Turf Equipment | 2023 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2023 | G2          | C                         | 16     | 25      | 3.692           | 238.46          | 2.825            | 0.017            | 0.199             | 0.199              | 429.44           | 0.229            |
| Commercial Turf Equipment | 2023 | G4          | C                         | 6      | 15      | 5.01            | 258.08          | 3.54             | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2023 | G4          | C                         | 16     | 25      | 4.863           | 273.933         | 3.707            | 0.01             | 0.239             | 0.239              | 429.44           | 0.271            |
| Commercial Turf Equipment | 2024 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2024 | G2          | C                         | 16     | 25      | 3.692           | 238.46          | 2.825            | 0.017            | 0.2               | 0.2                | 429.439          | 0.229            |
| Commercial Turf Equipment | 2024 | G4          | C                         | 6      | 15      | 5.009           | 258.043         | 3.54             | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2024 | G4          | C                         | 16     | 25      | 4.863           | 273.893         | 3.707            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |
| Commercial Turf Equipment | 2025 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2025 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.825            | 0.017            | 0.2               | 0.2                | 429.439          | 0.229            |
| Commercial Turf Equipment | 2025 | G4          | C                         | 6      | 15      | 5.008           | 258.005         | 3.54             | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2025 | G4          | C                         | 16     | 25      | 4.862           | 273.854         | 3.707            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |
| Commercial Turf Equipment | 2030 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2030 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.825            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2030 | G4          | C                         | 6      | 15      | 5.005           | 257.808         | 3.539            | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2030 | G4          | C                         | 16     | 25      | 4.859           | 273.644         | 3.706            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |
| Commercial Turf Equipment | 2035 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2035 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.826            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2035 | G4          | C                         | 6      | 15      | 5.002           | 257.605         | 3.537            | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2035 | G4          | C                         | 16     | 25      | 4.856           | 273.429         | 3.704            | 0.01             | 0.24              | 0.24               | 429.44           | 0.271            |
| Commercial Turf Equipment | 2040 | G2          | C                         | 6      | 15      | 3.718           | 224.659         | 2.794            | 0.017            | 0.199             | 0.199              | 429.439          | 0.231            |
| Commercial Turf Equipment | 2040 | G2          | C                         | 16     | 25      | 3.692           | 238.459         | 2.826            | 0.017            | 0.199             | 0.199              | 429.439          | 0.229            |
| Commercial Turf Equipment | 2040 | G4          | C                         | 6      | 15      | 4.999           | 257.385         | 3.536            | 0.012            | 0.239             | 0.239              | 429.439          | 0.279            |
| Commercial Turf Equipment | 2040 | G4          | C                         | 16     | 25      | 4.853           | 273.195         | 3.703            | 0.01             | 0.239             | 0.239              | 429.439          | 0.271            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|----------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Front Mowers   | 1990 | G4          | C                         | 6      | 15      | 22.909          | 915.938         | 8.6              | 0.359            | 0.371             | 0.371              | 858.879          | 2.705            |
| Front Mowers   | 1990 | G4          | C                         | 16     | 25      | 21.231          | 912.759         | 8.476            | 0.319            | 0.371             | 0.371              | 858.879          | 2.507            |
| Front Mowers   | 1990 | G4          | R                         | 6      | 15      | 22.909          | 915.938         | 8.6              | 0.359            | 0.371             | 0.371              | 858.879          | 2.705            |
| Front Mowers   | 1990 | G4          | R                         | 16     | 25      | 21.231          | 912.759         | 8.476            | 0.319            | 0.371             | 0.371              | 858.879          | 2.507            |
| Front Mowers   | 2000 | G4          | C                         | 6      | 15      | 20.645          | 670.814         | 6.649            | 0.034            | 0.37              | 0.37               | 858.879          | 1.128            |
| Front Mowers   | 2000 | G4          | C                         | 16     | 25      | 18.437          | 666.497         | 5.668            | 0.03             | 0.37              | 0.37               | 858.879          | 1.007            |
| Front Mowers   | 2000 | G4          | R                         | 6      | 15      | 20.645          | 670.814         | 6.649            | 0.034            | 0.37              | 0.37               | 858.879          | 1.128            |
| Front Mowers   | 2000 | G4          | R                         | 16     | 25      | 18.437          | 666.497         | 5.668            | 0.03             | 0.37              | 0.37               | 858.879          | 1.007            |
| Front Mowers   | 2005 | G4          | C                         | 6      | 15      | 13.656          | 554.614         | 7.702            | 0.024            | 0.37              | 0.37               | 858.879          | 0.766            |
| Front Mowers   | 2005 | G4          | C                         | 16     | 25      | 13.498          | 576.678         | 6.968            | 0.021            | 0.37              | 0.37               | 858.879          | 0.758            |
| Front Mowers   | 2005 | G4          | R                         | 6      | 15      | 13.656          | 554.614         | 7.702            | 0.024            | 0.37              | 0.37               | 858.879          | 0.766            |
| Front Mowers   | 2005 | G4          | R                         | 16     | 25      | 13.498          | 576.678         | 6.968            | 0.021            | 0.37              | 0.37               | 858.879          | 0.758            |
| Front Mowers   | 2010 | G4          | C                         | 6      | 15      | 9.521           | 522.282         | 6.198            | 0.024            | 0.37              | 0.37               | 858.879          | 0.534            |
| Front Mowers   | 2010 | G4          | C                         | 16     | 25      | 9.505           | 550.919         | 5.959            | 0.021            | 0.37              | 0.37               | 858.879          | 0.534            |
| Front Mowers   | 2010 | G4          | R                         | 6      | 15      | 9.521           | 522.282         | 6.198            | 0.024            | 0.37              | 0.37               | 858.879          | 0.534            |
| Front Mowers   | 2010 | G4          | R                         | 16     | 25      | 9.505           | 550.919         | 5.959            | 0.021            | 0.37              | 0.37               | 858.879          | 0.534            |
| Front Mowers   | 2011 | G4          | C                         | 6      | 15      | 9.168           | 519.756         | 6.099            | 0.024            | 0.37              | 0.37               | 858.879          | 0.515            |
| Front Mowers   | 2011 | G4          | C                         | 16     | 25      | 9.185           | 549.03          | 5.885            | 0.021            | 0.37              | 0.37               | 858.879          | 0.516            |
| Front Mowers   | 2011 | G4          | R                         | 6      | 15      | 9.168           | 519.756         | 6.099            | 0.024            | 0.37              | 0.37               | 858.879          | 0.515            |
| Front Mowers   | 2011 | G4          | R                         | 16     | 25      | 9.185           | 549.03          | 5.885            | 0.021            | 0.37              | 0.37               | 858.879          | 0.516            |
| Front Mowers   | 2012 | G4          | C                         | 6      | 15      | 8.85            | 517.872         | 5.992            | 0.024            | 0.37              | 0.37               | 858.879          | 0.497            |
| Front Mowers   | 2012 | G4          | C                         | 16     | 25      | 8.887           | 547.664         | 5.805            | 0.021            | 0.37              | 0.37               | 858.879          | 0.499            |
| Front Mowers   | 2012 | G4          | R                         | 6      | 15      | 8.85            | 517.872         | 5.992            | 0.024            | 0.37              | 0.37               | 858.879          | 0.497            |
| Front Mowers   | 2012 | G4          | R                         | 16     | 25      | 8.887           | 547.664         | 5.805            | 0.021            | 0.37              | 0.37               | 858.879          | 0.499            |
| Front Mowers   | 2013 | G4          | C                         | 6      | 15      | 8.562           | 516.232         | 5.892            | 0.024            | 0.37              | 0.37               | 858.879          | 0.481            |
| Front Mowers   | 2013 | G4          | C                         | 16     | 25      | 8.612           | 546.487         | 5.732            | 0.021            | 0.37              | 0.37               | 858.879          | 0.484            |
| Front Mowers   | 2013 | G4          | R                         | 6      | 15      | 8.562           | 516.232         | 5.892            | 0.024            | 0.37              | 0.37               | 858.879          | 0.481            |
| Front Mowers   | 2013 | G4          | R                         | 16     | 25      | 8.612           | 546.487         | 5.732            | 0.021            | 0.37              | 0.37               | 858.879          | 0.484            |
| Front Mowers   | 2014 | G4          | C                         | 6      | 15      | 8.303           | 514.847         | 5.793            | 0.024            | 0.37              | 0.37               | 858.879          | 0.466            |
| Front Mowers   | 2014 | G4          | C                         | 16     | 25      | 8.36            | 545.482         | 5.66             | 0.021            | 0.37              | 0.37               | 858.879          | 0.469            |
| Front Mowers   | 2014 | G4          | R                         | 6      | 15      | 8.303           | 514.847         | 5.793            | 0.024            | 0.37              | 0.37               | 858.879          | 0.466            |
| Front Mowers   | 2014 | G4          | R                         | 16     | 25      | 8.36            | 545.482         | 5.66             | 0.021            | 0.37              | 0.37               | 858.879          | 0.469            |
| Front Mowers   | 2015 | G4          | C                         | 6      | 15      | 8.07            | 513.744         | 5.696            | 0.024            | 0.37              | 0.37               | 858.879          | 0.453            |
| Front Mowers   | 2015 | G4          | C                         | 16     | 25      | 8.128           | 544.687         | 5.589            | 0.021            | 0.37              | 0.37               | 858.879          | 0.456            |
| Front Mowers   | 2015 | G4          | R                         | 6      | 15      | 8.07            | 513.744         | 5.696            | 0.024            | 0.37              | 0.37               | 858.879          | 0.453            |
| Front Mowers   | 2015 | G4          | R                         | 16     | 25      | 8.128           | 544.687         | 5.589            | 0.021            | 0.37              | 0.37               | 858.879          | 0.456            |
| Front Mowers   | 2016 | G4          | C                         | 6      | 15      | 7.873           | 512.921         | 5.604            | 0.024            | 0.37              | 0.37               | 858.879          | 0.442            |
| Front Mowers   | 2016 | G4          | C                         | 16     | 25      | 7.924           | 544.091         | 5.523            | 0.021            | 0.37              | 0.37               | 858.879          | 0.445            |
| Front Mowers   | 2016 | G4          | R                         | 6      | 15      | 7.873           | 512.921         | 5.604            | 0.024            | 0.37              | 0.37               | 858.879          | 0.442            |
| Front Mowers   | 2016 | G4          | R                         | 16     | 25      | 7.924           | 544.091         | 5.523            | 0.021            | 0.37              | 0.37               | 858.879          | 0.445            |
| Front Mowers   | 2017 | G4          | C                         | 6      | 15      | 7.773           | 512.361         | 5.568            | 0.024            | 0.37              | 0.37               | 858.879          | 0.437            |
| Front Mowers   | 2017 | G4          | C                         | 16     | 25      | 7.826           | 543.68          | 5.499            | 0.021            | 0.37              | 0.37               | 858.879          | 0.44             |
| Front Mowers   | 2017 | G4          | R                         | 6      | 15      | 7.773           | 512.361         | 5.568            | 0.024            | 0.37              | 0.37               | 858.879          | 0.437            |
| Front Mowers   | 2017 | G4          | R                         | 16     | 25      | 7.826           | 543.68          | 5.499            | 0.021            | 0.37              | 0.37               | 858.879          | 0.44             |
| Front Mowers   | 2018 | G4          | C                         | 6      | 15      | 7.704           | 511.993         | 5.54             | 0.024            | 0.37              | 0.37               | 858.879          | 0.433            |
| Front Mowers   | 2018 | G4          | C                         | 16     | 25      | 7.756           | 543.404         | 5.48             | 0.021            | 0.37              | 0.37               | 858.88           | 0.436            |
| Front Mowers   | 2018 | G4          | R                         | 6      | 15      | 7.704           | 511.993         | 5.54             | 0.024            | 0.37              | 0.37               | 858.879          | 0.433            |
| Front Mowers   | 2018 | G4          | R                         | 16     | 25      | 7.756           | 543.404         | 5.48             | 0.021            | 0.37              | 0.37               | 858.88           | 0.436            |
| Front Mowers   | 2019 | G4          | C                         | 6      | 15      | 7.66            | 511.821         | 5.514            | 0.024            | 0.37              | 0.37               | 858.879          | 0.43             |
| Front Mowers   | 2019 | G4          | C                         | 16     | 25      | 7.707           | 543.26          | 5.463            | 0.021            | 0.37              | 0.37               | 858.879          | 0.433            |
| Front Mowers   | 2019 | G4          | R                         | 6      | 15      | 7.66            | 511.821         | 5.514            | 0.024            | 0.37              | 0.37               | 858.879          | 0.43             |
| Front Mowers   | 2019 | G4          | R                         | 16     | 25      | 7.707           | 543.26          | 5.463            | 0.021            | 0.37              | 0.37               | 858.879          | 0.433            |
| Front Mowers   | 2020 | G4          | C                         | 6      | 15      | 7.631           | 511.749         | 5.492            | 0.024            | 0.37              | 0.37               | 858.88           | 0.429            |
| Front Mowers   | 2020 | G4          | C                         | 16     | 25      | 7.672           | 543.183         | 5.446            | 0.021            | 0.37              | 0.37               | 858.879          | 0.431            |
| Front Mowers   | 2020 | G4          | R                         | 6      | 15      | 7.631           | 511.749         | 5.492            | 0.024            | 0.37              | 0.37               | 858.88           | 0.429            |
| Front Mowers   | 2020 | G4          | R                         | 16     | 25      | 7.672           | 543.183         | 5.446            | 0.021            | 0.37              | 0.37               | 858.879          | 0.431            |
| Front Mowers   | 2021 | G4          | C                         | 6      | 15      | 7.604           | 511.699         | 5.471            | 0.024            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers   | 2021 | G4          | C                         | 16     | 25      | 7.641           | 543.13          | 5.43             | 0.021            | 0.37              | 0.37               | 858.879          | 0.429            |
| Front Mowers   | 2021 | G4          | R                         | 6      | 15      | 7.604           | 511.699         | 5.471            | 0.024            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers   | 2021 | G4          | R                         | 16     | 25      | 7.641           | 543.13          | 5.43             | 0.021            | 0.37              | 0.37               | 858.879          | 0.429            |
| Front Mowers   | 2022 | G4          | C                         | 6      | 15      | 7.589           | 511.628         | 5.459            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers   | 2022 | G4          | C                         | 16     | 25      | 7.622           | 543.055         | 5.422            | 0.021            | 0.37              | 0.37               | 858.879          | 0.428            |
| Front Mowers   | 2022 | G4          | R                         | 6      | 15      | 7.589           | 511.628         | 5.459            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers   | 2022 | G4          | R                         | 16     | 25      | 7.622           | 543.055         | 5.422            | 0.021            | 0.37              | 0.37               | 858.879          | 0.428            |
| Front Mowers   | 2023 | G4          | C                         | 6      | 15      | 7.579           | 511.555         | 5.452            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers   | 2023 | G4          | C                         | 16     | 25      | 7.609           | 542.977         | 5.417            | 0.021            | 0.37              | 0.37               | 858.879          | 0.428            |
| Front Mowers   | 2023 | G4          | R                         | 6      | 15      | 7.579           | 511.555         | 5.452            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers   | 2023 | G4          | R                         | 16     | 25      | 7.609           | 542.977         | 5.417            | 0.021            | 0.37              | 0.37               | 858.879          | 0.428            |
| Front Mowers   | 2024 | G4          | C                         | 6      | 15      | 7.573           | 511.479         | 5.447            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers   | 2024 | G4          | C                         | 16     | 25      | 7.602           | 542.897         | 5.414            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers   | 2024 | G4          | R                         | 6      | 15      | 7.573           | 511.479         | 5.447            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers   | 2024 | G4          | R                         | 16     | 25      | 7.602           | 542.897         | 5.414            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers   | 2025 | G4          | C                         | 6      | 15      | 7.571           | 511.402         | 5.445            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers   | 2025 | G4          | C                         | 16     | 25      | 7.599           | 542.815         | 5.413            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers   | 2025 | G4          | R                         | 6      | 15      | 7.571           | 511.402         | 5.445            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers   | 2025 | G4          | R                         | 16     | 25      | 7.599           | 542.815         | 5.413            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers   | 2030 | G4          | C                         | 6      | 15      | 7.565           | 510.995         | 5.443            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |



Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type         | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|------------------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Front Mowers           | 2030 | G4          | C                         | 16     | 25      | 7.593           | 542.383         | 5.411            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers           | 2030 | G4          | R                         | 6      | 15      | 7.565           | 510.995         | 5.443            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers           | 2030 | G4          | R                         | 16     | 25      | 7.593           | 542.383         | 5.411            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers           | 2035 | G4          | C                         | 6      | 15      | 7.56            | 510.58          | 5.441            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers           | 2035 | G4          | C                         | 16     | 25      | 7.588           | 541.943         | 5.409            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers           | 2035 | G4          | R                         | 6      | 15      | 7.56            | 510.58          | 5.441            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Front Mowers           | 2035 | G4          | R                         | 16     | 25      | 7.588           | 541.943         | 5.409            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers           | 2040 | G4          | C                         | 6      | 15      | 7.554           | 510.128         | 5.438            | 0.024            | 0.37              | 0.37               | 858.879          | 0.425            |
| Front Mowers           | 2040 | G4          | C                         | 16     | 25      | 7.582           | 541.463         | 5.406            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Front Mowers           | 2040 | G4          | R                         | 6      | 15      | 7.554           | 510.128         | 5.438            | 0.024            | 0.37              | 0.37               | 858.879          | 0.425            |
| Front Mowers           | 2040 | G4          | R                         | 16     | 25      | 7.582           | 541.463         | 5.406            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Lawn & Garden Tractors | 1990 | G4          | C                         | 6      | 15      | 18.822          | 906.929         | 8.251            | 0.359            | 0.325             | 0.325              | 858.879          | 2.223            |
| Lawn & Garden Tractors | 1990 | G4          | C                         | 16     | 25      | 17.993          | 905.359         | 8.189            | 0.319            | 0.325             | 0.325              | 858.88           | 2.125            |
| Lawn & Garden Tractors | 1990 | G4          | R                         | 6      | 15      | 18.822          | 906.929         | 8.251            | 0.359            | 0.325             | 0.325              | 858.879          | 2.223            |
| Lawn & Garden Tractors | 1990 | G4          | R                         | 16     | 25      | 17.993          | 905.359         | 8.189            | 0.319            | 0.325             | 0.325              | 858.88           | 2.125            |
| Lawn & Garden Tractors | 2000 | G4          | C                         | 6      | 15      | 15.672          | 650.815         | 6.587            | 0.034            | 0.324             | 0.324              | 858.879          | 0.856            |
| Lawn & Garden Tractors | 2000 | G4          | C                         | 16     | 25      | 14.456          | 658.129         | 5.618            | 0.03             | 0.324             | 0.324              | 858.879          | 0.79             |
| Lawn & Garden Tractors | 2000 | G4          | R                         | 6      | 15      | 15.672          | 650.815         | 6.587            | 0.034            | 0.324             | 0.324              | 858.879          | 0.856            |
| Lawn & Garden Tractors | 2000 | G4          | R                         | 16     | 25      | 14.456          | 658.129         | 5.618            | 0.03             | 0.324             | 0.324              | 858.879          | 0.79             |
| Lawn & Garden Tractors | 2005 | G4          | C                         | 6      | 15      | 11.473          | 549.36          | 7.036            | 0.024            | 0.324             | 0.324              | 858.879          | 0.644            |
| Lawn & Garden Tractors | 2005 | G4          | C                         | 16     | 25      | 11.524          | 574.455         | 6.354            | 0.021            | 0.324             | 0.324              | 858.879          | 0.647            |
| Lawn & Garden Tractors | 2005 | G4          | R                         | 6      | 15      | 11.473          | 549.36          | 7.036            | 0.024            | 0.324             | 0.324              | 858.879          | 0.644            |
| Lawn & Garden Tractors | 2005 | G4          | R                         | 16     | 25      | 11.524          | 574.455         | 6.354            | 0.021            | 0.324             | 0.324              | 858.879          | 0.647            |
| Lawn & Garden Tractors | 2010 | G4          | C                         | 6      | 15      | 8.137           | 520.395         | 5.536            | 0.024            | 0.324             | 0.324              | 858.879          | 0.457            |
| Lawn & Garden Tractors | 2010 | G4          | C                         | 16     | 25      | 8.287           | 550.131         | 5.203            | 0.021            | 0.324             | 0.324              | 858.879          | 0.465            |
| Lawn & Garden Tractors | 2010 | G4          | R                         | 6      | 15      | 8.137           | 520.395         | 5.536            | 0.024            | 0.324             | 0.324              | 858.879          | 0.457            |
| Lawn & Garden Tractors | 2010 | G4          | R                         | 16     | 25      | 8.287           | 550.131         | 5.203            | 0.021            | 0.324             | 0.324              | 858.879          | 0.465            |
| Lawn & Garden Tractors | 2011 | G4          | C                         | 6      | 15      | 7.862           | 518.247         | 5.427            | 0.024            | 0.324             | 0.324              | 858.879          | 0.441            |
| Lawn & Garden Tractors | 2011 | G4          | C                         | 16     | 25      | 8.029           | 548.398         | 5.114            | 0.021            | 0.324             | 0.324              | 858.879          | 0.451            |
| Lawn & Garden Tractors | 2011 | G4          | R                         | 6      | 15      | 7.862           | 518.247         | 5.427            | 0.024            | 0.324             | 0.324              | 858.879          | 0.441            |
| Lawn & Garden Tractors | 2011 | G4          | R                         | 16     | 25      | 8.029           | 548.398         | 5.114            | 0.021            | 0.324             | 0.324              | 858.879          | 0.451            |
| Lawn & Garden Tractors | 2012 | G4          | C                         | 6      | 15      | 7.611           | 516.686         | 5.314            | 0.024            | 0.324             | 0.324              | 858.879          | 0.427            |
| Lawn & Garden Tractors | 2012 | G4          | C                         | 16     | 25      | 7.787           | 547.16          | 5.023            | 0.021            | 0.324             | 0.324              | 858.879          | 0.437            |
| Lawn & Garden Tractors | 2012 | G4          | R                         | 6      | 15      | 7.611           | 516.686         | 5.314            | 0.024            | 0.324             | 0.324              | 858.879          | 0.427            |
| Lawn & Garden Tractors | 2012 | G4          | R                         | 16     | 25      | 7.787           | 547.16          | 5.023            | 0.021            | 0.324             | 0.324              | 858.879          | 0.437            |
| Lawn & Garden Tractors | 2013 | G4          | C                         | 6      | 15      | 7.383           | 515.349         | 5.21             | 0.024            | 0.324             | 0.324              | 858.879          | 0.414            |
| Lawn & Garden Tractors | 2013 | G4          | C                         | 16     | 25      | 7.566           | 546.1           | 4.939            | 0.021            | 0.324             | 0.324              | 858.879          | 0.425            |
| Lawn & Garden Tractors | 2013 | G4          | R                         | 6      | 15      | 7.383           | 515.349         | 5.21             | 0.024            | 0.324             | 0.324              | 858.879          | 0.414            |
| Lawn & Garden Tractors | 2013 | G4          | R                         | 16     | 25      | 7.566           | 546.1           | 4.939            | 0.021            | 0.324             | 0.324              | 858.879          | 0.425            |
| Lawn & Garden Tractors | 2014 | G4          | C                         | 6      | 15      | 7.177           | 514.218         | 5.11             | 0.024            | 0.324             | 0.324              | 858.879          | 0.403            |
| Lawn & Garden Tractors | 2014 | G4          | C                         | 16     | 25      | 7.361           | 545.193         | 4.858            | 0.021            | 0.324             | 0.324              | 858.879          | 0.413            |
| Lawn & Garden Tractors | 2014 | G4          | R                         | 6      | 15      | 7.177           | 514.218         | 5.11             | 0.024            | 0.324             | 0.324              | 858.879          | 0.403            |
| Lawn & Garden Tractors | 2014 | G4          | R                         | 16     | 25      | 7.361           | 545.193         | 4.858            | 0.021            | 0.324             | 0.324              | 858.879          | 0.413            |
| Lawn & Garden Tractors | 2015 | G4          | C                         | 6      | 15      | 6.989           | 513.324         | 5.013            | 0.024            | 0.324             | 0.324              | 858.879          | 0.392            |
| Lawn & Garden Tractors | 2015 | G4          | C                         | 16     | 25      | 7.172           | 544.478         | 4.78             | 0.021            | 0.324             | 0.324              | 858.879          | 0.403            |
| Lawn & Garden Tractors | 2015 | G4          | R                         | 6      | 15      | 6.989           | 513.324         | 5.013            | 0.024            | 0.324             | 0.324              | 858.879          | 0.392            |
| Lawn & Garden Tractors | 2015 | G4          | R                         | 16     | 25      | 7.172           | 544.478         | 4.78             | 0.021            | 0.324             | 0.324              | 858.879          | 0.403            |
| Lawn & Garden Tractors | 2016 | G4          | C                         | 6      | 15      | 6.827           | 512.658         | 4.923            | 0.024            | 0.324             | 0.324              | 858.88           | 0.383            |
| Lawn & Garden Tractors | 2016 | G4          | C                         | 16     | 25      | 7.005           | 543.942         | 4.708            | 0.021            | 0.324             | 0.324              | 858.879          | 0.393            |
| Lawn & Garden Tractors | 2016 | G4          | R                         | 6      | 15      | 6.827           | 512.658         | 4.923            | 0.024            | 0.324             | 0.324              | 858.88           | 0.383            |
| Lawn & Garden Tractors | 2016 | G4          | R                         | 16     | 25      | 7.005           | 543.942         | 4.708            | 0.021            | 0.324             | 0.324              | 858.879          | 0.393            |
| Lawn & Garden Tractors | 2017 | G4          | C                         | 6      | 15      | 6.75            | 512.203         | 4.887            | 0.024            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2017 | G4          | C                         | 16     | 25      | 6.928           | 543.572         | 4.68             | 0.021            | 0.324             | 0.324              | 858.879          | 0.389            |
| Lawn & Garden Tractors | 2017 | G4          | R                         | 6      | 15      | 6.75            | 512.203         | 4.887            | 0.024            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2017 | G4          | R                         | 16     | 25      | 6.928           | 543.572         | 4.68             | 0.021            | 0.324             | 0.324              | 858.879          | 0.389            |
| Lawn & Garden Tractors | 2018 | G4          | C                         | 6      | 15      | 6.696           | 511.901         | 4.86             | 0.024            | 0.324             | 0.324              | 858.879          | 0.376            |
| Lawn & Garden Tractors | 2018 | G4          | C                         | 16     | 25      | 6.872           | 543.321         | 4.659            | 0.021            | 0.324             | 0.324              | 858.879          | 0.386            |
| Lawn & Garden Tractors | 2018 | G4          | R                         | 6      | 15      | 6.696           | 511.901         | 4.86             | 0.024            | 0.324             | 0.324              | 858.879          | 0.376            |
| Lawn & Garden Tractors | 2018 | G4          | R                         | 16     | 25      | 6.872           | 543.321         | 4.659            | 0.021            | 0.324             | 0.324              | 858.879          | 0.386            |
| Lawn & Garden Tractors | 2019 | G4          | C                         | 6      | 15      | 6.658           | 511.751         | 4.836            | 0.024            | 0.324             | 0.324              | 858.88           | 0.374            |
| Lawn & Garden Tractors | 2019 | G4          | C                         | 16     | 25      | 6.831           | 543.186         | 4.64             | 0.021            | 0.324             | 0.324              | 858.879          | 0.384            |
| Lawn & Garden Tractors | 2019 | G4          | R                         | 6      | 15      | 6.658           | 511.751         | 4.836            | 0.024            | 0.324             | 0.324              | 858.88           | 0.374            |
| Lawn & Garden Tractors | 2019 | G4          | R                         | 16     | 25      | 6.831           | 543.186         | 4.64             | 0.021            | 0.324             | 0.324              | 858.879          | 0.384            |
| Lawn & Garden Tractors | 2020 | G4          | C                         | 6      | 15      | 6.632           | 511.679         | 4.816            | 0.024            | 0.324             | 0.324              | 858.879          | 0.373            |
| Lawn & Garden Tractors | 2020 | G4          | C                         | 16     | 25      | 6.801           | 543.109         | 4.624            | 0.021            | 0.324             | 0.324              | 858.88           | 0.382            |
| Lawn & Garden Tractors | 2020 | G4          | R                         | 6      | 15      | 6.632           | 511.679         | 4.816            | 0.024            | 0.324             | 0.324              | 858.879          | 0.373            |
| Lawn & Garden Tractors | 2020 | G4          | R                         | 16     | 25      | 6.801           | 543.109         | 4.624            | 0.021            | 0.324             | 0.324              | 858.88           | 0.382            |
| Lawn & Garden Tractors | 2021 | G4          | C                         | 6      | 15      | 6.609           | 511.629         | 4.799            | 0.024            | 0.324             | 0.324              | 858.879          | 0.371            |
| Lawn & Garden Tractors | 2021 | G4          | C                         | 16     | 25      | 6.775           | 543.056         | 4.609            | 0.021            | 0.324             | 0.324              | 858.879          | 0.381            |
| Lawn & Garden Tractors | 2021 | G4          | R                         | 6      | 15      | 6.609           | 511.629         | 4.799            | 0.024            | 0.324             | 0.324              | 858.879          | 0.371            |
| Lawn & Garden Tractors | 2021 | G4          | R                         | 16     | 25      | 6.775           | 543.056         | 4.609            | 0.021            | 0.324             | 0.324              | 858.879          | 0.381            |
| Lawn & Garden Tractors | 2022 | G4          | C                         | 6      | 15      | 6.595           | 511.558         | 4.788            | 0.024            | 0.324             | 0.324              | 858.88           | 0.371            |
| Lawn & Garden Tractors | 2022 | G4          | C                         | 16     | 25      | 6.759           | 542.981         | 4.601            | 0.021            | 0.324             | 0.324              | 858.879          | 0.38             |
| Lawn & Garden Tractors | 2022 | G4          | R                         | 6      | 15      | 6.595           | 511.558         | 4.788            | 0.024            | 0.324             | 0.324              | 858.88           | 0.371            |
| Lawn & Garden Tractors | 2022 | G4          | R                         | 16     | 25      | 6.759           | 542.981         | 4.601            | 0.021            | 0.324             | 0.324              | 858.879          | 0.38             |
| Lawn & Garden Tractors | 2023 | G4          | C                         | 6      | 15      | 6.586           | 511.485         | 4.781            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2023 | G4          | C                         | 16     | 25      | 6.748           | 542.904         | 4.596            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type         | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|------------------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Lawn & Garden Tractors | 2023 | G4          | R                         | 6      | 15      | 6.586           | 511.485         | 4.781            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2023 | G4          | R                         | 16     | 25      | 6.748           | 542.904         | 4.596            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2024 | G4          | C                         | 6      | 15      | 6.58            | 511.409         | 4.777            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2024 | G4          | C                         | 16     | 25      | 6.742           | 542.823         | 4.593            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2024 | G4          | R                         | 6      | 15      | 6.58            | 511.409         | 4.777            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2024 | G4          | R                         | 16     | 25      | 6.742           | 542.823         | 4.593            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2025 | G4          | C                         | 6      | 15      | 6.578           | 511.332         | 4.776            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2025 | G4          | C                         | 16     | 25      | 6.739           | 542.741         | 4.592            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2025 | G4          | R                         | 6      | 15      | 6.578           | 511.332         | 4.776            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2025 | G4          | R                         | 16     | 25      | 6.739           | 542.741         | 4.592            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2030 | G4          | C                         | 6      | 15      | 6.573           | 510.925         | 4.774            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2030 | G4          | C                         | 16     | 25      | 6.734           | 542.309         | 4.59             | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2030 | G4          | R                         | 6      | 15      | 6.573           | 510.925         | 4.774            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2030 | G4          | R                         | 16     | 25      | 6.734           | 542.309         | 4.59             | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2035 | G4          | C                         | 6      | 15      | 6.569           | 510.509         | 4.772            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2035 | G4          | C                         | 16     | 25      | 6.73            | 541.868         | 4.588            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2035 | G4          | R                         | 6      | 15      | 6.569           | 510.509         | 4.772            | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2035 | G4          | R                         | 16     | 25      | 6.73            | 541.868         | 4.588            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2040 | G4          | C                         | 6      | 15      | 6.564           | 510.057         | 4.77             | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2040 | G4          | C                         | 16     | 25      | 6.725           | 541.388         | 4.586            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn & Garden Tractors | 2040 | G4          | R                         | 6      | 15      | 6.564           | 510.057         | 4.77             | 0.024            | 0.324             | 0.324              | 858.879          | 0.37             |
| Lawn & Garden Tractors | 2040 | G4          | R                         | 16     | 25      | 6.725           | 541.388         | 4.586            | 0.021            | 0.324             | 0.324              | 858.879          | 0.379            |
| Lawn Mowers            | 1990 | G2          | C                         | 6      | 15      | 383.517         | 971.999         | 0.625            | 0.518            | 15.399            | 15.399             | 858.879          | 32.707           |
| Lawn Mowers            | 1990 | G2          | R                         | 6      | 15      | 383.517         | 971.999         | 0.625            | 0.518            | 15.399            | 15.399             | 858.879          | 32.707           |
| Lawn Mowers            | 1990 | G4          | C                         | 3      | 5       | 86.165          | 1366.863        | 4.921            | 0.434            | 2.4               | 2.4                | 858.879          | 10.153           |
| Lawn Mowers            | 1990 | G4          | R                         | 3      | 5       | 86.165          | 1366.863        | 4.921            | 0.434            | 2.4               | 2.4                | 858.879          | 10.153           |
| Lawn Mowers            | 2000 | G2          | C                         | 6      | 15      | 130.787         | 652.886         | 4.523            | 0.049            | 6.279             | 6.279              | 858.879          | 7.916            |
| Lawn Mowers            | 2000 | G2          | R                         | 6      | 15      | 130.787         | 652.886         | 4.523            | 0.049            | 6.279             | 6.279              | 858.879          | 7.916            |
| Lawn Mowers            | 2000 | G4          | C                         | 3      | 5       | 48.547          | 784.748         | 5.953            | 0.041            | 2.374             | 2.374              | 858.879          | 2.647            |
| Lawn Mowers            | 2000 | G4          | R                         | 3      | 5       | 48.547          | 784.748         | 5.953            | 0.041            | 2.374             | 2.374              | 858.879          | 2.647            |
| Lawn Mowers            | 2005 | G2          | C                         | 6      | 15      | 75.706          | 444.858         | 6.544            | 0.035            | 4.545             | 4.545              | 858.879          | 4.705            |
| Lawn Mowers            | 2005 | G2          | R                         | 6      | 15      | 75.706          | 444.858         | 6.544            | 0.035            | 4.545             | 4.545              | 858.879          | 4.705            |
| Lawn Mowers            | 2005 | G4          | C                         | 3      | 5       | 28.282          | 507.847         | 7.674            | 0.029            | 2.383             | 2.383              | 858.879          | 1.584            |
| Lawn Mowers            | 2005 | G4          | R                         | 3      | 5       | 28.282          | 507.847         | 7.674            | 0.029            | 2.383             | 2.383              | 858.879          | 1.584            |
| Lawn Mowers            | 2010 | G2          | C                         | 6      | 15      | 37.533          | 394.484         | 4.563            | 0.035            | 3.166             | 3.166              | 858.879          | 2.332            |
| Lawn Mowers            | 2010 | G2          | R                         | 6      | 15      | 37.533          | 394.484         | 4.563            | 0.035            | 3.166             | 3.166              | 858.879          | 2.332            |
| Lawn Mowers            | 2010 | G4          | C                         | 3      | 5       | 20.231          | 435.249         | 4.987            | 0.029            | 2.381             | 2.381              | 858.879          | 1.133            |
| Lawn Mowers            | 2010 | G4          | R                         | 3      | 5       | 20.231          | 435.249         | 4.987            | 0.029            | 2.381             | 2.381              | 858.879          | 1.133            |
| Lawn Mowers            | 2011 | G2          | C                         | 6      | 15      | 33.131          | 386.729         | 4.556            | 0.035            | 3.01              | 3.01               | 858.879          | 2.059            |
| Lawn Mowers            | 2011 | G2          | R                         | 6      | 15      | 33.131          | 386.729         | 4.556            | 0.035            | 3.01              | 3.01               | 858.879          | 2.059            |
| Lawn Mowers            | 2011 | G4          | C                         | 3      | 5       | 19.247          | 423.873         | 4.891            | 0.029            | 2.38              | 2.38               | 858.879          | 1.078            |
| Lawn Mowers            | 2011 | G4          | R                         | 3      | 5       | 19.247          | 423.873         | 4.891            | 0.029            | 2.38              | 2.38               | 858.879          | 1.078            |
| Lawn Mowers            | 2012 | G2          | C                         | 6      | 15      | 30.298          | 379.152         | 4.527            | 0.035            | 2.919             | 2.919              | 858.879          | 1.883            |
| Lawn Mowers            | 2012 | G2          | R                         | 6      | 15      | 30.298          | 379.152         | 4.527            | 0.035            | 2.919             | 2.919              | 858.879          | 1.883            |
| Lawn Mowers            | 2012 | G4          | C                         | 3      | 5       | 18.305          | 412.931         | 4.798            | 0.029            | 2.381             | 2.381              | 858.879          | 1.025            |
| Lawn Mowers            | 2012 | G4          | R                         | 3      | 5       | 18.305          | 412.931         | 4.798            | 0.029            | 2.381             | 2.381              | 858.879          | 1.025            |
| Lawn Mowers            | 2013 | G2          | C                         | 6      | 15      | 27.835          | 371.274         | 4.494            | 0.035            | 2.844             | 2.844              | 858.88           | 1.73             |
| Lawn Mowers            | 2013 | G2          | R                         | 6      | 15      | 27.835          | 371.274         | 4.494            | 0.035            | 2.844             | 2.844              | 858.88           | 1.73             |
| Lawn Mowers            | 2013 | G4          | C                         | 3      | 5       | 17.668          | 406.495         | 4.682            | 0.029            | 2.381             | 2.381              | 858.879          | 0.99             |
| Lawn Mowers            | 2013 | G4          | R                         | 3      | 5       | 17.668          | 406.495         | 4.682            | 0.029            | 2.381             | 2.381              | 858.879          | 0.99             |
| Lawn Mowers            | 2014 | G2          | C                         | 6      | 15      | 25.61           | 363.536         | 4.459            | 0.035            | 2.778             | 2.778              | 858.88           | 1.591            |
| Lawn Mowers            | 2014 | G2          | R                         | 6      | 15      | 25.61           | 363.536         | 4.459            | 0.035            | 2.778             | 2.778              | 858.88           | 1.591            |
| Lawn Mowers            | 2014 | G4          | C                         | 3      | 5       | 17.182          | 401.969         | 4.559            | 0.029            | 2.382             | 2.382              | 858.879          | 0.963            |
| Lawn Mowers            | 2014 | G4          | R                         | 3      | 5       | 17.182          | 401.969         | 4.559            | 0.029            | 2.382             | 2.382              | 858.879          | 0.963            |
| Lawn Mowers            | 2015 | G2          | C                         | 6      | 15      | 23.509          | 356.086         | 4.423            | 0.035            | 2.717             | 2.717              | 858.879          | 1.461            |
| Lawn Mowers            | 2015 | G2          | R                         | 6      | 15      | 23.509          | 356.086         | 4.423            | 0.035            | 2.717             | 2.717              | 858.879          | 1.461            |
| Lawn Mowers            | 2015 | G4          | C                         | 3      | 5       | 16.757          | 398.042         | 4.439            | 0.029            | 2.382             | 2.382              | 858.879          | 0.939            |
| Lawn Mowers            | 2015 | G4          | R                         | 3      | 5       | 16.757          | 398.042         | 4.439            | 0.029            | 2.382             | 2.382              | 858.879          | 0.939            |
| Lawn Mowers            | 2016 | G2          | C                         | 6      | 15      | 21.721          | 349.443         | 4.379            | 0.035            | 2.667             | 2.667              | 858.88           | 1.35             |
| Lawn Mowers            | 2016 | G2          | R                         | 6      | 15      | 21.721          | 349.443         | 4.379            | 0.035            | 2.667             | 2.667              | 858.88           | 1.35             |
| Lawn Mowers            | 2016 | G4          | C                         | 3      | 5       | 16.373          | 394.716         | 4.316            | 0.029            | 2.382             | 2.382              | 858.879          | 0.918            |
| Lawn Mowers            | 2016 | G4          | R                         | 3      | 5       | 16.373          | 394.716         | 4.316            | 0.029            | 2.382             | 2.382              | 858.879          | 0.918            |
| Lawn Mowers            | 2017 | G2          | C                         | 6      | 15      | 20.274          | 345.234         | 4.317            | 0.035            | 2.623             | 2.623              | 858.879          | 1.26             |
| Lawn Mowers            | 2017 | G2          | R                         | 6      | 15      | 20.274          | 345.234         | 4.317            | 0.035            | 2.623             | 2.623              | 858.879          | 1.26             |
| Lawn Mowers            | 2017 | G4          | C                         | 3      | 5       | 16.064          | 392.295         | 4.195            | 0.029            | 2.382             | 2.382              | 858.879          | 0.9              |
| Lawn Mowers            | 2017 | G4          | R                         | 3      | 5       | 16.064          | 392.295         | 4.195            | 0.029            | 2.382             | 2.382              | 858.879          | 0.9              |
| Lawn Mowers            | 2018 | G2          | C                         | 6      | 15      | 19.036          | 342.185         | 4.25             | 0.035            | 2.585             | 2.585              | 858.879          | 1.183            |
| Lawn Mowers            | 2018 | G2          | R                         | 6      | 15      | 19.036          | 342.185         | 4.25             | 0.035            | 2.585             | 2.585              | 858.879          | 1.183            |
| Lawn Mowers            | 2018 | G4          | C                         | 3      | 5       | 15.797          | 390.553         | 4.072            | 0.029            | 2.381             | 2.381              | 858.879          | 0.886            |
| Lawn Mowers            | 2018 | G4          | R                         | 3      | 5       | 15.797          | 390.553         | 4.072            | 0.029            | 2.381             | 2.381              | 858.879          | 0.886            |
| Lawn Mowers            | 2019 | G2          | C                         | 6      | 15      | 17.952          | 339.506         | 4.179            | 0.035            | 2.552             | 2.552              | 858.879          | 1.115            |
| Lawn Mowers            | 2019 | G2          | R                         | 6      | 15      | 17.952          | 339.506         | 4.179            | 0.035            | 2.552             | 2.552              | 858.879          | 1.115            |
| Lawn Mowers            | 2019 | G4          | C                         | 3      | 5       | 15.63           | 389.143         | 4.016            | 0.029            | 2.38              | 2.38               | 858.879          | 0.876            |
| Lawn Mowers            | 2019 | G4          | R                         | 3      | 5       | 15.63           | 389.143         | 4.016            | 0.029            | 2.38              | 2.38               | 858.879          | 0.876            |
| Lawn Mowers            | 2020 | G2          | C                         | 6      | 15      | 17.063          | 337.156         | 4.108            | 0.035            | 2.525             | 2.525              | 858.88           | 1.06             |
| Lawn Mowers            | 2020 | G2          | R                         | 6      | 15      | 17.063          | 337.156         | 4.108            | 0.035            | 2.525             | 2.525              | 858.88           | 1.06             |
| Lawn Mowers            | 2020 | G4          | C                         | 3      | 5       | 15.516          | 387.971         | 3.981            | 0.029            | 2.381             | 2.381              | 858.879          | 0.87             |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type       | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|----------------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Lawn Mowers          | 2020 | G4          | R                         | 3      | 5       | 15.516          | 387.971         | 3.981            | 0.029            | 2.381             | 2.381              | 858.879          | 0.87             |
| Lawn Mowers          | 2021 | G2          | C                         | 6      | 15      | 16.284          | 335.258         | 4.034            | 0.035            | 2.501             | 2.501              | 858.879          | 1.012            |
| Lawn Mowers          | 2021 | G2          | R                         | 6      | 15      | 16.284          | 335.258         | 4.034            | 0.035            | 2.501             | 2.501              | 858.879          | 1.012            |
| Lawn Mowers          | 2021 | G4          | C                         | 3      | 5       | 15.42           | 387.332         | 3.946            | 0.029            | 2.379             | 2.379              | 858.879          | 0.865            |
| Lawn Mowers          | 2021 | G4          | R                         | 3      | 5       | 15.42           | 387.332         | 3.946            | 0.029            | 2.379             | 2.379              | 858.879          | 0.865            |
| Lawn Mowers          | 2022 | G2          | C                         | 6      | 15      | 15.732          | 333.499         | 3.97             | 0.035            | 2.487             | 2.487              | 858.879          | 0.977            |
| Lawn Mowers          | 2022 | G2          | R                         | 6      | 15      | 15.732          | 333.499         | 3.97             | 0.035            | 2.487             | 2.487              | 858.879          | 0.977            |
| Lawn Mowers          | 2022 | G4          | C                         | 3      | 5       | 15.359          | 386.662         | 3.917            | 0.029            | 2.38              | 2.38               | 858.879          | 0.861            |
| Lawn Mowers          | 2022 | G4          | R                         | 3      | 5       | 15.359          | 386.662         | 3.917            | 0.029            | 2.38              | 2.38               | 858.879          | 0.861            |
| Lawn Mowers          | 2023 | G2          | C                         | 6      | 15      | 15.272          | 331.902         | 3.938            | 0.035            | 2.474             | 2.474              | 858.879          | 0.949            |
| Lawn Mowers          | 2023 | G2          | R                         | 6      | 15      | 15.272          | 331.902         | 3.938            | 0.035            | 2.474             | 2.474              | 858.879          | 0.949            |
| Lawn Mowers          | 2023 | G4          | C                         | 3      | 5       | 15.32           | 386.308         | 3.893            | 0.029            | 2.38              | 2.38               | 858.879          | 0.859            |
| Lawn Mowers          | 2023 | G4          | R                         | 3      | 5       | 15.32           | 386.308         | 3.893            | 0.029            | 2.38              | 2.38               | 858.879          | 0.859            |
| Lawn Mowers          | 2024 | G2          | C                         | 6      | 15      | 14.912          | 330.523         | 3.919            | 0.035            | 2.465             | 2.465              | 858.879          | 0.926            |
| Lawn Mowers          | 2024 | G2          | R                         | 6      | 15      | 14.912          | 330.523         | 3.919            | 0.035            | 2.465             | 2.465              | 858.879          | 0.926            |
| Lawn Mowers          | 2024 | G4          | C                         | 3      | 5       | 15.299          | 386.129         | 3.871            | 0.029            | 2.38              | 2.38               | 858.879          | 0.858            |
| Lawn Mowers          | 2024 | G4          | R                         | 3      | 5       | 15.299          | 386.129         | 3.871            | 0.029            | 2.38              | 2.38               | 858.879          | 0.858            |
| Lawn Mowers          | 2025 | G2          | C                         | 6      | 15      | 14.672          | 329.458         | 3.9              | 0.035            | 2.459             | 2.459              | 858.879          | 0.911            |
| Lawn Mowers          | 2025 | G2          | R                         | 6      | 15      | 14.672          | 329.458         | 3.9              | 0.035            | 2.459             | 2.459              | 858.879          | 0.911            |
| Lawn Mowers          | 2025 | G4          | C                         | 3      | 5       | 15.289          | 386.029         | 3.852            | 0.029            | 2.38              | 2.38               | 858.879          | 0.858            |
| Lawn Mowers          | 2025 | G4          | R                         | 3      | 5       | 15.289          | 386.029         | 3.852            | 0.029            | 2.38              | 2.38               | 858.879          | 0.858            |
| Lawn Mowers          | 2030 | G2          | C                         | 6      | 15      | 14.354          | 327.334         | 3.814            | 0.035            | 2.455             | 2.455              | 858.879          | 0.892            |
| Lawn Mowers          | 2030 | G2          | R                         | 6      | 15      | 14.354          | 327.334         | 3.814            | 0.035            | 2.455             | 2.455              | 858.879          | 0.892            |
| Lawn Mowers          | 2030 | G4          | C                         | 3      | 5       | 15.26           | 385.707         | 3.815            | 0.029            | 2.38              | 2.38               | 858.879          | 0.857            |
| Lawn Mowers          | 2030 | G4          | R                         | 3      | 5       | 15.26           | 385.707         | 3.815            | 0.029            | 2.38              | 2.38               | 858.879          | 0.857            |
| Lawn Mowers          | 2035 | G2          | C                         | 6      | 15      | 14.32           | 327.145         | 3.775            | 0.035            | 2.455             | 2.455              | 858.879          | 0.89             |
| Lawn Mowers          | 2035 | G2          | R                         | 6      | 15      | 14.32           | 327.145         | 3.775            | 0.035            | 2.455             | 2.455              | 858.879          | 0.89             |
| Lawn Mowers          | 2035 | G4          | C                         | 3      | 5       | 15.244          | 385.494         | 3.812            | 0.029            | 2.38              | 2.38               | 858.879          | 0.856            |
| Lawn Mowers          | 2035 | G4          | R                         | 3      | 5       | 15.244          | 385.494         | 3.812            | 0.029            | 2.38              | 2.38               | 858.879          | 0.856            |
| Lawn Mowers          | 2040 | G2          | C                         | 6      | 15      | 14.316          | 327.185         | 3.769            | 0.035            | 2.454             | 2.454              | 858.879          | 0.889            |
| Lawn Mowers          | 2040 | G2          | R                         | 6      | 15      | 14.316          | 327.185         | 3.769            | 0.035            | 2.454             | 2.454              | 858.879          | 0.889            |
| Lawn Mowers          | 2040 | G4          | C                         | 3      | 5       | 15.234          | 385.112         | 3.811            | 0.029            | 2.38              | 2.38               | 858.879          | 0.857            |
| Lawn Mowers          | 2040 | G4          | R                         | 3      | 5       | 15.234          | 385.112         | 3.811            | 0.029            | 2.38              | 2.38               | 858.879          | 0.857            |
| Leaf Blowers/Vacuums | 1990 | G2          | C                         | 0      | 2       | 417.573         | 1480.719        | 2.069            | 0.518            | 7.199             | 7.199              | 858.879          | 35.612           |
| Leaf Blowers/Vacuums | 1990 | G2          | R                         | 0      | 2       | 417.573         | 1480.719        | 2.069            | 0.518            | 7.199             | 7.199              | 858.879          | 35.612           |
| Leaf Blowers/Vacuums | 1990 | G4          | C                         | 3      | 5       | 66.617          | 1240.719        | 4.859            | 0.434            | 1.867             | 1.867              | 858.879          | 7.869            |
| Leaf Blowers/Vacuums | 1990 | G4          | R                         | 3      | 5       | 66.617          | 1240.719        | 4.859            | 0.434            | 1.867             | 1.867              | 858.879          | 7.869            |
| Leaf Blowers/Vacuums | 2000 | G2          | C                         | 0      | 2       | 241.563         | 630.464         | 2.96             | 0.049            | 3.973             | 3.973              | 858.879          | 14.621           |
| Leaf Blowers/Vacuums | 2000 | G2          | R                         | 0      | 2       | 241.563         | 630.464         | 2.96             | 0.049            | 3.973             | 3.973              | 858.879          | 14.621           |
| Leaf Blowers/Vacuums | 2000 | G4          | C                         | 3      | 5       | 36.418          | 783.667         | 5.349            | 0.041            | 1.858             | 1.858              | 858.879          | 1.99             |
| Leaf Blowers/Vacuums | 2000 | G4          | R                         | 3      | 5       | 36.418          | 783.667         | 5.349            | 0.041            | 1.858             | 1.858              | 858.879          | 1.99             |
| Leaf Blowers/Vacuums | 2005 | G2          | C                         | 0      | 2       | 180.783         | 495.991         | 2.743            | 0.035            | 2.565             | 2.565              | 858.879          | 11.236           |
| Leaf Blowers/Vacuums | 2005 | G2          | R                         | 0      | 2       | 180.783         | 495.991         | 2.743            | 0.035            | 2.565             | 2.565              | 858.879          | 11.236           |
| Leaf Blowers/Vacuums | 2005 | G4          | C                         | 3      | 5       | 24.991          | 596.754         | 6.325            | 0.029            | 1.861             | 1.861              | 858.879          | 1.403            |
| Leaf Blowers/Vacuums | 2005 | G4          | R                         | 3      | 5       | 24.991          | 596.754         | 6.325            | 0.029            | 1.861             | 1.861              | 858.879          | 1.403            |
| Leaf Blowers/Vacuums | 2010 | G2          | C                         | 0      | 2       | 136.866         | 396.425         | 2.775            | 0.035            | 1.656             | 1.656              | 858.879          | 8.506            |
| Leaf Blowers/Vacuums | 2010 | G2          | R                         | 0      | 2       | 136.866         | 396.425         | 2.775            | 0.035            | 1.656             | 1.656              | 858.879          | 8.506            |
| Leaf Blowers/Vacuums | 2010 | G4          | C                         | 3      | 5       | 17.271          | 539.377         | 3.881            | 0.029            | 1.863             | 1.863              | 858.879          | 0.97             |
| Leaf Blowers/Vacuums | 2010 | G4          | R                         | 3      | 5       | 17.271          | 539.377         | 3.881            | 0.029            | 1.863             | 1.863              | 858.879          | 0.97             |
| Leaf Blowers/Vacuums | 2011 | G2          | C                         | 0      | 2       | 129.72          | 382.943         | 2.794            | 0.035            | 1.478             | 1.478              | 858.879          | 8.062            |
| Leaf Blowers/Vacuums | 2011 | G2          | R                         | 0      | 2       | 129.72          | 382.943         | 2.794            | 0.035            | 1.478             | 1.478              | 858.879          | 8.062            |
| Leaf Blowers/Vacuums | 2011 | G4          | C                         | 3      | 5       | 16.444          | 531.587         | 3.798            | 0.029            | 1.862             | 1.862              | 858.879          | 0.923            |
| Leaf Blowers/Vacuums | 2011 | G4          | R                         | 3      | 5       | 16.444          | 531.587         | 3.798            | 0.029            | 1.862             | 1.862              | 858.879          | 0.923            |
| Leaf Blowers/Vacuums | 2012 | G2          | C                         | 0      | 2       | 123.505         | 372.378         | 2.811            | 0.035            | 1.314             | 1.314              | 858.88           | 7.676            |
| Leaf Blowers/Vacuums | 2012 | G2          | R                         | 0      | 2       | 123.505         | 372.378         | 2.811            | 0.035            | 1.314             | 1.314              | 858.88           | 7.676            |
| Leaf Blowers/Vacuums | 2012 | G4          | C                         | 3      | 5       | 15.817          | 524.344         | 3.715            | 0.029            | 1.862             | 1.862              | 858.879          | 0.888            |
| Leaf Blowers/Vacuums | 2012 | G4          | R                         | 3      | 5       | 15.817          | 524.344         | 3.715            | 0.029            | 1.862             | 1.862              | 858.879          | 0.888            |
| Leaf Blowers/Vacuums | 2013 | G2          | C                         | 0      | 2       | 117.639         | 362.541         | 2.826            | 0.035            | 1.158             | 1.158              | 858.879          | 7.311            |
| Leaf Blowers/Vacuums | 2013 | G2          | R                         | 0      | 2       | 117.639         | 362.541         | 2.826            | 0.035            | 1.158             | 1.158              | 858.879          | 7.311            |
| Leaf Blowers/Vacuums | 2013 | G4          | C                         | 3      | 5       | 15.23           | 517.066         | 3.632            | 0.029            | 1.862             | 1.862              | 858.879          | 0.855            |
| Leaf Blowers/Vacuums | 2013 | G4          | R                         | 3      | 5       | 15.23           | 517.066         | 3.632            | 0.029            | 1.862             | 1.862              | 858.879          | 0.855            |
| Leaf Blowers/Vacuums | 2014 | G2          | C                         | 0      | 2       | 112.276         | 353.588         | 2.838            | 0.035            | 1.015             | 1.015              | 858.879          | 6.978            |
| Leaf Blowers/Vacuums | 2014 | G2          | R                         | 0      | 2       | 112.276         | 353.588         | 2.838            | 0.035            | 1.015             | 1.015              | 858.879          | 6.978            |
| Leaf Blowers/Vacuums | 2014 | G4          | C                         | 3      | 5       | 14.675          | 509.992         | 3.552            | 0.029            | 1.862             | 1.862              | 858.879          | 0.824            |
| Leaf Blowers/Vacuums | 2014 | G4          | R                         | 3      | 5       | 14.675          | 509.992         | 3.552            | 0.029            | 1.862             | 1.862              | 858.879          | 0.824            |
| Leaf Blowers/Vacuums | 2015 | G2          | C                         | 0      | 2       | 107.472         | 345.461         | 2.846            | 0.035            | 0.886             | 0.886              | 858.879          | 6.679            |
| Leaf Blowers/Vacuums | 2015 | G2          | R                         | 0      | 2       | 107.472         | 345.461         | 2.846            | 0.035            | 0.886             | 0.886              | 858.879          | 6.679            |
| Leaf Blowers/Vacuums | 2015 | G4          | C                         | 3      | 5       | 14.134          | 503.126         | 3.474            | 0.029            | 1.862             | 1.862              | 858.879          | 0.794            |
| Leaf Blowers/Vacuums | 2015 | G4          | R                         | 3      | 5       | 14.134          | 503.126         | 3.474            | 0.029            | 1.862             | 1.862              | 858.879          | 0.794            |
| Leaf Blowers/Vacuums | 2016 | G2          | C                         | 0      | 2       | 104.485         | 340.134         | 2.839            | 0.035            | 0.812             | 0.812              | 858.879          | 6.494            |
| Leaf Blowers/Vacuums | 2016 | G2          | R                         | 0      | 2       | 104.485         | 340.134         | 2.839            | 0.035            | 0.812             | 0.812              | 858.879          | 6.494            |
| Leaf Blowers/Vacuums | 2016 | G4          | C                         | 3      | 5       | 13.639          | 496.909         | 3.395            | 0.029            | 1.862             | 1.862              | 858.879          | 0.766            |
| Leaf Blowers/Vacuums | 2016 | G4          | R                         | 3      | 5       | 13.639          | 496.909         | 3.395            | 0.029            | 1.862             | 1.862              | 858.879          | 0.766            |
| Leaf Blowers/Vacuums | 2017 | G2          | C                         | 0      | 2       | 102.351         | 336.104         | 2.824            | 0.035            | 0.762             | 0.762              | 858.879          | 6.361            |
| Leaf Blowers/Vacuums | 2017 | G2          | R                         | 0      | 2       | 102.351         | 336.104         | 2.824            | 0.035            | 0.762             | 0.762              | 858.879          | 6.361            |
| Leaf Blowers/Vacuums | 2017 | G4          | C                         | 3      | 5       | 13.189          | 491.294         | 3.319            | 0.029            | 1.862             | 1.862              | 858.879          | 0.741            |
| Leaf Blowers/Vacuums | 2017 | G4          | R                         | 3      | 5       | 13.189          | 491.294         | 3.319            | 0.029            | 1.862             | 1.862              | 858.879          | 0.741            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type                | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG g/bhp-hr | CO, g/bhp-hr | NOX, g/bhp-hr | SO2, g/bhp-hr | PM10, g/bhp-hr | PM2.5, g/bhp-hr | CO2, g/bhp-hr | CH4, g/bhp-hr |
|-------------------------------|------|-------------|---------------------------|--------|---------|--------------|--------------|---------------|---------------|----------------|-----------------|---------------|---------------|
| Leaf Blowers/Vacuums          | 2018 | G2          | C                         | 0      | 2       | 100.502      | 332.58       | 2.809         | 0.035         | 0.72           | 0.72            | 858.879       | 6.246         |
| Leaf Blowers/Vacuums          | 2018 | G2          | R                         | 0      | 2       | 100.502      | 332.58       | 2.809         | 0.035         | 0.72           | 0.72            | 858.879       | 6.246         |
| Leaf Blowers/Vacuums          | 2018 | G4          | C                         | 3      | 5       | 12.834       | 487.616      | 3.236         | 0.029         | 1.862          | 1.862           | 858.879       | 0.721         |
| Leaf Blowers/Vacuums          | 2018 | G4          | R                         | 3      | 5       | 12.834       | 487.616      | 3.236         | 0.029         | 1.862          | 1.862           | 858.879       | 0.721         |
| Leaf Blowers/Vacuums          | 2019 | G2          | C                         | 0      | 2       | 98.866       | 329.492      | 2.795         | 0.035         | 0.682          | 0.682           | 858.879       | 6.145         |
| Leaf Blowers/Vacuums          | 2019 | G2          | R                         | 0      | 2       | 98.866       | 329.492      | 2.795         | 0.035         | 0.682          | 0.682           | 858.879       | 6.145         |
| Leaf Blowers/Vacuums          | 2019 | G4          | C                         | 3      | 5       | 12.534       | 484.905      | 3.151         | 0.029         | 1.862          | 1.862           | 858.879       | 0.704         |
| Leaf Blowers/Vacuums          | 2019 | G4          | R                         | 3      | 5       | 12.534       | 484.905      | 3.151         | 0.029         | 1.862          | 1.862           | 858.879       | 0.704         |
| Leaf Blowers/Vacuums          | 2020 | G2          | C                         | 0      | 2       | 97.445       | 326.883      | 2.783         | 0.035         | 0.647          | 0.647           | 858.879       | 6.056         |
| Leaf Blowers/Vacuums          | 2020 | G2          | R                         | 0      | 2       | 97.445       | 326.883      | 2.783         | 0.035         | 0.647          | 0.647           | 858.879       | 6.056         |
| Leaf Blowers/Vacuums          | 2020 | G4          | C                         | 3      | 5       | 12.271       | 482.619      | 3.068         | 0.029         | 1.862          | 1.862           | 858.879       | 0.69          |
| Leaf Blowers/Vacuums          | 2020 | G4          | R                         | 3      | 5       | 12.271       | 482.619      | 3.068         | 0.029         | 1.862          | 1.862           | 858.879       | 0.69          |
| Leaf Blowers/Vacuums          | 2021 | G2          | C                         | 0      | 2       | 96.221       | 324.651      | 2.778         | 0.035         | 0.618          | 0.618           | 858.879       | 5.98          |
| Leaf Blowers/Vacuums          | 2021 | G2          | R                         | 0      | 2       | 96.221       | 324.651      | 2.778         | 0.035         | 0.618          | 0.618           | 858.879       | 5.98          |
| Leaf Blowers/Vacuums          | 2021 | G4          | C                         | 3      | 5       | 12.022       | 480.736      | 2.987         | 0.029         | 1.861          | 1.861           | 858.88        | 0.676         |
| Leaf Blowers/Vacuums          | 2021 | G4          | R                         | 3      | 5       | 12.022       | 480.736      | 2.987         | 0.029         | 1.861          | 1.861           | 858.88        | 0.676         |
| Leaf Blowers/Vacuums          | 2022 | G2          | C                         | 0      | 2       | 95.338       | 322.937      | 2.777         | 0.035         | 0.593          | 0.593           | 858.879       | 5.925         |
| Leaf Blowers/Vacuums          | 2022 | G2          | R                         | 0      | 2       | 95.338       | 322.937      | 2.777         | 0.035         | 0.593          | 0.593           | 858.879       | 5.925         |
| Leaf Blowers/Vacuums          | 2022 | G4          | C                         | 3      | 5       | 11.831       | 478.893      | 2.919         | 0.029         | 1.862          | 1.862           | 858.879       | 0.665         |
| Leaf Blowers/Vacuums          | 2022 | G4          | R                         | 3      | 5       | 11.831       | 478.893      | 2.919         | 0.029         | 1.862          | 1.862           | 858.879       | 0.665         |
| Leaf Blowers/Vacuums          | 2023 | G2          | C                         | 0      | 2       | 94.546       | 321.418      | 2.776         | 0.035         | 0.57           | 0.57            | 858.879       | 5.876         |
| Leaf Blowers/Vacuums          | 2023 | G2          | R                         | 0      | 2       | 94.546       | 321.418      | 2.776         | 0.035         | 0.57           | 0.57            | 858.879       | 5.876         |
| Leaf Blowers/Vacuums          | 2023 | G4          | C                         | 3      | 5       | 11.68        | 477.385      | 2.88          | 0.029         | 1.862          | 1.862           | 858.879       | 0.657         |
| Leaf Blowers/Vacuums          | 2023 | G4          | R                         | 3      | 5       | 11.68        | 477.385      | 2.88          | 0.029         | 1.862          | 1.862           | 858.879       | 0.657         |
| Leaf Blowers/Vacuums          | 2024 | G2          | C                         | 0      | 2       | 93.882       | 320.179      | 2.775         | 0.035         | 0.551          | 0.551           | 858.879       | 5.835         |
| Leaf Blowers/Vacuums          | 2024 | G2          | R                         | 0      | 2       | 93.882       | 320.179      | 2.775         | 0.035         | 0.551          | 0.551           | 858.879       | 5.835         |
| Leaf Blowers/Vacuums          | 2024 | G4          | C                         | 3      | 5       | 11.564       | 476.014      | 2.857         | 0.029         | 1.862          | 1.862           | 858.879       | 0.65          |
| Leaf Blowers/Vacuums          | 2024 | G4          | R                         | 3      | 5       | 11.564       | 476.014      | 2.857         | 0.029         | 1.862          | 1.862           | 858.879       | 0.65          |
| Leaf Blowers/Vacuums          | 2025 | G2          | C                         | 0      | 2       | 93.358       | 319.298      | 2.773         | 0.035         | 0.535          | 0.535           | 858.879       | 5.802         |
| Leaf Blowers/Vacuums          | 2025 | G2          | R                         | 0      | 2       | 93.358       | 319.298      | 2.773         | 0.035         | 0.535          | 0.535           | 858.879       | 5.802         |
| Leaf Blowers/Vacuums          | 2025 | G4          | C                         | 3      | 5       | 11.468       | 474.959      | 2.835         | 0.029         | 1.862          | 1.862           | 858.879       | 0.645         |
| Leaf Blowers/Vacuums          | 2025 | G4          | R                         | 3      | 5       | 11.468       | 474.959      | 2.835         | 0.029         | 1.862          | 1.862           | 858.879       | 0.645         |
| Leaf Blowers/Vacuums          | 2030 | G2          | C                         | 0      | 2       | 92.149       | 317.793      | 2.764         | 0.035         | 0.5            | 0.5             | 858.879       | 5.727         |
| Leaf Blowers/Vacuums          | 2030 | G2          | R                         | 0      | 2       | 92.149       | 317.793      | 2.764         | 0.035         | 0.5            | 0.5             | 858.879       | 5.727         |
| Leaf Blowers/Vacuums          | 2030 | G4          | C                         | 3      | 5       | 11.222       | 472.216      | 2.754         | 0.029         | 1.861          | 1.861           | 858.879       | 0.632         |
| Leaf Blowers/Vacuums          | 2030 | G4          | R                         | 3      | 5       | 11.222       | 472.216      | 2.754         | 0.029         | 1.861          | 1.861           | 858.879       | 0.632         |
| Leaf Blowers/Vacuums          | 2035 | G2          | C                         | 0      | 2       | 92.074       | 317.76       | 2.758         | 0.035         | 0.499          | 0.499           | 858.879       | 5.722         |
| Leaf Blowers/Vacuums          | 2035 | G2          | R                         | 0      | 2       | 92.074       | 317.76       | 2.758         | 0.035         | 0.499          | 0.499           | 858.879       | 5.722         |
| Leaf Blowers/Vacuums          | 2035 | G4          | C                         | 3      | 5       | 11.16        | 471.482      | 2.717         | 0.029         | 1.861          | 1.861           | 858.879       | 0.628         |
| Leaf Blowers/Vacuums          | 2035 | G4          | R                         | 3      | 5       | 11.16        | 471.482      | 2.717         | 0.029         | 1.861          | 1.861           | 858.879       | 0.628         |
| Leaf Blowers/Vacuums          | 2040 | G2          | C                         | 0      | 2       | 92.063       | 317.759      | 2.758         | 0.035         | 0.499          | 0.499           | 858.879       | 5.722         |
| Leaf Blowers/Vacuums          | 2040 | G2          | R                         | 0      | 2       | 92.063       | 317.759      | 2.758         | 0.035         | 0.499          | 0.499           | 858.879       | 5.722         |
| Leaf Blowers/Vacuums          | 2040 | G4          | C                         | 3      | 5       | 11.147       | 471.083      | 2.711         | 0.029         | 1.861          | 1.861           | 858.879       | 0.628         |
| Leaf Blowers/Vacuums          | 2040 | G4          | R                         | 3      | 5       | 11.147       | 471.083      | 2.711         | 0.029         | 1.861          | 1.861           | 858.879       | 0.628         |
| Other Lawn & Garden Equipment | 1990 | G2          | C                         | 0      | 2       | 417.573      | 1480.719     | 2.069         | 0.518         | 7.199          | 7.199           | 858.879       | 35.612        |
| Other Lawn & Garden Equipment | 1990 | G2          | R                         | 6      | 15      | 294.22       | 1043.999     | 1.832         | 0.518         | 7.239          | 7.239           | 858.879       | 25.092        |
| Other Lawn & Garden Equipment | 1990 | G2          | C                         | 0      | 2       | 417.573      | 1480.719     | 2.069         | 0.518         | 7.199          | 7.199           | 858.879       | 35.612        |
| Other Lawn & Garden Equipment | 1990 | G2          | R                         | 6      | 15      | 294.22       | 1043.999     | 1.832         | 0.518         | 7.239          | 7.239           | 858.879       | 25.092        |
| Other Lawn & Garden Equipment | 1990 | G4          | C                         | 3      | 5       | 70.524       | 1265.341     | 4.87          | 0.434         | 1.974          | 1.974           | 858.879       | 8.331         |
| Other Lawn & Garden Equipment | 1990 | G4          | R                         | 6      | 15      | 18.248       | 905.68       | 8.202         | 0.359         | 0.318          | 0.318           | 858.879       | 2.155         |
| Other Lawn & Garden Equipment | 1990 | G4          | C                         | 16     | 25      | 17.539       | 904.336      | 8.149         | 0.319         | 0.318          | 0.318           | 858.879       | 2.071         |
| Other Lawn & Garden Equipment | 1990 | G4          | R                         | 3      | 5       | 70.524       | 1265.341     | 4.87          | 0.434         | 1.974          | 1.974           | 858.879       | 8.331         |
| Other Lawn & Garden Equipment | 1990 | G4          | R                         | 6      | 15      | 18.248       | 905.68       | 8.202         | 0.359         | 0.318          | 0.318           | 858.879       | 2.155         |
| Other Lawn & Garden Equipment | 1990 | G4          | R                         | 16     | 25      | 17.539       | 904.336      | 8.149         | 0.319         | 0.318          | 0.318           | 858.879       | 2.071         |
| Other Lawn & Garden Equipment | 2000 | G2          | C                         | 0      | 2       | 255.682      | 687.225      | 2.511         | 0.049         | 5.341          | 5.341           | 858.879       | 15.475        |
| Other Lawn & Garden Equipment | 2000 | G2          | C                         | 6      | 15      | 213.998      | 571.185      | 2.331         | 0.049         | 5.941          | 5.941           | 858.879       | 12.952        |
| Other Lawn & Garden Equipment | 2000 | G2          | R                         | 0      | 2       | 255.682      | 687.225      | 2.511         | 0.049         | 5.341          | 5.341           | 858.879       | 15.475        |
| Other Lawn & Garden Equipment | 2000 | G2          | R                         | 6      | 15      | 213.998      | 571.185      | 2.331         | 0.049         | 5.941          | 5.941           | 858.879       | 12.952        |
| Other Lawn & Garden Equipment | 2000 | G4          | C                         | 3      | 5       | 38.922       | 777.377      | 5.505         | 0.041         | 1.967          | 1.967           | 858.879       | 2.127         |
| Other Lawn & Garden Equipment | 2000 | G4          | C                         | 6      | 15      | 15.49        | 660.87       | 6.637         | 0.034         | 0.317          | 0.317           | 858.88        | 0.846         |
| Other Lawn & Garden Equipment | 2000 | G4          | C                         | 16     | 25      | 14.439       | 666.768      | 5.802         | 0.03          | 0.317          | 0.317           | 858.879       | 0.789         |
| Other Lawn & Garden Equipment | 2000 | G4          | R                         | 3      | 5       | 38.922       | 777.377      | 5.505         | 0.041         | 1.967          | 1.967           | 858.879       | 2.127         |
| Other Lawn & Garden Equipment | 2000 | G4          | R                         | 6      | 15      | 15.49        | 660.87       | 6.637         | 0.034         | 0.317          | 0.317           | 858.88        | 0.846         |
| Other Lawn & Garden Equipment | 2000 | G4          | R                         | 16     | 25      | 14.439       | 666.768      | 5.802         | 0.03          | 0.317          | 0.317           | 858.879       | 0.789         |
| Other Lawn & Garden Equipment | 2005 | G2          | C                         | 0      | 2       | 159.33       | 495.992      | 3.006         | 0.035         | 2.565          | 2.565           | 858.879       | 9.903         |
| Other Lawn & Garden Equipment | 2005 | G2          | C                         | 6      | 15      | 137.825      | 434.477      | 2.933         | 0.035         | 2.769          | 2.769           | 858.879       | 8.566         |
| Other Lawn & Garden Equipment | 2005 | G2          | R                         | 0      | 2       | 159.33       | 495.992      | 3.006         | 0.035         | 2.565          | 2.565           | 858.879       | 9.903         |
| Other Lawn & Garden Equipment | 2005 | G2          | R                         | 6      | 15      | 137.825      | 434.477      | 2.933         | 0.035         | 2.769          | 2.769           | 858.879       | 8.566         |
| Other Lawn & Garden Equipment | 2005 | G4          | C                         | 3      | 5       | 26.099       | 584.277      | 6.584         | 0.029         | 1.97           | 1.97            | 858.879       | 1.465         |
| Other Lawn & Garden Equipment | 2005 | G4          | C                         | 6      | 15      | 11.731       | 569.53       | 7.02          | 0.024         | 0.318          | 0.318           | 858.879       | 0.658         |
| Other Lawn & Garden Equipment | 2005 | G4          | R                         | 16     | 25      | 11.785       | 591.718      | 6.419         | 0.021         | 0.318          | 0.318           | 858.879       | 0.661         |
| Other Lawn & Garden Equipment | 2005 | G4          | R                         | 3      | 5       | 26.099       | 584.277      | 6.584         | 0.029         | 1.97           | 1.97            | 858.879       | 1.465         |
| Other Lawn & Garden Equipment | 2005 | G4          | R                         | 6      | 15      | 11.731       | 569.53       | 7.02          | 0.024         | 0.318          | 0.318           | 858.879       | 0.658         |
| Other Lawn & Garden Equipment | 2005 | G4          | R                         | 16     | 25      | 11.785       | 591.718      | 6.419         | 0.021         | 0.318          | 0.318           | 858.879       | 0.661         |
| Other Lawn & Garden Equipment | 2010 | G2          | C                         | 0      | 2       | 112.488      | 396.425      | 2.775         | 0.035         | 1.656          | 1.656           | 858.879       | 6.991         |
| Other Lawn & Garden Equipment | 2010 | G2          | C                         | 6      | 15      | 103.891      | 373.197      | 2.732         | 0.035         | 1.818          | 1.818           | 858.879       | 6.457         |
| Other Lawn & Garden Equipment | 2010 | G2          | R                         | 0      | 2       | 112.488      | 396.425      | 2.775         | 0.035         | 1.656          | 1.656           | 858.879       | 6.991         |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type                | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|-------------------------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Other Lawn & Garden Equipment | 2010 | G2          | R                         | 6      | 15      | 103.891         | 373.197         | 2.732            | 0.035            | 1.818             | 1.818              | 858.879          | 6.457            |
| Other Lawn & Garden Equipment | 2010 | G4          | C                         | 3      | 5       | 18.025          | 518.999         | 4.238            | 0.029            | 1.972             | 1.972              | 858.879          | 1.012            |
| Other Lawn & Garden Equipment | 2010 | G4          | C                         | 6      | 15      | 8.92            | 540.914         | 5.705            | 0.024            | 0.318             | 0.318              | 858.879          | 0.501            |
| Other Lawn & Garden Equipment | 2010 | G4          | C                         | 16     | 25      | 8.966           | 567.825         | 5.282            | 0.021            | 0.318             | 0.318              | 858.879          | 0.503            |
| Other Lawn & Garden Equipment | 2010 | G4          | R                         | 3      | 5       | 18.025          | 518.999         | 4.238            | 0.029            | 1.972             | 1.972              | 858.879          | 1.012            |
| Other Lawn & Garden Equipment | 2010 | G4          | R                         | 6      | 15      | 8.92            | 540.914         | 5.705            | 0.024            | 0.318             | 0.318              | 858.879          | 0.501            |
| Other Lawn & Garden Equipment | 2010 | G4          | R                         | 16     | 25      | 8.966           | 567.825         | 5.282            | 0.021            | 0.318             | 0.318              | 858.879          | 0.503            |
| Other Lawn & Garden Equipment | 2011 | G2          | C                         | 0      | 2       | 105.244         | 382.943         | 2.794            | 0.035            | 1.478             | 1.478              | 858.879          | 6.541            |
| Other Lawn & Garden Equipment | 2011 | G2          | C                         | 6      | 15      | 98.289          | 364.342         | 2.758            | 0.035            | 1.619             | 1.619              | 858.879          | 6.109            |
| Other Lawn & Garden Equipment | 2011 | G2          | R                         | 0      | 2       | 105.244         | 382.943         | 2.794            | 0.035            | 1.478             | 1.478              | 858.879          | 6.541            |
| Other Lawn & Garden Equipment | 2011 | G2          | R                         | 6      | 15      | 98.289          | 364.342         | 2.758            | 0.035            | 1.619             | 1.619              | 858.879          | 6.109            |
| Other Lawn & Garden Equipment | 2011 | G4          | C                         | 3      | 5       | 17.166          | 511.452         | 4.062            | 0.029            | 1.971             | 1.971              | 858.879          | 0.964            |
| Other Lawn & Garden Equipment | 2011 | G4          | C                         | 6      | 15      | 8.57            | 538.09          | 5.532            | 0.024            | 0.318             | 0.318              | 858.879          | 0.481            |
| Other Lawn & Garden Equipment | 2011 | G4          | C                         | 16     | 25      | 8.612           | 565.627         | 5.144            | 0.021            | 0.318             | 0.318              | 858.879          | 0.483            |
| Other Lawn & Garden Equipment | 2011 | G4          | R                         | 3      | 5       | 17.166          | 511.452         | 4.062            | 0.029            | 1.971             | 1.971              | 858.879          | 0.964            |
| Other Lawn & Garden Equipment | 2011 | G4          | R                         | 6      | 15      | 8.57            | 538.09          | 5.532            | 0.024            | 0.318             | 0.318              | 858.879          | 0.481            |
| Other Lawn & Garden Equipment | 2011 | G4          | R                         | 16     | 25      | 8.612           | 565.627         | 5.144            | 0.021            | 0.318             | 0.318              | 858.879          | 0.483            |
| Other Lawn & Garden Equipment | 2012 | G2          | C                         | 0      | 2       | 98.97           | 372.378         | 2.811            | 0.035            | 1.314             | 1.314              | 858.879          | 6.151            |
| Other Lawn & Garden Equipment | 2012 | G2          | C                         | 6      | 15      | 93.154          | 356.813         | 2.781            | 0.035            | 1.431             | 1.431              | 858.879          | 5.79             |
| Other Lawn & Garden Equipment | 2012 | G2          | R                         | 0      | 2       | 98.97           | 372.378         | 2.811            | 0.035            | 1.314             | 1.314              | 858.879          | 6.151            |
| Other Lawn & Garden Equipment | 2012 | G2          | R                         | 6      | 15      | 93.154          | 356.813         | 2.781            | 0.035            | 1.431             | 1.431              | 858.879          | 5.79             |
| Other Lawn & Garden Equipment | 2012 | G4          | C                         | 3      | 5       | 16.541          | 504.415         | 3.953            | 0.029            | 1.971             | 1.971              | 858.879          | 0.929            |
| Other Lawn & Garden Equipment | 2012 | G4          | C                         | 6      | 15      | 8.305           | 534.997         | 5.415            | 0.024            | 0.318             | 0.318              | 858.879          | 0.466            |
| Other Lawn & Garden Equipment | 2012 | G4          | C                         | 16     | 25      | 8.354           | 563.036         | 5.056            | 0.021            | 0.318             | 0.318              | 858.879          | 0.469            |
| Other Lawn & Garden Equipment | 2012 | G4          | R                         | 3      | 5       | 16.541          | 504.415         | 3.953            | 0.029            | 1.971             | 1.971              | 858.879          | 0.929            |
| Other Lawn & Garden Equipment | 2012 | G4          | R                         | 6      | 15      | 8.305           | 534.997         | 5.415            | 0.024            | 0.318             | 0.318              | 858.879          | 0.466            |
| Other Lawn & Garden Equipment | 2012 | G4          | R                         | 16     | 25      | 8.354           | 563.036         | 5.056            | 0.021            | 0.318             | 0.318              | 858.879          | 0.469            |
| Other Lawn & Garden Equipment | 2013 | G2          | C                         | 0      | 2       | 93.015          | 362.541         | 2.826            | 0.035            | 1.158             | 1.158              | 858.879          | 5.781            |
| Other Lawn & Garden Equipment | 2013 | G2          | C                         | 6      | 15      | 88.205          | 349.607         | 2.801            | 0.035            | 1.252             | 1.252              | 858.879          | 5.482            |
| Other Lawn & Garden Equipment | 2013 | G2          | R                         | 0      | 2       | 93.015          | 362.541         | 2.826            | 0.035            | 1.158             | 1.158              | 858.879          | 5.781            |
| Other Lawn & Garden Equipment | 2013 | G2          | R                         | 6      | 15      | 88.205          | 349.607         | 2.801            | 0.035            | 1.252             | 1.252              | 858.879          | 5.482            |
| Other Lawn & Garden Equipment | 2013 | G4          | C                         | 3      | 5       | 15.973          | 497.231         | 3.87             | 0.029            | 1.972             | 1.972              | 858.879          | 0.897            |
| Other Lawn & Garden Equipment | 2013 | G4          | C                         | 6      | 15      | 8.091           | 531.613         | 5.338            | 0.024            | 0.318             | 0.318              | 858.879          | 0.454            |
| Other Lawn & Garden Equipment | 2013 | G4          | C                         | 16     | 25      | 8.158           | 560.112         | 4.999            | 0.021            | 0.318             | 0.318              | 858.879          | 0.458            |
| Other Lawn & Garden Equipment | 2013 | G4          | R                         | 3      | 5       | 15.973          | 497.231         | 3.87             | 0.029            | 1.972             | 1.972              | 858.879          | 0.897            |
| Other Lawn & Garden Equipment | 2013 | G4          | R                         | 6      | 15      | 8.091           | 531.613         | 5.338            | 0.024            | 0.318             | 0.318              | 858.879          | 0.454            |
| Other Lawn & Garden Equipment | 2013 | G4          | R                         | 16     | 25      | 8.158           | 560.112         | 4.999            | 0.021            | 0.318             | 0.318              | 858.879          | 0.458            |
| Other Lawn & Garden Equipment | 2014 | G2          | C                         | 0      | 2       | 87.581          | 353.588         | 2.838            | 0.035            | 1.015             | 1.015              | 858.879          | 5.443            |
| Other Lawn & Garden Equipment | 2014 | G2          | C                         | 6      | 15      | 83.672          | 342.992         | 2.819            | 0.035            | 1.086             | 1.086              | 858.879          | 5.2              |
| Other Lawn & Garden Equipment | 2014 | G2          | R                         | 0      | 2       | 87.581          | 353.588         | 2.838            | 0.035            | 1.015             | 1.015              | 858.879          | 5.443            |
| Other Lawn & Garden Equipment | 2014 | G2          | R                         | 6      | 15      | 83.672          | 342.992         | 2.819            | 0.035            | 1.086             | 1.086              | 858.879          | 5.2              |
| Other Lawn & Garden Equipment | 2014 | G4          | C                         | 3      | 5       | 15.432          | 490.368         | 3.788            | 0.029            | 1.971             | 1.971              | 858.879          | 0.867            |
| Other Lawn & Garden Equipment | 2014 | G4          | C                         | 6      | 15      | 7.898           | 528.312         | 5.278            | 0.024            | 0.318             | 0.318              | 858.879          | 0.443            |
| Other Lawn & Garden Equipment | 2014 | G4          | C                         | 16     | 25      | 7.988           | 557.256         | 4.954            | 0.021            | 0.318             | 0.318              | 858.879          | 0.449            |
| Other Lawn & Garden Equipment | 2014 | G4          | R                         | 3      | 5       | 15.432          | 490.368         | 3.788            | 0.029            | 1.971             | 1.971              | 858.879          | 0.867            |
| Other Lawn & Garden Equipment | 2014 | G4          | R                         | 6      | 15      | 7.898           | 528.312         | 5.278            | 0.024            | 0.318             | 0.318              | 858.879          | 0.443            |
| Other Lawn & Garden Equipment | 2014 | G4          | R                         | 16     | 25      | 7.988           | 557.256         | 4.954            | 0.021            | 0.318             | 0.318              | 858.879          | 0.449            |
| Other Lawn & Garden Equipment | 2015 | G2          | C                         | 0      | 2       | 82.696          | 345.46          | 2.846            | 0.035            | 0.886             | 0.886              | 858.879          | 5.139            |
| Other Lawn & Garden Equipment | 2015 | G2          | C                         | 6      | 15      | 79.612          | 337.013         | 2.832            | 0.035            | 0.937             | 0.937              | 858.879          | 4.948            |
| Other Lawn & Garden Equipment | 2015 | G2          | R                         | 0      | 2       | 82.696          | 345.46          | 2.846            | 0.035            | 0.886             | 0.886              | 858.879          | 5.139            |
| Other Lawn & Garden Equipment | 2015 | G2          | R                         | 6      | 15      | 79.612          | 337.013         | 2.832            | 0.035            | 0.937             | 0.937              | 858.879          | 4.948            |
| Other Lawn & Garden Equipment | 2015 | G4          | C                         | 3      | 5       | 14.909          | 483.663         | 3.709            | 0.029            | 1.971             | 1.971              | 858.879          | 0.838            |
| Other Lawn & Garden Equipment | 2015 | G4          | C                         | 6      | 15      | 7.71            | 525.103         | 5.22             | 0.024            | 0.318             | 0.318              | 858.879          | 0.433            |
| Other Lawn & Garden Equipment | 2015 | G4          | C                         | 16     | 25      | 7.821           | 554.482         | 4.912            | 0.021            | 0.318             | 0.318              | 858.879          | 0.439            |
| Other Lawn & Garden Equipment | 2015 | G4          | R                         | 3      | 5       | 14.909          | 483.663         | 3.709            | 0.029            | 1.971             | 1.971              | 858.879          | 0.838            |
| Other Lawn & Garden Equipment | 2015 | G4          | R                         | 6      | 15      | 7.71            | 525.103         | 5.22             | 0.024            | 0.318             | 0.318              | 858.879          | 0.433            |
| Other Lawn & Garden Equipment | 2015 | G4          | R                         | 16     | 25      | 7.821           | 554.482         | 4.912            | 0.021            | 0.318             | 0.318              | 858.879          | 0.439            |
| Other Lawn & Garden Equipment | 2016 | G2          | C                         | 0      | 2       | 79.657          | 340.134         | 2.839            | 0.035            | 0.812             | 0.812              | 858.879          | 4.951            |
| Other Lawn & Garden Equipment | 2016 | G2          | C                         | 6      | 15      | 77.163          | 333.3           | 2.827            | 0.035            | 0.853             | 0.853              | 858.879          | 4.796            |
| Other Lawn & Garden Equipment | 2016 | G2          | R                         | 0      | 2       | 79.657          | 340.134         | 2.839            | 0.035            | 0.812             | 0.812              | 858.879          | 4.951            |
| Other Lawn & Garden Equipment | 2016 | G2          | R                         | 6      | 15      | 77.163          | 333.3           | 2.827            | 0.035            | 0.853             | 0.853              | 858.879          | 4.796            |
| Other Lawn & Garden Equipment | 2016 | G4          | C                         | 3      | 5       | 14.43           | 477.614         | 3.63             | 0.029            | 1.971             | 1.971              | 858.879          | 0.811            |
| Other Lawn & Garden Equipment | 2016 | G4          | C                         | 6      | 15      | 7.53            | 522.211         | 5.164            | 0.024            | 0.318             | 0.318              | 858.88           | 0.423            |
| Other Lawn & Garden Equipment | 2016 | G4          | C                         | 16     | 25      | 7.662           | 551.995         | 4.871            | 0.021            | 0.318             | 0.318              | 858.879          | 0.43             |
| Other Lawn & Garden Equipment | 2016 | G4          | R                         | 3      | 5       | 14.43           | 477.614         | 3.63             | 0.029            | 1.971             | 1.971              | 858.879          | 0.811            |
| Other Lawn & Garden Equipment | 2016 | G4          | R                         | 6      | 15      | 7.53            | 522.211         | 5.164            | 0.024            | 0.318             | 0.318              | 858.88           | 0.423            |
| Other Lawn & Garden Equipment | 2016 | G4          | R                         | 16     | 25      | 7.662           | 551.995         | 4.871            | 0.021            | 0.318             | 0.318              | 858.879          | 0.43             |
| Other Lawn & Garden Equipment | 2017 | G2          | C                         | 0      | 2       | 77.493          | 336.104         | 2.824            | 0.035            | 0.762             | 0.762              | 858.879          | 4.816            |
| Other Lawn & Garden Equipment | 2017 | G2          | C                         | 6      | 15      | 75.472          | 330.608         | 2.815            | 0.035            | 0.798             | 0.798              | 858.879          | 4.69             |
| Other Lawn & Garden Equipment | 2017 | G2          | R                         | 0      | 2       | 77.493          | 336.104         | 2.824            | 0.035            | 0.762             | 0.762              | 858.879          | 4.816            |
| Other Lawn & Garden Equipment | 2017 | G2          | R                         | 6      | 15      | 75.472          | 330.608         | 2.815            | 0.035            | 0.798             | 0.798              | 858.879          | 4.69             |
| Other Lawn & Garden Equipment | 2017 | G4          | C                         | 3      | 5       | 13.993          | 472.178         | 3.552            | 0.029            | 1.971             | 1.971              | 858.879          | 0.786            |
| Other Lawn & Garden Equipment | 2017 | G4          | C                         | 6      | 15      | 7.362           | 519.618         | 5.111            | 0.024            | 0.318             | 0.318              | 858.879          | 0.413            |
| Other Lawn & Garden Equipment | 2017 | G4          | C                         | 16     | 25      | 7.513           | 549.763         | 4.832            | 0.021            | 0.318             | 0.318              | 858.879          | 0.422            |
| Other Lawn & Garden Equipment | 2017 | G4          | R                         | 3      | 5       | 13.993          | 472.178         | 3.552            | 0.029            | 1.971             | 1.971              | 858.879          | 0.786            |
| Other Lawn & Garden Equipment | 2017 | G4          | R                         | 6      | 15      | 7.362           | 519.618         | 5.111            | 0.024            | 0.318             | 0.318              | 858.879          | 0.413            |
| Other Lawn & Garden Equipment | 2017 | G4          | R                         | 16     | 25      | 7.513           | 549.763         | 4.832            | 0.021            | 0.318             | 0.318              | 858.879          | 0.422            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type                | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG g/bhp-hr | CO, g/bhp-hr | NOX, g/bhp-hr | SO2, g/bhp-hr | PM10, g/bhp-hr | PM2.5, g/bhp-hr | CO2, g/bhp-hr | CH4, g/bhp-hr |
|-------------------------------|------|-------------|---------------------------|--------|---------|--------------|--------------|---------------|---------------|----------------|-----------------|---------------|---------------|
| Other Lawn & Garden Equipment | 2018 | G2          | C                         | 0      | 2       | 75.613       | 332.581      | 2.809         | 0.035         | 0.72           | 0.72            | 858.879       | 4.699         |
| Other Lawn & Garden Equipment | 2018 | G2          | C                         | 6      | 15      | 74.009       | 328.268      | 2.801         | 0.035         | 0.751          | 0.751           | 858.879       | 4.6           |
| Other Lawn & Garden Equipment | 2018 | G2          | R                         | 0      | 2       | 75.613       | 332.581      | 2.809         | 0.035         | 0.72           | 0.72            | 858.879       | 4.699         |
| Other Lawn & Garden Equipment | 2018 | G2          | R                         | 6      | 15      | 74.009       | 328.268      | 2.801         | 0.035         | 0.751          | 0.751           | 858.879       | 4.6           |
| Other Lawn & Garden Equipment | 2018 | G4          | C                         | 3      | 5       | 13.649       | 468.588      | 3.469         | 0.029         | 1.972          | 1.972           | 858.879       | 0.767         |
| Other Lawn & Garden Equipment | 2018 | G4          | C                         | 6      | 15      | 7.227        | 518.013      | 5.055         | 0.024         | 0.318          | 0.318           | 858.879       | 0.406         |
| Other Lawn & Garden Equipment | 2018 | G4          | C                         | 16     | 25      | 7.386        | 548.386      | 4.786         | 0.021         | 0.318          | 0.318           | 858.879       | 0.415         |
| Other Lawn & Garden Equipment | 2018 | G4          | R                         | 3      | 5       | 13.649       | 468.588      | 3.469         | 0.029         | 1.972          | 1.972           | 858.879       | 0.767         |
| Other Lawn & Garden Equipment | 2018 | G4          | R                         | 6      | 15      | 7.227        | 518.013      | 5.055         | 0.024         | 0.318          | 0.318           | 858.879       | 0.406         |
| Other Lawn & Garden Equipment | 2018 | G4          | R                         | 16     | 25      | 7.386        | 548.386      | 4.786         | 0.021         | 0.318          | 0.318           | 858.879       | 0.415         |
| Other Lawn & Garden Equipment | 2019 | G2          | C                         | 0      | 2       | 73.95        | 329.492      | 2.795         | 0.035         | 0.682          | 0.682           | 858.879       | 4.596         |
| Other Lawn & Garden Equipment | 2019 | G2          | C                         | 6      | 15      | 72.71        | 326.209      | 2.788         | 0.035         | 0.709          | 0.709           | 858.879       | 4.519         |
| Other Lawn & Garden Equipment | 2019 | G2          | R                         | 0      | 2       | 73.95        | 329.492      | 2.795         | 0.035         | 0.682          | 0.682           | 858.879       | 4.596         |
| Other Lawn & Garden Equipment | 2019 | G2          | R                         | 6      | 15      | 72.71        | 326.209      | 2.788         | 0.035         | 0.709          | 0.709           | 858.879       | 4.519         |
| Other Lawn & Garden Equipment | 2019 | G4          | C                         | 3      | 5       | 13.355       | 465.968      | 3.384         | 0.029         | 1.972          | 1.972           | 858.879       | 0.751         |
| Other Lawn & Garden Equipment | 2019 | G4          | C                         | 6      | 15      | 7.111        | 516.889      | 5             | 0.024         | 0.318          | 0.318           | 858.879       | 0.399         |
| Other Lawn & Garden Equipment | 2019 | G4          | C                         | 16     | 25      | 7.273        | 547.426      | 4.738         | 0.021         | 0.318          | 0.318           | 858.879       | 0.409         |
| Other Lawn & Garden Equipment | 2019 | G4          | R                         | 3      | 5       | 13.355       | 465.968      | 3.384         | 0.029         | 1.972          | 1.972           | 858.879       | 0.751         |
| Other Lawn & Garden Equipment | 2019 | G4          | R                         | 6      | 15      | 7.111        | 516.889      | 5             | 0.024         | 0.318          | 0.318           | 858.879       | 0.399         |
| Other Lawn & Garden Equipment | 2019 | G4          | R                         | 16     | 25      | 7.273        | 547.426      | 4.738         | 0.021         | 0.318          | 0.318           | 858.879       | 0.409         |
| Other Lawn & Garden Equipment | 2020 | G2          | C                         | 0      | 2       | 72.499       | 326.883      | 2.783         | 0.035         | 0.647          | 0.647           | 858.88        | 4.506         |
| Other Lawn & Garden Equipment | 2020 | G2          | C                         | 6      | 15      | 71.561       | 324.439      | 2.777         | 0.035         | 0.67           | 0.67            | 858.879       | 4.447         |
| Other Lawn & Garden Equipment | 2020 | G2          | R                         | 0      | 2       | 72.499       | 326.883      | 2.783         | 0.035         | 0.647          | 0.647           | 858.88        | 4.506         |
| Other Lawn & Garden Equipment | 2020 | G2          | R                         | 6      | 15      | 71.561       | 324.439      | 2.777         | 0.035         | 0.67           | 0.67            | 858.879       | 4.447         |
| Other Lawn & Garden Equipment | 2020 | G4          | C                         | 3      | 5       | 13.097       | 463.764      | 3.301         | 0.029         | 1.972          | 1.972           | 858.879       | 0.736         |
| Other Lawn & Garden Equipment | 2020 | G4          | C                         | 6      | 15      | 7.003        | 515.951      | 4.947         | 0.024         | 0.318          | 0.318           | 858.879       | 0.393         |
| Other Lawn & Garden Equipment | 2020 | G4          | C                         | 16     | 25      | 7.166        | 546.629      | 4.693         | 0.021         | 0.318          | 0.318           | 858.879       | 0.403         |
| Other Lawn & Garden Equipment | 2020 | G4          | R                         | 3      | 5       | 13.097       | 463.764      | 3.301         | 0.029         | 1.972          | 1.972           | 858.879       | 0.736         |
| Other Lawn & Garden Equipment | 2020 | G4          | R                         | 6      | 15      | 7.003        | 515.951      | 4.947         | 0.024         | 0.318          | 0.318           | 858.879       | 0.393         |
| Other Lawn & Garden Equipment | 2020 | G4          | R                         | 16     | 25      | 7.166        | 546.629      | 4.693         | 0.021         | 0.318          | 0.318           | 858.879       | 0.403         |
| Other Lawn & Garden Equipment | 2021 | G2          | C                         | 0      | 2       | 71.211       | 324.651      | 2.778         | 0.035         | 0.618          | 0.618           | 858.879       | 4.426         |
| Other Lawn & Garden Equipment | 2021 | G2          | C                         | 6      | 15      | 70.528       | 322.915      | 2.773         | 0.035         | 0.637          | 0.637           | 858.879       | 4.383         |
| Other Lawn & Garden Equipment | 2021 | G2          | R                         | 0      | 2       | 71.211       | 324.651      | 2.778         | 0.035         | 0.618          | 0.618           | 858.879       | 4.426         |
| Other Lawn & Garden Equipment | 2021 | G2          | R                         | 6      | 15      | 70.528       | 322.915      | 2.773         | 0.035         | 0.637          | 0.637           | 858.879       | 4.383         |
| Other Lawn & Garden Equipment | 2021 | G4          | C                         | 3      | 5       | 12.85        | 462.031      | 3.218         | 0.029         | 1.97           | 1.97            | 858.879       | 0.722         |
| Other Lawn & Garden Equipment | 2021 | G4          | C                         | 6      | 15      | 6.895        | 515.104      | 4.893         | 0.024         | 0.318          | 0.318           | 858.879       | 0.387         |
| Other Lawn & Garden Equipment | 2021 | G4          | C                         | 16     | 25      | 7.061        | 545.911      | 4.646         | 0.021         | 0.318          | 0.318           | 858.879       | 0.397         |
| Other Lawn & Garden Equipment | 2021 | G4          | R                         | 3      | 5       | 12.85        | 462.031      | 3.218         | 0.029         | 1.97           | 1.97            | 858.879       | 0.722         |
| Other Lawn & Garden Equipment | 2021 | G4          | R                         | 6      | 15      | 6.895        | 515.104      | 4.893         | 0.024         | 0.318          | 0.318           | 858.879       | 0.387         |
| Other Lawn & Garden Equipment | 2021 | G4          | R                         | 16     | 25      | 7.061        | 545.911      | 4.646         | 0.021         | 0.318          | 0.318           | 858.879       | 0.397         |
| Other Lawn & Garden Equipment | 2022 | G2          | C                         | 0      | 2       | 70.359       | 322.937      | 2.777         | 0.035         | 0.593          | 0.593           | 858.879       | 4.373         |
| Other Lawn & Garden Equipment | 2022 | G2          | C                         | 6      | 15      | 69.865       | 321.711      | 2.773         | 0.035         | 0.608          | 0.608           | 858.879       | 4.342         |
| Other Lawn & Garden Equipment | 2022 | G2          | R                         | 0      | 2       | 70.359       | 322.937      | 2.777         | 0.035         | 0.593          | 0.593           | 858.879       | 4.373         |
| Other Lawn & Garden Equipment | 2022 | G2          | R                         | 6      | 15      | 69.865       | 321.711      | 2.773         | 0.035         | 0.608          | 0.608           | 858.879       | 4.342         |
| Other Lawn & Garden Equipment | 2022 | G4          | C                         | 3      | 5       | 12.663       | 460.239      | 3.15          | 0.029         | 1.971          | 1.971           | 858.879       | 0.712         |
| Other Lawn & Garden Equipment | 2022 | G4          | C                         | 6      | 15      | 6.803        | 514.379      | 4.847         | 0.024         | 0.318          | 0.318           | 858.879       | 0.382         |
| Other Lawn & Garden Equipment | 2022 | G4          | C                         | 16     | 25      | 6.97         | 545.298      | 4.608         | 0.021         | 0.318          | 0.318           | 858.879       | 0.392         |
| Other Lawn & Garden Equipment | 2022 | G4          | R                         | 3      | 5       | 12.663       | 460.239      | 3.15          | 0.029         | 1.971          | 1.971           | 858.879       | 0.712         |
| Other Lawn & Garden Equipment | 2022 | G4          | R                         | 6      | 15      | 6.803        | 514.379      | 4.847         | 0.024         | 0.318          | 0.318           | 858.879       | 0.382         |
| Other Lawn & Garden Equipment | 2022 | G4          | R                         | 16     | 25      | 6.97         | 545.298      | 4.608         | 0.021         | 0.318          | 0.318           | 858.879       | 0.392         |
| Other Lawn & Garden Equipment | 2023 | G2          | C                         | 0      | 2       | 69.52        | 321.418      | 2.776         | 0.035         | 0.57           | 0.57            | 858.879       | 4.321         |
| Other Lawn & Garden Equipment | 2023 | G2          | C                         | 6      | 15      | 69.189       | 320.632      | 2.773         | 0.035         | 0.583          | 0.583           | 858.879       | 4.3           |
| Other Lawn & Garden Equipment | 2023 | G2          | R                         | 0      | 2       | 69.52        | 321.418      | 2.776         | 0.035         | 0.57           | 0.57            | 858.879       | 4.321         |
| Other Lawn & Garden Equipment | 2023 | G2          | R                         | 6      | 15      | 69.189       | 320.632      | 2.773         | 0.035         | 0.583          | 0.583           | 858.879       | 4.3           |
| Other Lawn & Garden Equipment | 2023 | G4          | C                         | 3      | 5       | 12.525       | 458.636      | 3.114         | 0.029         | 1.972          | 1.972           | 858.879       | 0.704         |
| Other Lawn & Garden Equipment | 2023 | G4          | C                         | 6      | 15      | 6.722        | 513.716      | 4.806         | 0.024         | 0.318          | 0.318           | 858.879       | 0.378         |
| Other Lawn & Garden Equipment | 2023 | G4          | C                         | 16     | 25      | 6.889        | 544.729      | 4.574         | 0.021         | 0.318          | 0.318           | 858.879       | 0.387         |
| Other Lawn & Garden Equipment | 2023 | G4          | R                         | 3      | 5       | 12.525       | 458.636      | 3.114         | 0.029         | 1.972          | 1.972           | 858.879       | 0.704         |
| Other Lawn & Garden Equipment | 2023 | G4          | R                         | 6      | 15      | 6.722        | 513.716      | 4.806         | 0.024         | 0.318          | 0.318           | 858.879       | 0.378         |
| Other Lawn & Garden Equipment | 2023 | G4          | R                         | 16     | 25      | 6.889        | 544.729      | 4.574         | 0.021         | 0.318          | 0.318           | 858.879       | 0.387         |
| Other Lawn & Garden Equipment | 2024 | G2          | C                         | 0      | 2       | 68.855       | 320.179      | 2.775         | 0.035         | 0.551          | 0.551           | 858.88        | 4.279         |
| Other Lawn & Garden Equipment | 2024 | G2          | C                         | 6      | 15      | 68.655       | 319.739      | 2.773         | 0.035         | 0.56           | 0.56            | 858.879       | 4.267         |
| Other Lawn & Garden Equipment | 2024 | G2          | R                         | 0      | 2       | 68.855       | 320.179      | 2.775         | 0.035         | 0.551          | 0.551           | 858.88        | 4.279         |
| Other Lawn & Garden Equipment | 2024 | G2          | R                         | 6      | 15      | 68.655       | 319.739      | 2.773         | 0.035         | 0.56           | 0.56            | 858.879       | 4.267         |
| Other Lawn & Garden Equipment | 2024 | G4          | C                         | 3      | 5       | 12.406       | 457.453      | 3.088         | 0.029         | 1.972          | 1.972           | 858.879       | 0.698         |
| Other Lawn & Garden Equipment | 2024 | G4          | C                         | 6      | 15      | 6.664        | 513.136      | 4.781         | 0.024         | 0.318          | 0.318           | 858.879       | 0.375         |
| Other Lawn & Garden Equipment | 2024 | G4          | C                         | 16     | 25      | 6.834        | 544.234      | 4.554         | 0.021         | 0.318          | 0.318           | 858.879       | 0.384         |
| Other Lawn & Garden Equipment | 2024 | G4          | R                         | 3      | 5       | 12.406       | 457.453      | 3.088         | 0.029         | 1.972          | 1.972           | 858.879       | 0.698         |
| Other Lawn & Garden Equipment | 2024 | G4          | R                         | 6      | 15      | 6.664        | 513.136      | 4.781         | 0.024         | 0.318          | 0.318           | 858.879       | 0.375         |
| Other Lawn & Garden Equipment | 2024 | G4          | R                         | 16     | 25      | 6.834        | 544.234      | 4.554         | 0.021         | 0.318          | 0.318           | 858.879       | 0.384         |
| Other Lawn & Garden Equipment | 2025 | G2          | C                         | 0      | 2       | 68.3         | 319.298      | 2.773         | 0.035         | 0.535          | 0.535           | 858.879       | 4.245         |
| Other Lawn & Garden Equipment | 2025 | G2          | C                         | 6      | 15      | 68.187       | 319.079      | 2.772         | 0.035         | 0.542          | 0.542           | 858.879       | 4.238         |
| Other Lawn & Garden Equipment | 2025 | G2          | R                         | 0      | 2       | 68.3         | 319.298      | 2.773         | 0.035         | 0.535          | 0.535           | 858.879       | 4.245         |
| Other Lawn & Garden Equipment | 2025 | G2          | R                         | 6      | 15      | 68.187       | 319.079      | 2.772         | 0.035         | 0.542          | 0.542           | 858.879       | 4.238         |
| Other Lawn & Garden Equipment | 2025 | G4          | C                         | 3      | 5       | 12.316       | 456.385      | 3.066         | 0.029         | 1.972          | 1.972           | 858.879       | 0.693         |
| Other Lawn & Garden Equipment | 2025 | G4          | C                         | 6      | 15      | 6.622        | 512.645      | 4.766         | 0.024         | 0.318          | 0.318           | 858.879       | 0.372         |
| Other Lawn & Garden Equipment | 2025 | G4          | C                         | 16     | 25      | 6.795        | 543.816      | 4.543         | 0.021         | 0.318          | 0.318           | 858.879       | 0.382         |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type                | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|-------------------------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Other Lawn & Garden Equipment | 2025 | G4          | R                         | 3      | 5       | 12.316          | 456.385         | 3.066            | 0.029            | 1.972             | 1.972              | 858.879          | 0.693            |
| Other Lawn & Garden Equipment | 2025 | G4          | R                         | 6      | 15      | 6.622           | 512.645         | 4.766            | 0.024            | 0.318             | 0.318              | 858.879          | 0.372            |
| Other Lawn & Garden Equipment | 2025 | G4          | R                         | 16     | 25      | 6.795           | 543.816         | 4.543            | 0.021            | 0.318             | 0.318              | 858.879          | 0.382            |
| Other Lawn & Garden Equipment | 2030 | G2          | C                         | 0      | 2       | 67.063          | 317.793         | 2.764            | 0.035            | 0.5               | 0.5                | 858.879          | 4.168            |
| Other Lawn & Garden Equipment | 2030 | G2          | C                         | 6      | 15      | 67.061          | 317.79          | 2.764            | 0.035            | 0.5               | 0.5                | 858.879          | 4.168            |
| Other Lawn & Garden Equipment | 2030 | G2          | R                         | 0      | 2       | 67.063          | 317.793         | 2.764            | 0.035            | 0.5               | 0.5                | 858.879          | 4.168            |
| Other Lawn & Garden Equipment | 2030 | G2          | R                         | 6      | 15      | 67.061          | 317.79          | 2.764            | 0.035            | 0.5               | 0.5                | 858.879          | 4.168            |
| Other Lawn & Garden Equipment | 2030 | G4          | C                         | 3      | 5       | 12.077          | 453.765         | 2.985            | 0.029            | 1.971             | 1.971              | 858.879          | 0.68             |
| Other Lawn & Garden Equipment | 2030 | G4          | C                         | 6      | 15      | 6.486           | 511.085         | 4.712            | 0.024            | 0.318             | 0.318              | 858.879          | 0.365            |
| Other Lawn & Garden Equipment | 2030 | G4          | C                         | 16     | 25      | 6.668           | 542.44          | 4.502            | 0.021            | 0.318             | 0.318              | 858.879          | 0.375            |
| Other Lawn & Garden Equipment | 2030 | G4          | R                         | 3      | 5       | 12.077          | 453.765         | 2.985            | 0.029            | 1.971             | 1.971              | 858.879          | 0.68             |
| Other Lawn & Garden Equipment | 2030 | G4          | R                         | 6      | 15      | 6.486           | 511.085         | 4.712            | 0.024            | 0.318             | 0.318              | 858.879          | 0.365            |
| Other Lawn & Garden Equipment | 2030 | G4          | R                         | 16     | 25      | 6.668           | 542.44          | 4.502            | 0.021            | 0.318             | 0.318              | 858.879          | 0.375            |
| Other Lawn & Garden Equipment | 2035 | G2          | C                         | 0      | 2       | 66.983          | 317.759         | 2.758            | 0.035            | 0.499             | 0.499              | 858.879          | 4.163            |
| Other Lawn & Garden Equipment | 2035 | G2          | C                         | 6      | 15      | 66.983          | 317.759         | 2.758            | 0.035            | 0.499             | 0.499              | 858.879          | 4.163            |
| Other Lawn & Garden Equipment | 2035 | G2          | R                         | 0      | 2       | 66.983          | 317.759         | 2.758            | 0.035            | 0.499             | 0.499              | 858.879          | 4.163            |
| Other Lawn & Garden Equipment | 2035 | G2          | R                         | 6      | 15      | 66.983          | 317.759         | 2.758            | 0.035            | 0.499             | 0.499              | 858.879          | 4.163            |
| Other Lawn & Garden Equipment | 2035 | G4          | C                         | 3      | 5       | 12.016          | 453.055         | 2.948            | 0.029            | 1.971             | 1.971              | 858.879          | 0.677            |
| Other Lawn & Garden Equipment | 2035 | G4          | C                         | 6      | 15      | 6.44            | 510.509         | 4.686            | 0.024            | 0.318             | 0.318              | 858.879          | 0.362            |
| Other Lawn & Garden Equipment | 2035 | G4          | C                         | 16     | 25      | 6.62            | 541.868         | 4.48             | 0.021            | 0.318             | 0.318              | 858.879          | 0.373            |
| Other Lawn & Garden Equipment | 2035 | G4          | R                         | 3      | 5       | 12.016          | 453.055         | 2.948            | 0.029            | 1.971             | 1.971              | 858.879          | 0.677            |
| Other Lawn & Garden Equipment | 2035 | G4          | R                         | 6      | 15      | 6.44            | 510.509         | 4.686            | 0.024            | 0.318             | 0.318              | 858.879          | 0.362            |
| Other Lawn & Garden Equipment | 2035 | G4          | R                         | 16     | 25      | 6.62            | 541.868         | 4.48             | 0.021            | 0.318             | 0.318              | 858.879          | 0.373            |
| Other Lawn & Garden Equipment | 2040 | G2          | C                         | 0      | 2       | 66.971          | 317.759         | 2.758            | 0.035            | 0.499             | 0.499              | 858.879          | 4.162            |
| Other Lawn & Garden Equipment | 2040 | G2          | C                         | 6      | 15      | 66.971          | 317.759         | 2.758            | 0.035            | 0.499             | 0.499              | 858.879          | 4.162            |
| Other Lawn & Garden Equipment | 2040 | G2          | R                         | 0      | 2       | 66.971          | 317.759         | 2.758            | 0.035            | 0.499             | 0.499              | 858.879          | 4.162            |
| Other Lawn & Garden Equipment | 2040 | G2          | R                         | 6      | 15      | 66.971          | 317.759         | 2.758            | 0.035            | 0.499             | 0.499              | 858.879          | 4.162            |
| Other Lawn & Garden Equipment | 2040 | G4          | C                         | 3      | 5       | 12.002          | 452.678         | 2.942            | 0.029            | 1.971             | 1.971              | 858.879          | 0.676            |
| Other Lawn & Garden Equipment | 2040 | G4          | C                         | 6      | 15      | 6.428           | 510.057         | 4.679            | 0.024            | 0.318             | 0.318              | 858.879          | 0.362            |
| Other Lawn & Garden Equipment | 2040 | G4          | C                         | 16     | 25      | 6.607           | 541.388         | 4.474            | 0.021            | 0.318             | 0.318              | 858.879          | 0.372            |
| Other Lawn & Garden Equipment | 2040 | G4          | R                         | 3      | 5       | 12.002          | 452.678         | 2.942            | 0.029            | 1.971             | 1.971              | 858.879          | 0.676            |
| Other Lawn & Garden Equipment | 2040 | G4          | R                         | 6      | 15      | 6.428           | 510.057         | 4.679            | 0.024            | 0.318             | 0.318              | 858.879          | 0.362            |
| Other Lawn & Garden Equipment | 2040 | G4          | R                         | 16     | 25      | 6.607           | 541.388         | 4.474            | 0.021            | 0.318             | 0.318              | 858.879          | 0.372            |
| Rear Engine Riding Mowers     | 1990 | G4          | C                         | 6      | 15      | 22.909          | 915.938         | 8.6              | 0.359            | 0.371             | 0.371              | 858.879          | 2.705            |
| Rear Engine Riding Mowers     | 1990 | G4          | C                         | 16     | 25      | 21.231          | 912.759         | 8.476            | 0.319            | 0.371             | 0.371              | 858.879          | 2.507            |
| Rear Engine Riding Mowers     | 1990 | G4          | R                         | 6      | 15      | 22.909          | 915.938         | 8.6              | 0.359            | 0.371             | 0.371              | 858.879          | 2.705            |
| Rear Engine Riding Mowers     | 1990 | G4          | R                         | 16     | 25      | 21.231          | 912.759         | 8.476            | 0.319            | 0.371             | 0.371              | 858.879          | 2.507            |
| Rear Engine Riding Mowers     | 2000 | G4          | C                         | 6      | 15      | 20.645          | 670.814         | 6.649            | 0.034            | 0.37              | 0.37               | 858.879          | 1.128            |
| Rear Engine Riding Mowers     | 2000 | G4          | C                         | 16     | 25      | 18.437          | 666.497         | 5.668            | 0.03             | 0.37              | 0.37               | 858.879          | 1.007            |
| Rear Engine Riding Mowers     | 2000 | G4          | R                         | 6      | 15      | 20.645          | 670.814         | 6.649            | 0.034            | 0.37              | 0.37               | 858.879          | 1.128            |
| Rear Engine Riding Mowers     | 2000 | G4          | R                         | 16     | 25      | 18.437          | 666.497         | 5.668            | 0.03             | 0.37              | 0.37               | 858.879          | 1.007            |
| Rear Engine Riding Mowers     | 2005 | G4          | C                         | 6      | 15      | 13.656          | 554.614         | 7.702            | 0.024            | 0.37              | 0.37               | 858.879          | 0.766            |
| Rear Engine Riding Mowers     | 2005 | G4          | C                         | 16     | 25      | 13.498          | 576.678         | 6.968            | 0.021            | 0.37              | 0.37               | 858.879          | 0.758            |
| Rear Engine Riding Mowers     | 2005 | G4          | R                         | 6      | 15      | 13.656          | 554.614         | 7.702            | 0.024            | 0.37              | 0.37               | 858.879          | 0.766            |
| Rear Engine Riding Mowers     | 2005 | G4          | R                         | 16     | 25      | 13.498          | 576.678         | 6.968            | 0.021            | 0.37              | 0.37               | 858.879          | 0.758            |
| Rear Engine Riding Mowers     | 2010 | G4          | C                         | 6      | 15      | 9.521           | 522.282         | 6.198            | 0.024            | 0.37              | 0.37               | 858.879          | 0.534            |
| Rear Engine Riding Mowers     | 2010 | G4          | C                         | 16     | 25      | 9.505           | 550.919         | 5.959            | 0.021            | 0.37              | 0.37               | 858.879          | 0.534            |
| Rear Engine Riding Mowers     | 2010 | G4          | R                         | 6      | 15      | 9.521           | 522.282         | 6.198            | 0.024            | 0.37              | 0.37               | 858.879          | 0.534            |
| Rear Engine Riding Mowers     | 2010 | G4          | R                         | 16     | 25      | 9.505           | 550.919         | 5.959            | 0.021            | 0.37              | 0.37               | 858.879          | 0.534            |
| Rear Engine Riding Mowers     | 2011 | G4          | C                         | 6      | 15      | 9.168           | 519.756         | 6.099            | 0.024            | 0.37              | 0.37               | 858.879          | 0.515            |
| Rear Engine Riding Mowers     | 2011 | G4          | C                         | 16     | 25      | 9.185           | 549.03          | 5.885            | 0.021            | 0.37              | 0.37               | 858.879          | 0.516            |
| Rear Engine Riding Mowers     | 2011 | G4          | R                         | 6      | 15      | 9.168           | 519.756         | 6.099            | 0.024            | 0.37              | 0.37               | 858.879          | 0.515            |
| Rear Engine Riding Mowers     | 2011 | G4          | R                         | 16     | 25      | 9.185           | 549.03          | 5.885            | 0.021            | 0.37              | 0.37               | 858.879          | 0.516            |
| Rear Engine Riding Mowers     | 2012 | G4          | C                         | 6      | 15      | 8.85            | 517.872         | 5.992            | 0.024            | 0.37              | 0.37               | 858.879          | 0.497            |
| Rear Engine Riding Mowers     | 2012 | G4          | C                         | 16     | 25      | 8.887           | 547.664         | 5.805            | 0.021            | 0.37              | 0.37               | 858.879          | 0.499            |
| Rear Engine Riding Mowers     | 2012 | G4          | R                         | 6      | 15      | 8.85            | 517.872         | 5.992            | 0.024            | 0.37              | 0.37               | 858.879          | 0.497            |
| Rear Engine Riding Mowers     | 2012 | G4          | R                         | 16     | 25      | 8.887           | 547.664         | 5.805            | 0.021            | 0.37              | 0.37               | 858.879          | 0.499            |
| Rear Engine Riding Mowers     | 2013 | G4          | C                         | 6      | 15      | 8.562           | 516.231         | 5.892            | 0.024            | 0.37              | 0.37               | 858.879          | 0.481            |
| Rear Engine Riding Mowers     | 2013 | G4          | C                         | 16     | 25      | 8.612           | 546.488         | 5.732            | 0.021            | 0.37              | 0.37               | 858.879          | 0.484            |
| Rear Engine Riding Mowers     | 2013 | G4          | R                         | 6      | 15      | 8.562           | 516.231         | 5.892            | 0.024            | 0.37              | 0.37               | 858.879          | 0.481            |
| Rear Engine Riding Mowers     | 2013 | G4          | R                         | 16     | 25      | 8.612           | 546.488         | 5.732            | 0.021            | 0.37              | 0.37               | 858.879          | 0.484            |
| Rear Engine Riding Mowers     | 2014 | G4          | C                         | 6      | 15      | 8.303           | 514.847         | 5.793            | 0.024            | 0.37              | 0.37               | 858.879          | 0.466            |
| Rear Engine Riding Mowers     | 2014 | G4          | C                         | 16     | 25      | 8.36            | 545.483         | 5.66             | 0.021            | 0.37              | 0.37               | 858.879          | 0.469            |
| Rear Engine Riding Mowers     | 2014 | G4          | R                         | 6      | 15      | 8.303           | 514.847         | 5.793            | 0.024            | 0.37              | 0.37               | 858.879          | 0.466            |
| Rear Engine Riding Mowers     | 2014 | G4          | R                         | 16     | 25      | 8.36            | 545.483         | 5.66             | 0.021            | 0.37              | 0.37               | 858.879          | 0.469            |
| Rear Engine Riding Mowers     | 2015 | G4          | C                         | 6      | 15      | 8.07            | 513.744         | 5.696            | 0.024            | 0.37              | 0.37               | 858.879          | 0.453            |
| Rear Engine Riding Mowers     | 2015 | G4          | C                         | 16     | 25      | 8.128           | 544.687         | 5.589            | 0.021            | 0.37              | 0.37               | 858.879          | 0.456            |
| Rear Engine Riding Mowers     | 2015 | G4          | R                         | 6      | 15      | 8.07            | 513.744         | 5.696            | 0.024            | 0.37              | 0.37               | 858.879          | 0.453            |
| Rear Engine Riding Mowers     | 2015 | G4          | R                         | 16     | 25      | 8.128           | 544.687         | 5.589            | 0.021            | 0.37              | 0.37               | 858.879          | 0.456            |
| Rear Engine Riding Mowers     | 2016 | G4          | C                         | 6      | 15      | 7.873           | 512.921         | 5.604            | 0.024            | 0.37              | 0.37               | 858.879          | 0.442            |
| Rear Engine Riding Mowers     | 2016 | G4          | C                         | 16     | 25      | 7.924           | 544.091         | 5.523            | 0.021            | 0.37              | 0.37               | 858.879          | 0.445            |
| Rear Engine Riding Mowers     | 2016 | G4          | R                         | 6      | 15      | 7.873           | 512.921         | 5.604            | 0.024            | 0.37              | 0.37               | 858.879          | 0.442            |
| Rear Engine Riding Mowers     | 2016 | G4          | R                         | 16     | 25      | 7.924           | 544.091         | 5.523            | 0.021            | 0.37              | 0.37               | 858.879          | 0.445            |
| Rear Engine Riding Mowers     | 2017 | G4          | C                         | 6      | 15      | 7.773           | 512.361         | 5.568            | 0.024            | 0.37              | 0.37               | 858.88           | 0.437            |
| Rear Engine Riding Mowers     | 2017 | G4          | C                         | 16     | 25      | 7.826           | 543.681         | 5.499            | 0.021            | 0.37              | 0.37               | 858.879          | 0.44             |
| Rear Engine Riding Mowers     | 2017 | G4          | R                         | 6      | 15      | 7.773           | 512.361         | 5.568            | 0.024            | 0.37              | 0.37               | 858.88           | 0.437            |
| Rear Engine Riding Mowers     | 2017 | G4          | R                         | 16     | 25      | 7.826           | 543.681         | 5.499            | 0.021            | 0.37              | 0.37               | 858.879          | 0.44             |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type            | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|---------------------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Rear Engine Riding Mowers | 2018 | G4          | C                         | 6      | 15      | 7.704           | 511.993         | 5.54             | 0.024            | 0.37              | 0.37               | 858.879          | 0.433            |
| Rear Engine Riding Mowers | 2018 | G4          | C                         | 16     | 25      | 7.756           | 543.404         | 5.48             | 0.021            | 0.37              | 0.37               | 858.879          | 0.436            |
| Rear Engine Riding Mowers | 2018 | G4          | R                         | 6      | 15      | 7.704           | 511.993         | 5.54             | 0.024            | 0.37              | 0.37               | 858.879          | 0.433            |
| Rear Engine Riding Mowers | 2018 | G4          | R                         | 16     | 25      | 7.756           | 543.404         | 5.48             | 0.021            | 0.37              | 0.37               | 858.879          | 0.436            |
| Rear Engine Riding Mowers | 2019 | G4          | C                         | 6      | 15      | 7.66            | 511.821         | 5.514            | 0.024            | 0.37              | 0.37               | 858.879          | 0.43             |
| Rear Engine Riding Mowers | 2019 | G4          | C                         | 16     | 25      | 7.707           | 543.26          | 5.463            | 0.021            | 0.37              | 0.37               | 858.88           | 0.433            |
| Rear Engine Riding Mowers | 2019 | G4          | R                         | 6      | 15      | 7.66            | 511.821         | 5.514            | 0.024            | 0.37              | 0.37               | 858.879          | 0.43             |
| Rear Engine Riding Mowers | 2019 | G4          | R                         | 16     | 25      | 7.707           | 543.26          | 5.463            | 0.021            | 0.37              | 0.37               | 858.88           | 0.433            |
| Rear Engine Riding Mowers | 2020 | G4          | C                         | 6      | 15      | 7.631           | 511.749         | 5.492            | 0.024            | 0.37              | 0.37               | 858.879          | 0.429            |
| Rear Engine Riding Mowers | 2020 | G4          | C                         | 16     | 25      | 7.672           | 543.183         | 5.446            | 0.021            | 0.37              | 0.37               | 858.879          | 0.431            |
| Rear Engine Riding Mowers | 2020 | G4          | R                         | 6      | 15      | 7.631           | 511.749         | 5.492            | 0.024            | 0.37              | 0.37               | 858.879          | 0.429            |
| Rear Engine Riding Mowers | 2020 | G4          | R                         | 16     | 25      | 7.672           | 543.183         | 5.446            | 0.021            | 0.37              | 0.37               | 858.879          | 0.431            |
| Rear Engine Riding Mowers | 2021 | G4          | C                         | 6      | 15      | 7.604           | 511.699         | 5.471            | 0.024            | 0.37              | 0.37               | 858.88           | 0.427            |
| Rear Engine Riding Mowers | 2021 | G4          | C                         | 16     | 25      | 7.641           | 543.131         | 5.43             | 0.021            | 0.37              | 0.37               | 858.879          | 0.429            |
| Rear Engine Riding Mowers | 2021 | G4          | R                         | 6      | 15      | 7.604           | 511.699         | 5.471            | 0.024            | 0.37              | 0.37               | 858.88           | 0.427            |
| Rear Engine Riding Mowers | 2021 | G4          | R                         | 16     | 25      | 7.641           | 543.131         | 5.43             | 0.021            | 0.37              | 0.37               | 858.879          | 0.429            |
| Rear Engine Riding Mowers | 2022 | G4          | C                         | 6      | 15      | 7.589           | 511.628         | 5.459            | 0.024            | 0.37              | 0.37               | 858.88           | 0.426            |
| Rear Engine Riding Mowers | 2022 | G4          | C                         | 16     | 25      | 7.622           | 543.055         | 5.422            | 0.021            | 0.37              | 0.37               | 858.879          | 0.428            |
| Rear Engine Riding Mowers | 2022 | G4          | R                         | 6      | 15      | 7.589           | 511.628         | 5.459            | 0.024            | 0.37              | 0.37               | 858.88           | 0.426            |
| Rear Engine Riding Mowers | 2022 | G4          | R                         | 16     | 25      | 7.622           | 543.055         | 5.422            | 0.021            | 0.37              | 0.37               | 858.879          | 0.428            |
| Rear Engine Riding Mowers | 2023 | G4          | C                         | 6      | 15      | 7.579           | 511.555         | 5.452            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2023 | G4          | C                         | 16     | 25      | 7.609           | 542.977         | 5.417            | 0.021            | 0.37              | 0.37               | 858.879          | 0.428            |
| Rear Engine Riding Mowers | 2023 | G4          | R                         | 6      | 15      | 7.579           | 511.555         | 5.452            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2023 | G4          | R                         | 16     | 25      | 7.609           | 542.977         | 5.417            | 0.021            | 0.37              | 0.37               | 858.879          | 0.428            |
| Rear Engine Riding Mowers | 2024 | G4          | C                         | 6      | 15      | 7.573           | 511.479         | 5.447            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2024 | G4          | C                         | 16     | 25      | 7.602           | 542.897         | 5.414            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2024 | G4          | R                         | 6      | 15      | 7.573           | 511.479         | 5.447            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2024 | G4          | R                         | 16     | 25      | 7.602           | 542.897         | 5.414            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2025 | G4          | C                         | 6      | 15      | 7.571           | 511.402         | 5.445            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2025 | G4          | C                         | 16     | 25      | 7.599           | 542.815         | 5.413            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2025 | G4          | R                         | 6      | 15      | 7.571           | 511.402         | 5.445            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2025 | G4          | R                         | 16     | 25      | 7.599           | 542.815         | 5.413            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2030 | G4          | C                         | 6      | 15      | 7.565           | 510.995         | 5.443            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2030 | G4          | C                         | 16     | 25      | 7.593           | 542.384         | 5.411            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2030 | G4          | R                         | 6      | 15      | 7.565           | 510.995         | 5.443            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2030 | G4          | R                         | 16     | 25      | 7.593           | 542.384         | 5.411            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2035 | G4          | C                         | 6      | 15      | 7.56            | 510.58          | 5.441            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2035 | G4          | C                         | 16     | 25      | 7.588           | 541.943         | 5.409            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2035 | G4          | R                         | 6      | 15      | 7.56            | 510.58          | 5.441            | 0.024            | 0.37              | 0.37               | 858.879          | 0.426            |
| Rear Engine Riding Mowers | 2035 | G4          | R                         | 16     | 25      | 7.588           | 541.943         | 5.409            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2040 | G4          | C                         | 6      | 15      | 7.554           | 510.128         | 5.438            | 0.024            | 0.37              | 0.37               | 858.879          | 0.425            |
| Rear Engine Riding Mowers | 2040 | G4          | C                         | 16     | 25      | 7.582           | 541.463         | 5.406            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Rear Engine Riding Mowers | 2040 | G4          | R                         | 6      | 15      | 7.554           | 510.128         | 5.438            | 0.024            | 0.37              | 0.37               | 858.879          | 0.425            |
| Rear Engine Riding Mowers | 2040 | G4          | R                         | 16     | 25      | 7.582           | 541.463         | 5.406            | 0.021            | 0.37              | 0.37               | 858.879          | 0.427            |
| Shredders                 | 1990 | G2          | C                         | 6      | 15      | 383.517         | 971.999         | 0.625            | 0.518            | 7.199             | 7.199              | 858.879          | 32.707           |
| Shredders                 | 1990 | G2          | R                         | 6      | 15      | 383.517         | 971.999         | 0.625            | 0.518            | 7.199             | 7.199              | 858.879          | 32.707           |
| Shredders                 | 1990 | G4          | C                         | 3      | 5       | 73.086          | 1281.602        | 4.878            | 0.434            | 2.254             | 2.254              | 858.879          | 8.633            |
| Shredders                 | 1990 | G4          | R                         | 3      | 5       | 73.086          | 1281.602        | 4.878            | 0.434            | 2.254             | 2.254              | 858.879          | 8.633            |
| Shredders                 | 2000 | G2          | C                         | 6      | 15      | 140.016         | 646.117         | 4.113            | 0.049            | 7.199             | 7.199              | 858.879          | 8.474            |
| Shredders                 | 2000 | G2          | R                         | 6      | 15      | 140.016         | 646.117         | 4.113            | 0.049            | 7.199             | 7.199              | 858.879          | 8.474            |
| Shredders                 | 2000 | G4          | C                         | 3      | 5       | 42.745          | 785.17          | 5.669            | 0.041            | 5.16              | 5.16               | 858.879          | 2.336            |
| Shredders                 | 2000 | G4          | R                         | 3      | 5       | 42.745          | 785.17          | 5.669            | 0.041            | 5.16              | 5.16               | 858.879          | 2.336            |
| Shredders                 | 2005 | G2          | C                         | 6      | 15      | 87.504          | 541.643         | 5.415            | 0.035            | 7.199             | 7.199              | 858.879          | 5.438            |
| Shredders                 | 2005 | G2          | R                         | 6      | 15      | 87.504          | 541.643         | 5.415            | 0.035            | 7.199             | 7.199              | 858.879          | 5.438            |
| Shredders                 | 2005 | G4          | C                         | 3      | 5       | 26.261          | 563.118         | 7.001            | 0.029            | 1.606             | 1.606              | 858.879          | 1.474            |
| Shredders                 | 2005 | G4          | R                         | 3      | 5       | 26.261          | 563.118         | 7.001            | 0.029            | 1.606             | 1.606              | 858.879          | 1.474            |
| Shredders                 | 2010 | G2          | C                         | 6      | 15      | 44.762          | 499.088         | 6.097            | 0.035            | 7.199             | 7.199              | 858.879          | 2.782            |
| Shredders                 | 2010 | G2          | R                         | 6      | 15      | 44.762          | 499.088         | 6.097            | 0.035            | 7.199             | 7.199              | 858.879          | 2.782            |
| Shredders                 | 2010 | G4          | C                         | 3      | 5       | 21.525          | 509.857         | 7.252            | 0.029            | 1.289             | 1.289              | 858.879          | 1.209            |
| Shredders                 | 2010 | G4          | R                         | 3      | 5       | 21.525          | 509.857         | 7.252            | 0.029            | 1.289             | 1.289              | 858.879          | 1.209            |
| Shredders                 | 2011 | G2          | C                         | 6      | 15      | 36.618          | 490.701         | 6.226            | 0.035            | 7.199             | 7.199              | 858.879          | 2.275            |
| Shredders                 | 2011 | G2          | R                         | 6      | 15      | 36.618          | 490.701         | 6.226            | 0.035            | 7.199             | 7.199              | 858.879          | 2.275            |
| Shredders                 | 2011 | G4          | C                         | 3      | 5       | 20.596          | 499.294         | 7.299            | 0.029            | 1.218             | 1.218              | 858.879          | 1.157            |
| Shredders                 | 2011 | G4          | R                         | 3      | 5       | 20.596          | 499.294         | 7.299            | 0.029            | 1.218             | 1.218              | 858.879          | 1.157            |
| Shredders                 | 2012 | G2          | C                         | 6      | 15      | 29.387          | 482.281         | 6.335            | 0.035            | 7.199             | 7.199              | 858.879          | 1.826            |
| Shredders                 | 2012 | G2          | R                         | 6      | 15      | 29.387          | 482.281         | 6.335            | 0.035            | 7.199             | 7.199              | 858.879          | 1.826            |
| Shredders                 | 2012 | G4          | C                         | 3      | 5       | 19.754          | 488.364         | 7.34             | 0.029            | 1.143             | 1.143              | 858.879          | 1.11             |
| Shredders                 | 2012 | G4          | R                         | 3      | 5       | 19.754          | 488.364         | 7.34             | 0.029            | 1.143             | 1.143              | 858.879          | 1.11             |
| Shredders                 | 2013 | G2          | C                         | 6      | 15      | 25.29           | 477.106         | 6.4              | 0.035            | 7.199             | 7.199              | 858.879          | 1.571            |
| Shredders                 | 2013 | G2          | R                         | 6      | 15      | 25.29           | 477.106         | 6.4              | 0.035            | 7.199             | 7.199              | 858.879          | 1.571            |
| Shredders                 | 2013 | G4          | C                         | 3      | 5       | 19.236          | 481.12          | 7.372            | 0.029            | 1.031             | 1.031              | 858.879          | 1.081            |
| Shredders                 | 2013 | G4          | R                         | 3      | 5       | 19.236          | 481.12          | 7.372            | 0.029            | 1.031             | 1.031              | 858.879          | 1.081            |
| Shredders                 | 2014 | G2          | C                         | 6      | 15      | 22.674          | 473.079         | 6.444            | 0.035            | 7.199             | 7.199              | 858.879          | 1.409            |
| Shredders                 | 2014 | G2          | R                         | 6      | 15      | 22.674          | 473.079         | 6.444            | 0.035            | 7.199             | 7.199              | 858.879          | 1.409            |
| Shredders                 | 2014 | G4          | C                         | 3      | 5       | 18.878          | 474.915         | 7.402            | 0.029            | 0.904             | 0.904              | 858.879          | 1.061            |
| Shredders                 | 2014 | G4          | R                         | 3      | 5       | 18.878          | 474.915         | 7.402            | 0.029            | 0.904             | 0.904              | 858.879          | 1.061            |
| Shredders                 | 2015 | G2          | C                         | 6      | 15      | 20.409          | 469.199         | 6.483            | 0.035            | 7.199             | 7.199              | 858.879          | 1.268            |



Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|----------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Shredders      | 2015 | G2          | R                         | 6      | 15      | 20.409          | 469.199         | 6.483            | 0.035            | 7.199             | 7.199              | 858.879          | 1.268            |
| Shredders      | 2015 | G4          | C                         | 3      | 5       | 18.556          | 468.937         | 7.429            | 0.029            | 0.778             | 0.778              | 858.879          | 1.043            |
| Shredders      | 2015 | G4          | R                         | 3      | 5       | 18.556          | 468.937         | 7.429            | 0.029            | 0.778             | 0.778              | 858.879          | 1.043            |
| Shredders      | 2016 | G2          | C                         | 6      | 15      | 18.435          | 465.619         | 6.518            | 0.035            | 7.199             | 7.199              | 858.879          | 1.145            |
| Shredders      | 2016 | G2          | R                         | 6      | 15      | 18.435          | 465.619         | 6.518            | 0.035            | 7.199             | 7.199              | 858.879          | 1.145            |
| Shredders      | 2016 | G4          | C                         | 3      | 5       | 18.269          | 463.456         | 7.454            | 0.029            | 0.66              | 0.66               | 858.879          | 1.027            |
| Shredders      | 2016 | G4          | R                         | 3      | 5       | 18.269          | 463.456         | 7.454            | 0.029            | 0.66              | 0.66               | 858.879          | 1.027            |
| Shredders      | 2017 | G2          | C                         | 6      | 15      | 16.635          | 462.285         | 6.549            | 0.035            | 7.199             | 7.199              | 858.879          | 1.033            |
| Shredders      | 2017 | G2          | R                         | 6      | 15      | 16.635          | 462.285         | 6.549            | 0.035            | 7.199             | 7.199              | 858.879          | 1.033            |
| Shredders      | 2017 | G4          | C                         | 3      | 5       | 18.008          | 458.475         | 7.477            | 0.029            | 0.557             | 0.557              | 858.879          | 1.012            |
| Shredders      | 2017 | G4          | R                         | 3      | 5       | 18.008          | 458.475         | 7.477            | 0.029            | 0.557             | 0.557              | 858.879          | 1.012            |
| Shredders      | 2018 | G2          | C                         | 6      | 15      | 15.12           | 459.444         | 6.576            | 0.035            | 7.199             | 7.199              | 858.879          | 0.939            |
| Shredders      | 2018 | G2          | R                         | 6      | 15      | 15.12           | 459.444         | 6.576            | 0.035            | 7.199             | 7.199              | 858.879          | 0.939            |
| Shredders      | 2018 | G4          | C                         | 3      | 5       | 17.808          | 455.299         | 7.491            | 0.029            | 0.504             | 0.504              | 858.879          | 1.001            |
| Shredders      | 2018 | G4          | R                         | 3      | 5       | 17.808          | 455.299         | 7.491            | 0.029            | 0.504             | 0.504              | 858.879          | 1.001            |
| Shredders      | 2019 | G2          | C                         | 6      | 15      | 13.778          | 457.456         | 6.599            | 0.035            | 7.199             | 7.199              | 858.879          | 0.856            |
| Shredders      | 2019 | G2          | R                         | 6      | 15      | 13.778          | 457.456         | 6.599            | 0.035            | 7.199             | 7.199              | 858.879          | 0.856            |
| Shredders      | 2019 | G4          | C                         | 3      | 5       | 17.638          | 452.882         | 7.502            | 0.029            | 0.473             | 0.473              | 858.879          | 0.992            |
| Shredders      | 2019 | G4          | R                         | 3      | 5       | 17.638          | 452.882         | 7.502            | 0.029            | 0.473             | 0.473              | 858.879          | 0.992            |
| Shredders      | 2020 | G2          | C                         | 6      | 15      | 12.601          | 455.916         | 6.618            | 0.035            | 7.199             | 7.199              | 858.879          | 0.783            |
| Shredders      | 2020 | G2          | R                         | 6      | 15      | 12.601          | 455.916         | 6.618            | 0.035            | 7.199             | 7.199              | 858.879          | 0.783            |
| Shredders      | 2020 | G4          | C                         | 3      | 5       | 17.489          | 450.769         | 7.511            | 0.029            | 0.447             | 0.447              | 858.879          | 0.983            |
| Shredders      | 2020 | G4          | R                         | 3      | 5       | 17.489          | 450.769         | 7.511            | 0.029            | 0.447             | 0.447              | 858.879          | 0.983            |
| Shredders      | 2021 | G2          | C                         | 6      | 15      | 11.563          | 454.545         | 6.635            | 0.035            | 7.199             | 7.199              | 858.879          | 0.718            |
| Shredders      | 2021 | G2          | R                         | 6      | 15      | 11.563          | 454.545         | 6.635            | 0.035            | 7.199             | 7.199              | 858.879          | 0.718            |
| Shredders      | 2021 | G4          | C                         | 3      | 5       | 17.348          | 449.038         | 7.516            | 0.029            | 0.422             | 0.422              | 858.879          | 0.975            |
| Shredders      | 2021 | G4          | R                         | 3      | 5       | 17.348          | 449.038         | 7.516            | 0.029            | 0.422             | 0.422              | 858.879          | 0.975            |
| Shredders      | 2022 | G2          | C                         | 6      | 15      | 10.763          | 453.447         | 6.649            | 0.035            | 7.199             | 7.199              | 858.879          | 0.668            |
| Shredders      | 2022 | G2          | R                         | 6      | 15      | 10.763          | 453.447         | 6.649            | 0.035            | 7.199             | 7.199              | 858.879          | 0.668            |
| Shredders      | 2022 | G4          | C                         | 3      | 5       | 17.25           | 447.183         | 7.527            | 0.029            | 0.399             | 0.399              | 858.879          | 0.97             |
| Shredders      | 2022 | G4          | R                         | 3      | 5       | 17.25           | 447.183         | 7.527            | 0.029            | 0.399             | 0.399              | 858.879          | 0.97             |
| Shredders      | 2023 | G2          | C                         | 6      | 15      | 10.088          | 452.461         | 6.66             | 0.035            | 7.199             | 7.199              | 858.879          | 0.627            |
| Shredders      | 2023 | G2          | R                         | 6      | 15      | 10.088          | 452.461         | 6.66             | 0.035            | 7.199             | 7.199              | 858.879          | 0.627            |
| Shredders      | 2023 | G4          | C                         | 3      | 5       | 17.154          | 445.909         | 7.53             | 0.029            | 0.379             | 0.379              | 858.879          | 0.965            |
| Shredders      | 2023 | G4          | R                         | 3      | 5       | 17.154          | 445.909         | 7.53             | 0.029            | 0.379             | 0.379              | 858.879          | 0.965            |
| Shredders      | 2024 | G2          | C                         | 6      | 15      | 9.575           | 451.691         | 6.669            | 0.035            | 7.199             | 7.199              | 858.879          | 0.595            |
| Shredders      | 2024 | G2          | R                         | 6      | 15      | 9.575           | 451.691         | 6.669            | 0.035            | 7.199             | 7.199              | 858.879          | 0.595            |
| Shredders      | 2024 | G4          | C                         | 3      | 5       | 17.084          | 444.654         | 7.537            | 0.029            | 0.36              | 0.36               | 858.879          | 0.961            |
| Shredders      | 2024 | G4          | R                         | 3      | 5       | 17.084          | 444.654         | 7.537            | 0.029            | 0.36              | 0.36               | 858.879          | 0.961            |
| Shredders      | 2025 | G2          | C                         | 6      | 15      | 9.157           | 451.013         | 6.676            | 0.035            | 7.2               | 7.2                | 858.879          | 0.569            |
| Shredders      | 2025 | G2          | R                         | 6      | 15      | 9.157           | 451.013         | 6.676            | 0.035            | 7.2               | 7.2                | 858.879          | 0.569            |
| Shredders      | 2025 | G4          | C                         | 3      | 5       | 17.02           | 443.666         | 7.54             | 0.029            | 0.343             | 0.343              | 858.879          | 0.957            |
| Shredders      | 2025 | G4          | R                         | 3      | 5       | 17.02           | 443.666         | 7.54             | 0.029            | 0.343             | 0.343              | 858.879          | 0.957            |
| Shredders      | 2030 | G2          | C                         | 6      | 15      | 8.653           | 449.536         | 6.686            | 0.035            | 7.199             | 7.199              | 858.879          | 0.537            |
| Shredders      | 2030 | G2          | R                         | 6      | 15      | 8.653           | 449.536         | 6.686            | 0.035            | 7.199             | 7.199              | 858.879          | 0.537            |
| Shredders      | 2030 | G4          | C                         | 3      | 5       | 16.911          | 441.143         | 7.547            | 0.029            | 0.287             | 0.287              | 858.879          | 0.952            |
| Shredders      | 2030 | G4          | R                         | 3      | 5       | 16.911          | 441.143         | 7.547            | 0.029            | 0.287             | 0.287              | 858.879          | 0.952            |
| Shredders      | 2035 | G2          | C                         | 6      | 15      | 8.648           | 449.319         | 6.686            | 0.035            | 7.199             | 7.199              | 858.879          | 0.537            |
| Shredders      | 2035 | G2          | R                         | 6      | 15      | 8.648           | 449.319         | 6.686            | 0.035            | 7.199             | 7.199              | 858.879          | 0.537            |
| Shredders      | 2035 | G4          | C                         | 3      | 5       | 16.893          | 440.552         | 7.546            | 0.029            | 0.279             | 0.279              | 858.879          | 0.952            |
| Shredders      | 2035 | G4          | R                         | 3      | 5       | 16.893          | 440.552         | 7.546            | 0.029            | 0.279             | 0.279              | 858.879          | 0.952            |
| Shredders      | 2040 | G2          | C                         | 6      | 15      | 8.648           | 449.319         | 6.686            | 0.035            | 7.199             | 7.199              | 858.879          | 0.537            |
| Shredders      | 2040 | G2          | R                         | 6      | 15      | 8.648           | 449.319         | 6.686            | 0.035            | 7.199             | 7.199              | 858.879          | 0.537            |
| Shredders      | 2040 | G4          | C                         | 3      | 5       | 16.881          | 440.169         | 7.543            | 0.029            | 0.279             | 0.279              | 858.879          | 0.952            |
| Shredders      | 2040 | G4          | R                         | 3      | 5       | 16.881          | 440.169         | 7.543            | 0.029            | 0.279             | 0.279              | 858.879          | 0.952            |
| Snowblowers    | 1990 | G2          | C                         | 6      | 15      | 294.22          | 1043.999        | 1.937            | 0.518            | 7.239             | 7.239              | 858.879          | 25.092           |
| Snowblowers    | 1990 | G2          | C                         | 16     | 25      | 383.517         | 971.999         | 0.661            | 0.518            | 7.199             | 7.199              | 858.879          | 32.707           |
| Snowblowers    | 1990 | G2          | R                         | 6      | 15      | 294.22          | 1043.999        | 1.937            | 0.518            | 7.239             | 7.239              | 858.879          | 25.092           |
| Snowblowers    | 1990 | G2          | R                         | 16     | 25      | 383.517         | 971.999         | 0.661            | 0.518            | 7.199             | 7.199              | 858.879          | 32.707           |
| Snowblowers    | 1990 | G4          | C                         | 3      | 5       | 63.466          | 1319.693        | 5.335            | 0.434            | 1.646             | 1.646              | 858.879          | 6.925            |
| Snowblowers    | 1990 | G4          | C                         | 6      | 15      | 17.288          | 998.584         | 8.833            | 0.359            | 0.292             | 0.292              | 858.879          | 1.886            |
| Snowblowers    | 1990 | G4          | C                         | 16     | 25      | 17.033          | 998.089         | 8.814            | 0.319            | 0.292             | 0.292              | 858.879          | 1.858            |
| Snowblowers    | 1990 | G4          | R                         | 3      | 5       | 63.466          | 1319.693        | 5.335            | 0.434            | 1.646             | 1.646              | 858.879          | 6.925            |
| Snowblowers    | 1990 | G4          | R                         | 6      | 15      | 17.288          | 998.584         | 8.833            | 0.359            | 0.292             | 0.292              | 858.879          | 1.886            |
| Snowblowers    | 1990 | G4          | R                         | 16     | 25      | 17.033          | 998.089         | 8.814            | 0.319            | 0.292             | 0.292              | 858.879          | 1.858            |
| Snowblowers    | 2000 | G2          | C                         | 6      | 15      | 166.997         | 509.415         | 3.015            | 0.051            | 4.285             | 4.285              | 858.879          | 10.107           |
| Snowblowers    | 2000 | G2          | C                         | 16     | 25      | 183.257         | 440.038         | 2.719            | 0.051            | 4.275             | 4.275              | 858.879          | 11.092           |
| Snowblowers    | 2000 | G2          | R                         | 6      | 15      | 166.997         | 509.415         | 3.015            | 0.051            | 4.285             | 4.285              | 858.879          | 10.107           |
| Snowblowers    | 2000 | G2          | R                         | 16     | 25      | 183.257         | 440.038         | 2.719            | 0.051            | 4.275             | 4.275              | 858.879          | 11.092           |
| Snowblowers    | 2000 | G4          | C                         | 3      | 5       | 31.589          | 850.441         | 5.693            | 0.043            | 1.639             | 1.639              | 858.879          | 1.597            |
| Snowblowers    | 2000 | G4          | C                         | 6      | 15      | 13.541          | 715.233         | 7.256            | 0.035            | 0.292             | 0.292              | 858.88           | 0.684            |
| Snowblowers    | 2000 | G4          | C                         | 16     | 25      | 13.002          | 730.145         | 6.298            | 0.031            | 0.292             | 0.292              | 858.879          | 0.657            |
| Snowblowers    | 2000 | G4          | R                         | 3      | 5       | 31.589          | 850.441         | 5.693            | 0.043            | 1.639             | 1.639              | 858.879          | 1.597            |
| Snowblowers    | 2000 | G4          | R                         | 6      | 15      | 13.541          | 715.233         | 7.256            | 0.035            | 0.292             | 0.292              | 858.88           | 0.684            |
| Snowblowers    | 2000 | G4          | R                         | 16     | 25      | 13.002          | 730.145         | 6.298            | 0.031            | 0.292             | 0.292              | 858.879          | 0.657            |
| Snowblowers    | 2005 | G2          | C                         | 6      | 15      | 120.913         | 437.03          | 2.781            | 0.035            | 2.897             | 2.897              | 858.879          | 7.515            |
| Snowblowers    | 2005 | G2          | C                         | 16     | 25      | 127.158         | 389.652         | 2.603            | 0.035            | 2.89              | 2.89               | 858.879          | 7.903            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|----------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Snowblowers    | 2005 | G2          | R                         | 6      | 15      | 120.913         | 437.03          | 2.781            | 0.035            | 2.897             | 2.897              | 858.879          | 7.515            |
| Snowblowers    | 2005 | G2          | R                         | 16     | 25      | 127.158         | 389.652         | 2.603            | 0.035            | 2.89              | 2.89               | 858.879          | 7.903            |
| Snowblowers    | 2005 | G4          | C                         | 3      | 5       | 23.699          | 681.336         | 6.453            | 0.029            | 1.645             | 1.645              | 858.879          | 1.231            |
| Snowblowers    | 2005 | G4          | C                         | 6      | 15      | 11.29           | 624.579         | 7.317            | 0.024            | 0.292             | 0.292              | 858.879          | 0.587            |
| Snowblowers    | 2005 | G4          | C                         | 16     | 25      | 11.494          | 650.913         | 6.689            | 0.021            | 0.292             | 0.292              | 858.879          | 0.597            |
| Snowblowers    | 2005 | G4          | R                         | 3      | 5       | 23.699          | 681.336         | 6.453            | 0.029            | 1.645             | 1.645              | 858.879          | 1.231            |
| Snowblowers    | 2005 | G4          | R                         | 6      | 15      | 11.29           | 624.579         | 7.317            | 0.024            | 0.292             | 0.292              | 858.879          | 0.587            |
| Snowblowers    | 2005 | G4          | R                         | 16     | 25      | 11.494          | 650.913         | 6.689            | 0.021            | 0.292             | 0.292              | 858.879          | 0.597            |
| Snowblowers    | 2010 | G2          | C                         | 6      | 15      | 87.804          | 375.893         | 2.851            | 0.035            | 1.934             | 1.934              | 858.879          | 5.457            |
| Snowblowers    | 2010 | G2          | C                         | 16     | 25      | 89.649          | 344.324         | 2.79             | 0.035            | 1.932             | 1.932              | 858.879          | 5.572            |
| Snowblowers    | 2010 | G2          | R                         | 6      | 15      | 87.804          | 375.893         | 2.851            | 0.035            | 1.934             | 1.934              | 858.879          | 5.457            |
| Snowblowers    | 2010 | G2          | R                         | 16     | 25      | 89.649          | 344.324         | 2.79             | 0.035            | 1.932             | 1.932              | 858.879          | 5.572            |
| Snowblowers    | 2010 | G4          | C                         | 3      | 5       | 15.722          | 625.42          | 3.815            | 0.029            | 1.647             | 1.647              | 858.879          | 0.818            |
| Snowblowers    | 2010 | G4          | C                         | 6      | 15      | 8.524           | 596.884         | 5.71             | 0.024            | 0.292             | 0.292              | 858.879          | 0.443            |
| Snowblowers    | 2010 | G4          | C                         | 16     | 25      | 8.65            | 627.18          | 5.206            | 0.021            | 0.292             | 0.292              | 858.879          | 0.45             |
| Snowblowers    | 2010 | G4          | R                         | 3      | 5       | 15.722          | 625.42          | 3.815            | 0.029            | 1.647             | 1.647              | 858.879          | 0.818            |
| Snowblowers    | 2010 | G4          | R                         | 6      | 15      | 8.524           | 596.884         | 5.71             | 0.024            | 0.292             | 0.292              | 858.879          | 0.443            |
| Snowblowers    | 2010 | G4          | R                         | 16     | 25      | 8.65            | 627.18          | 5.206            | 0.021            | 0.292             | 0.292              | 858.879          | 0.45             |
| Snowblowers    | 2011 | G2          | C                         | 6      | 15      | 81.769          | 367.186         | 2.88             | 0.035            | 1.73              | 1.73               | 858.879          | 5.082            |
| Snowblowers    | 2011 | G2          | C                         | 16     | 25      | 83.443          | 339.783         | 2.832            | 0.035            | 1.728             | 1.728              | 858.879          | 5.186            |
| Snowblowers    | 2011 | G2          | R                         | 6      | 15      | 81.769          | 367.186         | 2.88             | 0.035            | 1.73              | 1.73               | 858.879          | 5.082            |
| Snowblowers    | 2011 | G2          | R                         | 16     | 25      | 83.443          | 339.783         | 2.832            | 0.035            | 1.728             | 1.728              | 858.879          | 5.186            |
| Snowblowers    | 2011 | G4          | C                         | 3      | 5       | 14.985          | 618.315         | 3.717            | 0.029            | 1.647             | 1.647              | 858.879          | 0.78             |
| Snowblowers    | 2011 | G4          | C                         | 6      | 15      | 8.316           | 593.895         | 5.631            | 0.024            | 0.292             | 0.292              | 858.88           | 0.433            |
| Snowblowers    | 2011 | G4          | C                         | 16     | 25      | 8.459           | 624.839         | 5.138            | 0.021            | 0.292             | 0.292              | 858.879          | 0.44             |
| Snowblowers    | 2011 | G4          | R                         | 3      | 5       | 14.985          | 618.315         | 3.717            | 0.029            | 1.647             | 1.647              | 858.879          | 0.78             |
| Snowblowers    | 2011 | G4          | R                         | 6      | 15      | 8.316           | 593.895         | 5.631            | 0.024            | 0.292             | 0.292              | 858.88           | 0.433            |
| Snowblowers    | 2011 | G4          | R                         | 16     | 25      | 8.459           | 624.839         | 5.138            | 0.021            | 0.292             | 0.292              | 858.879          | 0.44             |
| Snowblowers    | 2012 | G2          | C                         | 6      | 15      | 76.002          | 359.672         | 2.906            | 0.035            | 1.532             | 1.532              | 858.879          | 4.723            |
| Snowblowers    | 2012 | G2          | C                         | 16     | 25      | 77.837          | 336.967         | 2.865            | 0.035            | 1.531             | 1.531              | 858.88           | 4.837            |
| Snowblowers    | 2012 | G2          | R                         | 6      | 15      | 76.002          | 359.672         | 2.906            | 0.035            | 1.532             | 1.532              | 858.879          | 4.723            |
| Snowblowers    | 2012 | G2          | R                         | 16     | 25      | 77.837          | 336.967         | 2.865            | 0.035            | 1.531             | 1.531              | 858.88           | 4.837            |
| Snowblowers    | 2012 | G4          | C                         | 3      | 5       | 14.444          | 611.581         | 3.618            | 0.029            | 1.647             | 1.647              | 858.879          | 0.752            |
| Snowblowers    | 2012 | G4          | C                         | 6      | 15      | 8.128           | 590.571         | 5.557            | 0.024            | 0.292             | 0.292              | 858.879          | 0.423            |
| Snowblowers    | 2012 | G4          | C                         | 16     | 25      | 8.29            | 622.001         | 5.081            | 0.021            | 0.292             | 0.292              | 858.879          | 0.431            |
| Snowblowers    | 2012 | G4          | R                         | 3      | 5       | 14.444          | 611.581         | 3.618            | 0.029            | 1.647             | 1.647              | 858.879          | 0.752            |
| Snowblowers    | 2012 | G4          | R                         | 6      | 15      | 8.128           | 590.571         | 5.557            | 0.024            | 0.292             | 0.292              | 858.879          | 0.423            |
| Snowblowers    | 2012 | G4          | R                         | 16     | 25      | 8.29            | 622.001         | 5.081            | 0.021            | 0.292             | 0.292              | 858.879          | 0.431            |
| Snowblowers    | 2013 | G2          | C                         | 6      | 15      | 70.36           | 352.374         | 2.931            | 0.035            | 1.341             | 1.341              | 858.879          | 4.373            |
| Snowblowers    | 2013 | G2          | C                         | 16     | 25      | 72.339          | 334.375         | 2.895            | 0.035            | 1.34              | 1.34               | 858.879          | 4.496            |
| Snowblowers    | 2013 | G2          | R                         | 6      | 15      | 70.36           | 352.374         | 2.931            | 0.035            | 1.341             | 1.341              | 858.879          | 4.373            |
| Snowblowers    | 2013 | G2          | R                         | 16     | 25      | 72.339          | 334.375         | 2.895            | 0.035            | 1.34              | 1.34               | 858.879          | 4.496            |
| Snowblowers    | 2013 | G4          | C                         | 3      | 5       | 13.944          | 604.538         | 3.519            | 0.029            | 1.647             | 1.647              | 858.879          | 0.726            |
| Snowblowers    | 2013 | G4          | C                         | 6      | 15      | 7.943           | 586.794         | 5.483            | 0.024            | 0.292             | 0.292              | 858.879          | 0.413            |
| Snowblowers    | 2013 | G4          | C                         | 16     | 25      | 8.124           | 618.655         | 5.026            | 0.021            | 0.292             | 0.292              | 858.879          | 0.423            |
| Snowblowers    | 2013 | G4          | R                         | 3      | 5       | 13.944          | 604.538         | 3.519            | 0.029            | 1.647             | 1.647              | 858.879          | 0.726            |
| Snowblowers    | 2013 | G4          | R                         | 6      | 15      | 7.943           | 586.794         | 5.483            | 0.024            | 0.292             | 0.292              | 858.879          | 0.413            |
| Snowblowers    | 2013 | G4          | R                         | 16     | 25      | 8.124           | 618.655         | 5.026            | 0.021            | 0.292             | 0.292              | 858.879          | 0.423            |
| Snowblowers    | 2014 | G2          | C                         | 6      | 15      | 65.026          | 345.508         | 2.952            | 0.035            | 1.16              | 1.16               | 858.879          | 4.041            |
| Snowblowers    | 2014 | G2          | C                         | 16     | 25      | 67.062          | 331.911         | 2.922            | 0.035            | 1.159             | 1.159              | 858.879          | 4.168            |
| Snowblowers    | 2014 | G2          | R                         | 6      | 15      | 65.026          | 345.508         | 2.952            | 0.035            | 1.16              | 1.16               | 858.879          | 4.041            |
| Snowblowers    | 2014 | G2          | R                         | 16     | 25      | 67.062          | 331.911         | 2.922            | 0.035            | 1.159             | 1.159              | 858.879          | 4.168            |
| Snowblowers    | 2014 | G4          | C                         | 3      | 5       | 13.463          | 597.617         | 3.42             | 0.029            | 1.647             | 1.647              | 858.879          | 0.701            |
| Snowblowers    | 2014 | G4          | C                         | 6      | 15      | 7.759           | 583.06          | 5.411            | 0.024            | 0.292             | 0.292              | 858.879          | 0.404            |
| Snowblowers    | 2014 | G4          | C                         | 16     | 25      | 7.959           | 615.34          | 4.972            | 0.021            | 0.292             | 0.292              | 858.879          | 0.414            |
| Snowblowers    | 2014 | G4          | R                         | 3      | 5       | 13.463          | 597.617         | 3.42             | 0.029            | 1.647             | 1.647              | 858.879          | 0.701            |
| Snowblowers    | 2014 | G4          | R                         | 6      | 15      | 7.759           | 583.06          | 5.411            | 0.024            | 0.292             | 0.292              | 858.879          | 0.404            |
| Snowblowers    | 2014 | G4          | R                         | 16     | 25      | 7.959           | 615.34          | 4.972            | 0.021            | 0.292             | 0.292              | 858.879          | 0.414            |
| Snowblowers    | 2015 | G2          | C                         | 6      | 15      | 60.176          | 339.189         | 2.969            | 0.035            | 0.997             | 0.997              | 858.879          | 3.74             |
| Snowblowers    | 2015 | G2          | C                         | 16     | 25      | 62.152          | 329.468         | 2.944            | 0.035            | 0.996             | 0.996              | 858.879          | 3.863            |
| Snowblowers    | 2015 | G2          | R                         | 6      | 15      | 60.176          | 339.189         | 2.969            | 0.035            | 0.997             | 0.997              | 858.879          | 3.74             |
| Snowblowers    | 2015 | G2          | R                         | 16     | 25      | 62.152          | 329.468         | 2.944            | 0.035            | 0.996             | 0.996              | 858.879          | 3.863            |
| Snowblowers    | 2015 | G4          | C                         | 3      | 5       | 12.989          | 590.776         | 3.324            | 0.029            | 1.647             | 1.647              | 858.879          | 0.676            |
| Snowblowers    | 2015 | G4          | C                         | 6      | 15      | 7.579           | 579.355         | 5.341            | 0.024            | 0.292             | 0.292              | 858.879          | 0.395            |
| Snowblowers    | 2015 | G4          | C                         | 16     | 25      | 7.797           | 612.045         | 4.92             | 0.021            | 0.292             | 0.292              | 858.879          | 0.406            |
| Snowblowers    | 2015 | G4          | R                         | 3      | 5       | 12.989          | 590.776         | 3.324            | 0.029            | 1.647             | 1.647              | 858.879          | 0.676            |
| Snowblowers    | 2015 | G4          | R                         | 6      | 15      | 7.579           | 579.355         | 5.341            | 0.024            | 0.292             | 0.292              | 858.879          | 0.395            |
| Snowblowers    | 2015 | G4          | R                         | 16     | 25      | 7.797           | 612.045         | 4.92             | 0.021            | 0.292             | 0.292              | 858.879          | 0.406            |
| Snowblowers    | 2016 | G2          | C                         | 6      | 15      | 57.315          | 335.352         | 2.964            | 0.035            | 0.906             | 0.906              | 858.879          | 3.562            |
| Snowblowers    | 2016 | G2          | C                         | 16     | 25      | 59.144          | 327.612         | 2.943            | 0.035            | 0.905             | 0.905              | 858.879          | 3.676            |
| Snowblowers    | 2016 | G2          | R                         | 6      | 15      | 57.315          | 335.352         | 2.964            | 0.035            | 0.906             | 0.906              | 858.879          | 3.562            |
| Snowblowers    | 2016 | G2          | R                         | 16     | 25      | 59.144          | 327.612         | 2.943            | 0.035            | 0.905             | 0.905              | 858.879          | 3.676            |
| Snowblowers    | 2016 | G4          | C                         | 3      | 5       | 12.555          | 584.605         | 3.23             | 0.029            | 1.647             | 1.647              | 858.879          | 0.654            |
| Snowblowers    | 2016 | G4          | C                         | 6      | 15      | 7.408           | 576.051         | 5.274            | 0.024            | 0.292             | 0.292              | 858.879          | 0.386            |
| Snowblowers    | 2016 | G4          | C                         | 16     | 25      | 7.644           | 609.121         | 4.871            | 0.021            | 0.292             | 0.292              | 858.879          | 0.398            |
| Snowblowers    | 2016 | G4          | R                         | 3      | 5       | 12.555          | 584.605         | 3.23             | 0.029            | 1.647             | 1.647              | 858.879          | 0.654            |
| Snowblowers    | 2016 | G4          | R                         | 6      | 15      | 7.408           | 576.051         | 5.274            | 0.024            | 0.292             | 0.292              | 858.879          | 0.386            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|----------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Snowblowers    | 2016 | G4          | R                         | 16     | 25      | 7.644           | 609.121         | 4.871            | 0.021            | 0.292             | 0.292              | 858.879          | 0.398            |
| Snowblowers    | 2017 | G2          | C                         | 6      | 15      | 55.381          | 332.569         | 2.953            | 0.035            | 0.847             | 0.847              | 858.879          | 3.442            |
| Snowblowers    | 2017 | G2          | C                         | 16     | 25      | 57.035          | 325.993         | 2.936            | 0.035            | 0.847             | 0.847              | 858.879          | 3.545            |
| Snowblowers    | 2017 | G2          | R                         | 6      | 15      | 55.381          | 332.569         | 2.953            | 0.035            | 0.847             | 0.847              | 858.879          | 3.442            |
| Snowblowers    | 2017 | G2          | R                         | 16     | 25      | 57.035          | 325.993         | 2.936            | 0.035            | 0.847             | 0.847              | 858.879          | 3.545            |
| Snowblowers    | 2017 | G4          | C                         | 3      | 5       | 12.174          | 579.337         | 3.144            | 0.029            | 1.647             | 1.647              | 858.879          | 0.634            |
| Snowblowers    | 2017 | G4          | C                         | 6      | 15      | 7.258           | 573.275         | 5.213            | 0.024            | 0.292             | 0.292              | 858.879          | 0.378            |
| Snowblowers    | 2017 | G4          | C                         | 16     | 25      | 7.509           | 606.665         | 4.824            | 0.021            | 0.292             | 0.292              | 858.879          | 0.391            |
| Snowblowers    | 2017 | G4          | R                         | 3      | 5       | 12.174          | 579.337         | 3.144            | 0.029            | 1.647             | 1.647              | 858.879          | 0.634            |
| Snowblowers    | 2017 | G4          | R                         | 6      | 15      | 7.258           | 573.275         | 5.213            | 0.024            | 0.292             | 0.292              | 858.879          | 0.378            |
| Snowblowers    | 2017 | G4          | R                         | 16     | 25      | 7.509           | 606.665         | 4.824            | 0.021            | 0.292             | 0.292              | 858.879          | 0.391            |
| Snowblowers    | 2018 | G2          | C                         | 6      | 15      | 53.698          | 330.087         | 2.941            | 0.035            | 0.796             | 0.796              | 858.879          | 3.337            |
| Snowblowers    | 2018 | G2          | C                         | 16     | 25      | 55.166          | 324.485         | 2.928            | 0.035            | 0.796             | 0.796              | 858.879          | 3.428            |
| Snowblowers    | 2018 | G2          | R                         | 6      | 15      | 53.698          | 330.087         | 2.941            | 0.035            | 0.796             | 0.796              | 858.879          | 3.337            |
| Snowblowers    | 2018 | G2          | R                         | 16     | 25      | 55.166          | 324.485         | 2.928            | 0.035            | 0.796             | 0.796              | 858.879          | 3.428            |
| Snowblowers    | 2018 | G4          | C                         | 3      | 5       | 11.857          | 575.798         | 3.058            | 0.029            | 1.647             | 1.647              | 858.879          | 0.618            |
| Snowblowers    | 2018 | G4          | C                         | 6      | 15      | 7.134           | 571.462         | 5.154            | 0.024            | 0.292             | 0.292              | 858.879          | 0.372            |
| Snowblowers    | 2018 | G4          | C                         | 16     | 25      | 7.391           | 605.064         | 4.774            | 0.021            | 0.292             | 0.292              | 858.879          | 0.385            |
| Snowblowers    | 2018 | G4          | R                         | 3      | 5       | 11.857          | 575.798         | 3.058            | 0.029            | 1.647             | 1.647              | 858.879          | 0.618            |
| Snowblowers    | 2018 | G4          | R                         | 6      | 15      | 7.134           | 571.462         | 5.154            | 0.024            | 0.292             | 0.292              | 858.879          | 0.372            |
| Snowblowers    | 2018 | G4          | R                         | 16     | 25      | 7.391           | 605.064         | 4.774            | 0.021            | 0.292             | 0.292              | 858.879          | 0.385            |
| Snowblowers    | 2019 | G2          | C                         | 6      | 15      | 52.176          | 327.869         | 2.93             | 0.035            | 0.75              | 0.75               | 858.879          | 3.242            |
| Snowblowers    | 2019 | G2          | C                         | 16     | 25      | 53.46           | 323.141         | 2.92             | 0.035            | 0.75              | 0.75               | 858.879          | 3.322            |
| Snowblowers    | 2019 | G2          | R                         | 6      | 15      | 52.176          | 327.869         | 2.93             | 0.035            | 0.75              | 0.75               | 858.879          | 3.242            |
| Snowblowers    | 2019 | G2          | R                         | 16     | 25      | 53.46           | 323.141         | 2.92             | 0.035            | 0.75              | 0.75               | 858.879          | 3.322            |
| Snowblowers    | 2019 | G4          | C                         | 3      | 5       | 11.577          | 573.112         | 2.971            | 0.029            | 1.648             | 1.648              | 858.879          | 0.604            |
| Snowblowers    | 2019 | G4          | C                         | 6      | 15      | 7.023           | 570.119         | 5.096            | 0.024            | 0.292             | 0.292              | 858.879          | 0.366            |
| Snowblowers    | 2019 | G4          | C                         | 16     | 25      | 7.282           | 603.882         | 4.723            | 0.021            | 0.292             | 0.292              | 858.879          | 0.38             |
| Snowblowers    | 2019 | G4          | R                         | 3      | 5       | 11.577          | 573.112         | 2.971            | 0.029            | 1.648             | 1.648              | 858.879          | 0.604            |
| Snowblowers    | 2019 | G4          | R                         | 6      | 15      | 7.023           | 570.119         | 5.096            | 0.024            | 0.292             | 0.292              | 858.879          | 0.366            |
| Snowblowers    | 2019 | G4          | R                         | 16     | 25      | 7.282           | 603.882         | 4.723            | 0.021            | 0.292             | 0.292              | 858.879          | 0.38             |
| Snowblowers    | 2020 | G2          | C                         | 6      | 15      | 50.759          | 325.86          | 2.921            | 0.035            | 0.706             | 0.706              | 858.879          | 3.154            |
| Snowblowers    | 2020 | G2          | C                         | 16     | 25      | 51.862          | 321.96          | 2.913            | 0.035            | 0.706             | 0.706              | 858.879          | 3.223            |
| Snowblowers    | 2020 | G2          | R                         | 6      | 15      | 50.759          | 325.86          | 2.921            | 0.035            | 0.706             | 0.706              | 858.879          | 3.154            |
| Snowblowers    | 2020 | G2          | R                         | 16     | 25      | 51.862          | 321.96          | 2.913            | 0.035            | 0.706             | 0.706              | 858.879          | 3.223            |
| Snowblowers    | 2020 | G4          | C                         | 3      | 5       | 11.32           | 570.763         | 2.884            | 0.029            | 1.648             | 1.648              | 858.879          | 0.59             |
| Snowblowers    | 2020 | G4          | C                         | 6      | 15      | 6.917           | 568.949         | 5.038            | 0.024            | 0.292             | 0.292              | 858.879          | 0.361            |
| Snowblowers    | 2020 | G4          | C                         | 16     | 25      | 7.178           | 602.855         | 4.673            | 0.021            | 0.292             | 0.292              | 858.879          | 0.374            |
| Snowblowers    | 2020 | G4          | R                         | 3      | 5       | 11.32           | 570.763         | 2.884            | 0.029            | 1.648             | 1.648              | 858.879          | 0.59             |
| Snowblowers    | 2020 | G4          | R                         | 6      | 15      | 6.917           | 568.949         | 5.038            | 0.024            | 0.292             | 0.292              | 858.879          | 0.361            |
| Snowblowers    | 2020 | G4          | R                         | 16     | 25      | 7.178           | 602.855         | 4.673            | 0.021            | 0.292             | 0.292              | 858.879          | 0.374            |
| Snowblowers    | 2021 | G2          | C                         | 6      | 15      | 49.269          | 323.908         | 2.918            | 0.035            | 0.663             | 0.663              | 858.879          | 3.062            |
| Snowblowers    | 2021 | G2          | C                         | 16     | 25      | 50.166          | 320.811         | 2.913            | 0.035            | 0.663             | 0.663              | 858.879          | 3.118            |
| Snowblowers    | 2021 | G2          | R                         | 6      | 15      | 49.269          | 323.908         | 2.918            | 0.035            | 0.663             | 0.663              | 858.879          | 3.062            |
| Snowblowers    | 2021 | G2          | R                         | 16     | 25      | 50.166          | 320.811         | 2.913            | 0.035            | 0.663             | 0.663              | 858.879          | 3.118            |
| Snowblowers    | 2021 | G4          | C                         | 3      | 5       | 11.036          | 568.463         | 2.784            | 0.029            | 1.647             | 1.647              | 858.879          | 0.576            |
| Snowblowers    | 2021 | G4          | C                         | 6      | 15      | 6.794           | 567.544         | 4.97             | 0.024            | 0.292             | 0.292              | 858.879          | 0.354            |
| Snowblowers    | 2021 | G4          | C                         | 16     | 25      | 7.056           | 601.586         | 4.613            | 0.021            | 0.292             | 0.292              | 858.88           | 0.368            |
| Snowblowers    | 2021 | G4          | R                         | 3      | 5       | 11.036          | 568.463         | 2.784            | 0.029            | 1.647             | 1.647              | 858.879          | 0.576            |
| Snowblowers    | 2021 | G4          | R                         | 6      | 15      | 6.794           | 567.544         | 4.97             | 0.024            | 0.292             | 0.292              | 858.879          | 0.354            |
| Snowblowers    | 2021 | G4          | R                         | 16     | 25      | 7.056           | 601.586         | 4.613            | 0.021            | 0.292             | 0.292              | 858.88           | 0.368            |
| Snowblowers    | 2022 | G2          | C                         | 6      | 15      | 48.322          | 322.483         | 2.918            | 0.035            | 0.629             | 0.629              | 858.879          | 3.003            |
| Snowblowers    | 2022 | G2          | C                         | 16     | 25      | 49.065          | 320.014         | 2.915            | 0.035            | 0.629             | 0.629              | 858.879          | 3.049            |
| Snowblowers    | 2022 | G2          | R                         | 6      | 15      | 48.322          | 322.483         | 2.918            | 0.035            | 0.629             | 0.629              | 858.879          | 3.003            |
| Snowblowers    | 2022 | G2          | R                         | 16     | 25      | 49.065          | 320.014         | 2.915            | 0.035            | 0.629             | 0.629              | 858.879          | 3.049            |
| Snowblowers    | 2022 | G4          | C                         | 3      | 5       | 10.839          | 566.566         | 2.708            | 0.029            | 1.647             | 1.647              | 858.879          | 0.566            |
| Snowblowers    | 2022 | G4          | C                         | 6      | 15      | 6.963           | 600.747         | 4.567            | 0.021            | 0.292             | 0.292              | 858.88           | 0.363            |
| Snowblowers    | 2022 | G4          | R                         | 3      | 5       | 10.839          | 566.566         | 2.708            | 0.029            | 1.647             | 1.647              | 858.879          | 0.566            |
| Snowblowers    | 2022 | G4          | R                         | 6      | 15      | 6.7             | 566.599         | 4.917            | 0.024            | 0.292             | 0.292              | 858.879          | 0.349            |
| Snowblowers    | 2022 | G4          | R                         | 16     | 25      | 6.963           | 600.747         | 4.567            | 0.021            | 0.292             | 0.292              | 858.88           | 0.363            |
| Snowblowers    | 2023 | G2          | C                         | 6      | 15      | 47.429          | 321.202         | 2.919            | 0.035            | 0.599             | 0.599              | 858.879          | 2.947            |
| Snowblowers    | 2023 | G2          | C                         | 16     | 25      | 48.018          | 319.301         | 2.917            | 0.035            | 0.599             | 0.599              | 858.879          | 2.984            |
| Snowblowers    | 2023 | G2          | R                         | 6      | 15      | 47.429          | 321.202         | 2.919            | 0.035            | 0.599             | 0.599              | 858.879          | 2.947            |
| Snowblowers    | 2023 | G2          | R                         | 16     | 25      | 48.018          | 319.301         | 2.917            | 0.035            | 0.599             | 0.599              | 858.879          | 2.984            |
| Snowblowers    | 2023 | G4          | C                         | 3      | 5       | 10.691          | 564.937         | 2.664            | 0.029            | 1.647             | 1.647              | 858.879          | 0.558            |
| Snowblowers    | 2023 | G4          | C                         | 6      | 15      | 6.613           | 565.723         | 4.868            | 0.024            | 0.292             | 0.292              | 858.879          | 0.345            |
| Snowblowers    | 2023 | G4          | C                         | 16     | 25      | 6.877           | 599.961         | 4.524            | 0.021            | 0.292             | 0.292              | 858.879          | 0.359            |
| Snowblowers    | 2023 | G4          | R                         | 3      | 5       | 10.691          | 564.937         | 2.664            | 0.029            | 1.647             | 1.647              | 858.879          | 0.558            |
| Snowblowers    | 2023 | G4          | R                         | 6      | 15      | 6.613           | 565.723         | 4.868            | 0.024            | 0.292             | 0.292              | 858.879          | 0.345            |
| Snowblowers    | 2023 | G4          | R                         | 16     | 25      | 6.877           | 599.961         | 4.524            | 0.021            | 0.292             | 0.292              | 858.879          | 0.359            |
| Snowblowers    | 2024 | G2          | C                         | 6      | 15      | 46.67           | 320.149         | 2.92             | 0.035            | 0.573             | 0.573              | 858.879          | 2.9              |
| Snowblowers    | 2024 | G2          | C                         | 16     | 25      | 47.12           | 318.737         | 2.919            | 0.035            | 0.573             | 0.573              | 858.879          | 2.928            |
| Snowblowers    | 2024 | G2          | R                         | 6      | 15      | 46.67           | 320.149         | 2.92             | 0.035            | 0.573             | 0.573              | 858.879          | 2.9              |
| Snowblowers    | 2024 | G2          | R                         | 16     | 25      | 47.12           | 318.737         | 2.919            | 0.035            | 0.573             | 0.573              | 858.879          | 2.928            |
| Snowblowers    | 2024 | G4          | C                         | 3      | 5       | 10.578          | 563.519         | 2.635            | 0.029            | 1.647             | 1.647              | 858.879          | 0.552            |
| Snowblowers    | 2024 | G4          | C                         | 6      | 15      | 6.556           | 564.959         | 4.839            | 0.024            | 0.292             | 0.292              | 858.879          | 0.342            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|----------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Snowblowers    | 2024 | G4          | C                         | 16     | 25      | 6.822           | 599.274         | 4.5              | 0.021            | 0.292             | 0.292              | 858.879          | 0.356            |
| Snowblowers    | 2024 | G4          | R                         | 3      | 5       | 10.578          | 563.519         | 2.635            | 0.029            | 1.647             | 1.647              | 858.879          | 0.552            |
| Snowblowers    | 2024 | G4          | R                         | 6      | 15      | 6.556           | 564.959         | 4.839            | 0.024            | 0.292             | 0.292              | 858.879          | 0.342            |
| Snowblowers    | 2024 | G4          | R                         | 16     | 25      | 6.822           | 599.274         | 4.5              | 0.021            | 0.292             | 0.292              | 858.879          | 0.356            |
| Snowblowers    | 2025 | G2          | C                         | 6      | 15      | 46.053          | 319.364         | 2.919            | 0.035            | 0.552             | 0.552              | 858.879          | 2.862            |
| Snowblowers    | 2025 | G2          | C                         | 16     | 25      | 46.385          | 318.356         | 2.919            | 0.035            | 0.552             | 0.552              | 858.879          | 2.883            |
| Snowblowers    | 2025 | G2          | R                         | 6      | 15      | 46.053          | 319.364         | 2.919            | 0.035            | 0.552             | 0.552              | 858.879          | 2.862            |
| Snowblowers    | 2025 | G2          | R                         | 16     | 25      | 46.385          | 318.356         | 2.919            | 0.035            | 0.552             | 0.552              | 858.879          | 2.883            |
| Snowblowers    | 2025 | G4          | C                         | 3      | 5       | 10.49           | 562.347         | 2.61             | 0.029            | 1.647             | 1.647              | 858.879          | 0.548            |
| Snowblowers    | 2025 | G4          | C                         | 6      | 15      | 6.514           | 564.306         | 4.82             | 0.024            | 0.292             | 0.292              | 858.879          | 0.34             |
| Snowblowers    | 2025 | G4          | C                         | 16     | 25      | 6.782           | 598.683         | 4.485            | 0.021            | 0.292             | 0.292              | 858.879          | 0.354            |
| Snowblowers    | 2025 | G4          | R                         | 3      | 5       | 10.49           | 562.347         | 2.61             | 0.029            | 1.647             | 1.647              | 858.879          | 0.548            |
| Snowblowers    | 2025 | G4          | R                         | 6      | 15      | 6.514           | 564.306         | 4.82             | 0.024            | 0.292             | 0.292              | 858.879          | 0.34             |
| Snowblowers    | 2025 | G4          | R                         | 16     | 25      | 6.782           | 598.683         | 4.485            | 0.021            | 0.292             | 0.292              | 858.879          | 0.354            |
| Snowblowers    | 2030 | G2          | C                         | 6      | 15      | 44.544          | 317.797         | 2.911            | 0.035            | 0.501             | 0.501              | 858.879          | 2.768            |
| Snowblowers    | 2030 | G2          | C                         | 16     | 25      | 44.555          | 317.775         | 2.911            | 0.035            | 0.501             | 0.501              | 858.879          | 2.769            |
| Snowblowers    | 2030 | G2          | R                         | 6      | 15      | 44.544          | 317.797         | 2.911            | 0.035            | 0.501             | 0.501              | 858.879          | 2.768            |
| Snowblowers    | 2030 | G2          | R                         | 16     | 25      | 44.555          | 317.775         | 2.911            | 0.035            | 0.501             | 0.501              | 858.879          | 2.769            |
| Snowblowers    | 2030 | G4          | C                         | 3      | 5       | 10.268          | 559.045         | 2.518            | 0.029            | 1.647             | 1.647              | 858.879          | 0.537            |
| Snowblowers    | 2030 | G4          | C                         | 6      | 15      | 6.384           | 562.117         | 4.754            | 0.024            | 0.292             | 0.292              | 858.879          | 0.334            |
| Snowblowers    | 2030 | G4          | C                         | 16     | 25      | 6.658           | 596.614         | 4.433            | 0.021            | 0.292             | 0.292              | 858.879          | 0.348            |
| Snowblowers    | 2030 | G4          | R                         | 3      | 5       | 10.268          | 559.045         | 2.518            | 0.029            | 1.647             | 1.647              | 858.879          | 0.537            |
| Snowblowers    | 2030 | G4          | R                         | 6      | 15      | 6.384           | 562.117         | 4.754            | 0.024            | 0.292             | 0.292              | 858.879          | 0.334            |
| Snowblowers    | 2030 | G4          | R                         | 16     | 25      | 6.658           | 596.614         | 4.433            | 0.021            | 0.292             | 0.292              | 858.879          | 0.348            |
| Snowblowers    | 2035 | G2          | C                         | 6      | 15      | 44.492          | 317.759         | 2.904            | 0.035            | 0.499             | 0.499              | 858.879          | 2.765            |
| Snowblowers    | 2035 | G2          | C                         | 16     | 25      | 44.492          | 317.759         | 2.904            | 0.035            | 0.499             | 0.499              | 858.879          | 2.765            |
| Snowblowers    | 2035 | G2          | R                         | 6      | 15      | 44.492          | 317.759         | 2.904            | 0.035            | 0.499             | 0.499              | 858.879          | 2.765            |
| Snowblowers    | 2035 | G2          | R                         | 16     | 25      | 44.492          | 317.759         | 2.904            | 0.035            | 0.499             | 0.499              | 858.879          | 2.765            |
| Snowblowers    | 2035 | G4          | C                         | 3      | 5       | 10.203          | 557.747         | 2.478            | 0.029            | 1.647             | 1.647              | 858.88           | 0.534            |
| Snowblowers    | 2035 | G4          | C                         | 6      | 15      | 6.334           | 561.031         | 4.721            | 0.024            | 0.292             | 0.292              | 858.879          | 0.331            |
| Snowblowers    | 2035 | G4          | C                         | 16     | 25      | 6.607           | 595.493         | 4.404            | 0.021            | 0.292             | 0.292              | 858.879          | 0.346            |
| Snowblowers    | 2035 | G4          | R                         | 3      | 5       | 10.203          | 557.747         | 2.478            | 0.029            | 1.647             | 1.647              | 858.88           | 0.534            |
| Snowblowers    | 2035 | G4          | R                         | 6      | 15      | 6.334           | 561.031         | 4.721            | 0.024            | 0.292             | 0.292              | 858.879          | 0.331            |
| Snowblowers    | 2035 | G4          | R                         | 16     | 25      | 6.607           | 595.493         | 4.404            | 0.021            | 0.292             | 0.292              | 858.879          | 0.346            |
| Snowblowers    | 2040 | G2          | C                         | 6      | 15      | 44.458          | 317.759         | 2.902            | 0.035            | 0.499             | 0.499              | 858.879          | 2.763            |
| Snowblowers    | 2040 | G2          | C                         | 16     | 25      | 44.458          | 317.759         | 2.902            | 0.035            | 0.499             | 0.499              | 858.879          | 2.763            |
| Snowblowers    | 2040 | G2          | R                         | 6      | 15      | 44.458          | 317.759         | 2.902            | 0.035            | 0.499             | 0.499              | 858.879          | 2.763            |
| Snowblowers    | 2040 | G2          | R                         | 16     | 25      | 44.458          | 317.759         | 2.902            | 0.035            | 0.499             | 0.499              | 858.879          | 2.763            |
| Snowblowers    | 2040 | G4          | C                         | 3      | 5       | 10.181          | 556.898         | 2.469            | 0.029            | 1.647             | 1.647              | 858.879          | 0.534            |
| Snowblowers    | 2040 | G4          | C                         | 6      | 15      | 6.318           | 560.117         | 4.709            | 0.024            | 0.292             | 0.292              | 858.879          | 0.331            |
| Snowblowers    | 2040 | G4          | C                         | 16     | 25      | 6.589           | 594.522         | 4.393            | 0.021            | 0.292             | 0.292              | 858.879          | 0.345            |
| Snowblowers    | 2040 | G4          | R                         | 3      | 5       | 10.181          | 556.898         | 2.469            | 0.029            | 1.647             | 1.647              | 858.879          | 0.534            |
| Snowblowers    | 2040 | G4          | R                         | 6      | 15      | 6.318           | 560.117         | 4.709            | 0.024            | 0.292             | 0.292              | 858.879          | 0.331            |
| Snowblowers    | 2040 | G4          | R                         | 16     | 25      | 6.589           | 594.522         | 4.393            | 0.021            | 0.292             | 0.292              | 858.879          | 0.345            |
| Tillers        | 1990 | G4          | C                         | 3      | 5       | 78.112          | 1313.172        | 4.892            | 0.434            | 2.184             | 2.184              | 858.879          | 9.227            |
| Tillers        | 1990 | G4          | R                         | 3      | 5       | 78.112          | 1313.172        | 4.892            | 0.434            | 2.184             | 2.184              | 858.879          | 9.227            |
| Tillers        | 2000 | G4          | C                         | 3      | 5       | 44.791          | 796.46          | 5.611            | 0.041            | 2.193             | 2.193              | 858.879          | 2.448            |
| Tillers        | 2000 | G4          | R                         | 3      | 5       | 44.791          | 796.46          | 5.611            | 0.041            | 2.193             | 2.193              | 858.879          | 2.448            |
| Tillers        | 2005 | G4          | C                         | 3      | 5       | 30.033          | 576.602         | 6.868            | 0.029            | 2.205             | 2.205              | 858.879          | 1.686            |
| Tillers        | 2005 | G4          | R                         | 3      | 5       | 30.033          | 576.602         | 6.868            | 0.029            | 2.205             | 2.205              | 858.879          | 1.686            |
| Tillers        | 2010 | G4          | C                         | 3      | 5       | 19.82           | 476.644         | 4.825            | 0.029            | 2.202             | 2.202              | 858.879          | 1.113            |
| Tillers        | 2010 | G4          | R                         | 3      | 5       | 19.82           | 476.644         | 4.825            | 0.029            | 2.202             | 2.202              | 858.879          | 1.113            |
| Tillers        | 2011 | G4          | C                         | 3      | 5       | 18.665          | 464.23          | 4.587            | 0.029            | 2.201             | 2.201              | 858.879          | 1.048            |
| Tillers        | 2011 | G4          | R                         | 3      | 5       | 18.665          | 464.23          | 4.587            | 0.029            | 2.201             | 2.201              | 858.879          | 1.048            |
| Tillers        | 2012 | G4          | C                         | 3      | 5       | 17.59           | 452.097         | 4.413            | 0.029            | 2.201             | 2.201              | 858.879          | 0.988            |
| Tillers        | 2012 | G4          | R                         | 3      | 5       | 17.59           | 452.097         | 4.413            | 0.029            | 2.201             | 2.201              | 858.879          | 0.988            |
| Tillers        | 2013 | G4          | C                         | 3      | 5       | 16.614          | 440.935         | 4.284            | 0.029            | 2.202             | 2.202              | 858.879          | 0.933            |
| Tillers        | 2013 | G4          | R                         | 3      | 5       | 16.614          | 440.935         | 4.284            | 0.029            | 2.202             | 2.202              | 858.879          | 0.933            |
| Tillers        | 2014 | G4          | C                         | 3      | 5       | 16.012          | 434.739         | 4.16             | 0.029            | 2.203             | 2.203              | 858.879          | 0.899            |
| Tillers        | 2014 | G4          | R                         | 3      | 5       | 16.012          | 434.739         | 4.16             | 0.029            | 2.203             | 2.203              | 858.879          | 0.899            |
| Tillers        | 2015 | G4          | C                         | 3      | 5       | 15.546          | 430.244         | 4.042            | 0.029            | 2.203             | 2.203              | 858.879          | 0.873            |
| Tillers        | 2015 | G4          | R                         | 3      | 5       | 15.546          | 430.244         | 4.042            | 0.029            | 2.203             | 2.203              | 858.879          | 0.873            |
| Tillers        | 2016 | G4          | C                         | 3      | 5       | 15.127          | 426.462         | 3.92             | 0.029            | 2.203             | 2.203              | 858.879          | 0.85             |
| Tillers        | 2016 | G4          | R                         | 3      | 5       | 15.127          | 426.462         | 3.92             | 0.029            | 2.203             | 2.203              | 858.879          | 0.85             |
| Tillers        | 2017 | G4          | C                         | 3      | 5       | 14.77           | 423.384         | 3.802            | 0.029            | 2.203             | 2.203              | 858.879          | 0.83             |
| Tillers        | 2017 | G4          | R                         | 3      | 5       | 14.77           | 423.384         | 3.802            | 0.029            | 2.203             | 2.203              | 858.879          | 0.83             |
| Tillers        | 2018 | G4          | C                         | 3      | 5       | 14.48           | 421.308         | 3.679            | 0.029            | 2.202             | 2.202              | 858.879          | 0.814            |
| Tillers        | 2018 | G4          | R                         | 3      | 5       | 14.48           | 421.308         | 3.679            | 0.029            | 2.202             | 2.202              | 858.879          | 0.814            |
| Tillers        | 2019 | G4          | C                         | 3      | 5       | 14.288          | 419.526         | 3.625            | 0.029            | 2.201             | 2.201              | 858.879          | 0.803            |
| Tillers        | 2019 | G4          | R                         | 3      | 5       | 14.288          | 419.526         | 3.625            | 0.029            | 2.201             | 2.201              | 858.879          | 0.803            |
| Tillers        | 2020 | G4          | C                         | 3      | 5       | 14.146          | 417.94          | 3.592            | 0.029            | 2.201             | 2.201              | 858.879          | 0.795            |
| Tillers        | 2020 | G4          | R                         | 3      | 5       | 14.146          | 417.94          | 3.592            | 0.029            | 2.201             | 2.201              | 858.879          | 0.795            |
| Tillers        | 2021 | G4          | C                         | 3      | 5       | 14.021          | 417.224         | 3.555            | 0.029            | 2.199             | 2.199              | 858.879          | 0.788            |
| Tillers        | 2021 | G4          | R                         | 3      | 5       | 14.021          | 417.224         | 3.555            | 0.029            | 2.199             | 2.199              | 858.879          | 0.788            |
| Tillers        | 2022 | G4          | C                         | 3      | 5       | 13.948          | 416.23          | 3.529            | 0.029            | 2.2               | 2.2                | 858.879          | 0.784            |
| Tillers        | 2022 | G4          | R                         | 3      | 5       | 13.948          | 416.23          | 3.529            | 0.029            | 2.2               | 2.2                | 858.879          | 0.784            |
| Tillers        | 2023 | G4          | C                         | 3      | 5       | 13.897          | 415.541         | 3.507            | 0.029            | 2.201             | 2.201              | 858.879          | 0.781            |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type                | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG g/bhp-hr | CO, g/bhp-hr | NOX, g/bhp-hr | SO2, g/bhp-hr | PM10, g/bhp-hr | PM2.5, g/bhp-hr | CO2, g/bhp-hr | CH4, g/bhp-hr |
|-------------------------------|------|-------------|---------------------------|--------|---------|--------------|--------------|---------------|---------------|----------------|-----------------|---------------|---------------|
| Trimmers                      | 2023 | G4          | R                         | 3      | 5       | 13.897       | 415.541      | 3.507         | 0.029         | 2.201          | 2.201           | 858.879       | 0.781         |
| Trimmers                      | 2024 | G4          | C                         | 3      | 5       | 13.867       | 415.111      | 3.487         | 0.029         | 2.201          | 2.201           | 858.879       | 0.78          |
| Trimmers                      | 2024 | G4          | R                         | 3      | 5       | 13.867       | 415.111      | 3.487         | 0.029         | 2.201          | 2.201           | 858.879       | 0.78          |
| Trimmers                      | 2025 | G4          | C                         | 3      | 5       | 13.844       | 415.049      | 3.467         | 0.029         | 2.201          | 2.201           | 858.879       | 0.779         |
| Trimmers                      | 2025 | G4          | R                         | 3      | 5       | 13.844       | 415.049      | 3.467         | 0.029         | 2.201          | 2.201           | 858.879       | 0.779         |
| Trimmers                      | 2030 | G4          | C                         | 3      | 5       | 13.817       | 414.708      | 3.43          | 0.029         | 2.201          | 2.201           | 858.879       | 0.778         |
| Trimmers                      | 2030 | G4          | R                         | 3      | 5       | 13.817       | 414.708      | 3.43          | 0.029         | 2.201          | 2.201           | 858.879       | 0.778         |
| Trimmers                      | 2035 | G4          | C                         | 3      | 5       | 13.802       | 414.506      | 3.427         | 0.029         | 2.2            | 2.2             | 858.879       | 0.777         |
| Trimmers                      | 2035 | G4          | R                         | 3      | 5       | 13.802       | 414.506      | 3.427         | 0.029         | 2.2            | 2.2             | 858.879       | 0.777         |
| Trimmers                      | 2040 | G4          | C                         | 3      | 5       | 13.793       | 414.121      | 3.426         | 0.029         | 2.2            | 2.2             | 858.879       | 0.777         |
| Trimmers                      | 2040 | G4          | R                         | 3      | 5       | 13.793       | 414.121      | 3.426         | 0.029         | 2.2            | 2.2             | 858.879       | 0.777         |
| Trimmers/Edgers/Brush Cutters | 1990 | G2          | C                         | 0      | 2       | 375.815      | 1332.647     | 1.862         | 0.466         | 6.479          | 6.479           | 772.991       | 32.05         |
| Trimmers/Edgers/Brush Cutters | 1990 | G2          | R                         | 0      | 2       | 375.815      | 1332.647     | 1.862         | 0.466         | 6.479          | 6.479           | 772.991       | 32.05         |
| Trimmers/Edgers/Brush Cutters | 1990 | G4          | C                         | 3      | 5       | 87.785       | 1374.249     | 4.92          | 0.434         | 2.809          | 2.809           | 858.879       | 10.37         |
| Trimmers/Edgers/Brush Cutters | 1990 | G4          | R                         | 3      | 5       | 87.785       | 1374.249     | 4.92          | 0.434         | 2.809          | 2.809           | 858.879       | 10.37         |
| Trimmers/Edgers/Brush Cutters | 2000 | G2          | C                         | 0      | 2       | 176.618      | 459.625      | 2.752         | 0.044         | 3.345          | 3.345           | 772.991       | 10.69         |
| Trimmers/Edgers/Brush Cutters | 2000 | G2          | R                         | 0      | 2       | 176.618      | 459.625      | 2.752         | 0.044         | 3.345          | 3.345           | 772.991       | 10.69         |
| Trimmers/Edgers/Brush Cutters | 2000 | G4          | C                         | 3      | 5       | 54.699       | 841.478      | 5.786         | 0.041         | 5.753          | 5.753           | 858.879       | 2.99          |
| Trimmers/Edgers/Brush Cutters | 2000 | G4          | R                         | 3      | 5       | 54.699       | 841.478      | 5.786         | 0.041         | 5.753          | 5.753           | 858.879       | 2.99          |
| Trimmers/Edgers/Brush Cutters | 2005 | G2          | C                         | 0      | 2       | 98.602       | 316.166      | 2.832         | 0.031         | 1.087          | 1.087           | 772.991       | 6.128         |
| Trimmers/Edgers/Brush Cutters | 2005 | G2          | R                         | 0      | 2       | 98.602       | 316.166      | 2.832         | 0.031         | 1.087          | 1.087           | 772.991       | 6.128         |
| Trimmers/Edgers/Brush Cutters | 2005 | G4          | C                         | 3      | 5       | 35.939       | 581.254      | 7.372         | 0.029         | 2.009          | 2.009           | 858.879       | 2.018         |
| Trimmers/Edgers/Brush Cutters | 2005 | G4          | R                         | 3      | 5       | 35.939       | 581.254      | 7.372         | 0.029         | 2.009          | 2.009           | 858.879       | 2.018         |
| Trimmers/Edgers/Brush Cutters | 2010 | G2          | C                         | 0      | 2       | 79.871       | 287.902      | 2.592         | 0.031         | 0.496          | 0.496           | 772.991       | 4.964         |
| Trimmers/Edgers/Brush Cutters | 2010 | G2          | R                         | 0      | 2       | 79.871       | 287.902      | 2.592         | 0.031         | 0.496          | 0.496           | 772.991       | 4.964         |
| Trimmers/Edgers/Brush Cutters | 2010 | G4          | C                         | 3      | 5       | 26.461       | 465.71       | 8.024         | 0.029         | 1.29           | 1.29            | 858.879       | 1.486         |
| Trimmers/Edgers/Brush Cutters | 2010 | G4          | R                         | 3      | 5       | 26.461       | 465.71       | 8.024         | 0.029         | 1.29           | 1.29            | 858.879       | 1.486         |
| Trimmers/Edgers/Brush Cutters | 2011 | G2          | C                         | 0      | 2       | 78.813       | 286.76       | 2.544         | 0.031         | 0.468          | 0.468           | 772.991       | 4.898         |
| Trimmers/Edgers/Brush Cutters | 2011 | G2          | R                         | 0      | 2       | 78.813       | 286.76       | 2.544         | 0.031         | 0.468          | 0.468           | 772.991       | 4.898         |
| Trimmers/Edgers/Brush Cutters | 2011 | G4          | C                         | 3      | 5       | 25.278       | 450.89       | 8.121         | 0.029         | 1.107          | 1.107           | 858.879       | 1.42          |
| Trimmers/Edgers/Brush Cutters | 2011 | G4          | R                         | 3      | 5       | 25.278       | 450.89       | 8.121         | 0.029         | 1.107          | 1.107           | 858.879       | 1.42          |
| Trimmers/Edgers/Brush Cutters | 2012 | G2          | C                         | 0      | 2       | 78.373       | 286.165      | 2.526         | 0.031         | 0.454          | 0.454           | 772.991       | 4.871         |
| Trimmers/Edgers/Brush Cutters | 2012 | G2          | R                         | 0      | 2       | 78.373       | 286.165      | 2.526         | 0.031         | 0.454          | 0.454           | 772.991       | 4.871         |
| Trimmers/Edgers/Brush Cutters | 2012 | G4          | C                         | 3      | 5       | 24.16        | 436.282      | 8.219         | 0.029         | 0.931          | 0.931           | 858.879       | 1.357         |
| Trimmers/Edgers/Brush Cutters | 2012 | G4          | R                         | 3      | 5       | 24.16        | 436.282      | 8.219         | 0.029         | 0.931          | 0.931           | 858.879       | 1.357         |
| Trimmers/Edgers/Brush Cutters | 2013 | G2          | C                         | 0      | 2       | 78.144       | 285.984      | 2.511         | 0.031         | 0.449          | 0.449           | 772.991       | 4.857         |
| Trimmers/Edgers/Brush Cutters | 2013 | G2          | R                         | 0      | 2       | 78.144       | 285.984      | 2.511         | 0.031         | 0.449          | 0.449           | 772.991       | 4.857         |
| Trimmers/Edgers/Brush Cutters | 2013 | G4          | C                         | 3      | 5       | 23.066       | 422.421      | 8.311         | 0.029         | 0.765          | 0.765           | 858.879       | 1.296         |
| Trimmers/Edgers/Brush Cutters | 2013 | G4          | R                         | 3      | 5       | 23.066       | 422.421      | 8.311         | 0.029         | 0.765          | 0.765           | 858.879       | 1.296         |
| Trimmers/Edgers/Brush Cutters | 2014 | G2          | C                         | 0      | 2       | 78.02        | 285.983      | 2.5           | 0.031         | 0.449          | 0.449           | 772.991       | 4.849         |
| Trimmers/Edgers/Brush Cutters | 2014 | G2          | R                         | 0      | 2       | 78.02        | 285.983      | 2.5           | 0.031         | 0.449          | 0.449           | 772.991       | 4.849         |
| Trimmers/Edgers/Brush Cutters | 2014 | G4          | C                         | 3      | 5       | 22.083       | 409.949      | 8.4           | 0.029         | 0.613          | 0.613           | 858.879       | 1.241         |
| Trimmers/Edgers/Brush Cutters | 2014 | G4          | R                         | 3      | 5       | 22.083       | 409.949      | 8.4           | 0.029         | 0.613          | 0.613           | 858.879       | 1.241         |
| Trimmers/Edgers/Brush Cutters | 2015 | G2          | C                         | 0      | 2       | 77.92        | 285.983      | 2.491         | 0.031         | 0.449          | 0.449           | 772.991       | 4.843         |
| Trimmers/Edgers/Brush Cutters | 2015 | G2          | R                         | 0      | 2       | 77.92        | 285.983      | 2.491         | 0.031         | 0.449          | 0.449           | 772.991       | 4.843         |
| Trimmers/Edgers/Brush Cutters | 2015 | G4          | C                         | 3      | 5       | 21.454       | 402.105      | 8.453         | 0.029         | 0.544          | 0.544           | 858.879       | 1.206         |
| Trimmers/Edgers/Brush Cutters | 2015 | G4          | R                         | 3      | 5       | 21.454       | 402.105      | 8.453         | 0.029         | 0.544          | 0.544           | 858.879       | 1.206         |
| Trimmers/Edgers/Brush Cutters | 2016 | G2          | C                         | 0      | 2       | 77.872       | 285.983      | 2.486         | 0.031         | 0.449          | 0.449           | 772.991       | 4.84          |
| Trimmers/Edgers/Brush Cutters | 2016 | G2          | R                         | 0      | 2       | 77.872       | 285.983      | 2.486         | 0.031         | 0.449          | 0.449           | 772.991       | 4.84          |
| Trimmers/Edgers/Brush Cutters | 2016 | G4          | C                         | 3      | 5       | 20.977       | 396.349      | 8.491         | 0.029         | 0.498          | 0.498           | 858.879       | 1.179         |
| Trimmers/Edgers/Brush Cutters | 2016 | G4          | R                         | 3      | 5       | 20.977       | 396.349      | 8.491         | 0.029         | 0.498          | 0.498           | 858.879       | 1.179         |
| Trimmers/Edgers/Brush Cutters | 2017 | G2          | C                         | 0      | 2       | 77.862       | 285.983      | 2.483         | 0.031         | 0.449          | 0.449           | 772.992       | 4.839         |
| Trimmers/Edgers/Brush Cutters | 2017 | G2          | R                         | 0      | 2       | 77.862       | 285.983      | 2.483         | 0.031         | 0.449          | 0.449           | 772.992       | 4.839         |
| Trimmers/Edgers/Brush Cutters | 2017 | G4          | C                         | 3      | 5       | 20.584       | 391.403      | 8.525         | 0.029         | 0.456          | 0.456           | 858.879       | 1.157         |
| Trimmers/Edgers/Brush Cutters | 2017 | G4          | R                         | 3      | 5       | 20.584       | 391.403      | 8.525         | 0.029         | 0.456          | 0.456           | 858.879       | 1.157         |
| Trimmers/Edgers/Brush Cutters | 2018 | G2          | C                         | 0      | 2       | 77.847       | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.838         |
| Trimmers/Edgers/Brush Cutters | 2018 | G2          | R                         | 0      | 2       | 77.847       | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.838         |
| Trimmers/Edgers/Brush Cutters | 2018 | G4          | C                         | 3      | 5       | 20.244       | 387.191      | 8.552         | 0.029         | 0.419          | 0.419           | 858.88        | 1.138         |
| Trimmers/Edgers/Brush Cutters | 2018 | G4          | R                         | 3      | 5       | 20.244       | 387.191      | 8.552         | 0.029         | 0.419          | 0.419           | 858.88        | 1.138         |
| Trimmers/Edgers/Brush Cutters | 2019 | G2          | C                         | 0      | 2       | 77.85        | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.838         |
| Trimmers/Edgers/Brush Cutters | 2019 | G2          | R                         | 0      | 2       | 77.85        | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.838         |
| Trimmers/Edgers/Brush Cutters | 2019 | G4          | C                         | 3      | 5       | 19.984       | 384.057      | 8.573         | 0.029         | 0.389          | 0.389           | 858.88        | 1.123         |
| Trimmers/Edgers/Brush Cutters | 2019 | G4          | R                         | 3      | 5       | 19.984       | 384.057      | 8.573         | 0.029         | 0.389          | 0.389           | 858.88        | 1.123         |
| Trimmers/Edgers/Brush Cutters | 2020 | G2          | C                         | 0      | 2       | 77.851       | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.838         |
| Trimmers/Edgers/Brush Cutters | 2020 | G2          | R                         | 0      | 2       | 77.851       | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.838         |
| Trimmers/Edgers/Brush Cutters | 2020 | G4          | C                         | 3      | 5       | 19.759       | 381.691      | 8.585         | 0.029         | 0.361          | 0.361           | 858.879       | 1.111         |
| Trimmers/Edgers/Brush Cutters | 2020 | G4          | R                         | 3      | 5       | 19.759       | 381.691      | 8.585         | 0.029         | 0.361          | 0.361           | 858.879       | 1.111         |
| Trimmers/Edgers/Brush Cutters | 2021 | G2          | C                         | 0      | 2       | 77.75        | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.832         |
| Trimmers/Edgers/Brush Cutters | 2021 | G2          | R                         | 0      | 2       | 77.75        | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.832         |
| Trimmers/Edgers/Brush Cutters | 2021 | G4          | C                         | 3      | 5       | 19.581       | 380.309      | 8.589         | 0.029         | 0.338          | 0.338           | 858.879       | 1.101         |
| Trimmers/Edgers/Brush Cutters | 2021 | G4          | R                         | 3      | 5       | 19.581       | 380.309      | 8.589         | 0.029         | 0.338          | 0.338           | 858.879       | 1.101         |
| Trimmers/Edgers/Brush Cutters | 2022 | G2          | C                         | 0      | 2       | 77.784       | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.834         |
| Trimmers/Edgers/Brush Cutters | 2022 | G2          | R                         | 0      | 2       | 77.784       | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.834         |
| Trimmers/Edgers/Brush Cutters | 2022 | G4          | C                         | 3      | 5       | 19.486       | 378.671      | 8.602         | 0.029         | 0.318          | 0.318           | 858.879       | 1.096         |
| Trimmers/Edgers/Brush Cutters | 2022 | G4          | R                         | 3      | 5       | 19.486       | 378.671      | 8.602         | 0.029         | 0.318          | 0.318           | 858.879       | 1.096         |
| Trimmers/Edgers/Brush Cutters | 2023 | G2          | C                         | 0      | 2       | 77.802       | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.835         |
| Trimmers/Edgers/Brush Cutters | 2023 | G2          | R                         | 0      | 2       | 77.802       | 285.983      | 2.482         | 0.031         | 0.449          | 0.449           | 772.991       | 4.835         |

Table 7.2 Landscape Equipment Running Emission Factors

| Equipment Type                | Year | Engine Type | Commercial or Residential | Low Hp | High Hp | ROG<br>g/bhp-hr | CO,<br>g/bhp-hr | NOX,<br>g/bhp-hr | SO2,<br>g/bhp-hr | PM10,<br>g/bhp-hr | PM2.5,<br>g/bhp-hr | CO2,<br>g/bhp-hr | CH4,<br>g/bhp-hr |
|-------------------------------|------|-------------|---------------------------|--------|---------|-----------------|-----------------|------------------|------------------|-------------------|--------------------|------------------|------------------|
| Trimmers/Edgers/Brush Cutters | 2023 | G4          | C                         | 3      | 5       | 19.411          | 377.801         | 8.608            | 0.029            | 0.303             | 0.303              | 858.879          | 1.092            |
| Trimmers/Edgers/Brush Cutters | 2023 | G4          | R                         | 3      | 5       | 19.411          | 377.801         | 8.608            | 0.029            | 0.303             | 0.303              | 858.879          | 1.092            |
| Trimmers/Edgers/Brush Cutters | 2024 | G2          | C                         | 0      | 2       | 77.822          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.837            |
| Trimmers/Edgers/Brush Cutters | 2024 | G2          | R                         | 0      | 2       | 77.822          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.837            |
| Trimmers/Edgers/Brush Cutters | 2024 | G4          | C                         | 3      | 5       | 19.364          | 377.078         | 8.613            | 0.029            | 0.292             | 0.292              | 858.879          | 1.089            |
| Trimmers/Edgers/Brush Cutters | 2024 | G4          | R                         | 3      | 5       | 19.364          | 377.078         | 8.613            | 0.029            | 0.292             | 0.292              | 858.879          | 1.089            |
| Trimmers/Edgers/Brush Cutters | 2025 | G2          | C                         | 0      | 2       | 77.833          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.837            |
| Trimmers/Edgers/Brush Cutters | 2025 | G2          | R                         | 0      | 2       | 77.833          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.837            |
| Trimmers/Edgers/Brush Cutters | 2025 | G4          | C                         | 3      | 5       | 19.327          | 376.636         | 8.615            | 0.029            | 0.285             | 0.285              | 858.879          | 1.087            |
| Trimmers/Edgers/Brush Cutters | 2025 | G4          | R                         | 3      | 5       | 19.327          | 376.636         | 8.615            | 0.029            | 0.285             | 0.285              | 858.879          | 1.087            |
| Trimmers/Edgers/Brush Cutters | 2030 | G2          | C                         | 0      | 2       | 77.793          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.835            |
| Trimmers/Edgers/Brush Cutters | 2030 | G2          | R                         | 0      | 2       | 77.793          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.835            |
| Trimmers/Edgers/Brush Cutters | 2030 | G4          | C                         | 3      | 5       | 19.297          | 375.8           | 8.618            | 0.029            | 0.279             | 0.279              | 858.879          | 1.086            |
| Trimmers/Edgers/Brush Cutters | 2030 | G4          | R                         | 3      | 5       | 19.297          | 375.8           | 8.618            | 0.029            | 0.279             | 0.279              | 858.879          | 1.086            |
| Trimmers/Edgers/Brush Cutters | 2035 | G2          | C                         | 0      | 2       | 77.785          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.834            |
| Trimmers/Edgers/Brush Cutters | 2035 | G2          | R                         | 0      | 2       | 77.785          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.834            |
| Trimmers/Edgers/Brush Cutters | 2035 | G4          | C                         | 3      | 5       | 19.273          | 375.785         | 8.61             | 0.029            | 0.279             | 0.279              | 858.879          | 1.086            |
| Trimmers/Edgers/Brush Cutters | 2035 | G4          | R                         | 3      | 5       | 19.273          | 375.785         | 8.61             | 0.029            | 0.279             | 0.279              | 858.879          | 1.086            |
| Trimmers/Edgers/Brush Cutters | 2040 | G2          | C                         | 0      | 2       | 77.783          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.834            |
| Trimmers/Edgers/Brush Cutters | 2040 | G2          | R                         | 0      | 2       | 77.783          | 285.983         | 2.482            | 0.031            | 0.449             | 0.449              | 772.991          | 4.834            |
| Trimmers/Edgers/Brush Cutters | 2040 | G4          | C                         | 3      | 5       | 19.26           | 375.439         | 8.607            | 0.029            | 0.279             | 0.279              | 858.88           | 1.086            |
| Trimmers/Edgers/Brush Cutters | 2040 | G4          | R                         | 3      | 5       | 19.26           | 375.439         | 8.607            | 0.029            | 0.279             | 0.279              | 858.88           | 1.086            |
| Wood Splitters                | 1990 | G4          | C                         | 3      | 5       | 72.405          | 1277.201        | 4.876            | 0.434            | 2.026             | 2.026              | 858.879          | 8.553            |
| Wood Splitters                | 1990 | G4          | R                         | 3      | 5       | 72.405          | 1277.201        | 4.876            | 0.434            | 2.026             | 2.026              | 858.879          | 8.553            |
| Wood Splitters                | 2000 | G4          | C                         | 3      | 5       | 39.734          | 763.399         | 5.668            | 0.041            | 2.025             | 2.025              | 858.879          | 2.172            |
| Wood Splitters                | 2000 | G4          | R                         | 3      | 5       | 39.734          | 763.399         | 5.668            | 0.041            | 2.025             | 2.025              | 858.879          | 2.172            |
| Wood Splitters                | 2005 | G4          | C                         | 3      | 5       | 24.031          | 546.706         | 6.964            | 0.029            | 2.026             | 2.026              | 858.879          | 1.349            |
| Wood Splitters                | 2005 | G4          | R                         | 3      | 5       | 24.031          | 546.706         | 6.964            | 0.029            | 2.026             | 2.026              | 858.879          | 1.349            |
| Wood Splitters                | 2010 | G4          | C                         | 3      | 5       | 17.322          | 497.944         | 4.296            | 0.029            | 2.027             | 2.027              | 858.879          | 0.973            |
| Wood Splitters                | 2010 | G4          | R                         | 3      | 5       | 17.322          | 497.944         | 4.296            | 0.029            | 2.027             | 2.027              | 858.879          | 0.973            |
| Wood Splitters                | 2011 | G4          | C                         | 3      | 5       | 16.626          | 491.73          | 4.202            | 0.029            | 2.026             | 2.026              | 858.88           | 0.934            |
| Wood Splitters                | 2011 | G4          | R                         | 3      | 5       | 16.626          | 491.73          | 4.202            | 0.029            | 2.026             | 2.026              | 858.88           | 0.934            |
| Wood Splitters                | 2012 | G4          | C                         | 3      | 5       | 16.118          | 485.723         | 4.111            | 0.029            | 2.027             | 2.027              | 858.879          | 0.905            |
| Wood Splitters                | 2012 | G4          | R                         | 3      | 5       | 16.118          | 485.723         | 4.111            | 0.029            | 2.027             | 2.027              | 858.879          | 0.905            |
| Wood Splitters                | 2013 | G4          | C                         | 3      | 5       | 15.648          | 479.726         | 4.02             | 0.029            | 2.026             | 2.026              | 858.879          | 0.879            |
| Wood Splitters                | 2013 | G4          | R                         | 3      | 5       | 15.648          | 479.726         | 4.02             | 0.029            | 2.026             | 2.026              | 858.879          | 0.879            |
| Wood Splitters                | 2014 | G4          | C                         | 3      | 5       | 15.214          | 473.893         | 3.931            | 0.029            | 2.027             | 2.027              | 858.879          | 0.855            |
| Wood Splitters                | 2014 | G4          | R                         | 3      | 5       | 15.214          | 473.893         | 3.931            | 0.029            | 2.027             | 2.027              | 858.879          | 0.855            |
| Wood Splitters                | 2015 | G4          | C                         | 3      | 5       | 14.797          | 468.31          | 3.845            | 0.029            | 2.027             | 2.027              | 858.879          | 0.831            |
| Wood Splitters                | 2015 | G4          | R                         | 3      | 5       | 14.797          | 468.31          | 3.845            | 0.029            | 2.027             | 2.027              | 858.879          | 0.831            |
| Wood Splitters                | 2016 | G4          | C                         | 3      | 5       | 14.421          | 463.308         | 3.759            | 0.029            | 2.026             | 2.026              | 858.879          | 0.81             |
| Wood Splitters                | 2016 | G4          | R                         | 3      | 5       | 14.421          | 463.308         | 3.759            | 0.029            | 2.026             | 2.026              | 858.879          | 0.81             |
| Wood Splitters                | 2017 | G4          | C                         | 3      | 5       | 14.081          | 458.821         | 3.676            | 0.029            | 2.027             | 2.027              | 858.879          | 0.791            |
| Wood Splitters                | 2017 | G4          | R                         | 3      | 5       | 14.081          | 458.821         | 3.676            | 0.029            | 2.027             | 2.027              | 858.879          | 0.791            |
| Wood Splitters                | 2018 | G4          | C                         | 3      | 5       | 13.794          | 455.965         | 3.589            | 0.029            | 2.027             | 2.027              | 858.879          | 0.775            |
| Wood Splitters                | 2018 | G4          | R                         | 3      | 5       | 13.794          | 455.965         | 3.589            | 0.029            | 2.027             | 2.027              | 858.879          | 0.775            |
| Wood Splitters                | 2019 | G4          | C                         | 3      | 5       | 13.542          | 453.901         | 3.503            | 0.029            | 2.027             | 2.027              | 858.88           | 0.761            |
| Wood Splitters                | 2019 | G4          | R                         | 3      | 5       | 13.542          | 453.901         | 3.503            | 0.029            | 2.027             | 2.027              | 858.88           | 0.761            |
| Wood Splitters                | 2020 | G4          | C                         | 3      | 5       | 13.32           | 452.189         | 3.419            | 0.029            | 2.027             | 2.027              | 858.879          | 0.749            |
| Wood Splitters                | 2020 | G4          | R                         | 3      | 5       | 13.32           | 452.189         | 3.419            | 0.029            | 2.027             | 2.027              | 858.879          | 0.749            |
| Wood Splitters                | 2021 | G4          | C                         | 3      | 5       | 13.11           | 450.835         | 3.337            | 0.029            | 2.026             | 2.026              | 858.879          | 0.737            |
| Wood Splitters                | 2021 | G4          | R                         | 3      | 5       | 13.11           | 450.835         | 3.337            | 0.029            | 2.026             | 2.026              | 858.879          | 0.737            |
| Wood Splitters                | 2022 | G4          | C                         | 3      | 5       | 12.957          | 449.327         | 3.27             | 0.029            | 2.027             | 2.027              | 858.879          | 0.728            |
| Wood Splitters                | 2022 | G4          | R                         | 3      | 5       | 12.957          | 449.327         | 3.27             | 0.029            | 2.027             | 2.027              | 858.879          | 0.728            |
| Wood Splitters                | 2023 | G4          | C                         | 3      | 5       | 12.835          | 448.312         | 3.229            | 0.029            | 2.026             | 2.026              | 858.879          | 0.722            |
| Wood Splitters                | 2023 | G4          | R                         | 3      | 5       | 12.835          | 448.312         | 3.229            | 0.029            | 2.026             | 2.026              | 858.879          | 0.722            |
| Wood Splitters                | 2024 | G4          | C                         | 3      | 5       | 12.751          | 447.259         | 3.204            | 0.029            | 2.027             | 2.027              | 858.879          | 0.717            |
| Wood Splitters                | 2024 | G4          | R                         | 3      | 5       | 12.751          | 447.259         | 3.204            | 0.029            | 2.027             | 2.027              | 858.879          | 0.717            |
| Wood Splitters                | 2025 | G4          | C                         | 3      | 5       | 12.68           | 446.516         | 3.181            | 0.029            | 2.027             | 2.027              | 858.879          | 0.713            |
| Wood Splitters                | 2025 | G4          | R                         | 3      | 5       | 12.68           | 446.516         | 3.181            | 0.029            | 2.027             | 2.027              | 858.879          | 0.713            |
| Wood Splitters                | 2030 | G4          | C                         | 3      | 5       | 12.507          | 444.35          | 3.1              | 0.029            | 2.026             | 2.026              | 858.879          | 0.704            |
| Wood Splitters                | 2030 | G4          | R                         | 3      | 5       | 12.507          | 444.35          | 3.1              | 0.029            | 2.026             | 2.026              | 858.879          | 0.704            |
| Wood Splitters                | 2035 | G4          | C                         | 3      | 5       | 12.449          | 443.751         | 3.065            | 0.029            | 2.026             | 2.026              | 858.879          | 0.701            |
| Wood Splitters                | 2035 | G4          | R                         | 3      | 5       | 12.449          | 443.751         | 3.065            | 0.029            | 2.026             | 2.026              | 858.879          | 0.701            |
| Wood Splitters                | 2040 | G4          | C                         | 3      | 5       | 12.434          | 443.365         | 3.059            | 0.029            | 2.026             | 2.026              | 858.879          | 0.701            |
| Wood Splitters                | 2040 | G4          | R                         | 3      | 5       | 12.434          | 443.365         | 3.059            | 0.029            | 2.026             | 2.026              | 858.879          | 0.701            |

**Table 7.3 Landscape Equipment Usage**

| Land Use Type   | Landscape Equipment Type      | Usage    | Units       |
|-----------------|-------------------------------|----------|-------------|
| Non-Residential | Chainsaws                     | 2.47E-05 | hr/sqft/day |
|                 | Chainsaws Preempt             | 2.47E-05 | hr/sqft/day |
|                 | Front Mowers                  | 1.81E-06 | hr/sqft/day |
|                 | Lawn & Garden Tractors        | 4.04E-07 | hr/sqft/day |
|                 | Lawn Mowers                   | 2.49E-05 | hr/sqft/day |
|                 | Leaf Blowers/Vacuums          | 9.54E-06 | hr/sqft/day |
|                 | Other Lawn & Garden Equipment | 1.43E-05 | hr/sqft/day |
|                 | Rear Engine Riding Mowers     | 1.81E-06 | hr/sqft/day |
|                 | Shredders                     | 8.60E-06 | hr/sqft/day |
|                 | Snowblowers                   | 1.41E-07 | hr/sqft/day |
|                 | Tillers                       | 1.07E-06 | hr/sqft/day |
|                 | Trimmers/Edgers/Brush Cutters | 1.96E-05 | hr/sqft/day |
|                 | Wood Splitters                | 7.18E-06 | hr/sqft/day |
| Residential     | Chainsaws                     | 2.46E-03 | hr/du/day   |
|                 | Chainsaws Preempt             | 2.46E-03 | hr/du/day   |
|                 | Chippers/Stump Grinders       | 1.36E-03 | hr/du/day   |
|                 | Front Mowers                  | 3.09E-03 | hr/du/day   |
|                 | Lawn & Garden Tractors        | 7.60E-04 | hr/du/day   |
|                 | Lawn Mowers                   | 1.51E-02 | hr/du/day   |
|                 | Leaf Blowers/Vacuums          | 1.05E-03 | hr/du/day   |
|                 | Other Lawn & Garden Equipment | 3.53E-04 | hr/du/day   |
|                 | Rear Engine Riding Mowers     | 3.09E-03 | hr/du/day   |
|                 | Shredders                     | 5.18E-05 | hr/du/day   |
|                 | Snowblowers                   | 2.98E-05 | hr/du/day   |
|                 | Tillers                       | 1.48E-03 | hr/du/day   |
|                 | Trimmers/Edgers/Brush Cutters | 1.45E-03 | hr/du/day   |
|                 | Wood Splitters                | 5.42E-05 | hr/du/day   |

**Notes:**

1. Based on the total hours in OFFROAD2007 and number of dwelling units and non-residential square footage in California.

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type    | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                      |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Day-Care Center      | 10           | Y          | 3.64                | 1.49             | 4.52                 | 8.05                | 1.79             |
| Day-Care Center      | 11           | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Day-Care Center      | 5            | Y          | 0.86                | 1.27             | 3.11                 | 17.5                | 1.62             |
| Day-Care Center      | 9            | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Day-Care Center      | 1            | Y          | 2.18                | 1.48             | 4.55                 | 16.29               | 0.86             |
| Day-Care Center      | 6            | Y          | 2.74                | 2.17             | 3.82                 | 17.38               | 0.66             |
| Day-Care Center      | 14           | Y          | 2.18                | 1.48             | 4.55                 | 16.29               | 0.86             |
| Day-Care Center      | 12           | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Day-Care Center      | 3            | Y          | 2.81                | 1.89             | 3.69                 | 27.22               | 1.92             |
| Day-Care Center      | 7            | Y          | 2.54                | 1.95             | 4.27                 | 12.48               | 0.46             |
| Day-Care Center      | 13           | Y          | 2.03                | 1.18             | 3.14                 | 6.4                 | 0.48             |
| Day-Care Center      | 2            | Y          | 2.43                | 1.42             | 2.9                  | 11.11               | 0.42             |
| Day-Care Center      | 8            | Y          | 2.46                | 1.51             | 3.3                  | 12.37               | 1.03             |
| Day-Care Center      | 15           | Y          | 3.64                | 1.49             | 4.52                 | 8.05                | 1.79             |
| Day-Care Center      | 4            | Y          | 2.03                | 1.28             | 3.02                 | 21.22               | 0.93             |
| Elementary School    | 9            | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Elementary School    | 8            | Y          | 2.46                | 1.51             | 3.3                  | 12.37               | 1.03             |
| Elementary School    | 3            | Y          | 2.81                | 1.89             | 3.69                 | 27.22               | 1.92             |
| Elementary School    | 4            | Y          | 2.03                | 1.28             | 3.02                 | 21.22               | 0.93             |
| Elementary School    | 10           | Y          | 3.64                | 1.49             | 4.52                 | 8.05                | 1.79             |
| Elementary School    | 5            | Y          | 0.86                | 1.27             | 3.11                 | 17.5                | 1.62             |
| Elementary School    | 1            | Y          | 2.18                | 1.48             | 4.55                 | 16.29               | 0.86             |
| Elementary School    | 7            | Y          | 2.54                | 1.95             | 4.27                 | 12.48               | 0.46             |
| Elementary School    | 15           | Y          | 3.64                | 1.49             | 4.52                 | 8.05                | 1.79             |
| Elementary School    | 13           | Y          | 2.03                | 1.18             | 3.14                 | 6.4                 | 0.48             |
| Elementary School    | 2            | Y          | 2.43                | 1.42             | 2.9                  | 11.11               | 0.42             |
| Elementary School    | 14           | Y          | 2.18                | 1.48             | 4.55                 | 16.29               | 0.86             |
| Elementary School    | 11           | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Elementary School    | 6            | Y          | 2.74                | 2.17             | 3.82                 | 17.38               | 0.66             |
| Elementary School    | 12           | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Junior High School   | 10           | Y          | 3.64                | 1.49             | 4.52                 | 8.05                | 1.79             |
| Junior High School   | 9            | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Junior High School   | 13           | Y          | 2.03                | 1.18             | 3.14                 | 6.4                 | 0.48             |
| Junior High School   | 11           | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Junior High School   | 2            | Y          | 2.43                | 1.42             | 2.9                  | 11.11               | 0.42             |
| Junior High School   | 12           | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| Junior High School   | 5            | Y          | 0.86                | 1.27             | 3.11                 | 17.5                | 1.62             |
| Junior High School   | 8            | Y          | 2.46                | 1.51             | 3.3                  | 12.37               | 1.03             |
| Junior High School   | 1            | Y          | 2.18                | 1.48             | 4.55                 | 16.29               | 0.86             |
| Junior High School   | 6            | Y          | 2.74                | 2.17             | 3.82                 | 17.38               | 0.66             |
| Junior High School   | 14           | Y          | 2.18                | 1.48             | 4.55                 | 16.29               | 0.86             |
| Junior High School   | 4            | Y          | 2.03                | 1.28             | 3.02                 | 21.22               | 0.93             |
| Junior High School   | 7            | Y          | 2.54                | 1.95             | 4.27                 | 12.48               | 0.46             |
| Junior High School   | 3            | Y          | 2.81                | 1.89             | 3.69                 | 27.22               | 1.92             |
| Junior High School   | 15           | Y          | 3.64                | 1.49             | 4.52                 | 8.05                | 1.79             |
| High School          | 7            | Y          | 2.54                | 1.95             | 4.27                 | 12.48               | 0.46             |
| High School          | 1            | Y          | 2.18                | 1.48             | 4.55                 | 16.29               | 0.86             |
| High School          | 12           | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| High School          | 5            | Y          | 0.86                | 1.27             | 3.11                 | 17.5                | 1.62             |
| High School          | 14           | Y          | 2.18                | 1.48             | 4.55                 | 16.29               | 0.86             |
| High School          | 10           | Y          | 3.64                | 1.49             | 4.52                 | 8.05                | 1.79             |
| High School          | 13           | Y          | 2.03                | 1.18             | 3.14                 | 6.4                 | 0.48             |
| High School          | 9            | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| High School          | 8            | Y          | 2.46                | 1.51             | 3.3                  | 12.37               | 1.03             |
| High School          | 15           | Y          | 3.64                | 1.49             | 4.52                 | 8.05                | 1.79             |
| High School          | 6            | Y          | 2.74                | 2.17             | 3.82                 | 17.38               | 0.66             |
| High School          | 3            | Y          | 2.81                | 1.89             | 3.69                 | 27.22               | 1.92             |
| High School          | 11           | Y          | 2.29                | 1.59             | 3.2                  | 10.71               | 1.08             |
| High School          | 2            | Y          | 2.43                | 1.42             | 2.9                  | 11.11               | 0.42             |
| High School          | 4            | Y          | 2.03                | 1.28             | 3.02                 | 21.22               | 0.93             |
| Junior College (2yr) | 6            | Y          | 4.47                | 2.09             | 3.75                 | 31.42               | 0.23             |
| Junior College (2yr) | 10           | Y          | 2.64                | 1.92             | 4.86                 | 16.77               | 0.01             |
| Junior College (2yr) | 2            | Y          | 5.14                | 0.34             | 5.63                 | 50.36               | 0                |
| Junior College (2yr) | 11           | Y          | 4.07                | 3.59             | 4.14                 | 30.74               | 0.59             |
| Junior College (2yr) | 8            | Y          | 7.1                 | 2.72             | 5.59                 | 12.16               | 5.21             |
| Junior College (2yr) | 13           | Y          | 3.73                | 2.69             | 4.35                 | 36.09               | 5.16             |
| Junior College (2yr) | 5            | Y          | 5.41                | 3.15             | 3.61                 | 40.12               | 0.74             |
| Junior College (2yr) | 14           | Y          | 3.42                | 1.73             | 7.02                 | 24.56               | 0                |
| Junior College (2yr) | 9            | Y          | 4.07                | 3.59             | 4.14                 | 30.74               | 0.59             |
| Junior College (2yr) | 15           | Y          | 2.64                | 1.92             | 4.86                 | 16.77               | 0.01             |



Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type        | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|--------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                          |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Junior College (2yr)     | 7            | Y          | 4.74                | 6.44             | 7.07                 | 58.88               | 0.34             |
| Junior College (2yr)     | 1            | Y          | 3.42                | 1.73             | 7.02                 | 24.56               | 0                |
| Junior College (2yr)     | 4            | Y          | 3.49                | 2.27             | 3.58                 | 23.84               | 3.3              |
| Junior College (2yr)     | 3            | Y          | 3.94                | 2.63             | 7                    | 25                  | 1.34             |
| Junior College (2yr)     | 12           | Y          | 4.07                | 3.59             | 4.14                 | 30.74               | 0.59             |
| University/College (4yr) | 11           | Y          | 4.07                | 3.59             | 4.14                 | 30.74               | 0.59             |
| University/College (4yr) | 8            | Y          | 7.1                 | 2.72             | 5.59                 | 12.16               | 5.21             |
| University/College (4yr) | 6            | Y          | 4.47                | 2.09             | 3.75                 | 31.42               | 0.23             |
| University/College (4yr) | 10           | Y          | 2.64                | 1.92             | 4.86                 | 16.77               | 0.01             |
| University/College (4yr) | 4            | Y          | 3.49                | 2.27             | 3.58                 | 23.84               | 3.3              |
| University/College (4yr) | 15           | Y          | 2.64                | 1.92             | 4.86                 | 16.77               | 0.01             |
| University/College (4yr) | 9            | Y          | 4.07                | 3.59             | 4.14                 | 30.74               | 0.59             |
| University/College (4yr) | 14           | Y          | 3.42                | 1.73             | 7.02                 | 24.56               | 0                |
| University/College (4yr) | 7            | Y          | 4.74                | 6.44             | 7.07                 | 58.88               | 0.34             |
| University/College (4yr) | 13           | Y          | 3.73                | 2.69             | 4.35                 | 36.09               | 5.16             |
| University/College (4yr) | 3            | Y          | 3.94                | 2.63             | 7                    | 25                  | 1.34             |
| University/College (4yr) | 1            | Y          | 3.42                | 1.73             | 7.02                 | 24.56               | 0                |
| University/College (4yr) | 12           | Y          | 4.07                | 3.59             | 4.14                 | 30.74               | 0.59             |
| University/College (4yr) | 2            | Y          | 5.14                | 0.34             | 5.63                 | 50.36               | 0                |
| University/College (4yr) | 5            | Y          | 5.41                | 3.15             | 3.61                 | 40.12               | 0.74             |
| Library                  | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Library                  | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Library                  | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Library                  | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Library                  | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Library                  | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Library                  | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Library                  | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Library                  | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Library                  | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Library                  | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Library                  | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Library                  | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Library                  | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Library                  | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Place of Worship         | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Place of Worship         | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Place of Worship         | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Place of Worship         | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Place of Worship         | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Place of Worship         | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Place of Worship         | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Place of Worship         | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Place of Worship         | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Place of Worship         | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Place of Worship         | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Place of Worship         | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Place of Worship         | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Place of Worship         | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Place of Worship         | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| City Park                | 6            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 12           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 1            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 8            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 11           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 9            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 5            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 3            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 2            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 13           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 4            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 14           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 15           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 7            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 10           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course              | 7            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course              | 2            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course              | 14           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course              | 3            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course              | 5            | Y          | 0                   | 0                | 0                    | 0                   | 0                |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type          | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                            |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Golf Course                | 9            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 8            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 13           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 10           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 12           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 4            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 11           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 6            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 15           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 1            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 10           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 6            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 4            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 2            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 14           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 15           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 5            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 13           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 7            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 1            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 9            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 8            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 12           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 11           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 3            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Racquet Club               | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Racquet Club               | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Racquet Club               | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Racquet Club               | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Racquet Club               | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Racquet Club               | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Racquet Club               | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Racquet Club               | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Racquet Club               | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Racquet Club               | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Racquet Club               | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Racquet Club               | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Racquet Club               | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Racquet Club               | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Racquet Club               | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Health Club                | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Health Club                | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Health Club                | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Health Club                | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Health Club                | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Health Club                | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Health Club                | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Health Club                | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Health Club                | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Health Club                | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Health Club                | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Health Club                | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Health Club                | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Health Club                | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Health Club                | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Movie Theater (No Matinee) | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Movie Theater (No Matinee) | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Movie Theater (No Matinee) | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Movie Theater (No Matinee) | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Movie Theater (No Matinee) | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Movie Theater (No Matinee) | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Movie Theater (No Matinee) | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Movie Theater (No Matinee) | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Movie Theater (No Matinee) | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Movie Theater (No Matinee) | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Movie Theater (No Matinee) | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Movie Theater (No Matinee) | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Movie Theater (No Matinee) | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Movie Theater (No Matinee) | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Movie Theater (No Matinee) | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                    | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|--------------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                      |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Arena                                | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Arena                                | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Arena                                | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Arena                                | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Arena                                | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Arena                                | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Arena                                | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Arena                                | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Arena                                | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Arena                                | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Arena                                | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Arena                                | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Arena                                | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Arena                                | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Arena                                | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Quality Restaurant                   | 8            | Y          | 11.27               | 20.11            | 9.2                  | 83.7                | 180.76           |
| Quality Restaurant                   | 10           | Y          | 16.13               | 28.48            | 9.51                 | 83.58               | 195.77           |
| Quality Restaurant                   | 6            | Y          | 11.47               | 26.72            | 7.44                 | 64.97               | 118.04           |
| Quality Restaurant                   | 7            | Y          | 10.14               | 20.65            | 6.13                 | 20.52               | 81.41            |
| Quality Restaurant                   | 1            | Y          | 5.3                 | 15.83            | 5.76                 | 30.01               | 88.55            |
| Quality Restaurant                   | 3            | Y          | 8.49                | 16.25            | 7.47                 | 39.04               | 174.7            |
| Quality Restaurant                   | 12           | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| Quality Restaurant                   | 2            | Y          | 7.8                 | 17.72            | 9.18                 | 45.12               | 68.83            |
| Quality Restaurant                   | 4            | Y          | 6.58                | 22.3             | 6.25                 | 64.82               | 147.47           |
| Quality Restaurant                   | 9            | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| Quality Restaurant                   | 11           | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| Quality Restaurant                   | 14           | Y          | 5.3                 | 15.83            | 5.76                 | 30.01               | 88.55            |
| Quality Restaurant                   | 15           | Y          | 16.13               | 28.48            | 9.51                 | 83.58               | 195.77           |
| Quality Restaurant                   | 13           | Y          | 10.67               | 23.69            | 8.19                 | 38.26               | 138.46           |
| Quality Restaurant                   | 5            | Y          | 3.42                | 20.97            | 6.45                 | 42.87               | 128.02           |
| High Turnover (Sit Down Restaurant)  | 3            | Y          | 8.49                | 16.25            | 7.47                 | 39.04               | 174.7            |
| High Turnover (Sit Down Restaurant)  | 11           | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| High Turnover (Sit Down Restaurant)  | 13           | Y          | 10.67               | 23.69            | 8.19                 | 38.26               | 138.46           |
| High Turnover (Sit Down Restaurant)  | 5            | Y          | 3.42                | 20.97            | 6.45                 | 42.87               | 128.02           |
| High Turnover (Sit Down Restaurant)  | 12           | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| High Turnover (Sit Down Restaurant)  | 10           | Y          | 16.13               | 28.48            | 9.51                 | 83.58               | 195.77           |
| High Turnover (Sit Down Restaurant)  | 7            | Y          | 10.14               | 20.65            | 6.13                 | 20.52               | 81.41            |
| High Turnover (Sit Down Restaurant)  | 2            | Y          | 7.8                 | 17.72            | 9.18                 | 45.12               | 68.83            |
| High Turnover (Sit Down Restaurant)  | 9            | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| High Turnover (Sit Down Restaurant)  | 14           | Y          | 5.3                 | 15.83            | 5.76                 | 30.01               | 88.55            |
| High Turnover (Sit Down Restaurant)  | 6            | Y          | 11.47               | 26.72            | 7.44                 | 64.97               | 118.04           |
| High Turnover (Sit Down Restaurant)  | 8            | Y          | 11.27               | 20.11            | 9.2                  | 83.7                | 180.76           |
| High Turnover (Sit Down Restaurant)  | 15           | Y          | 16.13               | 28.48            | 9.51                 | 83.58               | 195.77           |
| High Turnover (Sit Down Restaurant)  | 4            | Y          | 6.58                | 22.3             | 6.25                 | 64.82               | 147.47           |
| High Turnover (Sit Down Restaurant)  | 1            | Y          | 5.3                 | 15.83            | 5.76                 | 30.01               | 88.55            |
| Fast Food Restaurant with Drive Thru | 11           | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| Fast Food Restaurant with Drive Thru | 13           | Y          | 10.67               | 23.69            | 8.19                 | 38.26               | 138.46           |
| Fast Food Restaurant with Drive Thru | 8            | Y          | 11.27               | 20.11            | 9.2                  | 83.7                | 180.76           |
| Fast Food Restaurant with Drive Thru | 10           | Y          | 16.13               | 28.48            | 9.51                 | 83.58               | 195.77           |
| Fast Food Restaurant with Drive Thru | 9            | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| Fast Food Restaurant with Drive Thru | 5            | Y          | 3.42                | 20.97            | 6.45                 | 42.87               | 128.02           |
| Fast Food Restaurant with Drive Thru | 15           | Y          | 16.13               | 28.48            | 9.51                 | 83.58               | 195.77           |
| Fast Food Restaurant with Drive Thru | 1            | Y          | 5.3                 | 15.83            | 5.76                 | 30.01               | 88.55            |
| Fast Food Restaurant with Drive Thru | 3            | Y          | 8.49                | 16.25            | 7.47                 | 39.04               | 174.7            |
| Fast Food Restaurant with Drive Thru | 14           | Y          | 5.3                 | 15.83            | 5.76                 | 30.01               | 88.55            |
| Fast Food Restaurant with Drive Thru | 6            | Y          | 11.47               | 26.72            | 7.44                 | 64.97               | 118.04           |
| Fast Food Restaurant with Drive Thru | 4            | Y          | 6.58                | 22.3             | 6.25                 | 64.82               | 147.47           |
| Fast Food Restaurant with Drive Thru | 2            | Y          | 7.8                 | 17.72            | 9.18                 | 45.12               | 68.83            |
| Fast Food Restaurant with Drive Thru | 7            | Y          | 10.14               | 20.65            | 6.13                 | 20.52               | 81.41            |
| Fast Food Restaurant with Drive Thru | 12           | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| Fast Food Restaurant w/o Drive Thru  | 11           | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| Fast Food Restaurant w/o Drive Thru  | 9            | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |
| Fast Food Restaurant w/o Drive Thru  | 15           | Y          | 16.13               | 28.48            | 9.51                 | 83.58               | 195.77           |
| Fast Food Restaurant w/o Drive Thru  | 13           | Y          | 10.67               | 23.69            | 8.19                 | 38.26               | 138.46           |
| Fast Food Restaurant w/o Drive Thru  | 7            | Y          | 10.14               | 20.65            | 6.13                 | 20.52               | 81.41            |
| Fast Food Restaurant w/o Drive Thru  | 5            | Y          | 3.42                | 20.97            | 6.45                 | 42.87               | 128.02           |
| Fast Food Restaurant w/o Drive Thru  | 8            | Y          | 11.27               | 20.11            | 9.2                  | 83.7                | 180.76           |
| Fast Food Restaurant w/o Drive Thru  | 3            | Y          | 8.49                | 16.25            | 7.47                 | 39.04               | 174.7            |
| Fast Food Restaurant w/o Drive Thru  | 2            | Y          | 7.8                 | 17.72            | 9.18                 | 45.12               | 68.83            |
| Fast Food Restaurant w/o Drive Thru  | 12           | Y          | 10.52               | 28.16            | 9.64                 | 46.57               | 187.78           |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                   | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-------------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                     |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Fast Food Restaurant w/o Drive Thru | 4            | Y          | 6.58                | 22.3             | 6.25                 | 64.82               | 147.47           |
| Fast Food Restaurant w/o Drive Thru | 6            | Y          | 11.47               | 26.72            | 7.44                 | 64.97               | 118.04           |
| Fast Food Restaurant w/o Drive Thru | 10           | Y          | 16.13               | 28.48            | 9.51                 | 83.58               | 195.77           |
| Fast Food Restaurant w/o Drive Thru | 1            | Y          | 5.3                 | 15.83            | 5.76                 | 30.01               | 88.55            |
| Fast Food Restaurant w/o Drive Thru | 14           | Y          | 5.3                 | 15.83            | 5.76                 | 30.01               | 88.55            |
| Hotel                               | 9            | Y          | 3.5                 | 2.89             | 2.67                 | 21.79               | 4.06             |
| Hotel                               | 7            | Y          | 5.99                | 3.68             | 4.67                 | 36.19               | 2.04             |
| Hotel                               | 8            | Y          | 3.64                | 3.24             | 3.71                 | 31.09               | 5.15             |
| Hotel                               | 6            | Y          | 4.91                | 3.33             | 3.53                 | 35.8                | 5.53             |
| Hotel                               | 3            | Y          | 5.38                | 2.3              | 1.93                 | 19.81               | 7.16             |
| Hotel                               | 11           | Y          | 3.5                 | 2.89             | 2.67                 | 21.79               | 4.06             |
| Hotel                               | 15           | Y          | 8.54                | 6.23             | 6.57                 | 63.16               | 4.86             |
| Hotel                               | 2            | Y          | 2.68                | 1.37             | 4.22                 | 28.26               | 0.26             |
| Hotel                               | 10           | Y          | 8.54                | 6.23             | 6.57                 | 63.16               | 4.86             |
| Hotel                               | 4            | Y          | 2.81                | 3.22             | 2.93                 | 42.1                | 4.75             |
| Hotel                               | 13           | Y          | 6.29                | 3.67             | 5.43                 | 50.49               | 11.1             |
| Hotel                               | 12           | Y          | 3.5                 | 2.89             | 2.67                 | 21.79               | 4.06             |
| Hotel                               | 1            | Y          | 2.8                 | 2.87             | 3.23                 | 21.81               | 0.05             |
| Hotel                               | 5            | Y          | 2.95                | 2.85             | 3.82                 | 31.8                | 7.13             |
| Hotel                               | 14           | Y          | 2.8                 | 2.87             | 3.23                 | 21.81               | 0.05             |
| Motel                               | 8            | Y          | 3.64                | 3.24             | 3.71                 | 31.09               | 5.15             |
| Motel                               | 12           | Y          | 3.5                 | 2.89             | 2.67                 | 21.79               | 4.06             |
| Motel                               | 10           | Y          | 8.54                | 6.23             | 6.57                 | 63.16               | 4.86             |
| Motel                               | 7            | Y          | 5.99                | 3.68             | 4.67                 | 36.19               | 2.04             |
| Motel                               | 13           | Y          | 6.29                | 3.67             | 5.43                 | 50.49               | 11.1             |
| Motel                               | 2            | Y          | 2.68                | 1.37             | 4.22                 | 28.26               | 0.26             |
| Motel                               | 3            | Y          | 5.38                | 2.3              | 1.93                 | 19.81               | 7.16             |
| Motel                               | 5            | Y          | 2.95                | 2.85             | 3.82                 | 31.8                | 7.13             |
| Motel                               | 1            | Y          | 2.8                 | 2.87             | 3.23                 | 21.81               | 0.05             |
| Motel                               | 11           | Y          | 3.5                 | 2.89             | 2.67                 | 21.79               | 4.06             |
| Motel                               | 9            | Y          | 3.5                 | 2.89             | 2.67                 | 21.79               | 4.06             |
| Motel                               | 14           | Y          | 2.8                 | 2.87             | 3.23                 | 21.81               | 0.05             |
| Motel                               | 6            | Y          | 4.91                | 3.33             | 3.53                 | 35.8                | 5.53             |
| Motel                               | 15           | Y          | 8.54                | 6.23             | 6.57                 | 63.16               | 4.86             |
| Motel                               | 4            | Y          | 2.81                | 3.22             | 2.93                 | 42.1                | 4.75             |
| Parking Lot                         | 5            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 6            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 2            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 15           | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 4            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 7            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 13           | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 10           | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 1            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 9            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 3            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 12           | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 14           | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 11           | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 8            | Y          | 0                   | 0                | 0.876                | 0                   | 0                |
| Unenclosed Parking Structure        | 3            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 11           | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 12           | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 5            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 8            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 1            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 2            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 13           | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 6            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 15           | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 14           | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 4            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 10           | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 7            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 9            | Y          | 0                   | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure          | 3            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure          | 11           | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure          | 12           | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure          | 5            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure          | 8            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                  |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Enclosed Parking Structure       | 1            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 2            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 13           | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 6            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 15           | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 14           | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 4            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 10           | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 7            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 9            | Y          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 3            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 11           | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 12           | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 5            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 8            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 1            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 2            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 13           | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 6            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 15           | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 14           | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 4            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 10           | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 7            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 9            | Y          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 3            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 11           | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 12           | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 5            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 8            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 1            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 2            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 13           | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 6            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 15           | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 14           | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 4            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 10           | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 7            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 9            | Y          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Other Asphalt Surfaces           | 3            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 11           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 12           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 5            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 8            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 1            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 2            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 13           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 6            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 15           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 14           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 4            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 10           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 7            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 9            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 3            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 11           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 12           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 5            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 8            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 1            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 2            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 13           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 6            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 15           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 14           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 4            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 10           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 7            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 9            | Y          | 0                   | 0                | 0                    | 0                   | 0                |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                 | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                   |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Free-Standing Discount Store      | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Free-Standing Discount Store      | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Free-Standing Discount Store      | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Free-Standing Discount Store      | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Free-Standing Discount Store      | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Free-Standing Discount Store      | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Free-Standing Discount Store      | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Free-Standing Discount Store      | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Free-Standing Discount Store      | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Free-Standing Discount Store      | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Free-Standing Discount Store      | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Free-Standing Discount Store      | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Free-Standing Discount Store      | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Free-Standing Discount Store      | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Free-Standing Discount Store      | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Free-Standing Discount Superstore | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Free-Standing Discount Superstore | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Free-Standing Discount Superstore | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Free-Standing Discount Superstore | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Free-Standing Discount Superstore | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Free-Standing Discount Superstore | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Free-Standing Discount Superstore | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Free-Standing Discount Superstore | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Free-Standing Discount Superstore | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Free-Standing Discount Superstore | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Free-Standing Discount Superstore | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Free-Standing Discount Superstore | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Free-Standing Discount Superstore | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Free-Standing Discount Superstore | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Free-Standing Discount Superstore | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Discount Club                     | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Discount Club                     | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Discount Club                     | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Discount Club                     | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Discount Club                     | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Discount Club                     | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Discount Club                     | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Discount Club                     | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Discount Club                     | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Discount Club                     | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Discount Club                     | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Discount Club                     | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Discount Club                     | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Discount Club                     | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Discount Club                     | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Regional Shopping Center          | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Regional Shopping Center          | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Regional Shopping Center          | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Regional Shopping Center          | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Regional Shopping Center          | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Regional Shopping Center          | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Regional Shopping Center          | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Regional Shopping Center          | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Regional Shopping Center          | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Regional Shopping Center          | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Regional Shopping Center          | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Regional Shopping Center          | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Regional Shopping Center          | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Regional Shopping Center          | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Regional Shopping Center          | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Electronic Superstore             | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Electronic Superstore             | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Electronic Superstore             | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Electronic Superstore             | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Electronic Superstore             | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Electronic Superstore             | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Electronic Superstore             | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Electronic Superstore             | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Electronic Superstore             | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Electronic Superstore             | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type            | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                              |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Electronic Superstore        | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Electronic Superstore        | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Electronic Superstore        | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Electronic Superstore        | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Electronic Superstore        | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Home Improvement Superstore  | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Home Improvement Superstore  | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Home Improvement Superstore  | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Home Improvement Superstore  | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Home Improvement Superstore  | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Home Improvement Superstore  | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Home Improvement Superstore  | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Home Improvement Superstore  | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Home Improvement Superstore  | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Home Improvement Superstore  | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Home Improvement Superstore  | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Home Improvement Superstore  | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Home Improvement Superstore  | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Home Improvement Superstore  | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Home Improvement Superstore  | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Strip Mall                   | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Strip Mall                   | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Strip Mall                   | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Strip Mall                   | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Strip Mall                   | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Strip Mall                   | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Strip Mall                   | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Strip Mall                   | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Strip Mall                   | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Strip Mall                   | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Strip Mall                   | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Strip Mall                   | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Strip Mall                   | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Strip Mall                   | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Strip Mall                   | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Hardware/Paint Store         | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Hardware/Paint Store         | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Hardware/Paint Store         | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Hardware/Paint Store         | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Hardware/Paint Store         | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Hardware/Paint Store         | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Hardware/Paint Store         | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Hardware/Paint Store         | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Hardware/Paint Store         | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Hardware/Paint Store         | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Hardware/Paint Store         | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Hardware/Paint Store         | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Hardware/Paint Store         | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Hardware/Paint Store         | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Hardware/Paint Store         | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Supermarket                  | 8            | Y          | 6.08                | 25.23            | 10.35                | 11.28               | 10.6             |
| Supermarket                  | 11           | Y          | 5.77                | 25.88            | 8.45                 | 11.07               | 12.24            |
| Supermarket                  | 2            | Y          | 7.5                 | 26.2             | 9.86                 | 45.07               | 0                |
| Supermarket                  | 6            | Y          | 7.36                | 25.85            | 10.53                | 19.14               | 9.38             |
| Supermarket                  | 13           | Y          | 4.18                | 25.54            | 8.33                 | 10.95               | 15.42            |
| Supermarket                  | 15           | Y          | 7.92                | 22.82            | 9.7                  | 15.07               | 6.61             |
| Supermarket                  | 12           | Y          | 5.77                | 25.88            | 8.45                 | 11.07               | 12.24            |
| Supermarket                  | 7            | Y          | 5.16                | 25.36            | 9.92                 | 8.47                | 0.95             |
| Supermarket                  | 1            | Y          | 3.02                | 25.04            | 8.09                 | 27.25               | 1.18             |
| Supermarket                  | 5            | Y          | 3.43                | 27.24            | 8.88                 | 28.18               | 12.69            |
| Supermarket                  | 4            | Y          | 5.25                | 30.13            | 8.17                 | 19.57               | 5.79             |
| Supermarket                  | 3            | Y          | 5.05                | 22.51            | 7.91                 | 17.65               | 14.03            |
| Supermarket                  | 9            | Y          | 5.77                | 25.88            | 8.45                 | 11.07               | 12.24            |
| Supermarket                  | 14           | Y          | 3.02                | 25.04            | 8.09                 | 27.25               | 1.18             |
| Supermarket                  | 10           | Y          | 7.92                | 22.82            | 9.7                  | 15.07               | 6.61             |
| Convenience Market (24 hour) | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Convenience Market (24 hour) | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Convenience Market (24 hour) | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Convenience Market (24 hour) | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Convenience Market (24 hour) | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                 | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                   |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Convenience Market (24 hour)      | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Convenience Market (24 hour)      | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Convenience Market (24 hour)      | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Convenience Market (24 hour)      | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Convenience Market (24 hour)      | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Convenience Market (24 hour)      | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Convenience Market (24 hour)      | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Convenience Market (24 hour)      | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Convenience Market (24 hour)      | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Convenience Market (24 hour)      | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Convenience Market with Gas Pumps | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Convenience Market with Gas Pumps | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Convenience Market with Gas Pumps | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Convenience Market with Gas Pumps | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Convenience Market with Gas Pumps | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Convenience Market with Gas Pumps | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Convenience Market with Gas Pumps | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Convenience Market with Gas Pumps | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Convenience Market with Gas Pumps | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Convenience Market with Gas Pumps | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Convenience Market with Gas Pumps | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Convenience Market with Gas Pumps | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Convenience Market with Gas Pumps | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Convenience Market with Gas Pumps | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Convenience Market with Gas Pumps | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Automobile Care Center            | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Automobile Care Center            | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Automobile Care Center            | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Automobile Care Center            | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Automobile Care Center            | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Automobile Care Center            | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Automobile Care Center            | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Automobile Care Center            | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Automobile Care Center            | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Automobile Care Center            | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Automobile Care Center            | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Automobile Care Center            | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Automobile Care Center            | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Automobile Care Center            | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Automobile Care Center            | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Gasoline/Service Station          | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Gasoline/Service Station          | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Gasoline/Service Station          | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Gasoline/Service Station          | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Gasoline/Service Station          | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Gasoline/Service Station          | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Gasoline/Service Station          | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Gasoline/Service Station          | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Gasoline/Service Station          | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Gasoline/Service Station          | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Gasoline/Service Station          | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Gasoline/Service Station          | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Gasoline/Service Station          | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Gasoline/Service Station          | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Gasoline/Service Station          | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Bank (with Drive-Through)         | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Bank (with Drive-Through)         | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Bank (with Drive-Through)         | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Bank (with Drive-Through)         | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Bank (with Drive-Through)         | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Bank (with Drive-Through)         | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Bank (with Drive-Through)         | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Bank (with Drive-Through)         | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Bank (with Drive-Through)         | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Bank (with Drive-Through)         | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Bank (with Drive-Through)         | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Bank (with Drive-Through)         | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Bank (with Drive-Through)         | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Bank (with Drive-Through)         | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Bank (with Drive-Through)         | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |



Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type          | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                            |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| General Office Building    | 13           | Y          | 6.14                | 4.97             | 4.63                 | 19.36               | 4.2              |
| General Office Building    | 11           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| General Office Building    | 5            | Y          | 5.42                | 4.8              | 4.34                 | 22.58               | 1.01             |
| General Office Building    | 8            | Y          | 6.17                | 4.94             | 5.27                 | 10.28               | 0.55             |
| General Office Building    | 3            | Y          | 3.45                | 3.58             | 3.58                 | 15.38               | 0.28             |
| General Office Building    | 6            | Y          | 6.76                | 5.75             | 4.5                  | 15.15               | 0.68             |
| General Office Building    | 15           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| General Office Building    | 2            | Y          | 4.2                 | 3.62             | 3.88                 | 19.58               | 0.47             |
| General Office Building    | 1            | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| General Office Building    | 10           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| General Office Building    | 12           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| General Office Building    | 9            | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| General Office Building    | 4            | Y          | 8.01                | 7.84             | 4.72                 | 19.9                | 0.06             |
| General Office Building    | 14           | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| General Office Building    | 7            | Y          | 3.78                | 3.31             | 4.58                 | 19.64               | 1.08             |
| Office Park                | 15           | Y          | 4.01                | 2.6              | 5.13                 | 3.64                | 0                |
| Office Park                | 12           | Y          | 7.3                 | 4.79             | 4.56                 | 11.79               | 0.19             |
| Office Park                | 11           | Y          | 7.3                 | 4.79             | 4.56                 | 11.79               | 0.19             |
| Office Park                | 1            | Y          | 1.78                | 2.42             | 4.48                 | 21.35               | 0                |
| Office Park                | 8            | Y          | 7.05                | 5.6              | 5.32                 | 12.78               | 0.73             |
| Office Park                | 10           | Y          | 4.01                | 2.6              | 5.13                 | 3.64                | 0                |
| Office Park                | 14           | Y          | 1.78                | 2.42             | 4.48                 | 21.35               | 0                |
| Office Park                | 5            | Y          | 5.65                | 4.81             | 4.21                 | 21.48               | 1.17             |
| Office Park                | 13           | Y          | 7.71                | 6.01             | 4.74                 | 31.12               | 6.68             |
| Office Park                | 4            | Y          | 9.54                | 8.4              | 4.71                 | 25.6                | 0.08             |
| Office Park                | 2            | Y          | 3.91                | 4.35             | 3.89                 | 13.12               | 0                |
| Office Park                | 6            | Y          | 7.89                | 6.47             | 4.84                 | 18.28               | 0.98             |
| Office Park                | 7            | Y          | 5.26                | 3.76             | 6.13                 | 44.13               | 0.13             |
| Office Park                | 3            | Y          | 4.73                | 4.49             | 4.39                 | 26.17               | 0.82             |
| Office Park                | 9            | Y          | 7.3                 | 4.79             | 4.56                 | 11.79               | 0.19             |
| Research & Development     | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Research & Development     | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Research & Development     | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Research & Development     | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Research & Development     | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Research & Development     | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Research & Development     | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Research & Development     | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Research & Development     | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Research & Development     | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Research & Development     | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Research & Development     | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Research & Development     | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Research & Development     | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Research & Development     | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Government Office Building | 1            | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| Government Office Building | 11           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Government Office Building | 13           | Y          | 6.14                | 4.97             | 4.63                 | 19.36               | 4.2              |
| Government Office Building | 7            | Y          | 3.78                | 3.31             | 4.58                 | 19.64               | 1.08             |
| Government Office Building | 12           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Government Office Building | 10           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| Government Office Building | 5            | Y          | 5.42                | 4.8              | 4.34                 | 22.58               | 1.01             |
| Government Office Building | 14           | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| Government Office Building | 3            | Y          | 3.45                | 3.58             | 3.58                 | 15.38               | 0.28             |
| Government Office Building | 9            | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Government Office Building | 8            | Y          | 6.17                | 4.94             | 5.27                 | 10.28               | 0.55             |
| Government Office Building | 4            | Y          | 8.01                | 7.84             | 4.72                 | 19.9                | 0.06             |
| Government Office Building | 15           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| Government Office Building | 6            | Y          | 6.76                | 5.75             | 4.5                  | 15.15               | 0.68             |
| Government Office Building | 2            | Y          | 4.2                 | 3.62             | 3.88                 | 19.58               | 0.47             |
| Government (Civic Center)  | 1            | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| Government (Civic Center)  | 6            | Y          | 6.76                | 5.75             | 4.5                  | 15.15               | 0.68             |
| Government (Civic Center)  | 14           | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| Government (Civic Center)  | 13           | Y          | 6.14                | 4.97             | 4.63                 | 19.36               | 4.2              |
| Government (Civic Center)  | 2            | Y          | 4.2                 | 3.62             | 3.88                 | 19.58               | 0.47             |
| Government (Civic Center)  | 15           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| Government (Civic Center)  | 12           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Government (Civic Center)  | 4            | Y          | 8.01                | 7.84             | 4.72                 | 19.9                | 0.06             |
| Government (Civic Center)  | 9            | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Government (Civic Center)  | 8            | Y          | 6.17                | 4.94             | 5.27                 | 10.28               | 0.55             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                  | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|------------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                    |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Government (Civic Center)          | 7            | Y          | 3.78                | 3.31             | 4.58                 | 19.64               | 1.08             |
| Government (Civic Center)          | 10           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| Government (Civic Center)          | 11           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Government (Civic Center)          | 3            | Y          | 3.45                | 3.58             | 3.58                 | 15.38               | 0.28             |
| Government (Civic Center)          | 5            | Y          | 5.42                | 4.8              | 4.34                 | 22.58               | 1.01             |
| Pharmacy/Drugstore with Drive Thru | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Pharmacy/Drugstore with Drive Thru | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Pharmacy/Drugstore with Drive Thru | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Pharmacy/Drugstore with Drive Thru | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Pharmacy/Drugstore with Drive Thru | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Pharmacy/Drugstore with Drive Thru | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Pharmacy/Drugstore with Drive Thru | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Pharmacy/Drugstore with Drive Thru | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Pharmacy/Drugstore with Drive Thru | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Pharmacy/Drugstore with Drive Thru | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Pharmacy/Drugstore with Drive Thru | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Pharmacy/Drugstore with Drive Thru | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Pharmacy/Drugstore with Drive Thru | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Pharmacy/Drugstore with Drive Thru | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Pharmacy/Drugstore with Drive Thru | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Pharmacy/Drugstore w/o Drive Thru  | 9            | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Pharmacy/Drugstore w/o Drive Thru  | 7            | Y          | 4.12                | 2.49             | 5.5                  | 6.84                | 0.07             |
| Pharmacy/Drugstore w/o Drive Thru  | 4            | Y          | 3.55                | 2.68             | 6.02                 | 2.92                | 0                |
| Pharmacy/Drugstore w/o Drive Thru  | 11           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Pharmacy/Drugstore w/o Drive Thru  | 10           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Pharmacy/Drugstore w/o Drive Thru  | 5            | Y          | 2.9                 | 3.36             | 5.88                 | 4.68                | 0.7              |
| Pharmacy/Drugstore w/o Drive Thru  | 2            | Y          | 4.97                | 1.98             | 7.17                 | 14.13               | 0.36             |
| Pharmacy/Drugstore w/o Drive Thru  | 6            | Y          | 4.2                 | 2.98             | 6.45                 | 5.52                | 0.93             |
| Pharmacy/Drugstore w/o Drive Thru  | 14           | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Pharmacy/Drugstore w/o Drive Thru  | 1            | Y          | 6.81                | 2.81             | 6.86                 | 9.02                | 0                |
| Pharmacy/Drugstore w/o Drive Thru  | 12           | Y          | 5.17                | 3.23             | 7.56                 | 1.33                | 0.49             |
| Pharmacy/Drugstore w/o Drive Thru  | 8            | Y          | 3.79                | 2.8              | 6.85                 | 1.06                | 1.05             |
| Pharmacy/Drugstore w/o Drive Thru  | 13           | Y          | 4.13                | 3.16             | 7.5                  | 1.32                | 1.09             |
| Pharmacy/Drugstore w/o Drive Thru  | 15           | Y          | 5.95                | 2.44             | 8.2                  | 2.29                | 0.3              |
| Pharmacy/Drugstore w/o Drive Thru  | 3            | Y          | 2.77                | 2.3              | 4.53                 | 10.42               | 2.08             |
| Medical Office Building            | 2            | Y          | 4.2                 | 3.62             | 3.88                 | 19.58               | 0.47             |
| Medical Office Building            | 13           | Y          | 6.14                | 4.97             | 4.63                 | 19.36               | 4.2              |
| Medical Office Building            | 1            | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| Medical Office Building            | 9            | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Medical Office Building            | 4            | Y          | 8.01                | 7.84             | 4.72                 | 19.9                | 0.06             |
| Medical Office Building            | 11           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Medical Office Building            | 15           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| Medical Office Building            | 12           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Medical Office Building            | 10           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| Medical Office Building            | 7            | Y          | 3.78                | 3.31             | 4.58                 | 19.64               | 1.08             |
| Medical Office Building            | 3            | Y          | 3.45                | 3.58             | 3.58                 | 15.38               | 0.28             |
| Medical Office Building            | 6            | Y          | 6.76                | 5.75             | 4.5                  | 15.15               | 0.68             |
| Medical Office Building            | 5            | Y          | 5.42                | 4.8              | 4.34                 | 22.58               | 1.01             |
| Medical Office Building            | 14           | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| Medical Office Building            | 8            | Y          | 6.17                | 4.94             | 5.27                 | 10.28               | 0.55             |
| Hospital                           | 7            | Y          | 4.7                 | 4.96             | 4.55                 | 27.6                | 1.9              |
| Hospital                           | 12           | Y          | 11.27               | 7.55             | 5.99                 | 61.6                | 9.82             |
| Hospital                           | 9            | Y          | 11.27               | 7.55             | 5.99                 | 61.6                | 9.82             |
| Hospital                           | 8            | Y          | 7.95                | 4.33             | 5.09                 | 56.13               | 9.03             |
| Hospital                           | 2            | Y          | 6.11                | 5.64             | 5.11                 | 64.29               | 23.87            |
| Hospital                           | 1            | Y          | 4.83                | 5.35             | 3.91                 | 10.69               | 0                |
| Hospital                           | 4            | Y          | 10.23               | 6.46             | 5.43                 | 100.56              | 16.57            |
| Hospital                           | 10           | Y          | 9.5                 | 5.56             | 5.13                 | 77.24               | 6.03             |
| Hospital                           | 5            | Y          | 7.39                | 5.52             | 4.78                 | 93.09               | 15.8             |
| Hospital                           | 3            | Y          | 6.26                | 3.96             | 4.17                 | 38.28               | 7.64             |
| Hospital                           | 15           | Y          | 9.5                 | 5.56             | 5.13                 | 77.24               | 6.03             |
| Hospital                           | 11           | Y          | 11.27               | 7.55             | 5.99                 | 61.6                | 9.82             |
| Hospital                           | 14           | Y          | 4.83                | 5.35             | 3.91                 | 10.69               | 0                |
| Hospital                           | 6            | Y          | 10.35               | 6.17             | 5.59                 | 64.04               | 9.61             |
| Hospital                           | 13           | Y          | 7.21                | 5.87             | 5.09                 | 53.56               | 6.92             |
| Unrefrigerated Warehouse-No Rail   | 9            | Y          | 0.85                | 1.34             | 2.38                 | 1.01                | 0.03             |
| Unrefrigerated Warehouse-No Rail   | 14           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-No Rail   | 7            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-No Rail   | 15           | Y          | 0.48                | 0.82             | 1.88                 | 2.48                | 0.03             |
| Unrefrigerated Warehouse-No Rail   | 8            | Y          | 0.77                | 1.61             | 2.3                  | 4.83                | 0.05             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                  |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Unrefrigerated Warehouse-No Rail | 4            | Y          | 0.42                | 1.07             | 2.57                 | 4.2                 | 0.07             |
| Unrefrigerated Warehouse-No Rail | 1            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-No Rail | 11           | Y          | 0.85                | 1.34             | 2.38                 | 1.01                | 0.03             |
| Unrefrigerated Warehouse-No Rail | 6            | Y          | 0.38                | 1.36             | 1.88                 | 0.62                | 0                |
| Unrefrigerated Warehouse-No Rail | 3            | Y          | 1.36                | 5.13             | 3.94                 | 17.98               | 1.05             |
| Unrefrigerated Warehouse-No Rail | 2            | Y          | 0.65                | 1.77             | 2.89                 | 7.64                | 0                |
| Unrefrigerated Warehouse-No Rail | 13           | Y          | 1.13                | 1.11             | 2.09                 | 1.91                | 0.11             |
| Unrefrigerated Warehouse-No Rail | 10           | Y          | 0.48                | 0.82             | 1.88                 | 2.48                | 0.03             |
| Unrefrigerated Warehouse-No Rail | 12           | Y          | 0.85                | 1.34             | 2.38                 | 1.01                | 0.03             |
| Unrefrigerated Warehouse-No Rail | 5            | Y          | 0.31                | 1.38             | 2.69                 | 1.43                | 0.21             |
| Refrigerated Warehouse-Rail      | 15           | Y          | 1.41                | 36.52            | 3.63                 | 3.42                | 48.51            |
| Refrigerated Warehouse-Rail      | 10           | Y          | 1.41                | 36.52            | 3.63                 | 3.42                | 48.51            |
| Refrigerated Warehouse-Rail      | 5            | Y          | 1.08                | 20.65            | 2.89                 | 5.79                | 12.77            |
| Refrigerated Warehouse-Rail      | 2            | Y          | 0.46                | 15.28            | 3.8                  | 1.32                | 0                |
| Refrigerated Warehouse-Rail      | 13           | Y          | 2.64                | 27.88            | 4.39                 | 7.02                | 0.02             |
| Refrigerated Warehouse-Rail      | 6            | Y          | 0.63                | 13.7             | 2.33                 | 0.93                | 0.63             |
| Refrigerated Warehouse-Rail      | 8            | Y          | 0.38                | 19.26            | 3.22                 | 0.96                | 0.06             |
| Refrigerated Warehouse-Rail      | 9            | Y          | 0.55                | 13.61            | 3.35                 | 1.08                | 0.09             |
| Refrigerated Warehouse-Rail      | 11           | Y          | 0.55                | 13.61            | 3.35                 | 1.08                | 0.09             |
| Refrigerated Warehouse-Rail      | 3            | Y          | 0.61                | 21.99            | 3.04                 | 0.19                | 0                |
| Refrigerated Warehouse-Rail      | 1            | Y          | 0.28                | 11.15            | 2.96                 | 0                   | 0                |
| Refrigerated Warehouse-Rail      | 4            | Y          | 0.19                | 7.99             | 1.82                 | 0.8                 | 3.06             |
| Refrigerated Warehouse-Rail      | 14           | Y          | 0.28                | 11.15            | 2.96                 | 0                   | 0                |
| Refrigerated Warehouse-Rail      | 12           | Y          | 0.55                | 13.61            | 3.35                 | 1.08                | 0.09             |
| Refrigerated Warehouse-Rail      | 7            | Y          | 0.72                | 26.24            | 2.64                 | 6.54                | 3.1              |
| General Light Industry           | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| General Light Industry           | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| General Light Industry           | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| General Light Industry           | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| General Light Industry           | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| General Light Industry           | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| General Light Industry           | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| General Light Industry           | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| General Light Industry           | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| General Light Industry           | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| General Light Industry           | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| General Light Industry           | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| General Light Industry           | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| General Light Industry           | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| General Light Industry           | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| General Heavy Industry           | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| General Heavy Industry           | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| General Heavy Industry           | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| General Heavy Industry           | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| General Heavy Industry           | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| General Heavy Industry           | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| General Heavy Industry           | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| General Heavy Industry           | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| General Heavy Industry           | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| General Heavy Industry           | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| General Heavy Industry           | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| General Heavy Industry           | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| General Heavy Industry           | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| General Heavy Industry           | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| General Heavy Industry           | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Industrial Park                  | 11           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Industrial Park                  | 8            | Y          | 6.17                | 4.94             | 5.27                 | 10.28               | 0.55             |
| Industrial Park                  | 7            | Y          | 3.78                | 3.31             | 4.58                 | 19.64               | 1.08             |
| Industrial Park                  | 10           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| Industrial Park                  | 14           | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| Industrial Park                  | 15           | Y          | 4.03                | 2.79             | 4.45                 | 4.2                 | 0                |
| Industrial Park                  | 3            | Y          | 3.45                | 3.58             | 3.58                 | 15.38               | 0.28             |
| Industrial Park                  | 13           | Y          | 6.14                | 4.97             | 4.63                 | 19.36               | 4.2              |
| Industrial Park                  | 6            | Y          | 6.76                | 5.75             | 4.5                  | 15.15               | 0.68             |
| Industrial Park                  | 1            | Y          | 5.02                | 3.98             | 4.24                 | 24.42               | 0                |
| Industrial Park                  | 2            | Y          | 4.2                 | 3.62             | 3.88                 | 19.58               | 0.47             |
| Industrial Park                  | 12           | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |
| Industrial Park                  | 5            | Y          | 5.42                | 4.8              | 4.34                 | 22.58               | 1.01             |
| Industrial Park                  | 4            | Y          | 8.01                | 7.84             | 4.72                 | 19.9                | 0.06             |
| Industrial Park                  | 9            | Y          | 5.99                | 4.62             | 4.63                 | 12.05               | 0.39             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type    | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                      |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Manufacturing        | 13           | Y          | 1.59                | 4.27             | 3.52                 | 5.04                | 7.25             |
| Manufacturing        | 14           | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Manufacturing        | 4            | Y          | 1.93                | 3.7              | 3.8                  | 22.58               | 6.67             |
| Manufacturing        | 3            | Y          | 2.52                | 4.16             | 3.35                 | 19.93               | 3.84             |
| Manufacturing        | 10           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Manufacturing        | 7            | Y          | 0.51                | 1.31             | 0.91                 | 19.32               | 0.12             |
| Manufacturing        | 8            | Y          | 2.12                | 3.83             | 3.7                  | 15.24               | 6.86             |
| Manufacturing        | 5            | Y          | 1.59                | 3.36             | 3.7                  | 20.06               | 6.9              |
| Manufacturing        | 1            | Y          | 0.83                | 1.85             | 2.28                 | 3.66                | 0.31             |
| Manufacturing        | 11           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Manufacturing        | 9            | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Manufacturing        | 2            | Y          | 2.17                | 4.2              | 3.26                 | 21.82               | 0.06             |
| Manufacturing        | 6            | Y          | 4.47                | 7.2              | 5.65                 | 26.2                | 12.42            |
| Manufacturing        | 15           | Y          | 2.89                | 5.02             | 3.62                 | 16.76               | 17.13            |
| Manufacturing        | 12           | Y          | 2.94                | 5.75             | 3.85                 | 15.35               | 4.45             |
| Day-Care Center      | 10           | N          | 3.4                 | 1.49             | 4.2                  | 7.34                | 1.79             |
| Day-Care Center      | 11           | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Day-Care Center      | 5            | N          | 0.81                | 1.27             | 2.89                 | 15.63               | 1.62             |
| Day-Care Center      | 9            | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Day-Care Center      | 1            | N          | 1.98                | 1.48             | 4.21                 | 14.21               | 0.86             |
| Day-Care Center      | 6            | N          | 2.51                | 2.17             | 3.55                 | 15.37               | 0.66             |
| Day-Care Center      | 14           | N          | 1.98                | 1.48             | 4.21                 | 14.21               | 0.86             |
| Day-Care Center      | 12           | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Day-Care Center      | 3            | N          | 2.62                | 1.89             | 3.43                 | 24.41               | 1.92             |
| Day-Care Center      | 7            | N          | 2.38                | 1.95             | 3.92                 | 10.78               | 0.46             |
| Day-Care Center      | 13           | N          | 1.86                | 1.18             | 2.92                 | 5.72                | 0.48             |
| Apartments High Rise | 1            | N          | 222.68138           | 2557.38          | 741.44               | 2693.04485          | 1662             |
| Apartments High Rise | 2            | N          | 322.47557           | 2554.47          | 741.44               | 8261.24759          | 1716.22          |
| Apartments High Rise | 3            | N          | 427.66156           | 2553.86          | 741.44               | 9942.80422          | 1662             |
| Apartments High Rise | 4            | N          | 226.56568           | 2558.55          | 741.44               | 6391.63527          | 1735.98          |
| Apartments High Rise | 5            | N          | 312.05058           | 2561.86          | 741.44               | 7191.66571          | 1662             |
| Apartments High Rise | 6            | N          | 322.47557           | 2554.47          | 741.44               | 8261.24759          | 1716.22          |
| Apartments High Rise | 7            | N          | 527.22475           | 2553.86          | 741.44               | 12726.3372          | 1704.22          |
| Apartments High Rise | 8            | N          | 181.82029           | 2555.58          | 741.44               | 6951.79613          | 1662             |
| Apartments High Rise | 9            | N          | 246.65582           | 2553.86          | 741.44               | 8201.58595          | 1718.92          |
| Apartments High Rise | 10           | N          | 559.53918           | 2553.86          | 741.44               | 10214.6057          | 1779.14          |
| Apartments High Rise | 11           | N          | 185.96598           | 2553.86          | 741.44               | 5157.79965          | 1662             |
| Apartments High Rise | 12           | N          | 267.11675           | 2553.86          | 741.44               | 5523.82106          | 1662             |
| Apartments High Rise | 13           | N          | 160.76972           | 2553.86          | 741.44               | 3820.46951          | 1662             |
| Apartments High Rise | 14           | N          | 222.68138           | 2557.38          | 741.44               | 2693.04485          | 1662             |
| Apartments High Rise | 15           | N          | 559.53918           | 2553.86          | 741.44               | 10214.6057          | 1779.14          |
| Apartments High Rise | 1            | Y          | 277.31181           | 2557.38          | 741.44               | 2895.74715          | 1662             |
| Apartments High Rise | 2            | Y          | 401.5885            | 2554.47          | 741.44               | 8883.06192          | 1716.22          |
| Apartments High Rise | 3            | Y          | 532.57978           | 2553.86          | 741.44               | 10691.1873          | 1662             |
| Apartments High Rise | 4            | Y          | 282.14904           | 2558.55          | 741.44               | 6872.7261           | 1735.98          |
| Apartments High Rise | 5            | Y          | 388.60595           | 2561.86          | 741.44               | 7732.97388          | 1662             |
| Apartments High Rise | 6            | Y          | 401.5885            | 2554.47          | 741.44               | 8883.06192          | 1716.22          |
| Apartments High Rise | 7            | Y          | 656.56881           | 2553.86          | 741.44               | 13684.2335          | 1704.22          |
| Apartments High Rise | 8            | Y          | 226.42627           | 2555.58          | 741.44               | 7475.0496           | 1662             |
| Apartments High Rise | 9            | Y          | 307.16789           | 2553.86          | 741.44               | 8818.90962          | 1718.92          |
| Apartments High Rise | 10           | Y          | 696.81093           | 2553.86          | 741.44               | 10983.447           | 1779.14          |
| Apartments High Rise | 11           | Y          | 231.58901           | 2553.86          | 741.44               | 5546.02113          | 1662             |
| Apartments High Rise | 12           | Y          | 332.64851           | 2553.86          | 741.44               | 5939.59254          | 1662             |
| Apartments High Rise | 13           | Y          | 200.21136           | 2553.86          | 741.44               | 4108.03173          | 1662             |
| Apartments High Rise | 14           | Y          | 277.31181           | 2557.38          | 741.44               | 2895.74715          | 1662             |
| Apartments High Rise | 15           | Y          | 696.81093           | 2553.86          | 741.44               | 10983.447           | 1779.14          |
| Apartments Low Rise  | 1            | N          | 150.10159           | 2635.07          | 810.36               | 10819.7598          | 2498             |
| Apartments Low Rise  | 2            | N          | 348.17635           | 2631.74          | 810.36               | 11068.0572          | 2498             |
| Apartments Low Rise  | 3            | N          | 400.70856           | 2630.88          | 810.36               | 12246.0806          | 2498             |
| Apartments Low Rise  | 4            | N          | 236.91164           | 2634.44          | 810.36               | 8283.4737           | 2498             |
| Apartments Low Rise  | 5            | N          | 115.11861           | 2630.88          | 810.36               | 20655.8708          | 2752.67          |
| Apartments Low Rise  | 6            | N          | 348.17635           | 2631.74          | 810.36               | 11068.0572          | 2498             |
| Apartments Low Rise  | 7            | N          | 352.41929           | 2630.88          | 810.36               | 14007.3847          | 2498             |
| Apartments Low Rise  | 8            | N          | 158.56315           | 2631.99          | 810.36               | 8518.36495          | 2498             |
| Apartments Low Rise  | 9            | N          | 229.93936           | 2630.88          | 810.36               | 11615.2195          | 2616.15          |
| Apartments Low Rise  | 10           | N          | 636.58075           | 2630.88          | 810.36               | 11224.1967          | 2498             |
| Apartments Low Rise  | 11           | N          | 137.3059            | 2630.88          | 810.36               | 10855.8939          | 2578.64          |
| Apartments Low Rise  | 12           | N          | 188.48864           | 2630.88          | 810.36               | 5288.14583          | 2498             |
| Apartments Low Rise  | 13           | N          | 184.75023           | 2635.92          | 810.36               | 8285.40232          | 2498             |
| Apartments Low Rise  | 14           | N          | 150.10159           | 2635.07          | 810.36               | 10819.7598          | 2498             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type   | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|---------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                     |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Apartments Low Rise | 15           | N          | 636.58075           | 2630.88          | 810.36               | 11224.1967          | 2498             |
| Apartments Low Rise | 1            | Y          | 186.92601           | 2635.07          | 810.36               | 11634.1503          | 2498             |
| Apartments Low Rise | 2            | Y          | 433.59446           | 2631.74          | 810.36               | 11901.1368          | 2498             |
| Apartments Low Rise | 3            | Y          | 499.0144            | 2630.88          | 810.36               | 13167.8286          | 2498             |
| Apartments Low Rise | 4            | Y          | 295.03318           | 2634.44          | 810.36               | 8906.96097          | 2498             |
| Apartments Low Rise | 5            | Y          | 143.36066           | 2630.88          | 810.36               | 22210.6137          | 2752.67          |
| Apartments Low Rise | 6            | Y          | 433.59446           | 2631.74          | 810.36               | 11901.1368          | 2498             |
| Apartments Low Rise | 7            | Y          | 438.87832           | 2630.88          | 810.36               | 15061.704           | 2498             |
| Apartments Low Rise | 8            | Y          | 197.46345           | 2631.99          | 810.36               | 9159.5322           | 2498             |
| Apartments Low Rise | 9            | Y          | 286.35039           | 2630.88          | 810.36               | 12489.4834          | 2616.15          |
| Apartments Low Rise | 10           | Y          | 792.75311           | 2630.88          | 810.36               | 12069.0287          | 2498             |
| Apartments Low Rise | 11           | Y          | 170.99116           | 2630.88          | 810.36               | 11673.0041          | 2578.64          |
| Apartments Low Rise | 12           | Y          | 234.73056           | 2630.88          | 810.36               | 5686.17831          | 2498             |
| Apartments Low Rise | 13           | Y          | 230.07501           | 2635.92          | 810.36               | 8909.03475          | 2498             |
| Apartments Low Rise | 14           | Y          | 186.92601           | 2635.07          | 810.36               | 11634.1503          | 2498             |
| Apartments Low Rise | 15           | Y          | 792.75311           | 2630.88          | 810.36               | 12069.0287          | 2498             |
| Apartments Mid Rise | 1            | N          | 222.68138           | 2557.38          | 741.44               | 2693.04485          | 1662             |
| Apartments Mid Rise | 2            | N          | 322.47557           | 2554.47          | 741.44               | 8261.24759          | 1716.22          |
| Apartments Mid Rise | 3            | N          | 427.66156           | 2553.86          | 741.44               | 9942.80422          | 1662             |
| Apartments Mid Rise | 4            | N          | 226.56568           | 2558.55          | 741.44               | 6391.63527          | 1735.98          |
| Apartments Mid Rise | 5            | N          | 312.05058           | 2561.86          | 741.44               | 7191.66571          | 1662             |
| Apartments Mid Rise | 6            | N          | 322.47557           | 2554.47          | 741.44               | 8261.24759          | 1716.22          |
| Apartments Mid Rise | 7            | N          | 527.22475           | 2553.86          | 741.44               | 12726.3372          | 1704.22          |
| Apartments Mid Rise | 8            | N          | 181.82029           | 2555.58          | 741.44               | 6951.79613          | 1662             |
| Apartments Mid Rise | 9            | N          | 246.65582           | 2553.86          | 741.44               | 8201.58595          | 1718.92          |
| Apartments Mid Rise | 10           | N          | 559.53918           | 2553.86          | 741.44               | 10214.6057          | 1779.14          |
| Apartments Mid Rise | 11           | N          | 185.96598           | 2553.86          | 741.44               | 5157.79965          | 1662             |
| Apartments Mid Rise | 12           | N          | 267.11675           | 2553.86          | 741.44               | 5523.82106          | 1662             |
| Apartments Mid Rise | 13           | N          | 160.76972           | 2553.86          | 741.44               | 3820.46951          | 1662             |
| Apartments Mid Rise | 14           | N          | 222.68138           | 2557.38          | 741.44               | 2693.04485          | 1662             |
| Apartments Mid Rise | 15           | N          | 559.53918           | 2553.86          | 741.44               | 10214.6057          | 1779.14          |
| Apartments Mid Rise | 1            | Y          | 277.31181           | 2557.38          | 741.44               | 2895.74715          | 1662             |
| Apartments Mid Rise | 2            | Y          | 401.5885            | 2554.47          | 741.44               | 8883.06192          | 1716.22          |
| Apartments Mid Rise | 3            | Y          | 532.57978           | 2553.86          | 741.44               | 10691.1873          | 1662             |
| Apartments Mid Rise | 4            | Y          | 282.14904           | 2558.55          | 741.44               | 6872.7261           | 1735.98          |
| Apartments Mid Rise | 5            | Y          | 388.60595           | 2561.86          | 741.44               | 7732.97388          | 1662             |
| Apartments Mid Rise | 6            | Y          | 401.5885            | 2554.47          | 741.44               | 8883.06192          | 1716.22          |
| Apartments Mid Rise | 7            | Y          | 656.56881           | 2553.86          | 741.44               | 13684.2335          | 1704.22          |
| Apartments Mid Rise | 8            | Y          | 226.42627           | 2555.58          | 741.44               | 7475.0496           | 1662             |
| Apartments Mid Rise | 9            | Y          | 307.16789           | 2553.86          | 741.44               | 8818.90962          | 1718.92          |
| Apartments Mid Rise | 10           | Y          | 696.81093           | 2553.86          | 741.44               | 10983.447           | 1779.14          |
| Apartments Mid Rise | 11           | Y          | 231.58901           | 2553.86          | 741.44               | 5546.02113          | 1662             |
| Apartments Mid Rise | 12           | Y          | 332.64851           | 2553.86          | 741.44               | 5939.59254          | 1662             |
| Apartments Mid Rise | 13           | Y          | 200.21136           | 2553.86          | 741.44               | 4108.03173          | 1662             |
| Apartments Mid Rise | 14           | Y          | 277.31181           | 2557.38          | 741.44               | 2895.74715          | 1662             |
| Apartments Mid Rise | 15           | Y          | 696.81093           | 2553.86          | 741.44               | 10983.447           | 1779.14          |
| Condo/Townhouse     | 1            | N          | 496.55158           | 3125.85          | 1001.1               | 3925.90832          | 2951             |
| Condo/Townhouse     | 2            | N          | 301.14537           | 3125.85          | 1001.1               | 18960.7982          | 2951             |
| Condo/Townhouse     | 3            | N          | 539.46728           | 3125.85          | 1001.1               | 15116.8168          | 2951             |
| Condo/Townhouse     | 4            | N          | 184.25178           | 3125.85          | 1001.1               | 16523.6084          | 2951             |
| Condo/Townhouse     | 5            | N          | 135.74367           | 3125.85          | 1001.1               | 21338.24            | 2951             |
| Condo/Townhouse     | 6            | N          | 301.14537           | 3125.85          | 1001.1               | 18960.7982          | 2951             |
| Condo/Townhouse     | 7            | N          | 442.52401           | 3125.85          | 1001.1               | 7826.47025          | 2951             |
| Condo/Townhouse     | 8            | N          | 197.21159           | 3126.32          | 1001.1               | 12874.1742          | 2951             |
| Condo/Townhouse     | 9            | N          | 269.80962           | 3126.97          | 1001.1               | 11455.0347          | 2951             |
| Condo/Townhouse     | 10           | N          | 749.55357           | 3125.85          | 1001.1               | 17654.5297          | 2951             |
| Condo/Townhouse     | 11           | N          | 230.21291           | 3125.85          | 1001.1               | 14173.6141          | 3046.55          |
| Condo/Townhouse     | 12           | N          | 270.06493           | 3125.85          | 1001.1               | 10359.2127          | 2974.44          |
| Condo/Townhouse     | 13           | N          | 206.6883            | 3126.41          | 1001.1               | 10789.4821          | 3001.57          |
| Condo/Townhouse     | 14           | N          | 496.55158           | 3125.85          | 1001.1               | 3925.90832          | 2951             |
| Condo/Townhouse     | 15           | N          | 749.55357           | 3125.85          | 1001.1               | 17654.5297          | 2951             |
| Condo/Townhouse     | 1            | Y          | 618.37059           | 3125.85          | 1001.1               | 4221.4068           | 2951             |
| Condo/Townhouse     | 2            | Y          | 375.02537           | 3125.85          | 1001.1               | 20387.955           | 2951             |
| Condo/Townhouse     | 3            | Y          | 671.81479           | 3125.85          | 1001.1               | 16254.6417          | 2951             |
| Condo/Townhouse     | 4            | Y          | 229.45427           | 3125.85          | 1001.1               | 17767.3209          | 2951             |
| Condo/Townhouse     | 5            | Y          | 169.04567           | 3125.85          | 1001.1               | 22944.3441          | 2951             |
| Condo/Townhouse     | 6            | Y          | 375.02537           | 3125.85          | 1001.1               | 20387.955           | 2951             |
| Condo/Townhouse     | 7            | Y          | 551.08843           | 3125.85          | 1001.1               | 8415.55941          | 2951             |
| Condo/Townhouse     | 8            | Y          | 245.59351           | 3126.32          | 1001.1               | 13843.1981          | 2951             |
| Condo/Townhouse     | 9            | Y          | 336.00202           | 3126.97          | 1001.1               | 12317.2416          | 2951             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type         | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|---------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                           |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Condo/Townhouse           | 10           | Y          | 933.44156           | 3125.85          | 1001.1               | 18983.3653          | 2951             |
| Condo/Townhouse           | 11           | Y          | 286.69104           | 3125.85          | 1001.1               | 15240.4453          | 3046.55          |
| Condo/Townhouse           | 12           | Y          | 336.31996           | 3125.85          | 1001.1               | 11138.9384          | 2974.44          |
| Condo/Townhouse           | 13           | Y          | 257.39514           | 3126.41          | 1001.1               | 11601.5936          | 3001.57          |
| Condo/Townhouse           | 14           | Y          | 618.37059           | 3125.85          | 1001.1               | 4221.4068           | 2951             |
| Condo/Townhouse           | 15           | Y          | 933.44156           | 3125.85          | 1001.1               | 18983.3653          | 2951             |
| Condo/Townhouse High Rise | 1            | N          | 496.55158           | 3125.85          | 1001.1               | 3925.90832          | 2951             |
| Condo/Townhouse High Rise | 2            | N          | 301.14537           | 3125.85          | 1001.1               | 18960.7982          | 2951             |
| Condo/Townhouse High Rise | 3            | N          | 539.46728           | 3125.85          | 1001.1               | 15116.8168          | 2951             |
| Condo/Townhouse High Rise | 4            | N          | 184.25178           | 3125.85          | 1001.1               | 16523.6084          | 2951             |
| Condo/Townhouse High Rise | 5            | N          | 135.74367           | 3125.85          | 1001.1               | 21338.24            | 2951             |
| Condo/Townhouse High Rise | 6            | N          | 301.14537           | 3125.85          | 1001.1               | 18960.7982          | 2951             |
| Condo/Townhouse High Rise | 7            | N          | 442.52401           | 3125.85          | 1001.1               | 7826.47025          | 2951             |
| Condo/Townhouse High Rise | 8            | N          | 197.21159           | 3126.32          | 1001.1               | 12874.1742          | 2951             |
| Condo/Townhouse High Rise | 9            | N          | 269.80962           | 3126.97          | 1001.1               | 11455.0347          | 2951             |
| Condo/Townhouse High Rise | 10           | N          | 749.55357           | 3125.85          | 1001.1               | 17654.5297          | 2951             |
| Condo/Townhouse High Rise | 11           | N          | 230.21291           | 3125.85          | 1001.1               | 14173.6141          | 3046.55          |
| Condo/Townhouse High Rise | 12           | N          | 270.06493           | 3125.85          | 1001.1               | 10359.2127          | 2974.44          |
| Condo/Townhouse High Rise | 13           | N          | 206.6883            | 3126.41          | 1001.1               | 10789.4821          | 3001.57          |
| Day-Care Center           | 2            | N          | 2.3                 | 1.42             | 2.7                  | 9.52                | 0.42             |
| Day-Care Center           | 8            | N          | 2.31                | 1.51             | 3.09                 | 11.38               | 1.03             |
| Day-Care Center           | 15           | N          | 3.4                 | 1.49             | 4.2                  | 7.34                | 1.79             |
| Day-Care Center           | 4            | N          | 1.9                 | 1.28             | 2.82                 | 18.43               | 0.93             |
| Elementary School         | 9            | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Elementary School         | 8            | N          | 2.31                | 1.51             | 3.09                 | 11.38               | 1.03             |
| Elementary School         | 3            | N          | 2.62                | 1.89             | 3.43                 | 24.41               | 1.92             |
| Elementary School         | 4            | N          | 1.9                 | 1.28             | 2.82                 | 18.43               | 0.93             |
| Elementary School         | 10           | N          | 3.4                 | 1.49             | 4.2                  | 7.34                | 1.79             |
| Elementary School         | 5            | N          | 0.81                | 1.27             | 2.89                 | 15.63               | 1.62             |
| Elementary School         | 1            | N          | 1.98                | 1.48             | 4.21                 | 14.21               | 0.86             |
| Elementary School         | 7            | N          | 2.38                | 1.95             | 3.92                 | 10.78               | 0.46             |
| Elementary School         | 15           | N          | 3.4                 | 1.49             | 4.2                  | 7.34                | 1.79             |
| Elementary School         | 13           | N          | 1.86                | 1.18             | 2.92                 | 5.72                | 0.48             |
| Elementary School         | 2            | N          | 2.3                 | 1.42             | 2.7                  | 9.52                | 0.42             |
| Elementary School         | 14           | N          | 1.98                | 1.48             | 4.21                 | 14.21               | 0.86             |
| Elementary School         | 11           | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Elementary School         | 6            | N          | 2.51                | 2.17             | 3.55                 | 15.37               | 0.66             |
| Elementary School         | 12           | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Junior High School        | 10           | N          | 3.4                 | 1.49             | 4.2                  | 7.34                | 1.79             |
| Junior High School        | 9            | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Junior High School        | 13           | N          | 1.86                | 1.18             | 2.92                 | 5.72                | 0.48             |
| Junior High School        | 11           | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Junior High School        | 2            | N          | 2.3                 | 1.42             | 2.7                  | 9.52                | 0.42             |
| Junior High School        | 12           | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| Junior High School        | 5            | N          | 0.81                | 1.27             | 2.89                 | 15.63               | 1.62             |
| Junior High School        | 8            | N          | 2.31                | 1.51             | 3.09                 | 11.38               | 1.03             |
| Junior High School        | 1            | N          | 1.98                | 1.48             | 4.21                 | 14.21               | 0.86             |
| Junior High School        | 6            | N          | 2.51                | 2.17             | 3.55                 | 15.37               | 0.66             |
| Junior High School        | 14           | N          | 1.98                | 1.48             | 4.21                 | 14.21               | 0.86             |
| Junior High School        | 4            | N          | 1.9                 | 1.28             | 2.82                 | 18.43               | 0.93             |
| Junior High School        | 7            | N          | 2.38                | 1.95             | 3.92                 | 10.78               | 0.46             |
| Junior High School        | 3            | N          | 2.62                | 1.89             | 3.43                 | 24.41               | 1.92             |
| Junior High School        | 15           | N          | 3.4                 | 1.49             | 4.2                  | 7.34                | 1.79             |
| High School               | 7            | N          | 2.38                | 1.95             | 3.92                 | 10.78               | 0.46             |
| High School               | 1            | N          | 1.98                | 1.48             | 4.21                 | 14.21               | 0.86             |
| High School               | 12           | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| High School               | 5            | N          | 0.81                | 1.27             | 2.89                 | 15.63               | 1.62             |
| High School               | 14           | N          | 1.98                | 1.48             | 4.21                 | 14.21               | 0.86             |
| High School               | 10           | N          | 3.4                 | 1.49             | 4.2                  | 7.34                | 1.79             |
| High School               | 13           | N          | 1.86                | 1.18             | 2.92                 | 5.72                | 0.48             |
| High School               | 9            | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| High School               | 8            | N          | 2.31                | 1.51             | 3.09                 | 11.38               | 1.03             |
| High School               | 15           | N          | 3.4                 | 1.49             | 4.2                  | 7.34                | 1.79             |
| High School               | 6            | N          | 2.51                | 2.17             | 3.55                 | 15.37               | 0.66             |
| High School               | 3            | N          | 2.62                | 1.89             | 3.43                 | 24.41               | 1.92             |
| High School               | 11           | N          | 2.13                | 1.59             | 2.98                 | 9.81                | 1.08             |
| High School               | 2            | N          | 2.3                 | 1.42             | 2.7                  | 9.52                | 0.42             |
| High School               | 4            | N          | 1.9                 | 1.28             | 2.82                 | 18.43               | 0.93             |
| Junior College (2yr)      | 6            | N          | 4.12                | 2.09             | 3.47                 | 27.37               | 0.23             |
| Junior College (2yr)      | 10           | N          | 2.41                | 1.92             | 4.53                 | 14.54               | 0.01             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type        | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|--------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                          |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Junior College (2yr)     | 2            | N          | 4.59                | 0.34             | 5.23                 | 42.99               | 0                |
| Junior College (2yr)     | 11           | N          | 3.71                | 3.59             | 3.86                 | 27.88               | 0.59             |
| Junior College (2yr)     | 8            | N          | 6.1                 | 2.72             | 5.23                 | 10.65               | 5.21             |
| Junior College (2yr)     | 13           | N          | 3.25                | 2.69             | 4.02                 | 32.81               | 5.16             |
| Junior College (2yr)     | 5            | N          | 5.06                | 3.15             | 3.36                 | 35.21               | 0.74             |
| Junior College (2yr)     | 14           | N          | 3.17                | 1.73             | 6.49                 | 22.85               | 0                |
| Junior College (2yr)     | 9            | N          | 3.71                | 3.59             | 3.86                 | 27.88               | 0.59             |
| Junior College (2yr)     | 15           | N          | 2.41                | 1.92             | 4.53                 | 14.54               | 0.01             |
| Junior College (2yr)     | 7            | N          | 4.43                | 6.44             | 6.57                 | 54.53               | 0.34             |
| Junior College (2yr)     | 1            | N          | 3.17                | 1.73             | 6.49                 | 22.85               | 0                |
| Junior College (2yr)     | 4            | N          | 3.34                | 2.27             | 3.34                 | 21.92               | 3.3              |
| Junior College (2yr)     | 3            | N          | 3.63                | 2.63             | 6.55                 | 21.84               | 1.34             |
| Junior College (2yr)     | 12           | N          | 3.71                | 3.59             | 3.86                 | 27.88               | 0.59             |
| University/College (4yr) | 11           | N          | 3.71                | 3.59             | 3.86                 | 27.88               | 0.59             |
| University/College (4yr) | 8            | N          | 6.1                 | 2.72             | 5.23                 | 10.65               | 5.21             |
| University/College (4yr) | 6            | N          | 4.12                | 2.09             | 3.47                 | 27.37               | 0.23             |
| University/College (4yr) | 10           | N          | 2.41                | 1.92             | 4.53                 | 14.54               | 0.01             |
| University/College (4yr) | 4            | N          | 3.34                | 2.27             | 3.34                 | 21.92               | 3.3              |
| University/College (4yr) | 15           | N          | 2.41                | 1.92             | 4.53                 | 14.54               | 0.01             |
| University/College (4yr) | 9            | N          | 3.71                | 3.59             | 3.86                 | 27.88               | 0.59             |
| University/College (4yr) | 14           | N          | 3.17                | 1.73             | 6.49                 | 22.85               | 0                |
| University/College (4yr) | 7            | N          | 4.43                | 6.44             | 6.57                 | 54.53               | 0.34             |
| University/College (4yr) | 13           | N          | 3.25                | 2.69             | 4.02                 | 32.81               | 5.16             |
| University/College (4yr) | 3            | N          | 3.63                | 2.63             | 6.55                 | 21.84               | 1.34             |
| University/College (4yr) | 1            | N          | 3.17                | 1.73             | 6.49                 | 22.85               | 0                |
| University/College (4yr) | 12           | N          | 3.71                | 3.59             | 3.86                 | 27.88               | 0.59             |
| University/College (4yr) | 2            | N          | 4.59                | 0.34             | 5.23                 | 42.99               | 0                |
| University/College (4yr) | 5            | N          | 5.06                | 3.15             | 3.36                 | 35.21               | 0.74             |
| Library                  | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Library                  | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Library                  | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Library                  | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Library                  | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Library                  | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Library                  | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Library                  | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Library                  | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Library                  | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Library                  | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Library                  | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Library                  | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Library                  | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Library                  | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Place of Worship         | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Place of Worship         | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Place of Worship         | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Place of Worship         | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Place of Worship         | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Place of Worship         | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Place of Worship         | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Place of Worship         | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Place of Worship         | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Place of Worship         | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Place of Worship         | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Place of Worship         | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Place of Worship         | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Place of Worship         | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Place of Worship         | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| City Park                | 6            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 12           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 1            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 8            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 11           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 9            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 5            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 3            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 2            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 13           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 4            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                | 14           | N          | 0                   | 0                | 0                    | 0                   | 0                |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type          | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                            |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| City Park                  | 15           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                  | 7            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| City Park                  | 10           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 7            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 2            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 14           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 3            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 5            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 9            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 8            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 13           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 10           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 12           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 4            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 11           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 6            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 15           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Golf Course                | 1            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 10           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 6            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 4            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 2            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 14           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 15           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 5            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 13           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 7            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 1            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 9            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 8            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 12           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 11           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Recreational Swimming Pool | 3            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Racquet Club               | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Racquet Club               | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Racquet Club               | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Racquet Club               | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Racquet Club               | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Racquet Club               | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Racquet Club               | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Racquet Club               | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Racquet Club               | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Racquet Club               | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Racquet Club               | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Racquet Club               | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Racquet Club               | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Racquet Club               | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Racquet Club               | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Health Club                | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Health Club                | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Health Club                | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Health Club                | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Health Club                | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Health Club                | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Health Club                | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Health Club                | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Health Club                | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Health Club                | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Health Club                | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Health Club                | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Health Club                | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Health Club                | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Health Club                | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Movie Theater (No Matinee) | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Movie Theater (No Matinee) | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Movie Theater (No Matinee) | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Movie Theater (No Matinee) | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Movie Theater (No Matinee) | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Movie Theater (No Matinee) | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Movie Theater (No Matinee) | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |



Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                    | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|--------------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                      |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Movie Theater (No Matinee)           | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Movie Theater (No Matinee)           | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Movie Theater (No Matinee)           | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Movie Theater (No Matinee)           | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Movie Theater (No Matinee)           | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Movie Theater (No Matinee)           | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Movie Theater (No Matinee)           | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Movie Theater (No Matinee)           | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Arena                                | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Arena                                | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Arena                                | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Arena                                | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Arena                                | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Arena                                | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Arena                                | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Arena                                | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Arena                                | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Arena                                | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Arena                                | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Arena                                | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Arena                                | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Arena                                | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Arena                                | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Quality Restaurant                   | 8            | N          | 10.64               | 20.11            | 8.58                 | 82.67               | 180.76           |
| Quality Restaurant                   | 10           | N          | 15.13               | 28.48            | 8.79                 | 81.74               | 195.77           |
| Quality Restaurant                   | 6            | N          | 10.75               | 26.72            | 6.96                 | 62.79               | 118.04           |
| Quality Restaurant                   | 7            | N          | 9.53                | 20.65            | 5.69                 | 18.61               | 81.41            |
| Quality Restaurant                   | 1            | N          | 4.89                | 15.83            | 5.36                 | 29.1                | 88.55            |
| Quality Restaurant                   | 3            | N          | 8                   | 16.25            | 6.94                 | 37.59               | 174.7            |
| Quality Restaurant                   | 12           | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| Quality Restaurant                   | 2            | N          | 7.4                 | 17.72            | 8.49                 | 42.71               | 68.83            |
| Quality Restaurant                   | 4            | N          | 6.19                | 22.3             | 5.8                  | 63.57               | 147.47           |
| Quality Restaurant                   | 9            | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| Quality Restaurant                   | 11           | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| Quality Restaurant                   | 14           | N          | 4.89                | 15.83            | 5.36                 | 29.1                | 88.55            |
| Quality Restaurant                   | 15           | N          | 15.13               | 28.48            | 8.79                 | 81.74               | 195.77           |
| Quality Restaurant                   | 13           | N          | 10.06               | 23.69            | 7.61                 | 37.8                | 138.46           |
| Quality Restaurant                   | 5            | N          | 3.26                | 20.97            | 6.01                 | 41.99               | 128.02           |
| High Turnover (Sit Down Restaurant)  | 3            | N          | 8                   | 16.25            | 6.94                 | 37.59               | 174.7            |
| High Turnover (Sit Down Restaurant)  | 11           | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| High Turnover (Sit Down Restaurant)  | 13           | N          | 10.06               | 23.69            | 7.61                 | 37.8                | 138.46           |
| High Turnover (Sit Down Restaurant)  | 5            | N          | 3.26                | 20.97            | 6.01                 | 41.99               | 128.02           |
| High Turnover (Sit Down Restaurant)  | 12           | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| High Turnover (Sit Down Restaurant)  | 10           | N          | 15.13               | 28.48            | 8.79                 | 81.74               | 195.77           |
| High Turnover (Sit Down Restaurant)  | 7            | N          | 9.53                | 20.65            | 5.69                 | 18.61               | 81.41            |
| High Turnover (Sit Down Restaurant)  | 2            | N          | 7.4                 | 17.72            | 8.49                 | 42.71               | 68.83            |
| High Turnover (Sit Down Restaurant)  | 9            | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| High Turnover (Sit Down Restaurant)  | 14           | N          | 4.89                | 15.83            | 5.36                 | 29.1                | 88.55            |
| High Turnover (Sit Down Restaurant)  | 6            | N          | 10.75               | 26.72            | 6.96                 | 62.79               | 118.04           |
| High Turnover (Sit Down Restaurant)  | 8            | N          | 10.64               | 20.11            | 8.58                 | 82.67               | 180.76           |
| High Turnover (Sit Down Restaurant)  | 15           | N          | 15.13               | 28.48            | 8.79                 | 81.74               | 195.77           |
| High Turnover (Sit Down Restaurant)  | 4            | N          | 6.19                | 22.3             | 5.8                  | 63.57               | 147.47           |
| High Turnover (Sit Down Restaurant)  | 1            | N          | 4.89                | 15.83            | 5.36                 | 29.1                | 88.55            |
| Fast Food Restaurant with Drive Thru | 11           | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| Fast Food Restaurant with Drive Thru | 13           | N          | 10.06               | 23.69            | 7.61                 | 37.8                | 138.46           |
| Fast Food Restaurant with Drive Thru | 8            | N          | 10.64               | 20.11            | 8.58                 | 82.67               | 180.76           |
| Fast Food Restaurant with Drive Thru | 10           | N          | 15.13               | 28.48            | 8.79                 | 81.74               | 195.77           |
| Fast Food Restaurant with Drive Thru | 9            | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| Fast Food Restaurant with Drive Thru | 5            | N          | 3.26                | 20.97            | 6.01                 | 41.99               | 128.02           |
| Fast Food Restaurant with Drive Thru | 15           | N          | 15.13               | 28.48            | 8.79                 | 81.74               | 195.77           |
| Fast Food Restaurant with Drive Thru | 1            | N          | 4.89                | 15.83            | 5.36                 | 29.1                | 88.55            |
| Fast Food Restaurant with Drive Thru | 3            | N          | 8                   | 16.25            | 6.94                 | 37.59               | 174.7            |
| Fast Food Restaurant with Drive Thru | 14           | N          | 4.89                | 15.83            | 5.36                 | 29.1                | 88.55            |
| Fast Food Restaurant with Drive Thru | 6            | N          | 10.75               | 26.72            | 6.96                 | 62.79               | 118.04           |
| Fast Food Restaurant with Drive Thru | 4            | N          | 6.19                | 22.3             | 5.8                  | 63.57               | 147.47           |
| Fast Food Restaurant with Drive Thru | 2            | N          | 7.4                 | 17.72            | 8.49                 | 42.71               | 68.83            |
| Fast Food Restaurant with Drive Thru | 7            | N          | 9.53                | 20.65            | 5.69                 | 18.61               | 81.41            |
| Fast Food Restaurant with Drive Thru | 12           | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| Fast Food Restaurant w/o Drive Thru  | 11           | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| Fast Food Restaurant w/o Drive Thru  | 9            | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                   | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-------------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                     |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Fast Food Restaurant w/o Drive Thru | 15           | N          | 15.13               | 28.48            | 8.79                 | 81.74               | 195.77           |
| Fast Food Restaurant w/o Drive Thru | 13           | N          | 10.06               | 23.69            | 7.61                 | 37.8                | 138.46           |
| Fast Food Restaurant w/o Drive Thru | 7            | N          | 9.53                | 20.65            | 5.69                 | 18.61               | 81.41            |
| Fast Food Restaurant w/o Drive Thru | 5            | N          | 3.26                | 20.97            | 6.01                 | 41.99               | 128.02           |
| Fast Food Restaurant w/o Drive Thru | 8            | N          | 10.64               | 20.11            | 8.58                 | 82.67               | 180.76           |
| Fast Food Restaurant w/o Drive Thru | 3            | N          | 8                   | 16.25            | 6.94                 | 37.59               | 174.7            |
| Fast Food Restaurant w/o Drive Thru | 2            | N          | 7.4                 | 17.72            | 8.49                 | 42.71               | 68.83            |
| Fast Food Restaurant w/o Drive Thru | 12           | N          | 9.91                | 28.16            | 8.84                 | 45.23               | 187.78           |
| Fast Food Restaurant w/o Drive Thru | 4            | N          | 6.19                | 22.3             | 5.8                  | 63.57               | 147.47           |
| Fast Food Restaurant w/o Drive Thru | 6            | N          | 10.75               | 26.72            | 6.96                 | 62.79               | 118.04           |
| Fast Food Restaurant w/o Drive Thru | 10           | N          | 15.13               | 28.48            | 8.79                 | 81.74               | 195.77           |
| Fast Food Restaurant w/o Drive Thru | 1            | N          | 4.89                | 15.83            | 5.36                 | 29.1                | 88.55            |
| Fast Food Restaurant w/o Drive Thru | 14           | N          | 4.89                | 15.83            | 5.36                 | 29.1                | 88.55            |
| Hotel                               | 9            | N          | 3.12                | 2.89             | 2.49                 | 20.96               | 4.06             |
| Hotel                               | 7            | N          | 5.55                | 3.68             | 4.32                 | 35.04               | 2.04             |
| Hotel                               | 8            | N          | 3.39                | 3.24             | 3.46                 | 30.62               | 5.15             |
| Hotel                               | 6            | N          | 4.39                | 3.33             | 3.3                  | 34.77               | 5.53             |
| Hotel                               | 3            | N          | 5.05                | 2.3              | 1.8                  | 18.93               | 7.16             |
| Hotel                               | 11           | N          | 3.12                | 2.89             | 2.49                 | 20.96               | 4.06             |
| Hotel                               | 15           | N          | 7.91                | 6.23             | 6.13                 | 58.04               | 4.86             |
| Hotel                               | 2            | N          | 2.29                | 1.37             | 3.86                 | 27.85               | 0.26             |
| Hotel                               | 10           | N          | 7.91                | 6.23             | 6.13                 | 58.04               | 4.86             |
| Hotel                               | 4            | N          | 2.5                 | 3.22             | 2.72                 | 41.63               | 4.75             |
| Hotel                               | 13           | N          | 5.84                | 3.67             | 5.08                 | 49.75               | 11.1             |
| Hotel                               | 12           | N          | 3.12                | 2.89             | 2.49                 | 20.96               | 4.06             |
| Hotel                               | 1            | N          | 2.47                | 2.87             | 2.97                 | 21.8                | 0.05             |
| Hotel                               | 5            | N          | 2.67                | 2.85             | 3.58                 | 30.92               | 7.13             |
| Hotel                               | 14           | N          | 2.47                | 2.87             | 2.97                 | 21.8                | 0.05             |
| Motel                               | 8            | N          | 3.39                | 3.24             | 3.46                 | 30.62               | 5.15             |
| Motel                               | 12           | N          | 3.12                | 2.89             | 2.49                 | 20.96               | 4.06             |
| Motel                               | 10           | N          | 7.91                | 6.23             | 6.13                 | 58.04               | 4.86             |
| Motel                               | 7            | N          | 5.55                | 3.68             | 4.32                 | 35.04               | 2.04             |
| Motel                               | 13           | N          | 5.84                | 3.67             | 5.08                 | 49.75               | 11.1             |
| Motel                               | 2            | N          | 2.29                | 1.37             | 3.86                 | 27.85               | 0.26             |
| Motel                               | 3            | N          | 5.05                | 2.3              | 1.8                  | 18.93               | 7.16             |
| Motel                               | 5            | N          | 2.67                | 2.85             | 3.58                 | 30.92               | 7.13             |
| Motel                               | 1            | N          | 2.47                | 2.87             | 2.97                 | 21.8                | 0.05             |
| Motel                               | 11           | N          | 3.12                | 2.89             | 2.49                 | 20.96               | 4.06             |
| Motel                               | 9            | N          | 3.12                | 2.89             | 2.49                 | 20.96               | 4.06             |
| Motel                               | 14           | N          | 2.47                | 2.87             | 2.97                 | 21.8                | 0.05             |
| Motel                               | 6            | N          | 4.39                | 3.33             | 3.3                  | 34.77               | 5.53             |
| Motel                               | 15           | N          | 7.91                | 6.23             | 6.13                 | 58.04               | 4.86             |
| Motel                               | 4            | N          | 2.5                 | 3.22             | 2.72                 | 41.63               | 4.75             |
| Parking Lot                         | 5            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 6            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 2            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 15           | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 4            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 7            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 13           | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 10           | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 1            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 9            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 3            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 12           | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 14           | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 11           | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Parking Lot                         | 8            | N          | 0                   | 0                | 0.876                | 0                   | 0                |
| Unenclosed Parking Structure        | 3            | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 11           | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 12           | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 5            | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 8            | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 1            | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 2            | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 13           | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 6            | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 15           | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 14           | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure        | 4            | N          | 0                   | 0                | 2.628                | 0                   | 0                |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                  |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Unenclosed Parking Structure     | 10           | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure     | 7            | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking Structure     | 9            | N          | 0                   | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 3            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 11           | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 12           | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 5            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 8            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 1            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 2            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 13           | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 6            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 15           | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 14           | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 4            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 10           | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 7            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Enclosed Parking Structure       | 9            | N          | 3.920976            | 0                | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 3            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 11           | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 12           | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 5            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 8            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 1            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 2            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 13           | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 6            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 15           | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 14           | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 4            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 10           | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 7            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Unenclosed Parking with Elevator | 9            | N          | 0                   | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 3            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 11           | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 12           | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 5            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 8            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 1            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 2            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 13           | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 6            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 15           | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 14           | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 4            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 10           | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 7            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Enclosed Parking with Elevator   | 9            | N          | 3.920976            | 0.19             | 2.628                | 0                   | 0                |
| Other Asphalt Surfaces           | 3            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 11           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 12           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 5            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 8            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 1            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 2            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 13           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 6            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 15           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 14           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 4            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 10           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 7            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Asphalt Surfaces           | 9            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 3            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 11           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 12           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 5            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 8            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 1            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces       | 2            | N          | 0                   | 0                | 0                    | 0                   | 0                |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                 | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                   |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Other Non-Asphalt Surfaces        | 13           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces        | 6            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces        | 15           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces        | 14           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces        | 4            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces        | 10           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces        | 7            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Other Non-Asphalt Surfaces        | 9            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Free-Standing Discount Store      | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Free-Standing Discount Store      | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Free-Standing Discount Store      | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Free-Standing Discount Store      | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Free-Standing Discount Store      | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Free-Standing Discount Store      | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Free-Standing Discount Store      | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Free-Standing Discount Store      | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Free-Standing Discount Store      | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Free-Standing Discount Store      | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Free-Standing Discount Store      | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Free-Standing Discount Store      | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Free-Standing Discount Store      | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Free-Standing Discount Store      | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Free-Standing Discount Store      | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Free-Standing Discount Superstore | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Free-Standing Discount Superstore | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Free-Standing Discount Superstore | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Free-Standing Discount Superstore | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Free-Standing Discount Superstore | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Free-Standing Discount Superstore | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Free-Standing Discount Superstore | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Free-Standing Discount Superstore | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Free-Standing Discount Superstore | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Free-Standing Discount Superstore | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Free-Standing Discount Superstore | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Free-Standing Discount Superstore | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Free-Standing Discount Superstore | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Free-Standing Discount Superstore | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Free-Standing Discount Superstore | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Discount Club                     | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Discount Club                     | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Discount Club                     | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Discount Club                     | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Discount Club                     | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Discount Club                     | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Discount Club                     | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Discount Club                     | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Discount Club                     | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Discount Club                     | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Discount Club                     | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Discount Club                     | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Discount Club                     | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Discount Club                     | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Discount Club                     | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Regional Shopping Center          | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Regional Shopping Center          | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Regional Shopping Center          | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Regional Shopping Center          | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Regional Shopping Center          | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Regional Shopping Center          | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Regional Shopping Center          | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Regional Shopping Center          | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Regional Shopping Center          | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Regional Shopping Center          | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Regional Shopping Center          | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Regional Shopping Center          | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Regional Shopping Center          | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Regional Shopping Center          | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Regional Shopping Center          | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Electronic Superstore             | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Electronic Superstore             | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type           | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-----------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                             |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Electronic Superstore       | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Electronic Superstore       | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Electronic Superstore       | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Electronic Superstore       | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Electronic Superstore       | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Electronic Superstore       | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Electronic Superstore       | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Electronic Superstore       | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Electronic Superstore       | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Electronic Superstore       | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Electronic Superstore       | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Electronic Superstore       | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Electronic Superstore       | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Home Improvement Superstore | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Home Improvement Superstore | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Home Improvement Superstore | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Home Improvement Superstore | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Home Improvement Superstore | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Home Improvement Superstore | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Home Improvement Superstore | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Home Improvement Superstore | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Home Improvement Superstore | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Home Improvement Superstore | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Home Improvement Superstore | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Home Improvement Superstore | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Home Improvement Superstore | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Home Improvement Superstore | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Home Improvement Superstore | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Strip Mall                  | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Strip Mall                  | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Strip Mall                  | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Strip Mall                  | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Strip Mall                  | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Strip Mall                  | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Strip Mall                  | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Strip Mall                  | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Strip Mall                  | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Strip Mall                  | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Strip Mall                  | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Strip Mall                  | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Strip Mall                  | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Strip Mall                  | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Strip Mall                  | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Hardware/Paint Store        | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Hardware/Paint Store        | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Hardware/Paint Store        | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Hardware/Paint Store        | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Hardware/Paint Store        | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Hardware/Paint Store        | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Hardware/Paint Store        | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Hardware/Paint Store        | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Hardware/Paint Store        | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Hardware/Paint Store        | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Hardware/Paint Store        | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Hardware/Paint Store        | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Hardware/Paint Store        | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Hardware/Paint Store        | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Hardware/Paint Store        | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Supermarket                 | 8            | N          | 5.76                | 25.23            | 9.7                  | 10.47               | 10.6             |
| Supermarket                 | 11           | N          | 5.4                 | 25.88            | 7.89                 | 10.35               | 12.24            |
| Supermarket                 | 2            | N          | 7.03                | 26.2             | 9.26                 | 41.05               | 0                |
| Supermarket                 | 6            | N          | 6.97                | 25.85            | 9.88                 | 16.86               | 9.38             |
| Supermarket                 | 13           | N          | 3.97                | 25.54            | 7.79                 | 10.21               | 15.42            |
| Supermarket                 | 15           | N          | 7.42                | 22.82            | 9.1                  | 13.31               | 6.61             |
| Supermarket                 | 12           | N          | 5.4                 | 25.88            | 7.89                 | 10.35               | 12.24            |
| Supermarket                 | 7            | N          | 4.88                | 25.36            | 9.25                 | 8.1                 | 0.95             |
| Supermarket                 | 1            | N          | 2.88                | 25.04            | 7.59                 | 25.83               | 1.18             |
| Supermarket                 | 5            | N          | 3.32                | 27.24            | 8.31                 | 25.82               | 12.69            |
| Supermarket                 | 4            | N          | 4.99                | 30.13            | 7.65                 | 17.56               | 5.79             |
| Supermarket                 | 3            | N          | 4.77                | 22.51            | 7.39                 | 15.57               | 14.03            |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                 | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                   |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Supermarket                       | 9            | N          | 5.4                 | 25.88            | 7.89                 | 10.35               | 12.24            |
| Supermarket                       | 14           | N          | 2.88                | 25.04            | 7.59                 | 25.83               | 1.18             |
| Supermarket                       | 10           | N          | 7.42                | 22.82            | 9.1                  | 13.31               | 6.61             |
| Convenience Market (24 hour)      | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Convenience Market (24 hour)      | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Convenience Market (24 hour)      | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Convenience Market (24 hour)      | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Convenience Market (24 hour)      | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Convenience Market (24 hour)      | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Convenience Market (24 hour)      | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Convenience Market (24 hour)      | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Convenience Market (24 hour)      | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Convenience Market (24 hour)      | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Convenience Market (24 hour)      | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Convenience Market (24 hour)      | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Convenience Market (24 hour)      | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Convenience Market (24 hour)      | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Convenience Market (24 hour)      | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Convenience Market with Gas Pumps | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Convenience Market with Gas Pumps | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Convenience Market with Gas Pumps | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Convenience Market with Gas Pumps | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Convenience Market with Gas Pumps | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Convenience Market with Gas Pumps | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Convenience Market with Gas Pumps | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Convenience Market with Gas Pumps | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Convenience Market with Gas Pumps | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Convenience Market with Gas Pumps | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Convenience Market with Gas Pumps | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Convenience Market with Gas Pumps | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Convenience Market with Gas Pumps | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Convenience Market with Gas Pumps | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Convenience Market with Gas Pumps | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Automobile Care Center            | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Automobile Care Center            | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Automobile Care Center            | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Automobile Care Center            | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Automobile Care Center            | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Automobile Care Center            | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Automobile Care Center            | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Automobile Care Center            | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Automobile Care Center            | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Automobile Care Center            | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Automobile Care Center            | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Automobile Care Center            | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Automobile Care Center            | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Automobile Care Center            | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Automobile Care Center            | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Gasoline/Service Station          | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Gasoline/Service Station          | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Gasoline/Service Station          | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Gasoline/Service Station          | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Gasoline/Service Station          | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Gasoline/Service Station          | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Gasoline/Service Station          | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Gasoline/Service Station          | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Gasoline/Service Station          | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Gasoline/Service Station          | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Gasoline/Service Station          | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Gasoline/Service Station          | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Gasoline/Service Station          | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Gasoline/Service Station          | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Gasoline/Service Station          | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Bank (with Drive-Through)         | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Bank (with Drive-Through)         | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Bank (with Drive-Through)         | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Bank (with Drive-Through)         | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Bank (with Drive-Through)         | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Bank (with Drive-Through)         | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Bank (with Drive-Through)         | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type          | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                            |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Bank (with Drive-Through)  | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Bank (with Drive-Through)  | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Bank (with Drive-Through)  | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Bank (with Drive-Through)  | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Bank (with Drive-Through)  | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Bank (with Drive-Through)  | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Bank (with Drive-Through)  | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Bank (with Drive-Through)  | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| General Office Building    | 13           | N          | 5.69                | 4.97             | 4.33                 | 16.83               | 4.2              |
| General Office Building    | 11           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| General Office Building    | 5            | N          | 5.01                | 4.8              | 4.07                 | 19.28               | 1.01             |
| General Office Building    | 8            | N          | 5.76                | 4.94             | 4.92                 | 9.04                | 0.55             |
| General Office Building    | 3            | N          | 3.2                 | 3.58             | 3.34                 | 13.44               | 0.28             |
| General Office Building    | 6            | N          | 6.08                | 5.75             | 4.21                 | 13.07               | 0.68             |
| General Office Building    | 15           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| General Office Building    | 2            | N          | 3.93                | 3.62             | 3.62                 | 16.83               | 0.47             |
| General Office Building    | 1            | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| General Office Building    | 10           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| General Office Building    | 12           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| General Office Building    | 9            | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| General Office Building    | 4            | N          | 7.46                | 7.84             | 4.41                 | 17.16               | 0.06             |
| General Office Building    | 14           | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| General Office Building    | 7            | N          | 3.53                | 3.31             | 4.28                 | 16.95               | 1.08             |
| Office Park                | 15           | N          | 3.75                | 2.6              | 4.8                  | 3.07                | 0                |
| Office Park                | 12           | N          | 6.86                | 4.79             | 4.25                 | 10.1                | 0.19             |
| Office Park                | 11           | N          | 6.86                | 4.79             | 4.25                 | 10.1                | 0.19             |
| Office Park                | 1            | N          | 1.69                | 2.42             | 4.19                 | 18.16               | 0                |
| Office Park                | 8            | N          | 6.59                | 5.6              | 4.98                 | 11.2                | 0.73             |
| Office Park                | 10           | N          | 3.75                | 2.6              | 4.8                  | 3.07                | 0                |
| Office Park                | 14           | N          | 1.69                | 2.42             | 4.19                 | 18.16               | 0                |
| Office Park                | 5            | N          | 5.22                | 4.81             | 3.95                 | 18.35               | 1.17             |
| Office Park                | 13           | N          | 7.16                | 6.01             | 4.43                 | 27                  | 6.68             |
| Office Park                | 4            | N          | 8.9                 | 8.4              | 4.4                  | 22.14               | 0.08             |
| Office Park                | 2            | N          | 3.66                | 4.35             | 3.64                 | 11.48               | 0                |
| Office Park                | 6            | N          | 7.05                | 6.47             | 4.54                 | 15.77               | 0.98             |
| Office Park                | 7            | N          | 4.84                | 3.76             | 5.75                 | 38.81               | 0.13             |
| Office Park                | 3            | N          | 4.37                | 4.49             | 4.09                 | 23.11               | 0.82             |
| Office Park                | 9            | N          | 6.86                | 4.79             | 4.25                 | 10.1                | 0.19             |
| Research & Development     | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Research & Development     | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Research & Development     | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Research & Development     | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Research & Development     | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Research & Development     | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Research & Development     | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Research & Development     | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Research & Development     | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Research & Development     | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Research & Development     | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Research & Development     | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Research & Development     | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Research & Development     | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Research & Development     | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Government Office Building | 1            | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| Government Office Building | 11           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Government Office Building | 13           | N          | 5.69                | 4.97             | 4.33                 | 16.83               | 4.2              |
| Government Office Building | 7            | N          | 3.53                | 3.31             | 4.28                 | 16.95               | 1.08             |
| Government Office Building | 12           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Government Office Building | 10           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| Government Office Building | 5            | N          | 5.01                | 4.8              | 4.07                 | 19.28               | 1.01             |
| Government Office Building | 14           | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| Government Office Building | 3            | N          | 3.2                 | 3.58             | 3.34                 | 13.44               | 0.28             |
| Government Office Building | 9            | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Government Office Building | 8            | N          | 5.76                | 4.94             | 4.92                 | 9.04                | 0.55             |
| Government Office Building | 4            | N          | 7.46                | 7.84             | 4.41                 | 17.16               | 0.06             |
| Government Office Building | 15           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| Government Office Building | 6            | N          | 6.08                | 5.75             | 4.21                 | 13.07               | 0.68             |
| Government Office Building | 2            | N          | 3.93                | 3.62             | 3.62                 | 16.83               | 0.47             |
| Government (Civic Center)  | 1            | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| Government (Civic Center)  | 6            | N          | 6.08                | 5.75             | 4.21                 | 13.07               | 0.68             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                  | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|------------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                    |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Government (Civic Center)          | 14           | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| Government (Civic Center)          | 13           | N          | 5.69                | 4.97             | 4.33                 | 16.83               | 4.2              |
| Government (Civic Center)          | 2            | N          | 3.93                | 3.62             | 3.62                 | 16.83               | 0.47             |
| Government (Civic Center)          | 15           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| Government (Civic Center)          | 12           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Government (Civic Center)          | 4            | N          | 7.46                | 7.84             | 4.41                 | 17.16               | 0.06             |
| Government (Civic Center)          | 9            | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Government (Civic Center)          | 8            | N          | 5.76                | 4.94             | 4.92                 | 9.04                | 0.55             |
| Government (Civic Center)          | 7            | N          | 3.53                | 3.31             | 4.28                 | 16.95               | 1.08             |
| Government (Civic Center)          | 10           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| Government (Civic Center)          | 11           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Government (Civic Center)          | 3            | N          | 3.2                 | 3.58             | 3.34                 | 13.44               | 0.28             |
| Government (Civic Center)          | 5            | N          | 5.01                | 4.8              | 4.07                 | 19.28               | 1.01             |
| Pharmacy/Drugstore with Drive Thru | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Pharmacy/Drugstore with Drive Thru | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Pharmacy/Drugstore with Drive Thru | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Pharmacy/Drugstore with Drive Thru | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Pharmacy/Drugstore with Drive Thru | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Pharmacy/Drugstore with Drive Thru | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Pharmacy/Drugstore with Drive Thru | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Pharmacy/Drugstore with Drive Thru | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Pharmacy/Drugstore with Drive Thru | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Pharmacy/Drugstore with Drive Thru | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Pharmacy/Drugstore with Drive Thru | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Pharmacy/Drugstore with Drive Thru | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Pharmacy/Drugstore with Drive Thru | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Pharmacy/Drugstore with Drive Thru | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Pharmacy/Drugstore with Drive Thru | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Pharmacy/Drugstore w/o Drive Thru  | 9            | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Pharmacy/Drugstore w/o Drive Thru  | 7            | N          | 3.86                | 2.49             | 5.12                 | 5.93                | 0.07             |
| Pharmacy/Drugstore w/o Drive Thru  | 4            | N          | 3.37                | 2.68             | 5.64                 | 2.49                | 0                |
| Pharmacy/Drugstore w/o Drive Thru  | 11           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Pharmacy/Drugstore w/o Drive Thru  | 10           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Pharmacy/Drugstore w/o Drive Thru  | 5            | N          | 2.74                | 3.36             | 5.51                 | 4.1                 | 0.7              |
| Pharmacy/Drugstore w/o Drive Thru  | 2            | N          | 4.76                | 1.98             | 6.65                 | 11.93               | 0.36             |
| Pharmacy/Drugstore w/o Drive Thru  | 6            | N          | 3.98                | 2.98             | 6.01                 | 4.72                | 0.93             |
| Pharmacy/Drugstore w/o Drive Thru  | 14           | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Pharmacy/Drugstore w/o Drive Thru  | 1            | N          | 6.12                | 2.81             | 6.41                 | 7.59                | 0                |
| Pharmacy/Drugstore w/o Drive Thru  | 12           | N          | 4.9                 | 3.23             | 7.04                 | 1.21                | 0.49             |
| Pharmacy/Drugstore w/o Drive Thru  | 8            | N          | 3.58                | 2.8              | 6.42                 | 1                   | 1.05             |
| Pharmacy/Drugstore w/o Drive Thru  | 13           | N          | 3.89                | 3.16             | 6.99                 | 1.2                 | 1.09             |
| Pharmacy/Drugstore w/o Drive Thru  | 15           | N          | 5.6                 | 2.44             | 7.62                 | 2.02                | 0.3              |
| Pharmacy/Drugstore w/o Drive Thru  | 3            | N          | 2.61                | 2.3              | 4.22                 | 9.07                | 2.08             |
| Medical Office Building            | 2            | N          | 3.93                | 3.62             | 3.62                 | 16.83               | 0.47             |
| Medical Office Building            | 13           | N          | 5.69                | 4.97             | 4.33                 | 16.83               | 4.2              |
| Medical Office Building            | 1            | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| Medical Office Building            | 9            | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Medical Office Building            | 4            | N          | 7.46                | 7.84             | 4.41                 | 17.16               | 0.06             |
| Medical Office Building            | 11           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Medical Office Building            | 15           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| Medical Office Building            | 12           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Medical Office Building            | 10           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| Medical Office Building            | 7            | N          | 3.53                | 3.31             | 4.28                 | 16.95               | 1.08             |
| Medical Office Building            | 3            | N          | 3.2                 | 3.58             | 3.34                 | 13.44               | 0.28             |
| Medical Office Building            | 6            | N          | 6.08                | 5.75             | 4.21                 | 13.07               | 0.68             |
| Medical Office Building            | 5            | N          | 5.01                | 4.8              | 4.07                 | 19.28               | 1.01             |
| Medical Office Building            | 14           | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| Medical Office Building            | 8            | N          | 5.76                | 4.94             | 4.92                 | 9.04                | 0.55             |
| Hospital                           | 7            | N          | 4.36                | 4.96             | 4.24                 | 24.73               | 1.9              |
| Hospital                           | 12           | N          | 10.44               | 7.55             | 5.6                  | 55.22               | 9.82             |
| Hospital                           | 9            | N          | 10.44               | 7.55             | 5.6                  | 55.22               | 9.82             |
| Hospital                           | 8            | N          | 7.35                | 4.33             | 4.76                 | 51.4                | 9.03             |
| Hospital                           | 2            | N          | 5.69                | 5.64             | 4.79                 | 60.86               | 23.87            |
| Hospital                           | 1            | N          | 4.52                | 5.35             | 3.65                 | 9.23                | 0                |
| Hospital                           | 4            | N          | 9.49                | 6.46             | 5.09                 | 93.82               | 16.57            |
| Hospital                           | 10           | N          | 8.75                | 5.56             | 4.79                 | 69.84               | 6.03             |
| Hospital                           | 5            | N          | 6.78                | 5.52             | 4.48                 | 85.32               | 15.8             |
| Hospital                           | 3            | N          | 5.86                | 3.96             | 3.89                 | 34.95               | 7.64             |
| Hospital                           | 15           | N          | 8.75                | 5.56             | 4.79                 | 69.84               | 6.03             |
| Hospital                           | 11           | N          | 10.44               | 7.55             | 5.6                  | 55.22               | 9.82             |



Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                  |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Hospital                         | 14           | N          | 4.52                | 5.35             | 3.65                 | 9.23                | 0                |
| Hospital                         | 6            | N          | 9.62                | 6.17             | 5.24                 | 58.2                | 9.61             |
| Hospital                         | 13           | N          | 6.68                | 5.87             | 4.76                 | 51.31               | 6.92             |
| Unrefrigerated Warehouse-No Rail | 9            | N          | 0.79                | 1.34             | 2.23                 | 0.88                | 0.03             |
| Unrefrigerated Warehouse-No Rail | 14           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-No Rail | 7            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-No Rail | 15           | N          | 0.45                | 0.82             | 1.75                 | 2.11                | 0.03             |
| Unrefrigerated Warehouse-No Rail | 8            | N          | 0.72                | 1.61             | 2.16                 | 4.08                | 0.05             |
| Unrefrigerated Warehouse-No Rail | 4            | N          | 0.39                | 1.07             | 2.39                 | 3.58                | 0.07             |
| Unrefrigerated Warehouse-No Rail | 1            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-No Rail | 11           | N          | 0.79                | 1.34             | 2.23                 | 0.88                | 0.03             |
| Unrefrigerated Warehouse-No Rail | 6            | N          | 0.32                | 1.36             | 1.76                 | 0.52                | 0                |
| Unrefrigerated Warehouse-No Rail | 3            | N          | 1.27                | 5.13             | 3.67                 | 17.92               | 1.05             |
| Unrefrigerated Warehouse-No Rail | 2            | N          | 0.61                | 1.77             | 2.7                  | 6.43                | 0                |
| Unrefrigerated Warehouse-No Rail | 13           | N          | 1.07                | 1.11             | 1.95                 | 1.64                | 0.11             |
| Unrefrigerated Warehouse-No Rail | 10           | N          | 0.45                | 0.82             | 1.75                 | 2.11                | 0.03             |
| Unrefrigerated Warehouse-No Rail | 12           | N          | 0.79                | 1.34             | 2.23                 | 0.88                | 0.03             |
| Unrefrigerated Warehouse-No Rail | 5            | N          | 0.29                | 1.38             | 2.52                 | 1.24                | 0.21             |
| Refrigerated Warehouse-Rail      | 15           | N          | 1.3                 | 36.52            | 3.4                  | 3.42                | 48.51            |
| Refrigerated Warehouse-Rail      | 10           | N          | 1.3                 | 36.52            | 3.4                  | 3.42                | 48.51            |
| Refrigerated Warehouse-Rail      | 5            | N          | 1.03                | 20.65            | 2.71                 | 5.18                | 12.77            |
| Refrigerated Warehouse-Rail      | 2            | N          | 0.44                | 15.28            | 3.55                 | 1.2                 | 0                |
| Refrigerated Warehouse-Rail      | 13           | N          | 2.53                | 27.88            | 4.1                  | 6.68                | 0.02             |
| Refrigerated Warehouse-Rail      | 6            | N          | 0.56                | 13.7             | 2.17                 | 0.87                | 0.63             |
| Refrigerated Warehouse-Rail      | 8            | N          | 0.36                | 19.26            | 3.02                 | 0.9                 | 0.06             |
| Refrigerated Warehouse-Rail      | 9            | N          | 0.51                | 13.61            | 3.14                 | 0.99                | 0.09             |
| Refrigerated Warehouse-Rail      | 11           | N          | 0.51                | 13.61            | 3.14                 | 0.99                | 0.09             |
| Refrigerated Warehouse-Rail      | 3            | N          | 0.58                | 21.99            | 2.82                 | 0.16                | 0                |
| Refrigerated Warehouse-Rail      | 1            | N          | 0.27                | 11.15            | 2.77                 | 0                   | 0                |
| Refrigerated Warehouse-Rail      | 4            | N          | 0.17                | 7.99             | 1.7                  | 0.77                | 3.06             |
| Refrigerated Warehouse-Rail      | 14           | N          | 0.27                | 11.15            | 2.77                 | 0                   | 0                |
| Refrigerated Warehouse-Rail      | 12           | N          | 0.51                | 13.61            | 3.14                 | 0.99                | 0.09             |
| Refrigerated Warehouse-Rail      | 7            | N          | 0.7                 | 26.24            | 2.46                 | 5.56                | 3.1              |
| General Light Industry           | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| General Light Industry           | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| General Light Industry           | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| General Light Industry           | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| General Light Industry           | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| General Light Industry           | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| General Light Industry           | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| General Light Industry           | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| General Light Industry           | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| General Light Industry           | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| General Light Industry           | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| General Light Industry           | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| General Light Industry           | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| General Light Industry           | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| General Light Industry           | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| General Heavy Industry           | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| General Heavy Industry           | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| General Heavy Industry           | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| General Heavy Industry           | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| General Heavy Industry           | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| General Heavy Industry           | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| General Heavy Industry           | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| General Heavy Industry           | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| General Heavy Industry           | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| General Heavy Industry           | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| General Heavy Industry           | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| General Heavy Industry           | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| General Heavy Industry           | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| General Heavy Industry           | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| General Heavy Industry           | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Industrial Park                  | 11           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Industrial Park                  | 8            | N          | 5.76                | 4.94             | 4.92                 | 9.04                | 0.55             |
| Industrial Park                  | 7            | N          | 3.53                | 3.31             | 4.28                 | 16.95               | 1.08             |
| Industrial Park                  | 10           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| Industrial Park                  | 14           | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| Industrial Park                  | 15           | N          | 3.75                | 2.79             | 4.15                 | 3.65                | 0                |
| Industrial Park                  | 3            | N          | 3.2                 | 3.58             | 3.34                 | 13.44               | 0.28             |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type                 | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-----------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                   |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Industrial Park                   | 13           | N          | 5.69                | 4.97             | 4.33                 | 16.83               | 4.2              |
| Industrial Park                   | 6            | N          | 6.08                | 5.75             | 4.21                 | 13.07               | 0.68             |
| Industrial Park                   | 1            | N          | 4.44                | 3.98             | 3.93                 | 20.56               | 0                |
| Industrial Park                   | 2            | N          | 3.93                | 3.62             | 3.62                 | 16.83               | 0.47             |
| Industrial Park                   | 12           | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Industrial Park                   | 5            | N          | 5.01                | 4.8              | 4.07                 | 19.28               | 1.01             |
| Industrial Park                   | 4            | N          | 7.46                | 7.84             | 4.41                 | 17.16               | 0.06             |
| Industrial Park                   | 9            | N          | 5.62                | 4.62             | 4.29                 | 10.54               | 0.39             |
| Manufacturing                     | 13           | N          | 1.48                | 4.27             | 3.25                 | 4.54                | 7.25             |
| Manufacturing                     | 14           | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Manufacturing                     | 4            | N          | 1.81                | 3.7              | 3.52                 | 20.74               | 6.67             |
| Manufacturing                     | 3            | N          | 2.39                | 4.16             | 3.11                 | 17.92               | 3.84             |
| Manufacturing                     | 10           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Manufacturing                     | 7            | N          | 0.49                | 1.31             | 0.84                 | 17.55               | 0.12             |
| Manufacturing                     | 8            | N          | 1.99                | 3.83             | 3.42                 | 14.78               | 6.86             |
| Manufacturing                     | 5            | N          | 1.48                | 3.36             | 3.43                 | 18.78               | 6.9              |
| Manufacturing                     | 1            | N          | 0.76                | 1.85             | 2.12                 | 3.37                | 0.31             |
| Manufacturing                     | 11           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Manufacturing                     | 9            | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Manufacturing                     | 2            | N          | 2.02                | 4.2              | 3.01                 | 19.55               | 0.06             |
| Manufacturing                     | 6            | N          | 4.17                | 7.2              | 5.19                 | 24.61               | 12.42            |
| Manufacturing                     | 15           | N          | 2.69                | 5.02             | 3.36                 | 16.16               | 17.13            |
| Manufacturing                     | 12           | N          | 2.75                | 5.75             | 3.55                 | 14.36               | 4.45             |
| Condo/Townhouse High Rise         | 14           | N          | 496.55158           | 3125.85          | 1001.1               | 3925.90832          | 2951             |
| Condo/Townhouse High Rise         | 15           | N          | 749.55357           | 3125.85          | 1001.1               | 17654.5297          | 2951             |
| Condo/Townhouse High Rise         | 1            | Y          | 618.37059           | 3125.85          | 1001.1               | 4221.4068           | 2951             |
| Condo/Townhouse High Rise         | 2            | Y          | 375.02537           | 3125.85          | 1001.1               | 20387.955           | 2951             |
| Condo/Townhouse High Rise         | 3            | Y          | 671.81479           | 3125.85          | 1001.1               | 16254.6417          | 2951             |
| Condo/Townhouse High Rise         | 4            | Y          | 229.45427           | 3125.85          | 1001.1               | 17767.3209          | 2951             |
| Condo/Townhouse High Rise         | 5            | Y          | 169.04567           | 3125.85          | 1001.1               | 22944.3441          | 2951             |
| Condo/Townhouse High Rise         | 6            | Y          | 375.02537           | 3125.85          | 1001.1               | 20387.955           | 2951             |
| Condo/Townhouse High Rise         | 7            | Y          | 551.08843           | 3125.85          | 1001.1               | 8415.55941          | 2951             |
| Condo/Townhouse High Rise         | 8            | Y          | 245.59351           | 3126.32          | 1001.1               | 13843.1981          | 2951             |
| Condo/Townhouse High Rise         | 9            | Y          | 336.00202           | 3126.97          | 1001.1               | 12317.2416          | 2951             |
| Condo/Townhouse High Rise         | 10           | Y          | 933.44156           | 3125.85          | 1001.1               | 18983.3653          | 2951             |
| Condo/Townhouse High Rise         | 11           | Y          | 286.69104           | 3125.85          | 1001.1               | 15240.4453          | 3046.55          |
| Condo/Townhouse High Rise         | 12           | Y          | 336.31996           | 3125.85          | 1001.1               | 11138.9384          | 2974.44          |
| Condo/Townhouse High Rise         | 13           | Y          | 257.39514           | 3126.41          | 1001.1               | 11601.5936          | 3001.57          |
| Condo/Townhouse High Rise         | 14           | Y          | 618.37059           | 3125.85          | 1001.1               | 4221.4068           | 2951             |
| Condo/Townhouse High Rise         | 15           | Y          | 933.44156           | 3125.85          | 1001.1               | 18983.3653          | 2951             |
| Congregate Care (Assisted Living) | 1            | N          | 222.68138           | 2557.38          | 741.44               | 2693.04485          | 1662             |
| Congregate Care (Assisted Living) | 2            | N          | 322.47557           | 2554.47          | 741.44               | 8261.24759          | 1716.22          |
| Congregate Care (Assisted Living) | 3            | N          | 427.66156           | 2553.86          | 741.44               | 9942.80422          | 1662             |
| Congregate Care (Assisted Living) | 4            | N          | 226.56568           | 2558.55          | 741.44               | 6391.63527          | 1735.98          |
| Congregate Care (Assisted Living) | 5            | N          | 312.05058           | 2561.86          | 741.44               | 7191.66571          | 1662             |
| Congregate Care (Assisted Living) | 6            | N          | 322.47557           | 2554.47          | 741.44               | 8261.24759          | 1716.22          |
| Congregate Care (Assisted Living) | 7            | N          | 527.22475           | 2553.86          | 741.44               | 12726.3372          | 1704.22          |
| Congregate Care (Assisted Living) | 8            | N          | 181.82029           | 2555.58          | 741.44               | 6951.79613          | 1662             |
| Congregate Care (Assisted Living) | 9            | N          | 246.65582           | 2553.86          | 741.44               | 8201.58595          | 1718.92          |
| Congregate Care (Assisted Living) | 10           | N          | 559.53918           | 2553.86          | 741.44               | 10214.6057          | 1779.14          |
| Congregate Care (Assisted Living) | 11           | N          | 185.96598           | 2553.86          | 741.44               | 5157.79965          | 1662             |
| Congregate Care (Assisted Living) | 12           | N          | 267.11675           | 2553.86          | 741.44               | 5523.82106          | 1662             |
| Congregate Care (Assisted Living) | 13           | N          | 160.76972           | 2553.86          | 741.44               | 3820.46951          | 1662             |
| Congregate Care (Assisted Living) | 14           | N          | 222.68138           | 2557.38          | 741.44               | 2693.04485          | 1662             |
| Congregate Care (Assisted Living) | 15           | N          | 559.53918           | 2553.86          | 741.44               | 10214.6057          | 1779.14          |
| Congregate Care (Assisted Living) | 1            | Y          | 277.31181           | 2557.38          | 741.44               | 2895.74715          | 1662             |
| Congregate Care (Assisted Living) | 2            | Y          | 401.5885            | 2554.47          | 741.44               | 8883.06192          | 1716.22          |
| Congregate Care (Assisted Living) | 3            | Y          | 532.57978           | 2553.86          | 741.44               | 10691.1873          | 1662             |
| Congregate Care (Assisted Living) | 4            | Y          | 282.14904           | 2558.55          | 741.44               | 6872.7261           | 1735.98          |
| Congregate Care (Assisted Living) | 5            | Y          | 388.60595           | 2561.86          | 741.44               | 7732.97388          | 1662             |
| Congregate Care (Assisted Living) | 6            | Y          | 401.5885            | 2554.47          | 741.44               | 8883.06192          | 1716.22          |
| Congregate Care (Assisted Living) | 7            | Y          | 656.56881           | 2553.86          | 741.44               | 13684.2335          | 1704.22          |
| Congregate Care (Assisted Living) | 8            | Y          | 226.42627           | 2555.58          | 741.44               | 7475.0496           | 1662             |
| Congregate Care (Assisted Living) | 9            | Y          | 307.16789           | 2553.86          | 741.44               | 8818.90962          | 1718.92          |
| Congregate Care (Assisted Living) | 10           | Y          | 696.81093           | 2553.86          | 741.44               | 10983.447           | 1779.14          |
| Congregate Care (Assisted Living) | 11           | Y          | 231.58901           | 2553.86          | 741.44               | 5546.02113          | 1662             |
| Congregate Care (Assisted Living) | 12           | Y          | 332.64851           | 2553.86          | 741.44               | 5939.59254          | 1662             |
| Congregate Care (Assisted Living) | 13           | Y          | 200.21136           | 2553.86          | 741.44               | 4108.03173          | 1662             |
| Congregate Care (Assisted Living) | 14           | Y          | 277.31181           | 2557.38          | 741.44               | 2895.74715          | 1662             |
| Congregate Care (Assisted Living) | 15           | Y          | 696.81093           | 2553.86          | 741.44               | 10983.447           | 1779.14          |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type     | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|-----------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                       |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Mobile Home Park      | 1            | N          | 480.74694           | 3335.73          | 1038.6               | 2863.53131          | 2103             |
| Mobile Home Park      | 2            | N          | 606.97135           | 3321.27          | 1038.6               | 5302.07733          | 2103             |
| Mobile Home Park      | 3            | N          | 774.68296           | 3329.98          | 1038.6               | 13980.9093          | 2174.22          |
| Mobile Home Park      | 4            | N          | 539.06608           | 3321.27          | 1038.6               | 14688.2957          | 2103             |
| Mobile Home Park      | 5            | N          | 407.38299           | 3321.27          | 1038.6               | 21018.0271          | 2103             |
| Mobile Home Park      | 6            | N          | 606.97135           | 3321.27          | 1038.6               | 5302.07733          | 2103             |
| Mobile Home Park      | 7            | N          | 661.04148           | 3322.99          | 1038.6               | 16212.4977          | 2342.76          |
| Mobile Home Park      | 8            | N          | 601.84092           | 3321.27          | 1038.6               | 17150.2516          | 2103             |
| Mobile Home Park      | 9            | N          | 535.98418           | 3321.27          | 1038.6               | 12298.7177          | 2103             |
| Mobile Home Park      | 10           | N          | 973.13461           | 3321.27          | 1038.6               | 19139.9163          | 2103             |
| Mobile Home Park      | 11           | N          | 509.37158           | 3321.27          | 1038.6               | 1972.5502           | 2103             |
| Mobile Home Park      | 12           | N          | 770.28197           | 3321.27          | 1038.6               | 25019.4729          | 2103             |
| Mobile Home Park      | 13           | N          | 662.99274           | 3321.27          | 1038.6               | 20078.0309          | 2103             |
| Mobile Home Park      | 14           | N          | 480.74694           | 3335.73          | 1038.6               | 2863.53131          | 2103             |
| Mobile Home Park      | 15           | N          | 973.13461           | 3321.27          | 1038.6               | 19139.9163          | 2103             |
| Mobile Home Park      | 1            | Y          | 598.68859           | 3335.73          | 1038.6               | 3079.06593          | 2103             |
| Mobile Home Park      | 2            | Y          | 755.87964           | 3321.27          | 1038.6               | 5701.15842          | 2103             |
| Mobile Home Park      | 3            | Y          | 964.73594           | 3329.98          | 1038.6               | 15033.2359          | 2174.22          |
| Mobile Home Park      | 4            | Y          | 671.31517           | 3321.27          | 1038.6               | 15793.8663          | 2103             |
| Mobile Home Park      | 5            | Y          | 507.32626           | 3321.27          | 1038.6               | 22600.0292          | 2103             |
| Mobile Home Park      | 6            | Y          | 755.87964           | 3321.27          | 1038.6               | 5701.15842          | 2103             |
| Mobile Home Park      | 7            | Y          | 823.21479           | 3322.99          | 1038.6               | 17432.7932          | 2342.76          |
| Mobile Home Park      | 8            | Y          | 749.49056           | 3321.27          | 1038.6               | 18441.1308          | 2103             |
| Mobile Home Park      | 9            | Y          | 667.47718           | 3321.27          | 1038.6               | 13224.4276          | 2103             |
| Mobile Home Park      | 10           | Y          | 1211.8737           | 3321.27          | 1038.6               | 20580.5552          | 2103             |
| Mobile Home Park      | 11           | Y          | 634.33572           | 3321.27          | 1038.6               | 2121.02172          | 2103             |
| Mobile Home Park      | 12           | Y          | 959.25526           | 3321.27          | 1038.6               | 26902.659           | 2103             |
| Mobile Home Park      | 13           | Y          | 825.64476           | 3321.27          | 1038.6               | 21589.2806          | 2103             |
| Mobile Home Park      | 14           | Y          | 598.68859           | 3335.73          | 1038.6               | 3079.06593          | 2103             |
| Mobile Home Park      | 15           | Y          | 1211.8737           | 3321.27          | 1038.6               | 20580.5552          | 2103             |
| Retirement Community  | 1            | N          | 496.55158           | 3125.85          | 1001.1               | 3925.90832          | 2951             |
| Retirement Community  | 2            | N          | 301.14537           | 3125.85          | 1001.1               | 18960.7982          | 2951             |
| Retirement Community  | 3            | N          | 539.46728           | 3125.85          | 1001.1               | 15116.8168          | 2951             |
| Retirement Community  | 4            | N          | 184.25178           | 3125.85          | 1001.1               | 16523.6084          | 2951             |
| Retirement Community  | 5            | N          | 135.74367           | 3125.85          | 1001.1               | 21338.24            | 2951             |
| Retirement Community  | 6            | N          | 301.14537           | 3125.85          | 1001.1               | 18960.7982          | 2951             |
| Retirement Community  | 7            | N          | 442.52401           | 3125.85          | 1001.1               | 7826.47025          | 2951             |
| Retirement Community  | 8            | N          | 197.21159           | 3126.32          | 1001.1               | 12874.1742          | 2951             |
| Retirement Community  | 9            | N          | 269.80962           | 3126.97          | 1001.1               | 11455.0347          | 2951             |
| Retirement Community  | 10           | N          | 749.55357           | 3125.85          | 1001.1               | 17654.5297          | 2951             |
| Retirement Community  | 11           | N          | 230.21291           | 3125.85          | 1001.1               | 14173.6141          | 3046.55          |
| Retirement Community  | 12           | N          | 270.06493           | 3125.85          | 1001.1               | 10359.2127          | 2974.44          |
| Retirement Community  | 13           | N          | 206.6883            | 3126.41          | 1001.1               | 10789.4821          | 3001.57          |
| Retirement Community  | 14           | N          | 496.55158           | 3125.85          | 1001.1               | 3925.90832          | 2951             |
| Retirement Community  | 15           | N          | 749.55357           | 3125.85          | 1001.1               | 17654.5297          | 2951             |
| Retirement Community  | 1            | Y          | 618.37059           | 3125.85          | 1001.1               | 4221.4068           | 2951             |
| Retirement Community  | 2            | Y          | 375.02537           | 3125.85          | 1001.1               | 20387.955           | 2951             |
| Retirement Community  | 3            | Y          | 671.81479           | 3125.85          | 1001.1               | 16254.6417          | 2951             |
| Retirement Community  | 4            | Y          | 229.45427           | 3125.85          | 1001.1               | 17767.3209          | 2951             |
| Retirement Community  | 5            | Y          | 169.04567           | 3125.85          | 1001.1               | 22944.3441          | 2951             |
| Retirement Community  | 6            | Y          | 375.02537           | 3125.85          | 1001.1               | 20387.955           | 2951             |
| Retirement Community  | 7            | Y          | 551.08843           | 3125.85          | 1001.1               | 8415.55941          | 2951             |
| Retirement Community  | 8            | Y          | 245.59351           | 3126.32          | 1001.1               | 13843.1981          | 2951             |
| Retirement Community  | 9            | Y          | 336.00202           | 3126.97          | 1001.1               | 12317.2416          | 2951             |
| Retirement Community  | 10           | Y          | 933.44156           | 3125.85          | 1001.1               | 18983.3653          | 2951             |
| Retirement Community  | 11           | Y          | 286.69104           | 3125.85          | 1001.1               | 15240.4453          | 3046.55          |
| Retirement Community  | 12           | Y          | 336.31996           | 3125.85          | 1001.1               | 11138.9384          | 2974.44          |
| Retirement Community  | 13           | Y          | 257.39514           | 3126.41          | 1001.1               | 11601.5936          | 3001.57          |
| Retirement Community  | 14           | Y          | 618.37059           | 3125.85          | 1001.1               | 4221.4068           | 2951             |
| Retirement Community  | 15           | Y          | 933.44156           | 3125.85          | 1001.1               | 18983.3653          | 2951             |
| Single Family Housing | 1            | N          | 530.64278           | 5105.81          | 1608.84              | 11663.1811          | 6168.12          |
| Single Family Housing | 2            | N          | 729.62065           | 5098.84          | 1608.84              | 26218.0119          | 5933.76          |
| Single Family Housing | 3            | N          | 960.8853            | 5093.98          | 1608.84              | 25333.3292          | 6005.2           |
| Single Family Housing | 4            | N          | 368.61369           | 5095.49          | 1608.84              | 29406.1009          | 5876.86          |
| Single Family Housing | 5            | N          | 248.69134           | 5096.44          | 1608.84              | 44827.0822          | 6192.92          |
| Single Family Housing | 6            | N          | 729.62065           | 5098.84          | 1608.84              | 26218.0119          | 5933.76          |
| Single Family Housing | 7            | N          | 763.79827           | 5099.35          | 1608.84              | 23622.3144          | 6069.6           |
| Single Family Housing | 8            | N          | 391.01854           | 5089.81          | 1608.84              | 23064.5017          | 5819             |
| Single Family Housing | 9            | N          | 596.09668           | 5089.81          | 1608.84              | 23944.0203          | 5856.92          |
| Single Family Housing | 10           | N          | 980.99015           | 5089.81          | 1608.84              | 27816.7755          | 5950.14          |

Table 8.1 Energy Use by Climate Zone and Land Use Type

| Land Use Sub Type              | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|--------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Single Family Housing          | 11           | N          | 361.41612           | 5089.81          | 1608.84              | 25765.9342          | 5819             |
| Single Family Housing          | 12           | N          | 753.66835           | 5089.81          | 1608.84              | 26767.5955          | 5819             |
| Single Family Housing          | 13           | N          | 425.61773           | 5089.81          | 1608.84              | 21834.4924          | 5819             |
| Single Family Housing          | 14           | N          | 530.64278           | 5105.81          | 1608.84              | 11663.1811          | 6168.12          |
| Single Family Housing          | 15           | N          | 980.99015           | 5089.81          | 1608.84              | 27816.7755          | 5950.14          |
| Single Family Housing          | 1            | Y          | 686.4719            | 5105.81          | 1608.84              | 12959.0901          | 6168.12          |
| Single Family Housing          | 2            | Y          | 943.88182           | 5098.84          | 1608.84              | 29131.1243          | 5933.76          |
| Single Family Housing          | 3            | Y          | 1243.0599           | 5093.98          | 1608.84              | 28148.1435          | 6005.2           |
| Single Family Housing          | 4            | Y          | 476.86118           | 5095.49          | 1608.84              | 32673.4454          | 5876.86          |
| Single Family Housing          | 5            | Y          | 321.7223            | 5096.44          | 1608.84              | 49807.8691          | 6192.92          |
| Single Family Housing          | 6            | Y          | 943.88182           | 5098.84          | 1608.84              | 29131.1243          | 5933.76          |
| Single Family Housing          | 7            | Y          | 988.09608           | 5099.35          | 1608.84              | 26247.0161          | 6069.6           |
| Single Family Housing          | 8            | Y          | 505.84546           | 5089.81          | 1608.84              | 25627.2242          | 5819             |
| Single Family Housing          | 9            | Y          | 771.14706           | 5089.81          | 1608.84              | 26604.467           | 5856.92          |
| Single Family Housing          | 10           | Y          | 1269.0688           | 5089.81          | 1608.84              | 30907.5283          | 5950.14          |
| Single Family Housing          | 11           | Y          | 467.54996           | 5089.81          | 1608.84              | 28628.8158          | 5819             |
| Single Family Housing          | 12           | Y          | 974.9914            | 5089.81          | 1608.84              | 29741.7728          | 5819             |
| Single Family Housing          | 13           | Y          | 550.60508           | 5089.81          | 1608.84              | 24260.5471          | 5819             |
| Single Family Housing          | 14           | Y          | 686.4719            | 5105.81          | 1608.84              | 12959.0901          | 6168.12          |
| Single Family Housing          | 15           | Y          | 1269.0688           | 5089.81          | 1608.84              | 30907.5283          | 5950.14          |
| Unrefrigerated Warehouse-Rail  | 7            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-Rail  | 10           | Y          | 0.48                | 0.82             | 1.88                 | 2.48                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 13           | Y          | 1.13                | 1.11             | 2.09                 | 1.91                | 0.11             |
| Unrefrigerated Warehouse-Rail  | 2            | Y          | 0.65                | 1.77             | 2.89                 | 7.64                | 0                |
| Unrefrigerated Warehouse-Rail  | 3            | Y          | 1.36                | 5.13             | 3.94                 | 17.98               | 1.05             |
| Unrefrigerated Warehouse-Rail  | 6            | Y          | 0.38                | 1.36             | 1.88                 | 0.62                | 0                |
| Unrefrigerated Warehouse-Rail  | 11           | Y          | 0.85                | 1.34             | 2.38                 | 1.01                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 1            | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-Rail  | 4            | Y          | 0.42                | 1.07             | 2.57                 | 4.2                 | 0.07             |
| Unrefrigerated Warehouse-Rail  | 9            | Y          | 0.85                | 1.34             | 2.38                 | 1.01                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 15           | Y          | 0.48                | 0.82             | 1.88                 | 2.48                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 14           | Y          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-Rail  | 9            | N          | 0.79                | 1.34             | 2.23                 | 0.88                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 12           | Y          | 0.85                | 1.34             | 2.38                 | 1.01                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 8            | Y          | 0.77                | 1.61             | 2.3                  | 4.83                | 0.05             |
| Unrefrigerated Warehouse-Rail  | 5            | Y          | 0.31                | 1.38             | 2.69                 | 1.43                | 0.21             |
| Unrefrigerated Warehouse-Rail  | 5            | N          | 0.29                | 1.38             | 2.52                 | 1.24                | 0.21             |
| Unrefrigerated Warehouse-Rail  | 12           | N          | 0.79                | 1.34             | 2.23                 | 0.88                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 10           | N          | 0.45                | 0.82             | 1.75                 | 2.11                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 13           | N          | 1.07                | 1.11             | 1.95                 | 1.64                | 0.11             |
| Unrefrigerated Warehouse-Rail  | 2            | N          | 0.61                | 1.77             | 2.7                  | 6.43                | 0                |
| Unrefrigerated Warehouse-Rail  | 3            | N          | 1.27                | 5.13             | 3.67                 | 17.92               | 1.05             |
| Unrefrigerated Warehouse-Rail  | 6            | N          | 0.32                | 1.36             | 1.76                 | 0.52                | 0                |
| Unrefrigerated Warehouse-Rail  | 11           | N          | 0.79                | 1.34             | 2.23                 | 0.88                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 1            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-Rail  | 4            | N          | 0.39                | 1.07             | 2.39                 | 3.58                | 0.07             |
| Unrefrigerated Warehouse-Rail  | 8            | N          | 0.72                | 1.61             | 2.16                 | 4.08                | 0.05             |
| Unrefrigerated Warehouse-Rail  | 15           | N          | 0.45                | 0.82             | 1.75                 | 2.11                | 0.03             |
| Unrefrigerated Warehouse-Rail  | 14           | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Unrefrigerated Warehouse-Rail  | 7            | N          | 0                   | 0                | 0                    | 0                   | 0                |
| Refrigerated Warehouse-No Rail | 12           | Y          | 0.55                | 13.61            | 3.35                 | 1.08                | 0.09             |
| Refrigerated Warehouse-No Rail | 15           | Y          | 1.41                | 36.52            | 3.63                 | 3.42                | 48.51            |
| Refrigerated Warehouse-No Rail | 10           | Y          | 1.41                | 36.52            | 3.63                 | 3.42                | 48.51            |
| Refrigerated Warehouse-No Rail | 5            | Y          | 1.08                | 20.65            | 2.89                 | 5.79                | 12.77            |
| Refrigerated Warehouse-No Rail | 2            | Y          | 0.46                | 15.28            | 3.8                  | 1.32                | 0                |
| Refrigerated Warehouse-No Rail | 13           | Y          | 2.64                | 27.88            | 4.39                 | 7.02                | 0.02             |
| Refrigerated Warehouse-No Rail | 6            | Y          | 0.63                | 13.7             | 2.33                 | 0.93                | 0.63             |
| Refrigerated Warehouse-No Rail | 8            | Y          | 0.38                | 19.26            | 3.22                 | 0.96                | 0.06             |
| Refrigerated Warehouse-No Rail | 9            | Y          | 0.55                | 13.61            | 3.35                 | 1.08                | 0.09             |
| Refrigerated Warehouse-No Rail | 11           | Y          | 0.55                | 13.61            | 3.35                 | 1.08                | 0.09             |
| Refrigerated Warehouse-No Rail | 3            | Y          | 0.61                | 21.99            | 3.04                 | 0.19                | 0                |
| Refrigerated Warehouse-No Rail | 1            | Y          | 0.28                | 11.15            | 2.96                 | 0                   | 0                |
| Refrigerated Warehouse-No Rail | 14           | Y          | 0.28                | 11.15            | 2.96                 | 0                   | 0                |
| Refrigerated Warehouse-No Rail | 7            | Y          | 0.72                | 26.24            | 2.64                 | 6.54                | 3.1              |
| Refrigerated Warehouse-No Rail | 4            | Y          | 0.19                | 7.99             | 1.82                 | 0.8                 | 3.06             |
| Refrigerated Warehouse-No Rail | 5            | N          | 1.03                | 20.65            | 2.71                 | 5.18                | 12.77            |
| Refrigerated Warehouse-No Rail | 7            | N          | 0.7                 | 26.24            | 2.46                 | 5.56                | 3.1              |
| Refrigerated Warehouse-No Rail | 10           | N          | 1.3                 | 36.52            | 3.4                  | 3.42                | 48.51            |
| Refrigerated Warehouse-No Rail | 2            | N          | 0.44                | 15.28            | 3.55                 | 1.2                 | 0                |
| Refrigerated Warehouse-No Rail | 13           | N          | 2.53                | 27.88            | 4.1                  | 6.68                | 0.02             |

**Table 8.1 Energy Use by Climate Zone and Land Use Type**

| Land Use Sub Type              | Climate Zone | Historical | T24 Electricity     | NT24 Electricity | Lighting Electricity | T24 Natural Gas     | NT24 Natural Gas |
|--------------------------------|--------------|------------|---------------------|------------------|----------------------|---------------------|------------------|
|                                |              |            | KWhr per DU or SQFT |                  |                      | kBtu per DU or SQFT |                  |
| Refrigerated Warehouse-No Rail | 6            | N          | 0.56                | 13.7             | 2.17                 | 0.87                | 0.63             |
| Refrigerated Warehouse-No Rail | 8            | N          | 0.36                | 19.26            | 3.02                 | 0.9                 | 0.06             |
| Refrigerated Warehouse-No Rail | 9            | N          | 0.51                | 13.61            | 3.14                 | 0.99                | 0.09             |
| Refrigerated Warehouse-No Rail | 3            | N          | 0.58                | 21.99            | 2.82                 | 0.16                | 0                |
| Refrigerated Warehouse-No Rail | 1            | N          | 0.27                | 11.15            | 2.77                 | 0                   | 0                |
| Refrigerated Warehouse-No Rail | 4            | N          | 0.17                | 7.99             | 1.7                  | 0.77                | 3.06             |
| Refrigerated Warehouse-No Rail | 14           | N          | 0.27                | 11.15            | 2.77                 | 0                   | 0                |
| Refrigerated Warehouse-No Rail | 12           | N          | 0.51                | 13.61            | 3.14                 | 0.99                | 0.09             |
| Refrigerated Warehouse-No Rail | 11           | N          | 0.51                | 13.61            | 3.14                 | 0.99                | 0.09             |
| Refrigerated Warehouse-No Rail | 15           | N          | 1.3                 | 36.52            | 3.4                  | 3.42                | 48.51            |

**Table 8.2 Natural Gas Emission Factors**

| Land Use Type  | TOG,<br>lb/MMBTU | ROG,<br>lb/MMBTU | SO <sub>2</sub> ,<br>lb/MMBTU | NOX,<br>lb/MMBTU | PB,<br>lb/MMBTU | PM <sub>10</sub> ,<br>lb/MMBTU | PM <sub>2.5</sub> ,<br>lb/MMBTU | CO,<br>lb/MMBTU | CO <sub>2</sub> _NBIO,<br>lb/MMBTU | CH <sub>4</sub> ,<br>lb/MMBTU | N <sub>2</sub> O,<br>lb/MMBTU |
|----------------|------------------|------------------|-------------------------------|------------------|-----------------|--------------------------------|---------------------------------|-----------------|------------------------------------|-------------------------------|-------------------------------|
| Residential    | 0.01078431       | 0.01078431       | 0.00058824                    | 0.09215686       | 4.90196E-07     | 0.00745098                     | 0.00745098                      | 0.03921569      | 117.647059                         | 0.0022549                     | 0.00215686                    |
| Nonresidential | 0.01078431       | 0.01078431       | 0.00058824                    | 0.09803922       | 4.90196E-07     | 0.00745098                     | 0.00745098                      | 0.08235294      | 117.647059                         | 0.0022549                     | 0.00215686                    |

**Table 9.1 Water Use Rates**

| <b>Land Use Sub Type</b>             | <b>Size Metric</b> | <b>Indoor Water,<br/>gal/size/year<sup>1</sup></b> | <b>Outdoor Water,<br/>gal/size/year<sup>1</sup></b> |
|--------------------------------------|--------------------|----------------------------------------------------|-----------------------------------------------------|
| Apartments High Rise                 | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Apartments Low Rise                  | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Apartments Mid Rise                  | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Arena                                | 1000sqft           | 430,770                                            | 27,496                                              |
| Arena                                | Acre               | 1,346,157                                          | 85,925                                              |
| Automobile Care Center               | 1000sqft           | 94,081                                             | 57,663                                              |
| Bank (with Drive-Through)            | 1000sqft           | 39,623                                             | 24,285                                              |
| City Park                            | Acre               |                                                    | 1,191,481                                           |
| Condo/Townhouse                      | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Condo/Townhouse High Rise            | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Congregate Care (Assisted Living)    | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Convenience Market (24 hour)         | 1000sqft           | 74,073                                             | 45,399                                              |
| Convenience Market with Gas Pumps    | 1000sqft           | 74,073                                             | 45,399                                              |
| Convenience Market with Gas Pumps    | Pump               | 10,457                                             | 6,409                                               |
| Day-Care Center                      | 1000sqft           | 42,890                                             | 110,287                                             |
| Day-Care Center                      | Student            | 2,424                                              | 6,234                                               |
| Day-Care Center                      | Employee           | 386                                                | 993                                                 |
| Discount Club                        | 1000sqft           | 74,073                                             | 45,399                                              |
| Electronic Superstore                | 1000sqft           | 74,073                                             | 45,399                                              |
| Elementary School                    | 1000sqft           | 28,997                                             | 74,564                                              |
| Elementary School                    | Student            | 2,424                                              | 6,234                                               |
| Elementary School                    | Employee           | 29,523                                             | 75,917                                              |
| Fast Food Restaurant w/o Drive Thru  | 1000sqft           | 303,534                                            | 19,374                                              |
| Fast Food Restaurant with Drive Thru | 1000sqft           | 303,534                                            | 19,374                                              |
| Free-Standing Discount Store         | 1000sqft           | 74,073                                             | 45,399                                              |
| Free-Standing Discount Superstore    | 1000sqft           | 74,073                                             | 45,399                                              |
| Gasoline/Service Station             | 1000sqft           | 94,081                                             | 57,663                                              |
| General Heavy Industry               | 1000sqft           | 231,250                                            |                                                     |
| General Light Industry               | 1000sqft           | 231,250                                            |                                                     |
| General Office Building              | 1000sqft           | 177,734                                            | 108,934                                             |
| Golf Course                          | Acre               |                                                    | 1,191,481                                           |
| Golf Course                          | Hole               |                                                    | 8,317,850                                           |
| Government (Civic Center)            | 1000sqft           | 198,660                                            | 121,759                                             |
| Government Office Building           | 1000sqft           | 198,660                                            | 121,759                                             |
| Hardware/Paint Store                 | 1000sqft           | 74,073                                             | 45,399                                              |
| health club                          | 1000sqft           | 59,143                                             | 36,249                                              |
| High School                          | 1000sqft           | 33,205                                             | 85,383                                              |
| High School                          | Employee           | 39,494                                             | 101,555                                             |
| High School                          | Student            | 4,405                                              | 11,327                                              |
| High Turnover (Sit Down Restaurant)  | 1000sqft           | 303,534                                            | 19,374                                              |
| Home Improvement Superstore          | 1000sqft           | 74,073                                             | 45,399                                              |
| Hospital                             | 1000sqft           | 125,481                                            | 23,901                                              |
| Hospital                             | Bed                | 89,814                                             | 17,107                                              |
| Hotel                                | Room               | 25,367                                             | 2,819                                               |
| Industrial Park                      | 1000sqft           | 231,250                                            |                                                     |
| Junior College (2yr)                 | 1000sqft           | 49,049                                             | 76,718                                              |
| Junior College (2yr)                 | Employee           | 58,339                                             | 91,248                                              |
| Junior College (2yr)                 | Student            | 2,141                                              | 3,349                                               |
| Junior High School                   | 1000sqft           | 20,621                                             | 53,025                                              |
| Junior High School                   | Student            | 2,424                                              | 6,234                                               |
| Junior High School                   | Employee           | 24,527                                             | 63,069                                              |

**Table 9.1 Water Use Rates**

| <b>Land Use Sub Type</b>           | <b>Size Metric</b> | <b>Indoor Water,<br/>gal/size/year<sup>1</sup></b> | <b>Outdoor Water,<br/>gal/size/year<sup>1</sup></b> |
|------------------------------------|--------------------|----------------------------------------------------|-----------------------------------------------------|
| Library                            | 1000sqft           | 31,289                                             | 48,939                                              |
| Library                            | Employee           | 29,219                                             | 45,702                                              |
| Manufacturing                      | 1000sqft           | 231,250                                            |                                                     |
| Medical Office Building            | 1000sqft           | 125,481                                            | 23,901                                              |
| Mobile Home Park                   | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Motel                              | Room               | 25,367                                             | 2,819                                               |
| Movie Theater (No Matinee)         | 1000sqft           | 401,601                                            | 25,634                                              |
| Movie Theater (No Matinee)         | Screen             | 1,104,404                                          | 70,494                                              |
| Movie Theater (No Matinee)         | Seat               | 9,036                                              | 577                                                 |
| Office Park                        | 1000sqft           | 177,734                                            | 108,934                                             |
| Parking Lot                        | Space              |                                                    |                                                     |
| Unenclosed Parking Structure       | Space              |                                                    |                                                     |
| Enclosed Parking Structure         | Space              |                                                    |                                                     |
| Unenclosed Parking with Elevator   | Space              |                                                    |                                                     |
| Enclosed Parking with Elevator     | Space              |                                                    |                                                     |
| Parking Lot                        | 1000sqft           |                                                    |                                                     |
| Unenclosed Parking Structure       | 1000sqft           |                                                    |                                                     |
| Enclosed Parking Structure         | 1000sqft           |                                                    |                                                     |
| Unenclosed Parking with Elevator   | 1000sqft           |                                                    |                                                     |
| Enclosed Parking with Elevator     | 1000sqft           |                                                    |                                                     |
| Other Asphalt Surfaces             | 1000sqft           |                                                    |                                                     |
| Other Non-Asphalt Surfaces         | 1000sqft           |                                                    |                                                     |
| Parking Lot                        | Acre               |                                                    |                                                     |
| Unenclosed Parking Structure       | Acre               |                                                    |                                                     |
| Enclosed Parking Structure         | Acre               |                                                    |                                                     |
| Unenclosed Parking with Elevator   | Acre               |                                                    |                                                     |
| Enclosed Parking with Elevator     | Acre               |                                                    |                                                     |
| Other Asphalt Surfaces             | Acre               |                                                    |                                                     |
| Other Non-Asphalt Surfaces         | Acre               |                                                    |                                                     |
| Pharmacy/Drugstore w/o Drive Thru  | 1000sqft           | 70,448                                             | 43,178                                              |
| Pharmacy/Drugstore with Drive Thru | 1000sqft           | 70,448                                             | 43,178                                              |
| Place of Worship                   | 1000sqft           | 31,289                                             | 48,939                                              |
| Place of Worship                   | Seat               | 1,580                                              | 2,472                                               |
| Quality Restaurant                 | 1000sqft           | 303,534                                            | 19,374                                              |
| Racquet Club                       | 1000sqft           | 59,143                                             | 36,249                                              |
| Recreational Swimming Pool         | 1000sqft           | 59,143                                             | 36,249                                              |
| Refrigerated Warehouse-No Rail     | 1000sqft           | 231,250                                            |                                                     |
| Refrigerated Warehouse-Rail        | 1000sqft           | 231,250                                            |                                                     |
| Regional Shopping Center           | 1000sqft           | 74,073                                             | 45,399                                              |
| Research & Development             | 1000sqft           | 491,694                                            |                                                     |
| Retirement Community               | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Single Family Housing              | Dwelling Unit      | 65,154                                             | 41,075                                              |
| Strip Mall                         | 1000sqft           | 74,073                                             | 45,399                                              |
| Supermarket                        | 1000sqft           | 123,268                                            | 3,812                                               |
| University/College (4yr)           | Employee           | 8,222                                              | 12,860                                              |
| University/College (4yr)           | Student            | 2,141                                              | 3,349                                               |
| University/College (4yr)           | 1000sqft           | 11,649                                             | 18,221                                              |
| Unrefrigerated Warehouse-No Rail   | 1000sqft           | 231,250                                            |                                                     |
| Unrefrigerated Warehouse-Rail      | 1000sqft           | 231,250                                            |                                                     |

1. Industrial water use is based on a work-year of 250 days per year.



Table 9.2 Water and Wastewater Electricity Intensity

| Location Type | Name                            | Source | Supply Water          | Treat Water | Distribute Water | Wastewater Treatment |
|---------------|---------------------------------|--------|-----------------------|-------------|------------------|----------------------|
|               |                                 |        | kWhr/ million gallons |             |                  |                      |
| Air Basin     | Great Basin Valleys             | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Lake County                     | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Lake Tahoe                      | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mojave Desert                   | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Mountain Counties               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | North Central Coast             | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | North Coast                     | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Northeast Plateau               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Sacramento Valley               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Salton Sea                      | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | San Diego                       | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | San Francisco Bay Area          | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | San Joaquin Valley              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | South Central Coast             | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | South Coast                     | 2      | 9727                  | 111         | 1272             | 1911                 |
| Air District  | Amador County APCD              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Antelope Valley APCD            | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Bay Area AQMD                   | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Butte County AQMD               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Calaveras County AQMD           | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Colusa County APCD              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | El Dorado County APCD           | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Feather River AQMD              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Glenn County APCD               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Great Basin UAPCD               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Imperial County APCD            | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Kern County APCD                | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Lake County AQMD                | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Lassen County APCD              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mariposa County APCD            | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mendocino County AQMD           | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Modoc County APCD               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mojave Desert AQMD              | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Monterey Bay Unified APCD       | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | North Coast Unified APCD        | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Northern Sierra AQMD            | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Northern Sonoma County APCD     | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Placer County APCD              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Sacramento Metropolitan AQMD    | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | San Diego County APCD           | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | San Joaquin Valley Unified APCD | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | San Luis Obispo County APCD     | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Santa Barbara County APCD       | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Shasta County AQMD              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Siskiyou County APCD            | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | South Coast AQMD                | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Tehama County APCD              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Tuolumne County APCD            | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Ventura County APCD             | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Yolo/Solano AQMD                | 1      | 2117                  | 111         | 1272             | 1911                 |

Table 9.2 Water and Wastewater Electricity Intensity

| Location Type | Name                                    | Source | Supply Water          | Treat Water | Distribute Water | Wastewater Treatment |
|---------------|-----------------------------------------|--------|-----------------------|-------------|------------------|----------------------|
|               |                                         |        | kWhr/ million gallons |             |                  |                      |
|               | Alameda                                 | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Alpine                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Amador                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Butte                                   | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Calaveras                               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Colusa                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Contra Costa                            | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Del Norte                               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | El Dorado-Lake Tahoe                    | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | El Dorado-Mountain County               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Fresno                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Glenn                                   | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Humboldt                                | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Imperial                                | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Inyo                                    | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Kern-Mojave Desert                      | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Kern-San Joaquin                        | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Kings                                   | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Lake                                    | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Lassen                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Los Angeles-Mojave Desert               | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Los Angeles-South Coast                 | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Madera                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Marin                                   | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mariposa                                | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mendocino-Coastal                       | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mendocino-Inland                        | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mendocino-Rural Inland North            | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mendocino-Rural Inland South            | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Merced                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Modoc                                   | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Mono                                    | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Monterey                                | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Napa                                    | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Nevada                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Orange                                  | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Placer-Lake Tahoe                       | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Placer-Mountain Counties                | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Placer-Sacramento                       | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Plumas                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Riverside-Mojave Desert MDAQMD          | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Riverside-Mojave Desert SCAQMD          | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Riverside-Salton Sea                    | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Riverside-South Coast                   | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Sacramento                              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | San Benito                              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | San Bernardino-Mojave Desert            | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | San Bernardino-South Coast              | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | San Diego                               | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | San Francisco                           | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | San Joaquin                             | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | San Luis Obispo                         | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | San Mateo                               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Santa Barbara-North of Santa Ynez       | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Santa Barbara-South of Santa Ynez Range | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Santa Clara                             | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Santa Cruz                              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Shasta                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Sierra                                  | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Siskiyou                                | 1      | 2117                  | 111         | 1272             | 1911                 |

**Table 9.2 Water and Wastewater Electricity Intensity**

| Location Type | Name                 | Source | Supply Water          | Treat Water | Distribute Water | Wastewater Treatment |
|---------------|----------------------|--------|-----------------------|-------------|------------------|----------------------|
|               |                      |        | kWhr/ million gallons |             |                  |                      |
| Counties      | Solano-San Francisco | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Solano-San Joaquin   | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Sonoma-North Coast   | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Sonoma-San Francisco | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Stanislaus           | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Sutter               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Tehama               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Trinity              | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Tulare               | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Tuolumne             | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Ventura              | 2      | 9727                  | 111         | 1272             | 1911                 |
|               | Yolo                 | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Yuba                 | 1      | 2117                  | 111         | 1272             | 1911                 |
|               | Statewide            | 3      | 5922                  | 111         | 1272             | 1911                 |

**Notes:**

1. Data is based on the value for Northern California reported in the CEC 2006 Report " Refining Estimates of Water-Related Energy Use in California."
2. Data is based on the value for Southern California reported in the CEC 2006 Report " Refining Estimates of Water-Related Energy Use in California."
3. Data is based on the average of the Northern and Southern California values reported in the CEC 2006 Report " Refining Estimates of Water-Related Energy Use in California."

Table 9.3 Percent of Wastewater Distribution Types

| Location Type | Name                            | Source | Septic Tank | Aerobic | Anaerobic, Facultative Lagoons | Anaerobic, Combustion of Gas | Anaerobic, Cogeneration of Gas |
|---------------|---------------------------------|--------|-------------|---------|--------------------------------|------------------------------|--------------------------------|
| Air Basin     | Great Basin Valleys             | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Lake County                     | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Lake Tahoe                      | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mojave Desert                   | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mountain Counties               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | North Central Coast             | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | North Coast                     | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Northeast Plateau               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Sacramento Valley               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Salton Sea                      | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Diego                       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Diego                       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Francisco Bay Area          | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Joaquin Valley              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | South Central Coast             | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | South Coast                     | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
| Air District  | Amador County APCD              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Antelope Valley APCD            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Bay Area AQMD                   | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Butte County AQMD               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Calaveras County AQMD           | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Colusa County APCD              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | El Dorado County APCD           | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Feather River AQMD              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Glenn County APCD               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Great Basin UAPCD               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Imperial County APCD            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Kern County APCD                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Lake County AQMD                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Lassen County APCD              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mariposa County APCD            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mendocino County AQMD           | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Modoc County APCD               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mojave Desert AQMD              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Monterey Bay Unified APCD       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | North Coast Unified APCD        | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Northern Sierra AQMD            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Northern Sonoma County APCD     | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Placer County APCD              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Sacramento Metropolitan AQMD    | 2      | 0           | 100     | 0                              | 15                           | 85                             |
|               | San Diego County APCD           | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Joaquin Valley Unified APCD | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Luis Obispo County APCD     | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Santa Barbara County APCD       | 2      | 0           | 100     | 0                              | 100                          | 0                              |
|               | Shasta County AQMD              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Siskiyou County APCD            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | South Coast AQMD                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Tehama County APCD              | 2      | 67          | 33      | 0                              | 100                          | 0                              |
|               | Tuolumne County APCD            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Ventura County APCD             | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Yolo/Solano AQMD                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Alameda                         | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Alpine                          | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Amador                          | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Butte                           | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Calaveras                       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Colusa                          | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Contra Costa                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Del Norte                       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | El Dorado-Lake Tahoe            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | El Dorado-Mountain County       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Fresno                          | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Glenn                           | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |

Table 9.3 Percent of Wastewater Distribution Types

| Location Type | Name                                    | Source | Septic Tank | Aerobic | Anaerobic, Facultative Lagoons | Anaerobic, Combustion of Gas | Anaerobic, Cogeneration of Gas |
|---------------|-----------------------------------------|--------|-------------|---------|--------------------------------|------------------------------|--------------------------------|
| Counties      | Humboldt                                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Imperial                                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Inyo                                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Kern-Mojave Desert                      | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Kern-San Joaquin                        | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Kings                                   | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Lake                                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Lassen                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Los Angeles-Mojave Desert               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Los Angeles-South Coast                 | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Madera                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Marin                                   | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mariposa                                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mendocino-Coastal                       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mendocino-Inland                        | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mendocino-Rural Inland North            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mendocino-Rural Inland South            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Merced                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Modoc                                   | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Mono                                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Monterey                                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Napa                                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Nevada                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Orange                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Placer-Lake Tahoe                       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Placer-Mountain Counties                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Placer-Sacramento                       | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Plumas                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Riverside-Mojave Desert MDAQMD          | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Riverside-Mojave Desert SCAQMD          | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Riverside-Salton Sea                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Riverside-South Coast                   | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Sacramento                              | 2      | 0           | 100     | 0                              | 15                           | 85                             |
|               | San Benito                              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Bernardino-Mojave Desert            | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Bernardino-South Coast              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Francisco                           | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Joaquin                             | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Luis Obispo                         | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | San Mateo                               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Santa Barbara-North of Santa Ynez       | 2      | 0           | 100     | 0                              | 100                          | 0                              |
|               | Santa Barbara-South of Santa Ynez Range | 2      | 0           | 100     | 0                              | 100                          | 0                              |
|               | Santa Clara                             | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Santa Cruz                              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Shasta                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Sierra                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Siskiyou                                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Solano-San Francisco                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Solano-San Joaquin                      | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Sonoma-North Coast                      | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Sonoma-San Francisco                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Stanislaus                              | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Sutter                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Tehama                                  | 2      | 67          | 33      | 0                              | 100                          | 0                              |
|               | Trinity                                 | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Tulare                                  | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Tuolumne                                | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Ventura                                 | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Yolo                                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
|               | Yuba                                    | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |
| Statewide     | Statewide                               | 1      | 10.33       | 87.46   | 2.21                           | 100                          | 0                              |

Notes:

**Table 9.3 Percent of Wastewater Distribution Types**

| <b>Location Type</b> | <b>Name</b> | <b>Source</b> | <b>Septic Tank</b> | <b>Aerobic</b> | <b>Anaerobic, Facultative Lagoons</b> | <b>Anaerobic, Combustion of Gas</b> | <b>Anaerobic, Cogeneration of Gas</b> |
|----------------------|-------------|---------------|--------------------|----------------|---------------------------------------|-------------------------------------|---------------------------------------|
|----------------------|-------------|---------------|--------------------|----------------|---------------------------------------|-------------------------------------|---------------------------------------|

1. The default is based on the ratio of wastewater treatment types used in California GHG emission inventories developed by ARB.
2. The value is based on information provided by the District.

**Table 9.4 Wastewater Treatment Direct Emissions**

| <b>Wastewater Treatment Type</b> | <b>CO2 Biogenic, ton/gal</b> | <b>CO2 Non-Biogenic, ton/gal</b> | <b>CH4, ton/gal</b> | <b>N2O, ton/gal</b> |
|----------------------------------|------------------------------|----------------------------------|---------------------|---------------------|
| Septic                           | 0                            | 0                                | 2.50362E-07         | 8.48121E-10         |
| Aerobic                          | 3.89999E-07                  | 0                                | 1.34234E-09         | 8.48121E-10         |
| Anaerobic Facultative            | 3.89999E-07                  | 0                                | 4.01921E-07         | 8.48121E-10         |
| Digester Burn                    | 0                            | 0                                | 0                   | 0                   |
| Digester Cogen                   | 0                            | 0                                | 0                   | 0                   |

**Note:**

Digester combustion emissions are estimated using water intensity emission factors.

Table 10.1 Solid Waste Disposal Rates

| Location Type | Name                            | Land Use Sub Type     | Size Metric | Rate,<br>ton/size/year |
|---------------|---------------------------------|-----------------------|-------------|------------------------|
| Air Basin     | Great Basin Valleys             | Single Family Housing | Resident    | 0.25                   |
|               | Lake County                     | Single Family Housing | Resident    | 0.36                   |
|               | Lake Tahoe                      | Single Family Housing | Resident    | 0.31                   |
|               | Mojave Desert                   | Single Family Housing | Resident    | 0.41                   |
|               | Mountain Counties               | Single Family Housing | Resident    | 0.26                   |
|               | North Central Coast             | Single Family Housing | Resident    | 0.44                   |
|               | North Coast                     | Single Family Housing | Resident    | 0.40                   |
|               | Northeast Plateau               | Single Family Housing | Resident    | 0.25                   |
|               | Sacramento Valley               | Single Family Housing | Resident    | 0.36                   |
|               | Salton Sea                      | Single Family Housing | Resident    | 0.41                   |
|               | San Diego                       | Single Family Housing | Resident    | 0.41                   |
|               | San Diego                       | Single Family Housing | Resident    | 0.41                   |
|               | San Francisco Bay Area          | Single Family Housing | Resident    | 0.42                   |
|               | San Joaquin Valley              | Single Family Housing | Resident    | 0.38                   |
|               | South Central Coast             | Single Family Housing | Resident    | 0.41                   |
|               | South Coast                     | Single Family Housing | Resident    | 0.41                   |
| Air District  | Amador County APCD              | Single Family Housing | Resident    | 0.25                   |
|               | Antelope Valley APCD            | Single Family Housing | Resident    | 0.41                   |
|               | Bay Area AQMD                   | Single Family Housing | Resident    | 0.42                   |
|               | Butte County AQMD               | Single Family Housing | Resident    | 0.36                   |
|               | Calaveras County AQMD           | Single Family Housing | Resident    | 0.25                   |
|               | Colusa County APCD              | Single Family Housing | Resident    | 0.36                   |
|               | El Dorado County APCD           | Single Family Housing | Resident    | 0.25                   |
|               | Feather River AQMD              | Single Family Housing | Resident    | 0.36                   |
|               | Glenn County APCD               | Single Family Housing | Resident    | 0.36                   |
|               | Great Basin UAPCD               | Single Family Housing | Resident    | 0.25                   |
|               | Imperial County APCD            | Single Family Housing | Resident    | 0.41                   |
|               | Kern County APCD                | Single Family Housing | Resident    | 0.41                   |
|               | Lake County AQMD                | Single Family Housing | Resident    | 0.36                   |
|               | Lassen County APCD              | Single Family Housing | Resident    | 0.25                   |
|               | Mariposa County APCD            | Single Family Housing | Resident    | 0.25                   |
|               | Mendocino County AQMD           | Single Family Housing | Resident    | 0.44                   |
|               | Modoc County APCD               | Single Family Housing | Resident    | 0.25                   |
|               | Mojave Desert AQMD              | Single Family Housing | Resident    | 0.41                   |
|               | Monterey Bay Unified APCD       | Single Family Housing | Resident    | 0.44                   |
|               | North Coast Unified APCD        | Single Family Housing | Resident    | 0.38                   |
|               | Northern Sierra AQMD            | Single Family Housing | Resident    | 0.25                   |
|               | Northern Sonoma County APCD     | Single Family Housing | Resident    | 0.42                   |
|               | Placer County APCD              | Single Family Housing | Resident    | 0.36                   |
|               | Sacramento Metropolitan AQMD    | Single Family Housing | Resident    | 0.36                   |
|               | San Diego County APCD           | Single Family Housing | Resident    | 0.41                   |
|               | San Joaquin Valley Unified APCD | Single Family Housing | Resident    | 0.38                   |
|               | San Luis Obispo County APCD     | Single Family Housing | Resident    | 0.41                   |
|               | Santa Barbara County APCD       | Single Family Housing | Resident    | 0.41                   |
|               | Shasta County AQMD              | Single Family Housing | Resident    | 0.25                   |
|               | Siskiyou County APCD            | Single Family Housing | Resident    | 0.25                   |
|               | South Coast AQMD                | Single Family Housing | Resident    | 0.41                   |
|               | Tehama County APCD              | Single Family Housing | Resident    | 0.36                   |
|               | Tuolumne County APCD            | Single Family Housing | Resident    | 0.25                   |
|               | Ventura County APCD             | Single Family Housing | Resident    | 0.41                   |
|               | Yolo/Solano AQMD                | Single Family Housing | Resident    | 0.39                   |
|               | Alameda                         | Single Family Housing | Resident    | 0.42                   |
|               | Alpine                          | Single Family Housing | Resident    | 0.25                   |
|               | Amador                          | Single Family Housing | Resident    | 0.25                   |
|               | Butte                           | Single Family Housing | Resident    | 0.36                   |
|               | Calaveras                       | Single Family Housing | Resident    | 0.25                   |
|               | Colusa                          | Single Family Housing | Resident    | 0.36                   |



Table 10.1 Solid Waste Disposal Rates

| Location Type | Name                                    | Land Use Sub Type     | Size Metric | Rate,<br>ton/size/year |
|---------------|-----------------------------------------|-----------------------|-------------|------------------------|
| County        | Contra Costa                            | Single Family Housing | Resident    | 0.42                   |
|               | Del Norte                               | Single Family Housing | Resident    | 0.44                   |
|               | El Dorado-Lake Tahoe                    | Single Family Housing | Resident    | 0.25                   |
|               | El Dorado-Mountain County               | Single Family Housing | Resident    | 0.25                   |
|               | Fresno                                  | Single Family Housing | Resident    | 0.36                   |
|               | Glenn                                   | Single Family Housing | Resident    | 0.36                   |
|               | Humboldt                                | Single Family Housing | Resident    | 0.44                   |
|               | Imperial                                | Single Family Housing | Resident    | 0.41                   |
|               | Inyo                                    | Single Family Housing | Resident    | 0.25                   |
|               | Kern-Mojave Desert                      | Single Family Housing | Resident    | 0.41                   |
|               | Kern-San Joaquin                        | Single Family Housing | Resident    | 0.41                   |
|               | Kings                                   | Single Family Housing | Resident    | 0.36                   |
|               | Lake                                    | Single Family Housing | Resident    | 0.36                   |
|               | Lassen                                  | Single Family Housing | Resident    | 0.25                   |
|               | Los Angeles-Mojave Desert               | Single Family Housing | Resident    | 0.41                   |
|               | Los Angeles-South Coast                 | Single Family Housing | Resident    | 0.41                   |
|               | Madera                                  | Single Family Housing | Resident    | 0.36                   |
|               | Marin                                   | Single Family Housing | Resident    | 0.42                   |
|               | Mariposa                                | Single Family Housing | Resident    | 0.25                   |
|               | Mendocino-Coastal                       | Single Family Housing | Resident    | 0.44                   |
|               | Mendocino-Inland                        | Single Family Housing | Resident    | 0.44                   |
|               | Mendocino-Rural Inland North            | Single Family Housing | Resident    | 0.44                   |
|               | Mendocino-Rural Inland South            | Single Family Housing | Resident    | 0.44                   |
|               | Merced                                  | Single Family Housing | Resident    | 0.36                   |
|               | Modoc                                   | Single Family Housing | Resident    | 0.25                   |
|               | Mono                                    | Single Family Housing | Resident    | 0.25                   |
|               | Monterey                                | Single Family Housing | Resident    | 0.44                   |
|               | Napa                                    | Single Family Housing | Resident    | 0.42                   |
|               | Nevada                                  | Single Family Housing | Resident    | 0.25                   |
|               | Orange                                  | Single Family Housing | Resident    | 0.41                   |
|               | Placer-Lake Tahoe                       | Single Family Housing | Resident    | 0.36                   |
|               | Placer-Mountain Counties                | Single Family Housing | Resident    | 0.36                   |
|               | Placer-Sacramento                       | Single Family Housing | Resident    | 0.36                   |
|               | Plumas                                  | Single Family Housing | Resident    | 0.25                   |
|               | Riverside-Mojave Desert MDAQMD          | Single Family Housing | Resident    | 0.41                   |
|               | Riverside-Mojave Desert SCAQMD          | Single Family Housing | Resident    | 0.41                   |
|               | Riverside-Salton Sea                    | Single Family Housing | Resident    | 0.41                   |
|               | Riverside-South Coast                   | Single Family Housing | Resident    | 0.41                   |
|               | Sacramento                              | Single Family Housing | Resident    | 0.36                   |
|               | San Benito                              | Single Family Housing | Resident    | 0.44                   |
|               | San Bernardino-Mojave Desert            | Single Family Housing | Resident    | 0.41                   |
|               | San Bernardino-South Coast              | Single Family Housing | Resident    | 0.41                   |
|               | San Francisco                           | Single Family Housing | Resident    | 0.42                   |
|               | San Joaquin                             | Single Family Housing | Resident    | 0.36                   |
|               | San Luis Obispo                         | Single Family Housing | Resident    | 0.41                   |
|               | San Mateo                               | Single Family Housing | Resident    | 0.42                   |
|               | Santa Barbara-North of Santa Ynez       | Single Family Housing | Resident    | 0.41                   |
|               | Santa Barbara-South of Santa Ynez Range | Single Family Housing | Resident    | 0.41                   |
|               | Santa Clara                             | Single Family Housing | Resident    | 0.42                   |
|               | Santa Cruz                              | Single Family Housing | Resident    | 0.44                   |
|               | Shasta                                  | Single Family Housing | Resident    | 0.25                   |
|               | Sierra                                  | Single Family Housing | Resident    | 0.25                   |
|               | Siskiyou                                | Single Family Housing | Resident    | 0.25                   |
|               | Solano-San Francisco                    | Single Family Housing | Resident    | 0.42                   |
|               | Solano-San Joaquin                      | Single Family Housing | Resident    | 0.42                   |
|               | Sonoma-North Coast                      | Single Family Housing | Resident    | 0.42                   |
|               | Sonoma-San Francisco                    | Single Family Housing | Resident    | 0.42                   |

Table 10.1 Solid Waste Disposal Rates

| Location Type | Name       | Land Use Sub Type                    | Size Metric   | Rate,<br>ton/size/year |
|---------------|------------|--------------------------------------|---------------|------------------------|
|               | Stanislaus | Single Family Housing                | Resident      | 0.36                   |
|               | Sutter     | Single Family Housing                | Resident      | 0.36                   |
|               | Tehama     | Single Family Housing                | Resident      | 0.36                   |
|               | Trinity    | Single Family Housing                | Resident      | 0.25                   |
|               | Tulare     | Single Family Housing                | Resident      | 0.36                   |
|               | Tuolumne   | Single Family Housing                | Resident      | 0.25                   |
|               | Ventura    | Single Family Housing                | Resident      | 0.41                   |
|               | Yolo       | Single Family Housing                | Resident      | 0.36                   |
|               | Yuba       | Single Family Housing                | Resident      | 0.36                   |
|               | Statewide  | Single Family Housing                | Resident      | 0.36                   |
|               | Statewide  | Apartments High Rise                 | Dwelling Unit | 0.46                   |
|               | Statewide  | Apartments Low Rise                  | Dwelling Unit | 0.46                   |
|               | Statewide  | Apartments Mid Rise                  | Dwelling Unit | 0.46                   |
|               | Statewide  | Arena                                | 100visitors   | 0.09                   |
|               | Statewide  | Arena                                | 1000sqft      | 0.03                   |
|               | Statewide  | Arena                                | Acre          | 0.09                   |
|               | Statewide  | Automobile Care Center               | Employee      | 0.86                   |
|               | Statewide  | Automobile Care Center               | 1000sqft      | 3.82                   |
|               | Statewide  | Bank (with Drive-Through)            | 1000sqft      | 0.93                   |
|               | Statewide  | City Park                            | 100visitors   | 0.09                   |
|               | Statewide  | City Park                            | Acre          | 0.09                   |
|               | Statewide  | Condo/Townhouse                      | Dwelling Unit | 0.46                   |
|               | Statewide  | Condo/Townhouse High Rise            | Dwelling Unit | 0.46                   |
|               | Statewide  | Congregate Care (Assisted Living)    | Dwelling Unit | 0.91                   |
|               | Statewide  | Convenience Market (24 hour)         | Employee      | 0.86                   |
|               | Statewide  | Convenience Market (24 hour)         | 1000sqft      | 3.01                   |
|               | Statewide  | Convenience Market with Gas Pumps    | Employee      | 0.86                   |
|               | Statewide  | Convenience Market with Gas Pumps    | 1000sqft      | 3.01                   |
|               | Statewide  | Convenience Market with Gas Pumps    | pumps         | 0.42                   |
|               | Statewide  | Day-Care Center                      | 1000sqft      | 1.30                   |
|               | Statewide  | Day-Care Center                      | Employee      | 0.80                   |
|               | Statewide  | Day-Care Center                      | Student       | 0.18                   |
|               | Statewide  | Discount Club                        | Employee      | 1.23                   |
|               | Statewide  | Discount Club                        | 1000sqft      | 4.30                   |
|               | Statewide  | Electronic Superstore                | Employee      | 0.86                   |
|               | Statewide  | Electronic Superstore                | 1000sqft      | 3.01                   |
|               | Statewide  | Elementary School                    | 1000sqft      | 1.30                   |
|               | Statewide  | Elementary School                    | Employee      | 0.80                   |
|               | Statewide  | Elementary School                    | Student       | 0.18                   |
|               | Statewide  | Fast Food Restaurant w/o Drive Thru  | Employee      | 2.13                   |
|               | Statewide  | Fast Food Restaurant w/o Drive Thru  | 1000sqft      | 11.52                  |
|               | Statewide  | Fast Food Restaurant with Drive Thru | Employee      | 2.13                   |
|               | Statewide  | Fast Food Restaurant with Drive Thru | 1000sqft      | 11.52                  |
|               | Statewide  | Free-Standing Discount Store         | Employee      | 1.23                   |
|               | Statewide  | Free-Standing Discount Store         | 1000sqft      | 4.30                   |
|               | Statewide  | Free-Standing Discount Superstore    | Employee      | 1.23                   |
|               | Statewide  | Free-Standing Discount Superstore    | 1000sqft      | 4.30                   |
|               | Statewide  | Gasoline/Service Station             | Employee      | 0.86                   |
|               | Statewide  | Gasoline/Service Station             | Pump          | 0.54                   |
|               | Statewide  | Gasoline/Service Station             | 1000sqft      | 3.82                   |
|               | Statewide  | General Heavy Industry               | Employee      | 1.15                   |
|               | Statewide  | General Heavy Industry               | 1000sqft      | 1.24                   |
|               | Statewide  | General Light Industry               | Employee      | 1.15                   |
|               | Statewide  | General Light Industry               | 1000sqft      | 1.24                   |
|               | Statewide  | General Office Building              | 1000sqft      | 0.93                   |
|               | Statewide  | Golf Course                          | 100visitors   | 0.93                   |
|               | Statewide  | Golf Course                          | Acre          | 0.93                   |

Table 10.1 Solid Waste Disposal Rates

| Location Type | Name      | Land Use Sub Type                   | Size Metric   | Rate,<br>ton/size/year |
|---------------|-----------|-------------------------------------|---------------|------------------------|
| Statewide     | Statewide | Golf Course                         | Employee      | 0.93                   |
|               | Statewide | Golf Course                         | Hole          | 0.13                   |
|               | Statewide | Government (Civic Center)           | 1000sqft      | 5.70                   |
|               | Statewide | Government (Civic Center)           | 100visitors   | 0.09                   |
|               | Statewide | Government Office Building          | 1000sqft      | 0.93                   |
|               | Statewide | Hardware/Paint Store                | Employee      | 3.17                   |
|               | Statewide | Hardware/Paint Store                | 1000sqft      | 11.09                  |
|               | Statewide | Health Club                         | 1000sqft      | 5.70                   |
|               | Statewide | Health Club                         | 100visitors   | 0.09                   |
|               | Statewide | High School                         | 1000sqft      | 1.30                   |
|               | Statewide | High School                         | Employee      | 0.80                   |
|               | Statewide | High School                         | Student       | 0.18                   |
|               | Statewide | High Turnover (Sit Down Restaurant) | Employee      | 2.20                   |
|               | Statewide | High Turnover (Sit Down Restaurant) | 1000sqft      | 11.90                  |
|               | Statewide | Home Improvement Superstore         | Employee      | 3.17                   |
|               | Statewide | Home Improvement Superstore         | 1000sqft      | 11.09                  |
|               | Statewide | Hospital                            | Bed           | 2.92                   |
|               | Statewide | Hospital                            | Employee      | 2.02                   |
|               | Statewide | Hospital                            | 1000sqft      | 10.80                  |
|               | Statewide | Hotel                               | Employee      | 1.95                   |
|               | Statewide | Hotel                               | Room          | 0.55                   |
|               | Statewide | Hotel                               | 1000sqft      | 10.80                  |
|               | Statewide | Industrial Park                     | Employee      | 1.15                   |
|               | Statewide | Industrial Park                     | 1000sqft      | 1.24                   |
|               | Statewide | Junior College (2yr)                | 1000sqft      | 1.30                   |
|               | Statewide | Junior College (2yr)                | Employee      | 0.80                   |
|               | Statewide | Junior College (2yr)                | Student       | 0.18                   |
|               | Statewide | Junior High School                  | 1000sqft      | 1.30                   |
|               | Statewide | Junior High School                  | Employee      | 0.80                   |
|               | Statewide | Junior High School                  | Student       | 0.18                   |
|               | Statewide | Library                             | 1000sqft      | 0.92                   |
|               | Statewide | Library                             | Employee      | 0.86                   |
|               | Statewide | Manufacturing                       | Employee      | 1.15                   |
|               | Statewide | Manufacturing                       | 1000sqft      | 1.24                   |
|               | Statewide | Medical Office Building             | Employee      | 3.09                   |
|               | Statewide | Medical Office Building             | 1000sqft      | 10.80                  |
|               | Statewide | Mobile Home Park                    | Dwelling Unit | 0.46                   |
|               | Statewide | Motel                               | Employee      | 1.95                   |
|               | Statewide | Motel                               | Room          | 0.55                   |
|               | Statewide | Motel                               | 1000sqft      | 10.80                  |
|               | Statewide | Movie Theater (No Matinee)          | 1000sqft      | 5.70                   |
|               | Statewide | Movie Theater (No Matinee)          | 100visitors   | 0.09                   |
|               | Statewide | Movie Theater (No Matinee)          | Screen        | 15.68                  |
|               | Statewide | Movie Theater (no matinee)          | seats         | 0.13                   |
|               | Statewide | Office Park                         | 1000sqft      | 0.93                   |
|               | Statewide | Parking Lot                         | Space         | 0.00                   |
|               | Statewide | Unenclosed Parking Structure        | Space         | 0.00                   |
|               | Statewide | Enclosed Parking Structure          | Space         | 0.00                   |
|               | Statewide | Unenclosed Parking with Elevator    | Space         | 0.00                   |
|               | Statewide | Enclosed Parking with Elevator      | Space         | 0.00                   |
|               | Statewide | Parking Lot                         | Acre          | 0.00                   |
|               | Statewide | Unenclosed Parking Structure        | Acre          | 0.00                   |
|               | Statewide | Enclosed Parking Structure          | Acre          | 0.00                   |
|               | Statewide | Unenclosed Parking with Elevator    | Acre          | 0.00                   |
|               | Statewide | Enclosed Parking with Elevator      | Acre          | 0.00                   |
|               | Statewide | Parking Lot                         | 1000sqft      | 0.00                   |
|               | Statewide | Unenclosed Parking Structure        | 1000sqft      | 0.00                   |

Table 10.1 Solid Waste Disposal Rates

| Location Type | Name      | Land Use Sub Type                  | Size Metric   | Rate,<br>ton/size/year |
|---------------|-----------|------------------------------------|---------------|------------------------|
|               | Statewide | Enclosed Parking Structure         | 1000sqft      | 0.00                   |
|               | Statewide | Unenclosed Parking with Elevator   | 1000sqft      | 0.00                   |
|               | Statewide | Enclosed Parking with Elevator     | 1000sqft      | 0.00                   |
|               | Statewide | Other Asphalt Surfaces             | Acre          | 0.00                   |
|               | Statewide | Other Non-Asphalt Surfaces         | Acre          | 0.00                   |
|               | Statewide | Other Asphalt Surfaces             | 1000sqft      | 0.00                   |
|               | Statewide | Other Non-Asphalt Surfaces         | 1000sqft      | 0.00                   |
|               | Statewide | Pharmacy/Drugstore w/o Drive Thru  | Employee      | 0.86                   |
|               | Statewide | Pharmacy/Drugstore w/o Drive Thru  | 1000sqft      | 3.01                   |
|               | Statewide | Pharmacy/Drugstore with Drive Thru | Employee      | 0.86                   |
|               | Statewide | Pharmacy/Drugstore with Drive Thru | 1000sqft      | 3.01                   |
|               | Statewide | Place of Worship                   | 1000sqft      | 5.70                   |
|               | Statewide | Place of Worship                   | 100visitors   | 0.09                   |
|               | Statewide | Place of Worship                   | Seat          | 9.00                   |
|               | Statewide | Quality Restaurant                 | Employee      | 2.20                   |
|               | Statewide | Quality Restaurant                 | 1000sqft      | 0.91                   |
|               | Statewide | Racquet Club                       | 1000sqft      | 5.70                   |
|               | Statewide | Racquet Club                       | 100visitors   | 0.09                   |
|               | Statewide | Recreational Swimming Pool         | 1000sqft      | 5.70                   |
|               | Statewide | Recreational Swimming Pool         | 100visitors   | 0.09                   |
|               | Statewide | Refrigerated Warehouse-No Rail     | Employee      | 1.15                   |
|               | Statewide | Refrigerated Warehouse-No Rail     | 1000sqft      | 0.94                   |
|               | Statewide | Refrigerated Warehouse-Rail        | Employee      | 1.15                   |
|               | Statewide | Refrigerated Warehouse-Rail        | 1000sqft      | 0.94                   |
|               | Statewide | Regional Shopping Center           | 1000sqft      | 1.05                   |
|               | Statewide | Research & Development             | Employee      | 7.60                   |
|               | Statewide | Research & Development             | 1000sqft      | 0.08                   |
|               | Statewide | Retirement Community               | Dwelling Unit | 0.46                   |
|               | Statewide | Strip Mall                         | 1000sqft      | 1.05                   |
|               | Statewide | Supermarket                        | Employee      | 2.38                   |
|               | Statewide | Supermarket                        | 1000sqft      | 5.64                   |
|               | Statewide | University/College (4yr)           | Employee      | 0.8                    |
|               | Statewide | University/College (4yr)           | Student       | 0.1825                 |
|               | Statewide | University/College (4yr)           | 1000sqft      | 1.3                    |
|               | Statewide | Unrefrigerated Warehouse-No Rail   | Employee      | 1.15                   |
|               | Statewide | Unrefrigerated Warehouse-No Rail   | 1000sqft      | 0.94                   |
|               | Statewide | Unrefrigerated Warehouse-Rail      | Employee      | 1.15                   |
|               | Statewide | Unrefrigerated Warehouse-Rail      | 1000sqft      | 0.94                   |

**Table 10.2 Support for Solid Waste Emission Factors**

| MSW Category            | Fraction Total Organic Degradable Carbon per Waste Type <sup>a</sup> | Default Decomposable Anaerobic Fraction <sup>b</sup> | Waste Stream Composition Fraction <sup>c</sup> | Fraction of Carbon Emissions |
|-------------------------|----------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------|------------------------------|
| Newspaper               | 0.465                                                                | 0.161                                                | 0.013                                          | 0.00049                      |
| Office Paper            | 0.398                                                                | 0.874                                                | 0.019                                          | 0.00330                      |
| Corrugated Boxes        | 0.405                                                                | 0.383                                                | 0.048                                          | 0.00372                      |
| Coated paper            | 0.405                                                                | 0.21                                                 | 0.094                                          | 0.00400                      |
| Food                    | 0.117                                                                | 0.828                                                | 0.155                                          | 0.00751                      |
| Grass                   | 0.192                                                                | 0.322                                                | 0.025333333                                    | 0.00078                      |
| Leaves                  | 0.478                                                                | 0.1                                                  | 0.012666667                                    | 0.00030                      |
| Branches                | 0.279                                                                | 0.176                                                | 0.033                                          | 0.00081                      |
| Lumber                  | 0.43                                                                 | 0.233                                                | 0.145                                          | 0.00726                      |
| textiles                | 0.24                                                                 | 0.5                                                  | 0.054                                          | 0.00324                      |
| diapers                 | 0.24                                                                 | 0.5                                                  | 0.043                                          | 0.00258                      |
| construction demolition | 0.04                                                                 | 0.5                                                  | 0.146                                          | 0.00146                      |
| medical waste           | 0.15                                                                 | 0.5                                                  | 0                                              | 0.00000                      |
| sludge/manure           | 0.05                                                                 | 0.5                                                  | 0.001                                          | 0.00001                      |

|                     |                      |         |
|---------------------|----------------------|---------|
| Generation Fraction | mass carbon          | 0.03547 |
|                     | mass CH <sub>4</sub> | 0.04730 |
|                     | mass CO <sub>2</sub> | 0.13006 |

**Emission Factors**

| Description             | Collection Efficiency | Destruction Fraction | Oxidation Fraction | CO <sub>2</sub> Emissions, <sup>d</sup><br>ton/ton waste | CH <sub>4</sub> Emissions, <sup>e</sup><br>ton/ton waste |
|-------------------------|-----------------------|----------------------|--------------------|----------------------------------------------------------|----------------------------------------------------------|
| No LFG Collection       | 0                     | 0                    | 0.1                | 0.143068564                                              | 0.042565854                                              |
| LFG Collect and Combust | 0.75                  | 0.98                 | 0.1                | 0.228909703                                              | 0.011350894                                              |
| Cogen                   |                       |                      |                    | waste*(0.2289 - 6.3382E-05*UtilityCO <sub>2</sub> )      | 0.011350894                                              |

- a) California Air Resources Board, the California Climate Action Registry, ICLEI-Local Governments for Sustainability and The Climate Registry, Local Government Operations Protocol for the quantification and reporting of greenhouse gas emissions inventories, Version 1.0, September 2008, Table 9.6 Total Organic Degradable Carbon per Waste Type (TDOC).
- b) CARB, 2008, Table 9.7 Default Decomposable Anaerobic Fraction (DANF) of the TDOC per waste type
- c) California Integrated Waste Management Board, California 2008 Statewide Waste Characterization Study, August 2009, Table ES-3: Composition of California's Overall Disposed Waste Stream by Material Type

- d)  $\text{CO}_2$  emission factor, ton/ton waste = generation fraction  $\times$  (collection fraction  $\times$  destruction fraction  $\times$  (1 - collection fraction)  $\times$  oxidation fraction + 1)  $\times$  molecular weight of  $\text{CO}_2$ /molecular weight of carbon
- e)  $\text{CH}_4$  emission factor, ton/ton waste = generation fraction  $\times$  (collection fraction  $\times$  (1 - destruction fraction) + (1 - collection fraction)  $\times$  (1 - oxidation fraction))  $\times$  molecular weight of  $\text{CH}_4$ /molecular weight of carbon

**Table 11.1 Change in Sequestered GHG Emissions**

| <b>Vegetation Land Use Type</b> | <b>Vegetation Land Use Subtype</b> | <b>Biogenic CO2 Emissions (MT CO2/Acre)</b> |
|---------------------------------|------------------------------------|---------------------------------------------|
| Forest Land                     | Scrub                              | 14.3                                        |
| Forest Land                     | Trees                              | 111                                         |
| Cropland                        | Cropland                           | 6.2                                         |
| Grassland                       | Grassland                          | 4.31                                        |
| Wetlands                        | Wetlands                           | 0                                           |
| Others                          | Others                             | 0                                           |

**Notes:**

1. Based on values indicated in IPCC Guidelines for National Greenhouse Gas Inventories (IPCC Guidelines). Available online at <http://www.ipccnggip.iges.or.jp/public/2006gl/vol4.htm>

**Table 11.2 Sequestration of Trees**

| <b>Species</b>   | <b>CO2 Sequestered (MT/tree/year)</b> |
|------------------|---------------------------------------|
| Aspen            | 0.0352                                |
| Soft Maple       | 0.0433                                |
| Mixed Hardwood   | 0.0367                                |
| Hardwood Maple   | 0.0521                                |
| Juniper          | 0.0121                                |
| Cedar/Larch      | 0.0264                                |
| Douglas Fir      | 0.0447                                |
| True Fir/Hemlock | 0.0381                                |
| Pine             | 0.0319                                |
| Spruce           | 0.0337                                |
| Miscellaneous    | 0.0354                                |

Notes:

1. Species class-specific sequestration values are provided in Table 8.2 of "2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4". For species that do not appear in Table 8.2, the species was classified as "miscellaneous" and the average value of all listed data was used.
2. An active growing period of 20 years is assumed for the new trees planted.





**California Emissions Estimator Model®**

Appendix E  
Technical Source  
Documentation

Prepared for:  
**California Air Pollution Control Officers  
Association (CAPCOA)**

Prepared by:  
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**Revised: July 2013  
CalEEMod v. 2013.2**  
*(Previous version: February 2011)*

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# **1 Construction Survey by SCAQMD**

South Coast Air Quality Management District performed some construction surveys in order to develop default equipment usage and construction phase lengths. The initial survey was for projects less than five acres in size and is described in the following reference: The Sample Construction Scenarios for Projects Less than Five Acres in Size

(<http://www.aqmd.gov/ceqa/handbook/LST/FinalReport.pdf>)

An additional 16 sites between five and thirty acres were surveyed for mid-sized projects. The amount and types of equipment was developed by attempting to find trends in data (i.e., comparing projects within the same project size, length of construction phases, number of pieces of equipment with areas disturbed, etc.).

The results of these surveys are included in the following tables.

| Demolition<br>One Acre       |                 |        | Demolition<br>Two Acre       |                 |        | Demolition<br>Three Acre       |                 |        | Demolition<br>Five Acre       |                 |        |
|------------------------------|-----------------|--------|------------------------------|-----------------|--------|--------------------------------|-----------------|--------|-------------------------------|-----------------|--------|
| Equipment Type               | No. of<br>Equip | hr/day | Equipment Type               | No. of<br>Equip | hr/day | Equipment Type                 | No. of<br>Equip | hr/day | Equipment Type                | No. of<br>Equip | hr/day |
| Rubber Tired Dozers          | 1               | 1      | Rubber Tired Dozers          | 1               | 8      | Rubber Tired Dozers            | 1               | 8      | Rubber Tired Dozers           | 2               | 8      |
| Concrete/Industrial Saws     | 1               | 8      | Concrete Saw                 | 1               | 8      | Concrete Saw                   | 1               | 8      | Concrete Saw                  | 1               | 8      |
| Excavators                   |                 |        | Excavators                   |                 |        | Excavators                     |                 |        | Excavators                    | 3               | 8      |
| Bore/Drill Rigs              |                 |        | Bore/Drill Rigs              |                 |        | Bore/Drill Rigs                |                 |        | Bore/Drill Rigs               |                 |        |
| Tractors/Loaders/Backhoes    | 2               | 6      | Tractors/Loaders/Backhoes    | 3               | 8      | Tractors/Loaders/Backhoes      | 3               | 8      | Tractors/Loaders/Backhoes     |                 |        |
|                              | 4               |        |                              | 5               |        |                                | 5               |        |                               | 6               |        |
| Grading<br>One Acre          |                 |        | Grading<br>Two Acre          |                 |        | Grading<br>Three Acre          |                 |        | Grading<br>Five Acre          |                 |        |
| Equipment Type               | No. of<br>Equip | hr/day | Equipment Type               | No. of<br>Equip | hr/day | Equipment Type                 | No. of<br>Equip | hr/day | Equipment Type                | No. of<br>Equip | hr/day |
| Rubber Tired Dozers          | 1               | 6      | Rubber Tired Dozers          | 1               | 8      | Rubber Tired Dozers            | 1               | 8      | Rubber Tired Dozers           | 1               | 8      |
| Excavators                   |                 |        | Excavators                   |                 |        | Excavators                     |                 |        | Excavators                    | 1               | 8      |
| Graders                      | 1               | 6      | Graders                      | 1               | 8      | Graders                        | 1               | 8      | Graders                       | 1               | 8      |
| Scrapers                     |                 |        | Scrapers                     |                 |        | Scrapers                       |                 |        | Scrapers                      |                 |        |
| Tractors/Loaders/Backhoes    | 1               | 7      | Tractors/Loaders/Backhoes    | 2               | 7      | Tractors/Loaders/Backhoes      | 2               | 7      | Tractors/Loaders/Backhoes     | 3               | 8      |
|                              | 3               |        |                              | 4               |        |                                | 4               |        |                               | 6               |        |
| Construction<br>One Acre     |                 |        | Construction<br>Two Acre     |                 |        | Construction<br>Three Acre     |                 |        | Construction<br>Five Acre     |                 |        |
| Equipment Type               | No. of<br>Equip | hr/day | Equipment Type               | No. of<br>Equip | hr/day | Equipment Type                 | No. of<br>Equip | hr/day | Equipment Type                | No. of<br>Equip | hr/day |
| Cranes                       | 1               | 4      | Cranes                       | 1               | 6      | Cranes                         | 1               | 8      | Cranes                        | 1               | 7      |
| Welders                      |                 |        | Welders                      | 3               | 8      | Welders                        | 3               | 8      | Welders                       | 1               | 8      |
| Excavators                   |                 |        | Excavators                   |                 |        | Excavators                     |                 |        | Excavators                    |                 |        |
| Forklifts                    | 2               | 6      | Forklifts                    | 1               | 6      | Forklifts                      | 2               | 7      | Forklifts                     | 3               | 8      |
| Generator Sets               |                 |        | Generator Sets               | 1               | 8      | Generator Sets                 | 1               | 8      | Generator Sets                | 1               | 8      |
| Tractors/Loaders/Backhoes    | 2               | 8      | Tractors/Loaders/Backhoes    | 1               | 6      | Tractors/Loaders/Backhoes      | 1               | 6      | Tractors/Loaders/Backhoes     | 3               | 7      |
|                              | 5               |        |                              | 7               |        |                                | 8               |        |                               | 9               |        |
| Coating/Paving<br>One Acre   |                 |        | Coating/Paving<br>Two Acre   |                 |        | Coating/Paving<br>Three Acre   |                 |        | Coating/Paving<br>Five Acre   |                 |        |
| Equipment Type               | No. of<br>Equip | hr/day | Equipment Type               | No. of<br>Equip | hr/day | Equipment Type                 | No. of<br>Equip | hr/day | Equipment Type                | No. of<br>Equip | hr/day |
| Pavers                       | 1               | 7      | Pavers                       | 1               | 6      | Pavers                         | 1               | 8      | Pavers                        | 1               | 8      |
| Paving Equipment             |                 |        | Paving Equipment             | 1               | 8      | Paving Equipment               | 1               | 8      | Paving Equipment              | 2               | 6      |
| Cement and Mortar Mixers     | 4               | 6      | Cement and Mortar Mixers     | 1               | 6      | Cement and Mortar Mixers       | 1               | 8      | Cement and Mortar Mixers      | 2               | 6      |
| Plate Compactors             |                 |        | Plate Compactors             |                 |        | Plate Compactors               |                 |        | Plate Compactors              |                 |        |
| Rollers                      | 1               | 7      | Rollers                      | 1               | 7      | Rollers                        | 2               | 8      | Rollers                       | 2               | 6      |
| Tractors/Loaders/Backhoes    | 1               | 7      | Tractors/Loaders/Backhoes    | 1               | 8      | Tractors/Loaders/Backhoes      | 1               | 8      | Tractors/Loaders/Backhoes     | 1               | 8      |
|                              | 7               |        |                              | 5               |        |                                | 6               |        |                               | 8               |        |
| Site Preparation<br>One Acre |                 |        | Site Preparation<br>Two Acre |                 |        | Site Preparation<br>Three Acre |                 |        | Site Preparation<br>Five Acre |                 |        |
| Equipment Type               | No. of<br>Equip | hr/day | Equipment Type               | No. of<br>Equip | hr/day | Equipment Type                 | No. of<br>Equip | hr/day | Equipment Type                | No. of<br>Equip | hr/day |
| Grader                       | 1               | 8      | Grader                       | 1               | 8      | Grader                         | 1               | 8      | Grader                        |                 |        |
| Bulldozer                    |                 |        | Bulldozer                    |                 |        | Bulldozer                      |                 |        | Bulldozer                     | 3               | 8      |
| Excavator                    |                 |        | Excavator                    | 1               | 7      | Excavator                      |                 |        | Excavator                     |                 |        |
| Scraper                      |                 |        | Scraper                      |                 |        | Scraper                        | 1               | 8      | Scraper                       |                 |        |
| Tractor/Loader/Backhoe       | 1               | 8      | Tractor/Loader/Backhoe       | 1               | 8      | Tractor/Loader/Backhoe         | 1               | 7      | Tractor/Loader/Backhoe        | 4               | 8      |
|                              | 2               |        |                              | 3               |        |                                | 3               |        |                               | 7               |        |

| Equipment                    |              |        |                                  |              |        |                                 |              |        |                                      |              |        |
|------------------------------|--------------|--------|----------------------------------|--------------|--------|---------------------------------|--------------|--------|--------------------------------------|--------------|--------|
| Demolition<br>Ten Acre       |              |        | Demolition<br>Fifteen Acre       |              |        | Demolition<br>Twenty Acre       |              |        | Demolition<br>Twenty-five Acre       |              |        |
| Equipment Type               | No. of Equip | hr/day | Equipment Type                   | No. of Equip | hr/day | Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Rubber Tired Dozers          | 2            | 8      | Rubber Tired Dozers              | 2            | 8      | Rubber Tired Dozers             | 2            | 8      | Rubber Tired Dozers                  | 2            | 8      |
| Concrete Saw                 | 1            | 8      | Concrete Saw                     | 1            | 8      | Concrete Saw                    | 1            | 8      | Concrete Saw                         | 1            | 8      |
| Excavators                   | 3            | 8      | Excavators                       | 3            | 8      | Excavators                      | 3            | 8      | Excavators                           | 3            | 8      |
| Bore/Drill Rigs              |              |        | Bore/Drill Rigs                  |              |        | Bore/Drill Rigs                 |              |        | Bore/Drill Rigs                      |              |        |
| Tractors/Loaders/Backhoes    |              |        | Tractors/Loaders/Backhoes        |              |        | Tractors/Loaders/Backhoes       |              |        | Tractors/Loaders/Backhoes            |              |        |
|                              | 6            |        |                                  | 6            |        |                                 | 6            |        |                                      | 6            |        |
| Grading<br>Ten Acre          |              |        | Grading<br>Fifteen Acre          |              |        | Grading<br>Twenty Acre          |              |        | Grading<br>Twenty-five Acre          |              |        |
| Equipment Type               | No. of Equip | hr/day | Equipment Type                   | No. of Equip | hr/day | Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Rubber Tired Dozers          | 1            | 8      | Rubber Tired Dozers              | 1            | 8      | Rubber Tired Dozers             | 1            | 8      | Rubber Tired Dozers                  | 1            | 8      |
| Excavators                   | 1            | 8      | Excavators                       | 2            | 8      | Excavators                      | 2            | 8      | Excavators                           | 2            | 8      |
| Graders                      | 1            | 8      | Graders                          | 1            | 8      | Graders                         | 1            | 8      | Graders                              | 1            | 8      |
| Scrapers                     |              |        | Scrapers                         | 2            | 8      | Scrapers                        | 2            | 8      | Scrapers                             | 2            | 8      |
| Tractors/Loaders/Backhoes    | 3            | 8      | Tractors/Loaders/Backhoes        | 2            | 8      | Tractors/Loaders/Backhoes       | 2            | 8      | Tractors/Loaders/Backhoes            | 2            | 8      |
|                              | 6            |        |                                  | 8            |        |                                 | 8            |        |                                      | 8            |        |
| Construction<br>Ten Acre     |              |        | Construction<br>Fifteen Acre     |              |        | Construction<br>Twenty Acre     |              |        | Construction<br>Twenty-five Acre     |              |        |
| Equipment Type               | No. of Equip | hr/day | Equipment Type                   | No. of Equip | hr/day | Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Cranes                       | 1            | 7      | Cranes                           | 1            | 7      | Cranes                          | 1            | 7      | Cranes                               | 1            | 7      |
| Welders                      | 1            | 8      | Welders                          | 1            | 8      | Welders                         | 1            | 8      | Welders                              | 1            | 8      |
| Excavators                   |              |        | Excavators                       |              |        | Excavators                      |              |        | Excavators                           |              |        |
| Forklifts                    | 3            | 8      | Forklifts                        | 3            | 8      | Forklifts                       | 3            | 8      | Forklifts                            | 3            | 8      |
| Generator Sets               | 1            | 8      | Generator Sets                   | 1            | 8      | Generator Sets                  | 1            | 8      | Generator Sets                       | 1            | 8      |
| Tractors/Loaders/Backhoes    | 3            | 7      | Tractors/Loaders/Backhoes        | 3            | 7      | Tractors/Loaders/Backhoes       | 3            | 7      | Tractors/Loaders/Backhoes            | 3            | 7      |
|                              | 9            |        |                                  | 9            |        |                                 | 9            |        |                                      | 9            |        |
| Coating/Paving<br>Ten Acre   |              |        | Coating/Paving<br>Fifteen Acre   |              |        | Coating/Paving<br>Twenty Acre   |              |        | Coating/Paving<br>Twenty-five Acre   |              |        |
| Equipment Type               | No. of Equip | hr/day | Equipment Type                   | No. of Equip | hr/day | Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Pavers                       | 2            | 8      | Pavers                           | 2            | 8      | Pavers                          | 2            | 8      | Pavers                               | 2            | 8      |
| Paving Equipment             | 2            | 8      | Paving Equipment                 | 2            | 8      | Paving Equipment                | 2            | 8      | Paving Equipment                     | 2            | 8      |
| Cement and Mortar Mixers     |              |        | Cement and Mortar Mixers         |              |        | Cement and Mortar Mixers        |              |        | Cement and Mortar Mixers             |              |        |
| Plate Compactors             |              |        | Plate Compactors                 |              |        | Plate Compactors                |              |        | Plate Compactors                     |              |        |
| Rollers                      | 2            | 8      | Rollers                          | 2            | 8      | Rollers                         | 2            | 8      | Rollers                              | 2            | 8      |
| Tractors/Loaders/Backhoes    |              |        | Tractors/Loaders/Backhoes        |              |        | Tractors/Loaders/Backhoes       |              |        | Tractors/Loaders/Backhoes            |              |        |
|                              | 6            |        |                                  | 6            |        |                                 | 6            |        |                                      | 6            |        |
| Site Preparation<br>Ten Acre |              |        | Site Preparation<br>Fifteen Acre |              |        | Site Preparation<br>Twenty Acre |              |        | Site Preparation<br>Twenty-five Acre |              |        |
| Equipment Type               | No. of Equip | hr/day | Equipment Type                   | No. of Equip | hr/day | Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Grader                       |              |        | Grader                           |              |        | Grader                          |              |        | Grader                               |              |        |
| Bulldozer                    | 3            | 8      | Bulldozer                        | 3            | 8      | Bulldozer                       | 3            | 8      | Bulldozer                            | 3            | 8      |
| Excavator                    |              |        | Excavator                        |              |        | Excavator                       |              |        | Excavator                            |              |        |
| Scraper                      |              |        | Scraper                          |              |        | Scraper                         |              |        | Scraper                              |              |        |
| Tractor/Loader/Backhoe       | 4            | 8      | Tractor/Loader/Backhoe           | 4            | 8      | Tractor/Loader/Backhoe          | 4            | 8      | Tractor/Loader/Backhoe               | 4            | 8      |
|                              | 7            |        |                                  | 7            |        |                                 | 7            |        |                                      | 7            |        |

| Demolition<br>Thirty Acre       |              |        | Demolition<br>Thirty-four Acre       |              |        |
|---------------------------------|--------------|--------|--------------------------------------|--------------|--------|
| Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Rubber Tired Dozers             | 2            | 8      | Rubber Tired Dozers                  | 2            | 8      |
| Concrete Saw                    | 1            | 8      | Concrete Saw                         | 1            | 8      |
| Excavators                      | 3            | 8      | Excavators                           | 3            | 8      |
| Bore/Drill Rigs                 |              |        | Bore/Drill Rigs                      |              |        |
| Tractors/Loaders/Backhoes       |              |        | Tractors/Loaders/Backhoes            |              |        |
|                                 | 6            |        |                                      | 6            |        |
| Grading<br>Thirty Acre          |              |        | Grading<br>Thirty-four Acre          |              |        |
| Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Rubber Tired Dozers             | 1            | 8      | Rubber Tired Dozers                  | 1            | 8      |
| Excavators                      | 2            | 8      | Excavators                           | 2            | 8      |
| Graders                         | 1            | 8      | Graders                              | 1            | 8      |
| Scrapers                        | 2            | 8      | Scrapers                             | 2            | 8      |
| Tractors/Loaders/Backhoes       | 2            | 8      | Tractors/Loaders/Backhoes            | 2            | 8      |
|                                 | 8            |        |                                      | 8            |        |
| Construction<br>Thirty Acre     |              |        | Construction<br>Thirty-four Acre     |              |        |
| Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Cranes                          | 1            | 7      | Cranes                               | 1            | 7      |
| Welders                         | 1            | 8      | Welders                              | 1            | 8      |
| Excavators                      |              |        | Excavators                           |              |        |
| Forklifts                       | 3            | 8      | Forklifts                            | 3            | 8      |
| Generator Sets                  | 1            | 8      | Generator Sets                       | 1            | 8      |
| Tractors/Loaders/Backhoes       | 3            | 7      | Tractors/Loaders/Backhoes            | 3            | 7      |
|                                 | 9            |        |                                      | 9            |        |
| Coating/Paving<br>Thirty Acre   |              |        | Coating/Paving<br>Thirty-four Acre   |              |        |
| Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Pavers                          | 2            | 8      | Pavers                               | 2            | 8      |
| Paving Equipment                | 2            | 8      | Paving Equipment                     | 2            | 8      |
| Cement and Mortar Mixers        |              |        | Cement and Mortar Mixers             |              |        |
| Plate Compactors                |              |        | Plate Compactors                     |              |        |
| Rollers                         | 2            | 8      | Rollers                              | 2            | 8      |
| Tractors/Loaders/Backhoes       |              |        | Tractors/Loaders/Backhoes            |              |        |
|                                 | 6            |        |                                      | 6            |        |
| Site Preparation<br>Thirty Acre |              |        | Site Preparation<br>Thirty-four Acre |              |        |
| Equipment Type                  | No. of Equip | hr/day | Equipment Type                       | No. of Equip | hr/day |
| Grader                          |              |        | Grader                               |              |        |
| Bulldozer                       | 3            | 8      | Bulldozer                            | 3            | 8      |
| Excavator                       |              |        | Excavator                            |              |        |
| Scraper                         |              |        | Scraper                              |              |        |
| Tractor/Loader/Backhoe          | 4            | 8      | Tractor/Loader/Backhoe               | 4            | 8      |
|                                 | 7            |        |                                      | 7            |        |

## **2 Building Construction Worker and Vendor Trip Rates**

### Construction Vendor Trips - Defaults for CalEEMod

Based on 2008 SMAQMD Field Survey - SCAQMD 2010 Update

| Site                       | Location       | Type                                  | # Units | Square Footage          |                        |                    | Raw Data Collection in Field |             |            | Observation Time (minutes) | Multiplier to Equate Mins to 8 hrs/day |
|----------------------------|----------------|---------------------------------------|---------|-------------------------|------------------------|--------------------|------------------------------|-------------|------------|----------------------------|----------------------------------------|
|                            |                |                                       |         | Residential Area, sq ft | Commerical Area, sq ft | Office Area, sq ft | Light Duty                   | Medium Duty | Heavy Duty |                            |                                        |
| Heritage Park              | Woodland       | Single Family Residential             | 2,037   |                         |                        |                    | 13                           | 3           | 6          | 37                         | 12.97                                  |
| Heritage Park (2nd visit)  | Woodland       | Single Family Residential             | 2,037   |                         |                        |                    | 13                           | 3           | 2          | 30                         | 16                                     |
| Yolo Co. Emergency Service | Woodland       | Commercial                            |         |                         | 43,560                 |                    | 2                            | 2           | 0          | 30                         | 16                                     |
| Woodshire                  | Woodland       | Single Family Residential             | 2,000   |                         |                        |                    | 5                            | 3           | 5          | 35                         | 13.71                                  |
| Woodshire (2nd visit)      | Woodland       | Single Family Residential             | 2,000   |                         |                        |                    | 10                           | 0           | 3          | 30                         | 16                                     |
| 815 H St.                  | Davis          | Multi-Family Residential              | 8       |                         |                        |                    | 1                            | 0           | 0          | 30                         | 16                                     |
| Eleanor Roosevelt Cr.      | Davis          | Multi-Family Residential              | 60      |                         |                        |                    | 2                            | 0           | 0          | 30                         | 16                                     |
| Parlin Ranch               | West Sac       | Single Family Residential             | 306     |                         |                        |                    | 2                            | 1           | 3          | 30                         | 16                                     |
| Bridgeway Lakes 2          | West Sac       | Single Family Residential             | 487     |                         |                        |                    | 7                            | 2           | 0          | 30                         | 16                                     |
| The Rivers                 | West Sac       | Single Family Residential             | 1,139   |                         |                        |                    | 7                            | 2           | 0          | 30                         | 16                                     |
| The River's Side           | West Sac       | Single Fam/ Multi Fam/ Comm           | 29      | 43,560                  | 3,850                  |                    | 2                            | 2           | 0          | 30                         | 16                                     |
| Carriage Lane              | Sacramento     | Multi-Family Residential              | 156     |                         |                        |                    | 0                            | 2           | 1          | 30                         | 16                                     |
| Promenade                  | Sacramento     | Office/ Comm & Retail                 |         |                         | 751,000                | 504,000            | 10                           | 1           | 6          | 40                         | 12                                     |
| Serenade                   | Sacramento     | Single Family Residential             |         |                         |                        |                    | 5                            | 7           | 2          | 30                         | 16                                     |
| 1801 L St. Building        | Sacramento     | Multi-Fam Res/ Comm & Retail          | 176     | 48,226                  | 9,600                  |                    | 2                            | 0           | 0          | 30                         | 16                                     |
| 800 J Lofts                | Sacramento     | Multi-Fam Res/ Retail                 |         | 144,035                 | 50,965                 |                    | 2                            | 1           | 0          | 30                         | 16                                     |
| Marriott Hotel             | Sacramento     | Multi-Family Res/ Comm                | 30      | 80,143                  | 187,000                |                    | 1                            | 0           | 1          | 30                         | 16                                     |
| Anatolia I                 | Rancho Cordova | Single Fam Res/ Comm                  | 1,038   | 7,122,060               | 631,620                |                    | 19                           | 15          | 10         | 30                         | 16                                     |
| Pappas Gateway Ctr         | Elk Grove      | Comm/ Retail                          |         |                         | 11,200                 |                    | 1                            | 0           | 2          | 30                         | 16                                     |
| Sheldon Place              | Elk Grove      | Single Family Residential             | 164     |                         |                        |                    | 6                            | 2           | 0          | 30                         | 16                                     |
| Laguna Ridge (east pt)     | Elk Grove      | SF Res/ MF Res/ Office/ Comm & Retail | 7,826   | 1,132,560               | 2,853,180              | 307,969            | 4                            | 5           | 51         | 30                         | 16                                     |
| Laguna Ridge (west pt)     | Elk Grove      | SF Res/ MF Res/ Office/ Comm & Retail | 7,826   | 1,132,560               | 2,853,180              | 307,969            | 7                            | 8           | 8          | 30                         | 16                                     |

Total Units/SqFt

|        |           |           |           |
|--------|-----------|-----------|-----------|
| 27,319 | 9,703,144 | 7,395,155 | 1,119,938 |
|--------|-----------|-----------|-----------|



**Construction Vendor Trips - Defaults for CalEEMod**

Based on 2008 SMAQMD Field Survey - SCAQMD 2010 Update

| Site                                    | Daily Count |             |            | Residential |             |            | Commercial |             |            | Office     |             |            | References for the Residential SqFt                                                                                                                                                                                                         |
|-----------------------------------------|-------------|-------------|------------|-------------|-------------|------------|------------|-------------|------------|------------|-------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Light Duty  | Medium Duty | Heavy Duty | Light Duty  | Medium Duty | Heavy Duty | Light Duty | Medium Duty | Heavy Duty | Light Duty | Medium Duty | Heavy Duty |                                                                                                                                                                                                                                             |
| Heritage Park                           | 169         | 39          | 78         | 169         | 39          | 78         | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Heritage Park (2nd visit)               | 208         | 48          | 32         | 208         | 48          | 32         | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Yolo Co. Emergency Service              | 32          | 32          | 0          | 0           | 0           | 0          | 32         | 32          | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Woodshire                               | 69          | 41          | 69         | 69          | 41          | 69         | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Woodshire (2nd visit)                   | 160         | 0           | 48         | 160         | 0           | 48         | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| 815 H St.                               | 16          | 0           | 0          | 16          | 0           | 0          | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Eleanor Roosevelt Cr.                   | 32          | 0           | 0          | 32          | 0           | 0          | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Parlin Ranch                            | 32          | 16          | 48         | 32          | 16          | 48         | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Bridgeway Lakes 2                       | 112         | 32          | 0          | 112         | 32          | 0          | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| The Rivers                              | 112         | 32          | 0          | 112         | 32          | 0          | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| The River's Side                        | 32          | 32          | 0          | 29          | 29          | 0          | 3          | 3           | 0          | 0          | 0           | 0          | <a href="http://www.mintierharnish.com/projects/westsac/pdf/2008-2013HousingElementUpdate.pdf">http://www.mintierharnish.com/projects/westsac/pdf/2008-2013HousingElementUpdate.pdf</a>                                                     |
| Carriage Lane                           | 0           | 32          | 16         | 0           | 32          | 16         | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Promenade                               | 120         | 12          | 72         | 0           | 0           | 0          | 72         | 7           | 43         | 48         | 5           | 29         |                                                                                                                                                                                                                                             |
| Serenade                                | 80          | 112         | 32         | 80          | 112         | 32         | 0          | 0           | 0          | 0          | 0           | 0          | Serenade at Regency Park Homeowners Association (916) 925-9000                                                                                                                                                                              |
| 1801 L St. Building                     | 32          | 0           | 0          | 27          | 0           | 0          | 5          | 0           | 0          | 0          | 0           | 0          | <a href="http://www.kuchman.com/architecture-portfolio/urban/1801L.html">http://www.kuchman.com/architecture-portfolio/urban/1801L.html</a>                                                                                                 |
| 800 J Lofts                             | 32          | 16          | 0          | 24          | 12          | 0          | 8          | 4           | 0          | 0          | 0           | 0          | <a href="http://www.cityofsacramento.org/econdev/development-projects/documents/700-800_K_Street_Final_Proposal_web.pdf">http://www.cityofsacramento.org/econdev/development-projects/documents/700-800_K_Street_Final_Proposal_web.pdf</a> |
| Marriott Hotel                          | 16          | 0           | 16         | 5           | 0           | 5          | 11         | 0           | 11         | 0          | 0           | 0          | <a href="http://sacramento.bizjournals.com/sacramento/business_travel/guide/hotels.html">http://sacramento.bizjournals.com/sacramento/business_travel/guide/hotels.html</a>                                                                 |
| Anatolia I                              | 304         | 240         | 160        | 279         | 220         | 147        | 25         | 20          | 13         | 0          | 0           | 0          | <a href="http://www.cityofranchocordova.org/Modules/ShowDocument.aspx?documentid=758">http://www.cityofranchocordova.org/Modules/ShowDocument.aspx?documentid=758</a>                                                                       |
| Pappas Gateway Ctr                      | 16          | 0           | 32         | 0           | 0           | 0          | 16         | 0           | 32         | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Sheldon Place                           | 96          | 32          | 0          | 96          | 32          | 0          | 0          | 0           | 0          | 0          | 0           | 0          |                                                                                                                                                                                                                                             |
| Laguna Ridge (east pt)                  | 64          | 80          | 816        | 17          | 21          | 215        | 43         | 53          | 542        | 4          | 6           | 59         | <a href="http://sacramento.bizjournals.com/sacramento/stories/2008/05/12/story7.html">http://sacramento.bizjournals.com/sacramento/stories/2008/05/12/story7.html</a>                                                                       |
| Laguna Ridge (west pt)                  | 112         | 128         | 128        | 30          | 34          | 34         | 74         | 85          | 85         | 8          | 9           | 9          | <a href="http://sacramento.bizjournals.com/sacramento/stories/2008/05/12/story7.html">http://sacramento.bizjournals.com/sacramento/stories/2008/05/12/story7.html</a>                                                                       |
| Total Daily Vehicle Trips               | 1,846       | 925         | 1,547      |             |             |            |            |             |            |            |             |            |                                                                                                                                                                                                                                             |
| Total Daily Vehicle Trips               |             |             |            | 1,496       | 701         | 724        | 289        | 204         | 727        | 60         | 20          | 97         |                                                                                                                                                                                                                                             |
| Vehicle Trips per Unit or 1k Sq Ft      |             |             |            | 0.0548      | 0.0256      | 0.0265     | 0.0391     | 0.0275      | 0.0983     | 0.0538     | 0.0176      | 0.0863     |                                                                                                                                                                                                                                             |
| TOTAL Vehicle Trips per Unit or 1k SqFt |             |             |            | 0.1069      |             |            | 0.1649     |             |            | 0.1577     |             |            |                                                                                                                                                                                                                                             |

# Construction Vendor Trips - Defaults for CalEEMod

Based on 2008 SMAQMD Field Survey - SCAQMD 2010 Update

| Site                       | Commerical and Office Area, sq ft | Commercial and Office Daily Count |               |            |
|----------------------------|-----------------------------------|-----------------------------------|---------------|------------|
|                            |                                   | Light Duty                        | Medium Duty   | Heavy Duty |
| Heritage Park              | 0                                 | 0                                 | 0             | 0          |
| Heritage Park (2nd visit)  | 0                                 | 0                                 | 0             | 0          |
| Yolo Co. Emergency Service | 43,560                            | 32                                | 32            | 0          |
| Woodshire                  | 0                                 | 0                                 | 0             | 0          |
| Woodshire (2nd visit)      | 0                                 | 0                                 | 0             | 0          |
| 815 H St.                  | 0                                 | 0                                 | 0             | 0          |
| Eleanor Roosevelt Cr.      | 0                                 | 0                                 | 0             | 0          |
| Parlin Ranch               | 0                                 | 0                                 | 0             | 0          |
| Bridgeway Lakes 2          | 0                                 | 0                                 | 0             | 0          |
| The Rivers                 | 0                                 | 0                                 | 0             | 0          |
| The River's Side           | 3,850                             | 3                                 | 3             | 0          |
| Carriage Lane              | 0                                 | 0                                 | 0             | 0          |
| Promenade                  | 1,255,000                         | 120                               | 12            | 72         |
| Serenade                   | 0                                 | 0                                 | 0             | 0          |
| 1801 L St. Building        | 9,600                             | 5                                 | 0             | 0          |
| 800 J Lofts                | 50,965                            | 8                                 | 4             | 0          |
| Marriott Hotel             | 187,000                           | 11                                | 0             | 11         |
| Anatolia I                 | 631,620                           | 25                                | 20            | 13         |
| Pappas Gateway Ctr         | 11,200                            | 16                                | 0             | 32         |
| Sheldon Place              | 0                                 | 0                                 | 0             | 0          |
| Laguna Ridge (east pt)     | 3,161,149                         | 47                                | 59            | 601        |
| Laguna Ridge (west pt)     | 3,161,149                         | 82                                | 94            | 94         |
| TOTALS                     | <b>8,515,093</b>                  | <b>349</b>                        | <b>223</b>    | <b>823</b> |
|                            |                                   | 0.0410                            | 0.0262        | 0.0967     |
|                            |                                   |                                   | <b>0.1639</b> |            |

### **3 Analysis of Warehouse Trip Generation Rates by SCAQMD**

Note – This appendix is based on information available at the time the first version of CalEEMod was released. SCAQMD is currently overseeing a study on High Cube Warehouse truck trip rates. Once this study has been completed, the CalEEMod Focus Group within CAPCOA will consider revising this appendix and the default High Cube Warehouse trip rates within CalEEMod. Further information regarding this study is available on the web here: <http://www.aqmd.gov/ceqa/Warehouse/Warehouse.html>.



## **Large Warehouse and Distribution Center Trip Rates**

### ***Introduction***

New large warehouse projects and distribution centers (>100,000 square feet) have become a more common project type in the past several years, especially in the western Riverside County and San Bernardino County area. As an example, at least 8 new EIRs for warehouse projects totaling 17.75 million square feet have been reviewed by SCAQMD staff since late 2008 just in the vicinity of the city of Perris in Riverside County. These warehouse projects are commonly associated with substantial diesel emissions due to the high volume of heavy duty trucks that serve them. Diesel Particulate Matter (DPM) from internal combustion engines has been classified as a carcinogen by the California Air Resources Board (CARB). This white paper has been prepared because the number of truck trips associated with warehousing projects is a key component in determining the potential impact of DPM emissions on surrounding communities. Due to concern about these emissions, the CARB in its *Air Quality and Land Use Handbook* recommended providing a 1,000 foot setback from any distribution center serving more than 100 trucks per day.

For CEQA purposes, the volume of truck traffic predicted to serve a new large warehouse project is typically derived using the Institute of Transportation Engineers Trip Generation manual. This is the same source of traffic data used in the URBEMIS air quality model. The trip rate value used in URBEMIS is 4.96 trips per 1,000 square feet (TSF) for warehouse projects (land use type 150). This value is from the 7<sup>th</sup> Edition of the Trip Generation manual, published in 2003. Several developers of high-cube warehouses in recent years have questioned the validity of this value for modern warehousing operations and have commissioned local studies to investigate these trip rates. As a result, in the most recent version of the Trip Generation manual (8<sup>th</sup> Edition, 2008), additional data has been included to provide a new high-cube warehouse (land use 152) trip rate of 1.44 trips/TSF.

SCAQMD staff and other interested parties have questioned lead agencies about this lower rate because of concern that industrial warehouse project analyses may be underestimating the number of trucks serving them. If this were true, air quality impacts may be underreported in the corresponding CEQA analyses. This memo and attached spreadsheet presents a meta-analysis of available traffic studies that have targeted high-cube warehouses.

## **Studies**

The seven studies included in this meta-analysis are listed below. Studies marked with an (\*) are included in the 8<sup>th</sup> Edition of the ITE Trip Generation manual.

1. \**Westside Industrial Park, Warehouse Trip Generation Study – Twenty Five Buildings, Duval County Florida*, December 5, 2008. King Engineering Associates, Inc.
2. \**Westside Industrial Park, Warehouse Trip Generation Study –Eight Buildings, Duval County Florida*, December 5, 2008. King Engineering Associates, Inc.
3. \**Trip Generation Study. High-Cube Warehouse Buildings, Fresno California*, January 19, 2007. Peters Engineering Group
4. \**Trip Generation Study. Existing High-Cube Warehouse Buildings, Visalia California*, October 1, 2008. Peters Engineering Group
5. \**Western Riverside County Warehouse/Distribution Center Trip Generation Study*, May 2008. Crain and Associates
6. \**San Bernardino/Riverside County Warehouse/Distribution Center Vehicle Trip Generation Study (Inland Empire Study)*, January 2005. Crain and Associates
7. *Truck Trip Generation Study, City of Fontana*, August 2003. Transportation Engineering and Planning, Inc.

Together these seven studies include traffic counts for 68 different warehouse buildings. 35 of those warehouses are in California, and 25 are in the South Coast Basin. As a comparison, a total of 35 individual buildings were included in the ITE Trip Generation 8<sup>th</sup> Edition.

## **Data Analysis**

In the ITE 8<sup>th</sup> Edition manual the trip rates range from 0.20-2.88 trips/TSF with an average of 1.44 and a standard deviation of 1.39. In order to investigate the high standard deviation and range of rates, all 68 warehouses from the above mentioned studies were investigated using overhead and oblique aerial photography to determine site-specific characteristics. Table 1 and Chart 1 present a statistical summary of trip rates determined from all seven studies. Based on this aerial reconnaissance, two factors were identified that may lower the reported trip rate for individual warehouses including the presence of a rail line serving the facility, and the potential partial vacancy of a facility.

| Statistical Measure                                  | Rail Service? | Potential Vacancy? | Number of Buildings | Trips/TSF   |
|------------------------------------------------------|---------------|--------------------|---------------------|-------------|
| Minimum trip rate                                    | No            | Yes                | 68                  | 0.17        |
| Maximum trip rate                                    | No            | No                 | 68                  | 5.25        |
| Average of all trip rates                            | Some          | Some               | 68                  | 1.57        |
| Standard Deviation of all trip rates                 | Some          | Some               | 68                  | 0.81        |
| 95 <sup>th</sup> Percentile of all trip rates        | Some          | Some               | 68                  | 2.57        |
| Average for CA warehouses                            | Some          | Some               | 35                  | 1.44        |
| Average for SCAB warehouses                          | Some          | Some               | 25                  | 1.57        |
| Average for all warehouses                           | Yes           | Yes                | 14                  | 0.73        |
| Average for all warehouses                           | Yes           | No                 | 8                   | 0.81        |
| Average for all warehouses                           | No            | Some               | 58                  | 1.79        |
| Average for all warehouses                           | No            | No                 | 54                  | 1.91        |
| 95 <sup>th</sup> Percentile for SCAB warehouses      | No            | No                 | 13                  | 3.68        |
| <b>95<sup>th</sup> Percentile for all warehouses</b> | <b>No</b>     | <b>No</b>          | <b>54</b>           | <b>2.59</b> |
| <b>95<sup>th</sup> Percentile for all warehouses</b> | <b>Yes</b>    | <b>No</b>          | <b>8</b>            | <b>1.63</b> |
| <b>ITE High-Cube warehouses</b>                      | <b>Some</b>   | <b>Some</b>        | <b>35</b>           | <b>1.44</b> |

**Table 1** Statistical summary of trip rates

CA= California, SCAB=South Coast Air Basin

Rail lines are expected to lower the truck trip rate by diverting the transportation of goods from trucks to trains that directly service the facility. Rail service must include spurs that are adjacent to loading docks at the facility (Figure 1). Vacancies or partial vacancies in the trip rate studies are difficult to verify, however analysis of aerial photographs provides circumstantial evidence that anomalously low trip rates are associated with facilities with virtually no trucks parked at the loading docks at the time that the photograph was taken (Figure 2). While this accounts for the majority of the anomalously low trip rates, the lack of adequate business histories or historical photographic coverage make this correlation difficult to validate. Trip rates were also investigated in comparison to building size; however no correlation was identified (Chart 2).

In order to avoid underestimating the number of trips associated with large warehouse / distribution center operations without rail service, AQMD staff recommends that lead agencies utilize a rate of 2.59 trips per TSF for large warehouse air quality analyses on a project specific basis. The value of 2.59 from the nationwide dataset is preferable instead of the SCAB rate of 3.68 due to the greater reliability of data based on the larger sample size. For warehouses with rail service, a rate of 1.63 trips per TSF may be used. These values provide reasonable worst case default rates for individual new warehouses in the absence of more project-specific data.

In the case that air quality is evaluated for multiple warehouses (>10), such as in an analysis for a general plan, the average rate of 1.44 trips per TSF from the ITE 8<sup>th</sup> Edition Trip Generation manual is acceptable. This lower value may be more appropriate as on average, a small portion

of warehouses can be expected to operate at varying levels of service, including some warehouses experiencing temporary partial or complete vacancy.

### ***Fleet Mix***

The fleet mix used in the URBEMIS model is derived from the regional average distribution of trips obtained from the EMFAC model. While this fleet mix may be appropriate for the majority of land uses, it may not be appropriate for specialized uses such as warehouses. For example, as reported in the ITE 8<sup>th</sup> Edition Trip Generation manual, truck trips may account for 9 to 29 percent of total trips. Five of the seven studies analyzed here did not report specific truck traffic data, though some generally reported similar rates. The Inland Empire study (#6) found that trucks accounted for 28 to 65 percent of total trips for the ten warehouses in the study, with an average of 48%. The Fontana study (#7) found that trucks make up approximately 20% of total trips for the four warehouses evaluated. This study also broke down the trip distribution among 2, 3, and 4+ axle trucks (3.46%, 4.64%, 12.33%, respectively). In order to avoid underestimating the number of trucks visiting warehouse facilities, AQMD staff recommends that lead agencies conservatively assume that an average of 40% of total trips are truck trips  $[(0.48 \times 10 + 0.2 \times 4) / (10 + 4) = 0.4]$ . Without more project-specific data (such as detailed trip rates based on a known tenant schedule), this average rate of 40% provides a reasonably conservative value based on currently available data.

The fleet mix from the Fontana study as quoted above may be used to determine the distribution of truck type. In order to convert the axle based fleet mix to the vehicle classes utilized by EMFAC, one of two methods may be used.

1. 4+ axles=HHDT, 3 axles=MHDT, 2 axles=LHDT1, all others=LDA
2. Caltrans *Transportation Project-Level Carbon Monoxide Protocol* Appendix B (illustrated below).  
 $\%HDGT = 0.50(\%2\text{-axle}) + 0.25(\%3\text{-axle}) + 0.10(\%4\text{ axle})$   
 $\%HDDT = 0.50(\%2\text{-axle}) + 0.75(\%3\text{-axle}) + 0.90(\%4\text{-axle}) + 1.0(\%5\text{-axle})$   
All others=LDA

# Chart 1 - Total Trips vs. Building Area for All Warehouses

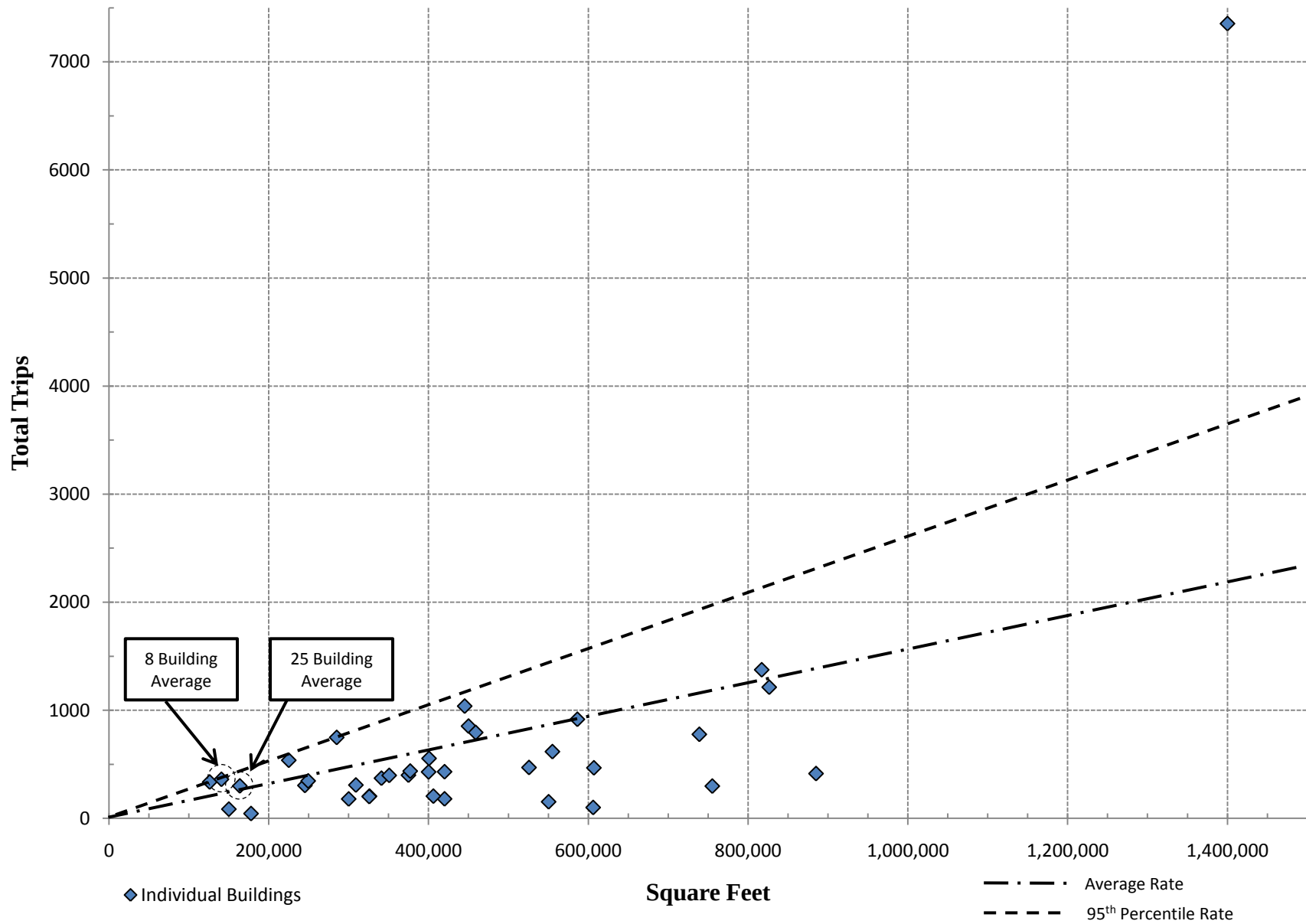
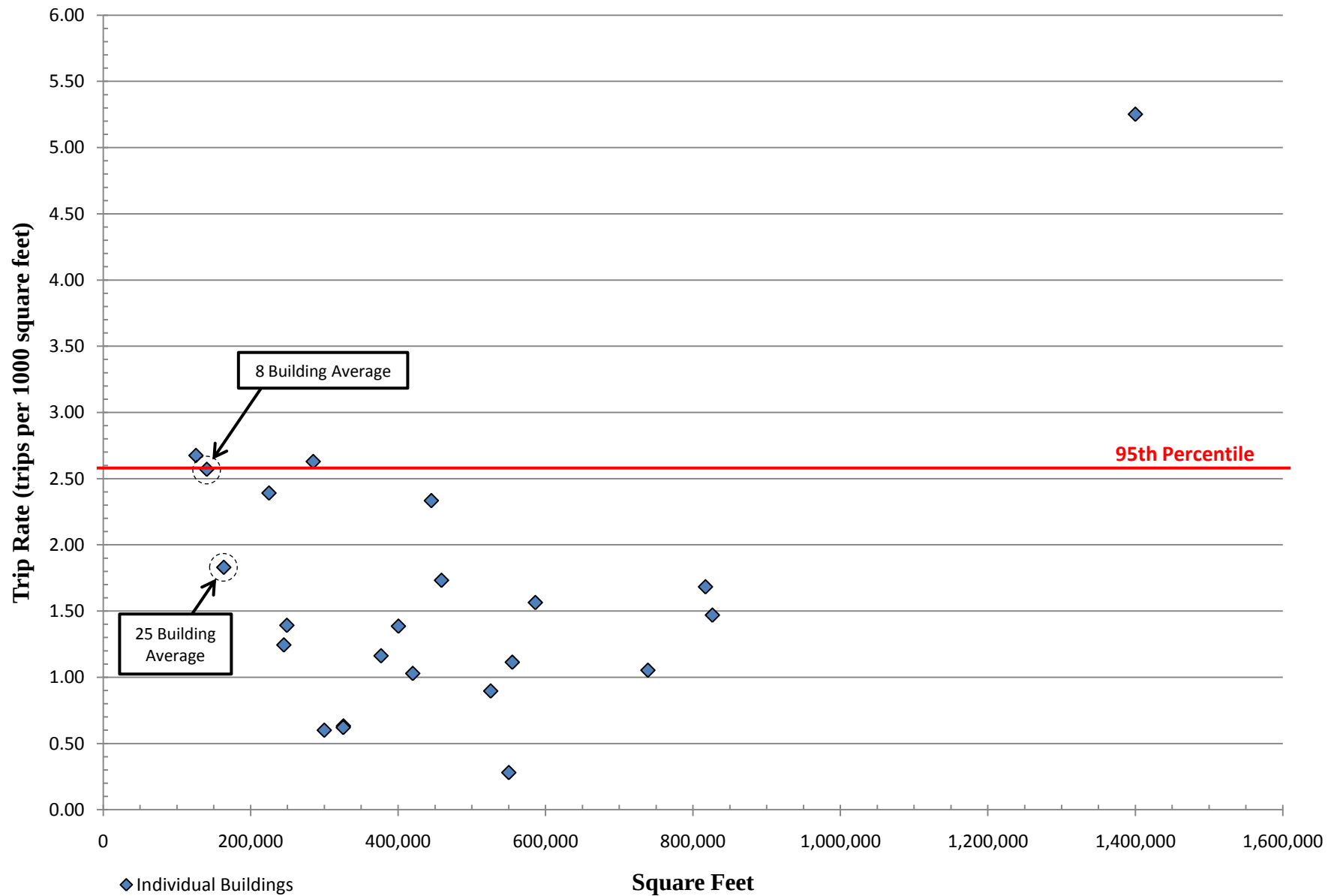




**Chart 2 - Trip Rate vs. Building Area (without rail or potential vacancy)**



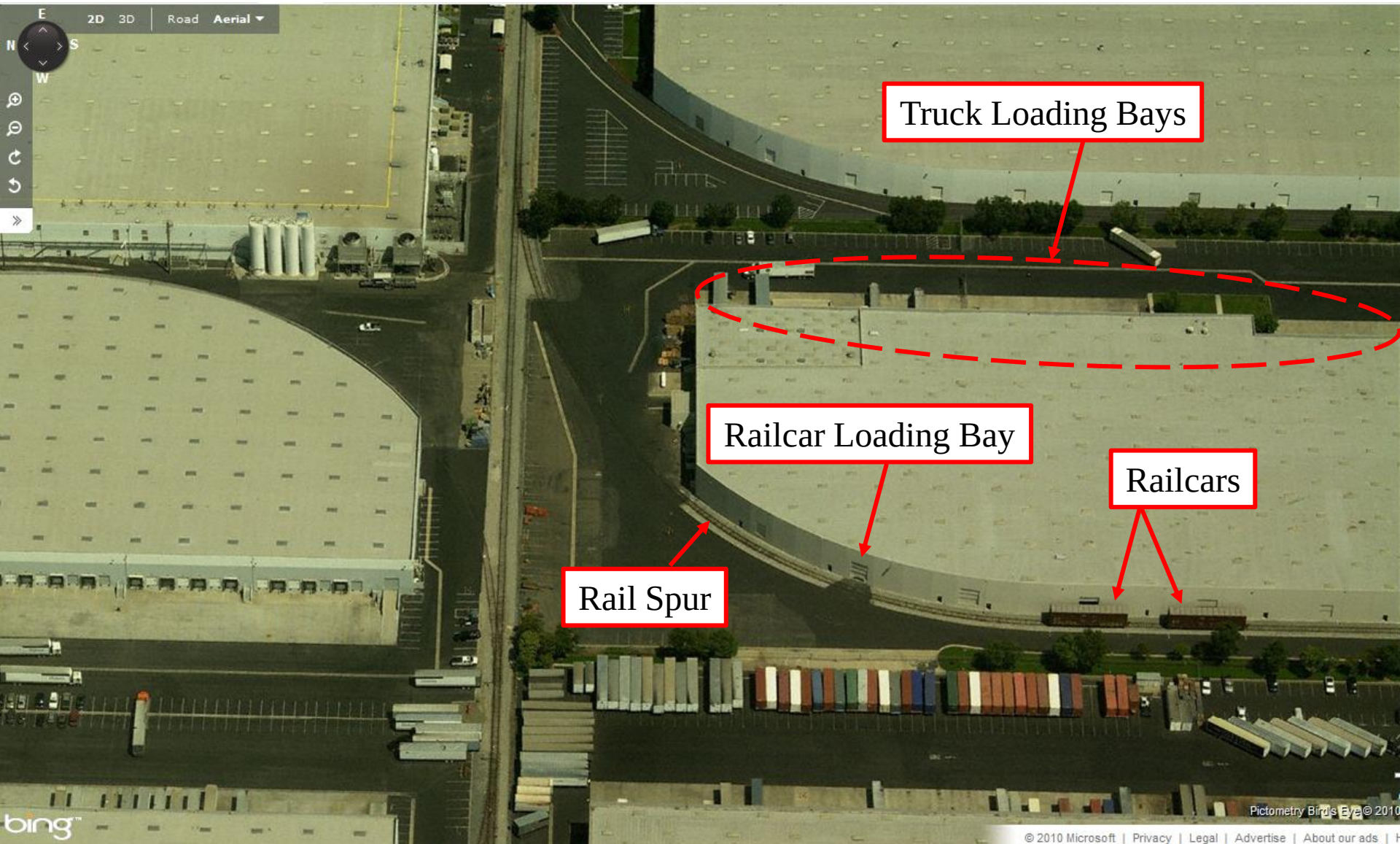
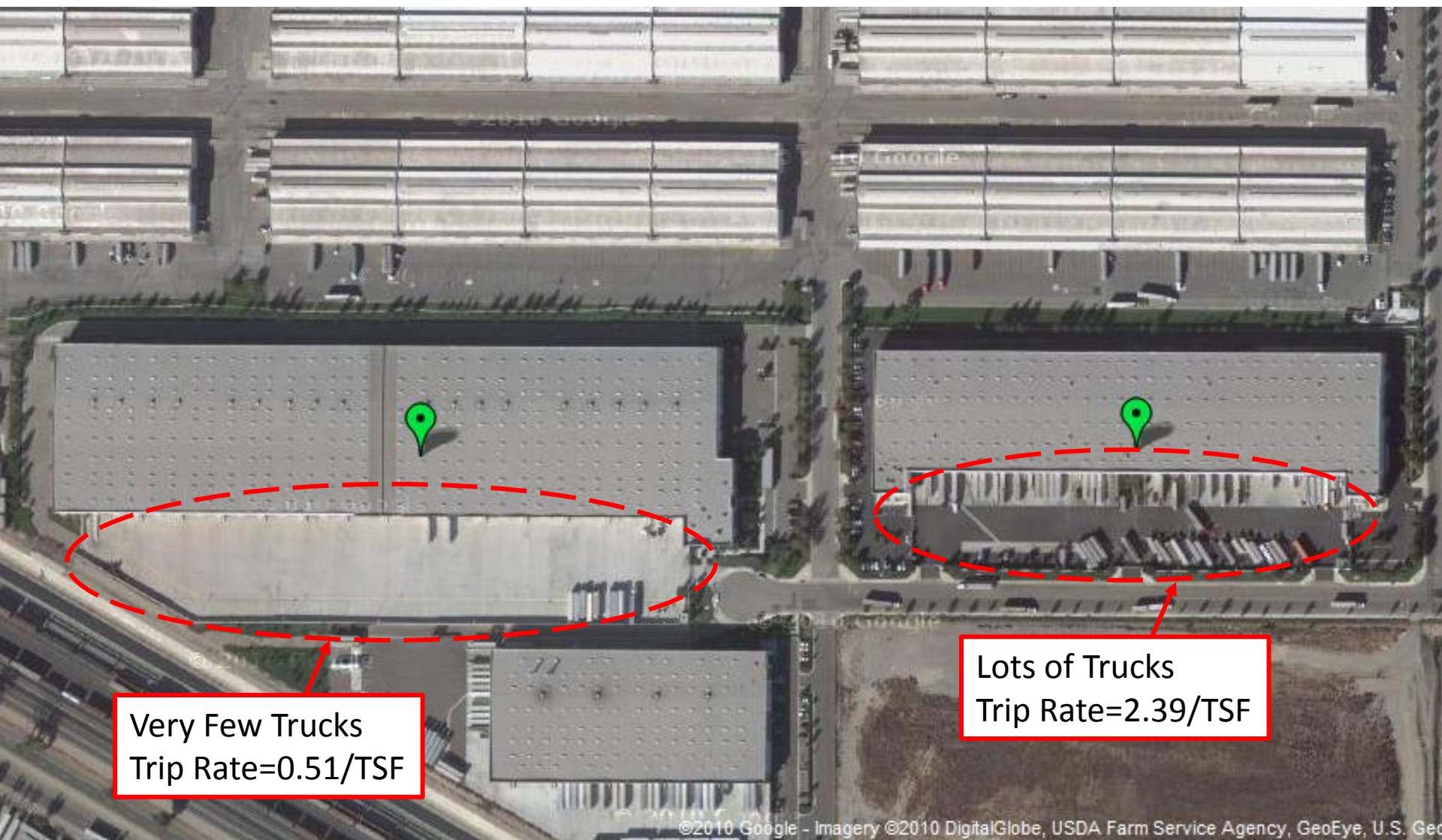


**Figure 1** Oblique aerial photograph showing an example of a facility evaluated in the NAIOP San Bernardino County Truck Study. The truck trip rate for this facility was 1.13/TSF





Very Few Trucks  
Trip Rate=0.51/TSF

Lots of Trucks  
Trip Rate=2.39/TSF

**Figure 2** Aerial photograph showing an example of two facilities evaluated in the NAIOP Riverside County Truck Study. The facility on the left is suspected to be at least partially vacant.

## MEMORANDUM

Date: August 23, 2010

To: Jennifer Schulte, ENVIRON

From: David Robinson, Meghan Mitman, Fehr & Peers

**Subject: Large Warehouse and Distribution Center Trip Rates**

SF10-0495

Fehr & Peers completed its review of the Large Warehouse and Distribution Center Trip Rates white paper prepared by the Southern California Air Quality Management District (SCAQMD). The white paper presents the results of a meta-analysis of seven trip generation studies of warehouse and distribution centers located in California and Florida.

Our review of the white paper focused on the recommended trip generation rates presented in Table 1 (Statistical Summary of Trip Rates) and the statistical analysis provided in file SCAQMD Trip Rate Study\_7-21-10.xlsx). We have the following observations based on our review:

- Use of 95 Percentile – The recommended trip generation rates are based on the 95 percentile of trip generation rate observations. The 95 percentile trip generation rate can be defined as the lowest trip generation rate that is greater than 95 percent of the observed trip generation rates. The use of the 95 percentile may be overly conservative. Another approach would be to base the recommended trip generation rate on the 95 percentile confidence interval, which would result in a trip generation rate between the average and 95 percentile rates for all warehouses.
- Observations – Both studies from Florida (i.e., reference 1 and 2 on Page 2) were treated as single observations to calculate the average trip generation rate for all warehouses, but were treated as multiple observations for the standard deviation calculation, which would affect the calculation of the confidence interval (discussed above). These studies and corresponding trip generation rates are based on the combined trip generation and building area of multiple buildings/uses in the same industrial park. One study included 31 buildings and the other included 9 buildings. The building size ranged from about 64,000 to about 440,000 square-feet.
- Outliers – One observation from the Fontana study (i.e., reference 7 on Page 2) is considerably higher than the other observations. Eliminating this observation results in a 20% decrease in the average trip generation rate for all warehouses.

Clarification Responses by SCAQMD regarding Fehr and Peers August 23, 2010 Memorandum  
Large Warehouse and Distribution Center Trip Rates

Use of 95 Percentile

- o AQMD STAFF RESPONSE – A CONFIDENCE INTERVAL APPROACH IS INAPPROPRIATE FOR A CEQA AIR QUALITY ANALYSIS AS THIS GIVES THE ODDS THAT A NEW POPULATION WILL RETURN AN AVERAGE WITHIN THE CONFIDENCE INTERVAL. IN THE CONTEXT OF CEQA, AIR QUALITY ANALYSES SHOULD EVALUATE A REASONABLE WORST CASE SCENARIO SO AS NOT TO UNDERESTIMATE IMPACTS. THIS CONSERVATIVE APPROACH IS SUPPORTED BY CEQA CASE LAW AND IS CONSISTENT WITH AQMD GUIDANCE ON PREPARING AIR QUALITY ANALYSES. ALSO, IT IS WORTH NOTING THAT 11 OUT OF 54 BUILDINGS ARE ALREADY AT OR ABOVE THE 95<sup>TH</sup> PERCENTILE.

Observations

- o AQMD STAFF RESPONSE – THE STATISTICAL APPROACH DESCRIBED IN THIS COMMENT DOES NOT MAKE AFFECT THE TRIP RATE. SPLITTING OUT INDIVIDUAL BUILDINGS FOR THE AVERAGE DOESN'T ALTER THE TRIP RATE SINCE THE AVERAGE IS TRIPS/SQ. FT. HOWEVER, THE NUMBER OF INDIVIDUAL BUILDINGS ARE NEEDED FOR THE STANDARD DEVIATION, SO THE FLORIDA STUDIES WERE SPLIT UP TO OBTAIN A CORRECT 'N' ( EVERY BUILDING WAS ASSIGNED THE SAME RATE).

Outliers

- o AQMD STAFF RESPONSE - THIS IS EXACTLY THE POINT, IF WE KNOW THAT SOME BUILDINGS HAVE A RATE CONSIDERABLY HIGHER THAN OTHER BUILDINGS, THEN THE USE OF AVERAGES MAY CONSIDERABLY UNDERESTIMATE POTENTIAL AIR QUALITY IMPACTS. THIS IS ESPECIALLY IMPORTANT FOR ANY SENSITIVE RECEPTORS THAT MAY BE LOCATED IN CLOSE PROXIMITY TO EITHER THE FACILITIES OR THE TRUCK ROUTES SERVING THEM. UNLIKE SOME OTHER STATISTICAL STUDIES, THIS SINGULAR HIGH RATE (FROM A SMALL DATASET) IS NOT A MEASUREMENT ERROR, HENCE IT SHOULD NOT BE DISCARDED AS IT IS A REAL FACILITY WITH REAL IMPACTS IN THE COMMUNITY.

## **4 Consumer Product Use Analysis by SCAQMD**

# Consumer Products Summary

Statewide Volatile Organic Compound (VOC) emissions data was obtained from the 2008 California Air Resources Board (CARB) Consumer Product Emission Inventory.<sup>1</sup> Statewide total VOC emissions were 239.6 tons/day.

The statewide total building area is 22,435,267,518 square feet. The general building stock inventory was obtained from the HAZUS-MH software and backup databases prepared by the Federal Emergency Management Agency.<sup>2</sup> This inventory was found to be the most comprehensive statewide data available that included building area for all land use types. The inventory was developed from the following information:

- Census of Population and Housing, 2000: Summary Tape File 1B Extract on CDROM prepared by the Bureau of Census.
- Census of Population and Housing, 2000: Summary Tape File 3 on CD-ROM prepared by the Bureau of Census.
- Dun & Bradstreet, Business Population Report aggregated by Standard Industrial Classification (SIC) and Census Block, May 2002.
- Department of Energy, Housing Characteristics 1993. Office of Energy Markets and End Use, DOE/EIA-0314 (93), June 1995.
- Department of Energy, A Look at Residential Energy Consumption in 1997, DOE/EIA-0632(97), November 1999.
- Department of Energy, A Look at Commercial Buildings in 1995: Characteristics, Energy Consumption, and Energy Expenditures, DOE/EIA-0625(95), October 1998.

Statewide VOC's per building square feet are therefore:

$(239.6 \text{ tons/day} \times 2000 \text{ lbs/ton}) / 22,435,267,518 \text{ sq. ft.} = 2.14e-5 \text{ lbs/(sq.ft.-day)}$

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<sup>1</sup> [http://www.arb.ca.gov/app/emsmv/emssumcat\\_query.php?F\\_YR=2008&F\\_DIV=-4&F\\_SEASON=A&SP=2009&F\\_AREA=CA#5](http://www.arb.ca.gov/app/emsmv/emssumcat_query.php?F_YR=2008&F_DIV=-4&F_SEASON=A&SP=2009&F_AREA=CA#5)

<sup>2</sup> Detailed information is contained in the HAZUS-MH Earthquake Technical Manual, Chapter 3.2.1.3 available here: <http://www.fema.gov/plan/prevent/hazus/>

| Data Grouping                                          | Total VOC<br>(tons/day) | Population* | Total VOC<br>(lbs/person-day) | Total Building Area<br>(Square Feet)                                      |
|--------------------------------------------------------|-------------------------|-------------|-------------------------------|---------------------------------------------------------------------------|
| 2003 Survey Commercial (45.3% of 2003 Land Use Total)  | 47.4                    |             |                               |                                                                           |
| 2003 Survey Residential (48.0% of 2003 Land Use Total) | 50.3                    |             |                               |                                                                           |
| 2003 Survey Industrial (6.7% of 2003 Land Use Total)   | 7.0                     |             |                               |                                                                           |
| 2003 Survey Land Use Total (42.3% of Grand Total)      | 104.7                   |             |                               |                                                                           |
| 2003 Survey ARB Data Total                             | 186.3                   | 34,650,690  | 1.08E-02                      | 8,600,000,000 from AQMD draft staff report for consumer products rule     |
| 2006 Survey ARB Data Total                             | 61.1                    | 36,457,549  | 3.35E-03                      |                                                                           |
| <b>Grand Total</b>                                     | <b>247.3</b>            |             | <b>1.41E-02</b>               | <b>22,435,267,518</b> from HAZUS-MH, data from late 1990's - early 2000's |

\*Data from American Communities Survey from the US Census

|                                                  |       |                                                                                                      |                  |
|--------------------------------------------------|-------|------------------------------------------------------------------------------------------------------|------------------|
| 2008 ARB Emission Inventory (Consumer Products)  | 239.6 | <div> <div>Total VOC<br/>(lbs/building sq. ft.)</div> <div>2.14E-05</div> <div>2.04E-05</div> </div> | Statewide Factor |
| SCAQMD R1143 reduction to 300 g/l (as of 1/1/11) | 11.3  |                                                                                                      |                  |
| If 25 g/L gets upheld by the courts              | 17.5  |                                                                                                      |                  |

1.98E-05 SCAQMD



## **5 Analysis of Building Energy Use Data by ENVIRON**

# Analysis of Building Energy Use Data by ENVIRON

This summarizes the steps and assumptions used in preparing building energy use estimates used in CalEEMod.

## Background

GHGs are emitted as a result of activities in residential and commercial buildings when electricity and natural gas are used as energy sources. New California buildings must be designed to meet the building energy efficiency standards of Title 24, also known as the California Building Standards Code. Title 24 Part 6 regulates energy uses including space heating and cooling, hot water heating, ventilation, and hard-wired lighting. By committing to a percent improvement over Title 24, a development reduces its energy use and resulting GHG emissions.

The Title 24 standards have been updated twice (in 2005 and 2008)<sup>1</sup> since some of these data used to estimate energy use were compiled. California Energy Commission (CEC) has published reports estimating the percentage deductions in energy use resulting from these new standards. Based on CEC's discussion on average savings for Title 24 improvements, these CEC savings percentages by end use can be used to account for reductions in electricity and natural gas use due to the two most recent updates to Title 24. Since energy use for each different system type (ie, heating, cooling, water heating, and ventilation) as well as appliances is defined in this survey, the use of survey data with updates for Title 24 will easily allow for application of mitigation measures aimed at reducing the energy use of these devices in a prescriptive manner.

Another mitigation measure to reduce a building's energy consumption as well as the associated GHG emissions from natural gas combustion and electricity production is to use energy-efficient appliances. For residential dwellings, typical builder-supplied appliances include refrigerators and dishwashers. Clothes washers and ceiling fans would be applicable if the builder supplied them. For commercial land uses, only energy-efficient refrigerators have been evaluated for grocery stores.

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<sup>1</sup> California Energy Commission. 2003. Impact Analysis: 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available at:

[http://www.energy.ca.gov/title24/2005standards/archive/rulemaking/documents/2003-07-11\\_400-03-014.PDF](http://www.energy.ca.gov/title24/2005standards/archive/rulemaking/documents/2003-07-11_400-03-014.PDF)

California Energy Commission. 2006. California Commercial End-Use Survey. Prepared by Itron Inc. Available at:

<http://www.energy.ca.gov/ceus/>

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## Methodology

### Datasets

The Residential Appliance Saturation Survey (RASS)<sup>2</sup> and California Commercial Energy Use Survey (CEUS)<sup>3</sup> datasets were used to estimate the energy intensities of residential and non-residential buildings, respectively, since the data are available for several land use categories in different climate zones in California. The RASS dataset further differentiates the energy use intensities between single-family, multi-family and townhome residences.

The Energy Star and Other Climate Protection Partnerships 2008 Annual Report<sup>4</sup> and subsequent Annual Reports were reviewed for typical reductions for energy-efficient appliances. ENERGY STAR residential refrigerators, clothes washers, dishwashers, and ceiling fans use 15%, 25%, 40%, and 50% less electricity than standard appliances, respectively. ENERGY STAR commercial refrigerators use 35% less electricity than standard appliances.

### Calculations

RASS and CEUS datasets were used to obtain the energy intensities of different end use categories for different building types in different climate zones. Energy intensities from CEUS are given per square foot per year and used as presented. RASS presents Unit Energy Consumption (UEC) per dwelling unit per year and saturation values; the energy intensities used in this analysis are products of the UEC and saturation values.

Data for some climate zones are not presented in the CEUS and RASS studies. However, data from adjacent climate zones are assumed to be representative and substituted as follows:

For non-residential building types:

- Climate Zone 11 used Climate Zone 9 data.
- Climate Zone 12 used Climate Zone 9 data.
- Climate Zone 14 used Climate Zone 1 data.
- Climate Zone 15 used Climate Zone 10 data.

For residential building types:

- Climate Zone 6 used Climate Zone 2 data.
- Climate Zone 14 used Climate Zone 1 data.
- Climate Zone 15 used Climate Zone 10 data.

RASS and CEUS data are based on 2002 consumption data. Because older buildings tend to be less energy efficient, and the majority of the buildings in the survey were likely constructed before 2001, the RASS and CEUS data likely overestimate energy use for a 2001 Title 24-compliant building.

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<sup>2</sup> California Statewide Residential Appliance Saturation Study Reporting Center. Available at:

<http://websafe.kemainc.com/RASSWEB/DesktopDefault.aspx>

<sup>3</sup> California Energy Commission. 2006. California Commercial End-Use Survey. Prepared by Itron Inc. Available at:

<http://www.energy.ca.gov/ceus/>

<sup>4</sup> United States Environmental Protection Agency 2009. ENERGY STAR and Other Climate Protection Partnerships: 2008 Annual Report. Available at: <http://www.epa.gov/cpd/pdf/2008AnnualReportFinal.pdf>

To account for updates since the 2001 Title 24 standards, percentage reductions for each end use category taken directly from the CEC's "Impact Analysis for 2005 Energy Efficiency Standards" and "Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings" reports were applied to the CEUS and RASS datasets for improvements from 2001 to 2005, and 2005 to 2008, respectively (see Table 1 and 2). For the CEUS data, exterior lighting was assumed to be covered by Title 24 lighting and therefore has the full percentage reductions taken. Interior lighting was assumed to be 50% Title 24 and 50% non-Title 24 uses. Therefore only half of the reduction for lighting was applied. The resulting 2008 numbers were then used as baseline energy intensities. In CalEEMod, if the user selects use historical (2005), the reductions only include up to the 2005 standards. The total baseline energy intensities are calculated as follows:

$$\text{Baseline} = \sum [T24_{2001} \times (1 - R_{2001-2005}) \times (1 - R_{2005-2008})] + \sum \text{NT24}$$

Where:

- Baseline = Total baseline energy intensities of building category
- $T24_{2001}$  = Energy intensities of Title 24 regulated end use from RASS or CEUS
- $R_{2001-2005}$  = Reduction from 2001 to 2005
- $R_{2005-2008}$  = Reduction from 2005 to 2008
- NT24 = Non-Title 24 regulated end use energy intensities

Table 1  
Reduction in Title 24 Regulated End Use for Non-Residential Buildings

| Energy Source | End Use           | Reduction from 2001 to 2005 | Reduction from 2005 to 2008 |
|---------------|-------------------|-----------------------------|-----------------------------|
| Electricity   | Heating           | 4.9%                        | 37.2%                       |
|               | Ventilation       | 5.0%                        | 1.5%                        |
|               | Refrigeration     | 0.0%                        | 0.0%                        |
|               | Process           | 0.0%                        | 0.0%                        |
|               | Office Equipment  | 0.0%                        | 0.0%                        |
|               | Motors            | 0.0%                        | 0.0%                        |
|               | Miscellaneous     | 0.0%                        | 0.0%                        |
|               | Interior Lighting | 4.9%                        | 5.9%                        |
|               | Water Heating     | 0.0%                        | 0.0%                        |
|               | Cooking           | 0.0%                        | 0.0%                        |
|               | Air Compressors   | 0.0%                        | 0.0%                        |
|               | Cooling           | 6.7%                        | 8.3%                        |
|               | Exterior Lighting | 9.8%                        | 11.7%                       |
| Natural Gas   | Cooking           | 0.0%                        | 0.0%                        |
|               | Cooling           | 10.4%                       | 9.3%                        |
|               | Heating           | 3.1%                        | 15.9%                       |
|               | Water Heating     | 0.0%                        | 0.0%                        |
|               | Process           | 0.0%                        | 0.0%                        |
|               | Miscellaneous     | 0.0%                        | 0.0%                        |

Table 2  
Reduction in Title 24 Regulated End Use for Residential Buildings

| Energy Source | End Use<br>(As presented in RASS Dataset) | Reduction from 2001 to 2005 |               |           | Reduction from 2005 to 2008 |               |           |
|---------------|-------------------------------------------|-----------------------------|---------------|-----------|-----------------------------|---------------|-----------|
|               |                                           | Multi-family                | Single family | Town home | Multi-family                | Single family | Town home |
| Electricity   | Conv. Electric heat                       | 24.3%                       | 19.8%         | 24.3%     | 19.7%                       | 22.7%         | 19.7%     |
|               | HP Eheat                                  | 24.3%                       | 19.8%         | 24.3%     | 19.7%                       | 22.7%         | 19.7%     |
|               | Aux Eheat                                 | 24.3%                       | 19.8%         | 24.3%     | 19.7%                       | 22.7%         | 19.7%     |
|               | Furnace Fan                               | 24.3%                       | 19.8%         | 24.3%     | 19.7%                       | 22.7%         | 19.7%     |
|               | Central A/C                               | 24.3%                       | 19.8%         | 24.3%     | 19.7%                       | 22.7%         | 19.7%     |
|               | Room A/C                                  | 24.3%                       | 19.8%         | 24.3%     | 19.7%                       | 22.7%         | 19.7%     |
|               | Evap Cooling                              | 24.3%                       | 19.8%         | 24.3%     | 19.7%                       | 22.7%         | 19.7%     |
|               | Water Heat                                | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Solar Water Heater                        | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Dryer                                     | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Clothes Washer                            | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Dish Washer                               | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | First Refrigerator                        | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Second Refrigerator                       | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Freezer                                   | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Pool Pump                                 | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Spa                                       | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Outdoor Lighting                          | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Range/Oven                                | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | TV                                        | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Spa Electric Heat                         | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Microwave                                 | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Home Office                               | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | PC                                        | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Water Bed                                 | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Well Pump                                 | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Miscellaneous                             | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
| Natural Gas   | Primary Heat                              | 15.7%                       | 6.7%          | 15.7%     | 7.0%                        | 10.0%         | 7.0%      |
|               | Auxiliary Heat                            | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Conv. Gas Water Heat                      | 15.7%                       | 6.7%          | 15.7%     | 7.0%                        | 10.0%         | 7.0%      |
|               | Solar Water Heat w/Gas Backup             | 15.7%                       | 6.7%          | 15.7%     | 7.0%                        | 10.0%         | 7.0%      |
|               | Dryer                                     | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Range/Oven                                | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Pool Heat                                 | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Spa Heat                                  | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |
|               | Miscellaneous                             | 0.0%                        | 0.0%          | 0.0%      | 0.0%                        | 0.0%          | 0.0%      |

## **6 Assessment of Energy Emissions Associated with Parking Lots and Structures**

## Introduction

This paper recommends electricity energy use rates to calculate the energy consumption from the operation of car parking facilities in California. The energy uses considered include lighting, ventilation, and elevator use. Recommendations apply to open air parking lots, parking facilities with open walls and access to fresh air, and fully enclosed parking facilities, such as those that are underground, and require ventilation systems. These energy use rates allow the user to calculate lighting, ventilation and elevator use energy impacts separately.

## Purpose

This effort was undertaken in conjunction with the CalEEMod Land Use Model (“CalEEMod”) 2012 updates. Our intent is to determine if enough information is available to support the development of energy use rates for parking facilities in CalEEMod, and if so, what these recommended energy use rates should be.

## Limitations

Energy use rates from water pumps, for fire safety systems or for storm water removal, were not considered because CalEEMod does not include emissions estimates from any stationary sources located at land use development projects. Our research has not identified energy use rates for operational systems, such as from systems designed to collect payments or secure the property, such as computer, ticketing, camera surveillance, or automated and human-activated gate systems. To our knowledge, research is not available to determine in which situations or size of facilities these systems would be utilized. Likewise, research is not available to determine in which situations parking facilities include energy use from natural gas, heating, cooling, and water delivery. Therefore, these energy use rates are not considered.

## Proposed Energy Use Rates: Lighting and Ventilation

Energy Star is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy to promote energy efficient products and practices. As part of a larger project to evaluate the efficiency of buildings, Energy Star developed energy factors for parking facilities based on data from the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE), and a review of existing building codes and local ordinances in the United States. **Table 1** below presents factors for energy use in parking facilities, based on the Energy Star “Performance Ratings Technical Methodology for Parking” technical paper.<sup>i</sup>



| Table 1: Energy Use for Lighting and Ventilation by Parking Type                                                                                                     |                               |                                             |                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------|----------------------------|
|                                                                                                                                                                      |                               | Hourly Watts or Horse Power Per Square Foot | Assumed Hours of Operation |
| Open Parking                                                                                                                                                         | Lighting                      | 0.15 W/ft <sup>2</sup>                      | 16 hours/day               |
|                                                                                                                                                                      | Ventilation                   | none                                        |                            |
| Unenclosed Parking (no walls)                                                                                                                                        | Lighting                      | 0.30 W/ft <sup>2</sup>                      | 24 hours/day               |
|                                                                                                                                                                      | Ventilation                   | none                                        |                            |
| Fully Enclosed Parking (walls)                                                                                                                                       | Lighting                      | 0.30 W/ft <sup>2</sup>                      | 24 hours/day               |
|                                                                                                                                                                      | Ventilation <sup>(1)(2)</sup> | 0.6 hp/1,000 ft <sup>2</sup>                |                            |
| Notes:                                                                                                                                                               |                               |                                             |                            |
| 1. Ventilation is characterized in terms of flow rate (cubic feet per minute per square foot, cfm/ft <sup>2</sup> equals 0.6 horse power per 1,000ft <sup>2</sup> ). |                               |                                             |                            |
| 2. One horse power( hp) is equal to 0.746 kiloWatts.                                                                                                                 |                               |                                             |                            |

**Table 2** shows the results of these factors in annual kWh per square foot of parking area.

| Table 2: Energy Use for Lighting and Ventilation by Parking Type |                  |           |           |                 |                       |
|------------------------------------------------------------------|------------------|-----------|-----------|-----------------|-----------------------|
| Type of Parking                                                  | Use              | Days/Year | Hours/Day | Annual kWh/SqFt | Total Annual kWh/SqFt |
| Open Parking                                                     | Lighting         | 365       | 16        | 0.876           | 0.876                 |
|                                                                  | (No) Ventilation |           |           |                 |                       |
| Unenclosed Parking (no walls)                                    | Lighting         | 365       | 24        | 2.63            | 2.63                  |
|                                                                  | (No) Ventilation |           |           |                 |                       |
| Fully Enclosed Parking (walls)                                   | Lighting         | 365       | 24        | 2.63            | 6.55                  |
|                                                                  | Ventilation      |           |           | 3.92            |                       |

The Energy Star energy rates are generally consistent with California Title 24 standards. The Title 24 year 2008 standard for indoor parking structure lighting is 0.30 Watts per foot squared; Title 24 year 2005 outdoor parking lighting standard is 0.15 Watts per foot squared; and the proposed Title 24 year 2013 standard for ventilation is 0.6 horse power per 1,000 feet squared<sup>ii</sup>. We have not identified any other sources to compare these factors to that are more appropriate. Note that the energy intensity of parking structures is one of the few land uses that the California Energy Commission (CEC) does not include in the California Commercial End-Use Survey (CEUS) analysis<sup>iii</sup>.

None of the other land uses already accounted for in CalEEMod have energy use rates as low as the Energy Star rates for parking facilities, and this is to be expected. Based on the analysis above, parking facilities use between 0.05 and 0.40 kW per square foot per year, and this is much lower when compared to some of the land uses already represented in CalEEMod. The lower end of electric energy rates in CalEEMod includes manufacturing, unrefrigerated warehouses and racquet ball clubs. Depending upon the climate zone, CalEEMod estimates the kW per square foot in unrefrigerated warehouses to be between 3 and 10 kW, and for racquet clubs between 2 and 12 kW. While this doesn't confirm the appropriateness of the Energy Star energy use rates, it is reasonable that parking facilities would have lower energy use rates than other uses.

## Proposed Energy Use Rates: Elevators

There are various elevator energy calculations available on the web<sup>iv</sup>. To our knowledge, none are independently verified by a public, private or government agency. This section presents three energy use rates for elevators. Energy use rates will depend on the manufacturer, the type and size of elevator, how many floors the elevator serves, the idle mode settings selected, how often the elevator is used and with how many people. For example, buildings with seven or fewer floors may use elevators powered by hydraulic motors, whereas buildings with eight or more floors will need more powerful and energy-intensive “geared or gearless traction” elevators. These elevators are driven by direct current motor-generator sets (DC MG), silicon controlled rectified (SCR) DC motors, or variable voltage variable frequency (VVVF) drives coupled to alternate current (AC) motors. All of these configurations provide variable and high-speed operation and provide regeneration, but exhibit different operating efficiencies<sup>v</sup>.

For our purposes, it is assumed that a parking structure elevator will serve ten or fewer floors. Elevators serving more than 10 floors are likely to be located in buildings with uses in addition to parking, and therefore CalEEMod will assume the energy use rates (including elevator use) associated with the other land uses in its calculations.

**Table 3** presents the **first example**. Dover Elevators has calculated the average kWh required per day for a single elevator equipped with MG, SCR, and VVVF drives. Based on these daily estimates, Table 3 calculates the per hour and annual energy use for two to five floors and six to ten floors based on the type of elevator technology employed.

| Table 3: Average Energy Consumption (kWh) for 2,500 Pound Capacity Elevators <sup>(1)</sup> |                                                                                       |            |                                    |            |                 |            |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------|------------------------------------|------------|-----------------|------------|
| Number of Floors                                                                            | kW Energy Use Based On How Electrical Current is Controlled (per hour)                |            |                                    |            |                 |            |
|                                                                                             | Variable Voltage Variable Frequency (VVVF)                                            |            | Silicon Controlled Rectified (SCR) |            | DC MG Sets (MG) |            |
| 2 to 5                                                                                      | 3.875                                                                                 |            | 6.625                              |            | 9               |            |
| 6 to 10                                                                                     | 4.875                                                                                 |            | 6.75                               |            | 9.5             |            |
| Number of Floors                                                                            | kW Energy Use Based On How Electrical Current is Controlled (per year) <sup>(2)</sup> |            |                                    |            |                 |            |
|                                                                                             | 16 hrs/day                                                                            | 24 hrs/day | 16 hrs/day                         | 24 hrs/day | 16 hrs/day      | 24 hrs/day |
| 2 to 5                                                                                      | 22,630                                                                                | 33,945     | 38,690                             | 58,035     | 52,560          | 78,840     |
| 6 to 10                                                                                     | 28,470                                                                                | 42,705     | 39,420                             | 59,130     | 55,480          | 83,220     |

**Notes:**

1. Based on calculations from Dover Elevators.
2. Combines calculations from Dover Elevators and Energy Star assumptions about hours of operations per day.

The **second example** is cited in the California Energy Commission (CEC) *2013 Nonresidential ACM Manual – Draft Version*, June 2011, (the “CEC Draft Manual”)<sup>vi</sup>. These estimates are based on a TIAX

report cited by the U.S. Energy Information Administration entitled, “Commercial and Residential Spector Miscellaneous Electricity Consumption: Y2005 and Projections to 2030” (the “TIAX Report”) and includes buildings with at least 50 percent of space dedicated to non-residential uses, including agricultural, industrial, schools, and institutional uses<sup>vii</sup>. **Table 4** below presents unit energy consumption data from a sample of approximately 5,200 buildings for 2,500 pound capacity elevators, based on time spent in different elevator modes – active, ready, standby, and off:

| <b>Table 4: Average Energy Consumption (kWh) for 2500 Pound Capacity Elevators<sup>(1)</sup></b> |                                     |                                  |                             |                      |
|--------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------|-----------------------------|----------------------|
| <b>Elevator Mode</b>                                                                             | <b>Percent of Time in Each Mode</b> | <b>Annual Hours in Each Mode</b> | <b>kWh Use in Each Mode</b> | <b>Annual kWh</b>    |
| Active                                                                                           | 3%                                  | 300                              | 10                          | 300                  |
| Ready                                                                                            | 84%                                 | 7,365                            | 0.5                         | 3683                 |
| Standby                                                                                          | 13%                                 | 1,095                            | 0.25                        | 274                  |
| Off                                                                                              | 0%                                  | 0                                | 0                           | 0                    |
| Total                                                                                            | 100%                                | 8760 <sup>(2)</sup>              | 11                          | 6,956 <sup>(3)</sup> |

**Notes:**

1. TIAX LLC. *Commercial and Residential Spector Miscellaneous Electricity Consumption: Y2005 and Projections to 2030*. September 22, 2006.
2. Assumes operation 365 days per year for 24 hours per day.
3. This energy use represents rates from 2003 projected out to 2005. Year 2005 shows only a slight decrease from the year 2003 baseline.

The differences in energy use estimates in Table 3 and Table 4 is astonishing. The TIAX Report estimates the energy use from the average 2,500 pound capacity elevator to be approximately 20 percent of the kWhs needed for a 24-hour day of the least-energy intensive elevator in the Dover estimates.

The **third example** is based on calculations provided by Kone Elevators documenting the energy savings between a hydraulic elevator and Kone’s elevators with the most energy efficient features selected.<sup>viii</sup> These features include energy-saving LED lighting, standby modes for lights, signalization, ceiling fans, and destination control systems, a lightweight hoisting system, and energy regenerating technology. According to Kone, the bulk of energy use in hydraulic elevators comes from the hoisting system. **Table 5** below is based on the information presented by Kone on annual energy consumption from hydraulic elevators and its “EcoSpace” option.

| <b>Table 5: Kone Average Energy Consumption (kWh) for 3500 Pound Capacity Elevator<sup>(1)</sup></b> |                                      |                                          |                          |
|------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------|--------------------------|
| <b>Energy Use</b>                                                                                    | <b>Hydraulic Elevator (kWh/year)</b> | <b>Kone EcoSpace Elevator (kWh/year)</b> | <b>Percent Reduction</b> |
| Lighting                                                                                             | 2,015                                | 153                                      | - 92%                    |
| Electrification                                                                                      | 1,139                                | 1,360                                    | +19%                     |
| Hoisting                                                                                             | 6,024                                | 895                                      | -85%                     |
| Total                                                                                                | 9,178                                | 2,408                                    | -74%                     |

**Notes:**

1. Based on information provided by Kone, Inc.

These estimates are based on a 3,500 pound capacity serving four floors with 200,000 starts per year, or 34 starts an hour, assuming 16 hours of operation per day.

## Evaluation of Data

It is a challenge to compare the three available examples. The Dover (*first example*) data are detailed and offer specifics about energy use based on the types of elevator systems, but no information on the usage, such as hours per day of operation, speed, or starts per day. This source also presents energy consumption much higher than the other two sources. The Dover information was collected from a website maintained by Washington State University and the Western Area Power Administration and is not dated. It is not clear if these data are current. The Kone (*third example*) estimates are also based on very specific elevator specifications that will not necessarily transfer to our application, which requires a much more general approach. It is not anticipated that CalEEMod users will have detailed information about the size, capacity, usage rates, and type of elevators (hydraulic, geared or gearless traction, etc.) or other specifications, such as type of lighting or ceiling fans selected.

The CEC Draft Manual reports that that elevators are custom designed for each building and “little information is known on how to model elevators.” Our research also resulted in few sources that were either specific to the manufacturer or very general.

TIAX (*second example*) is a reliable and reputable company who has conducted a robust study (5,200 buildings) of a variety of elevator types that would be more reflective of the real world and provides a simpler and direct method of determining energy use from an average-used elevator. The question still remains as to whether there is a standard in determining the number of elevators for a size of a parking lot. However, aside from the Americans with Disabilities Act requiring “one passenger elevator serving each level in all multi-story buildings,” a building code does not seem to exist requiring how many per size or square footage. It should be noted that the Americans with Disabilities Act does allow parking structures that provide the correct number of accessible spaces on the ground floor to not install an elevator<sup>ix</sup>. As elevators would increase building costs and consume valuable square feet, it seems reasonable to conclude that parking structures are constructed with as few elevators as required by local building codes.

The TIAX Report does include energy use rate projections for a selected future year (2015, 2020, etc.) based on project build out year<sup>x</sup> but, at this time, such programming would be more complex and would require more information from the User. Thus, it is concluded for the default to use a fixed value in time.

Ultimately, decisions regarding the number of elevators is left to the developer who may choose based on a number of reasons. However, there are other sources, including this “rule of thumb” based on all modern American construction (not just commercial buildings):

| Table 6: Estimates for Number of Elevators Needed <sup>(1)</sup> |                                 |                              |                              |
|------------------------------------------------------------------|---------------------------------|------------------------------|------------------------------|
| No. of Floors                                                    | Building Meters Squared (gross) | Building Square Feet (gross) | Recommended No. of Elevators |
| Up to 3                                                          | 5,000                           | 53,820                       | 1                            |
| 4 or more                                                        | 6,000                           | 64,583                       | 2                            |
| 4 or more                                                        | 10,000                          | 107,639                      | 3                            |

**Notes:**

1. Bhatia, A. *Building Elevator Systems*, CED Engineering.com. Course No: A06-001. Note that if elevators are distributed throughout the building, instead of at a centralized bank of elevators, to account for inefficiencies and imbalances in demand, increase the number of elevators by 60 percent.

Using TIAX study conclusion that one 2500 pound elevator consumes 7,000 kWh per year (**Table 4**) and the number of elevators for a particular sized parking lot (**Table 6**), data can be extrapolated to determine the energy factor to apply (**Table 7**).

| Table 7: Annual kWh per Square Foot |           |            |                        |
|-------------------------------------|-----------|------------|------------------------|
| Gross Sq Ft                         | Elevators | Annual kWh | Annual kWh/square foot |
| 54,000                              | 1         | 7000       | 0.13                   |
| 65,000                              | 2         | 14000      | 0.22                   |
| 108,000                             | 3         | 21000      | 0.19                   |
| 162,000                             | 4         | 28000      | 0.17                   |
| 216,000                             | 5         | 35000      | 0.16                   |
| 270,000                             | 6         | 42000      | 0.16                   |
| 324,000                             | 7         | 49000      | 0.15                   |
| 378,000                             | 8         | 56000      | 0.15                   |
| 432,000                             | 9         | 63000      | 0.15                   |
| 486,000                             | 10        | 70000      | 0.14                   |
| 540,000                             | 11        | 77000      | 0.14                   |
| 594,000                             | 12        | 84000      | 0.14                   |
| 648,000                             | 13        | 91000      | 0.14                   |
| 702,000                             | 14        | 98000      | 0.14                   |
| 756,000                             | 15        | 105000     | 0.14                   |
| 810,000                             | 16        | 112000     | 0.14                   |
| 864,000                             | 17        | 119000     | 0.14                   |
| 918,000                             | 18        | 126000     | 0.14                   |
| 972,000                             | 19        | 133000     | 0.14                   |
| 1,026,000                           | 20        | 140000     | 0.14                   |
| 1,080,000                           | 21        | 147000     | 0.14                   |
| 1,134,000                           | 22        | 154000     | 0.14                   |
| 1,188,000                           | 23        | 161000     | 0.14                   |

## Conclusion

For the purposes of estimating energy use rates in parking lots and structures in California, CalEEMod should base energy use rate assumptions on the Energy Star estimates for lighting and ventilation. That would require CalEEMod to establish the following new sub-land uses (*with energy impact calculated*) under Parking:

1. Parking lot (*lighting energy use only*)
2. Unenclosed parking structure (*lighting energy use only*)
3. Enclosed parking structure (*lighting and ventilation energy use*)
4. Unenclosed parking structure with elevator (*lighting and elevator energy use*)
5. Enclosed parking structure with elevator (*lighting, ventilation, and elevator energy use*)

The default energy factor (annual kWh/square foot) recommended and used in CalEEMod is 0.19 annual kWh/sq ft which is based on the real data in Tables 4 and 6 and not the highest or lowest factor. CalEEMod will provide the ability for the User to override the default factor if the number of elevators is known (per total square feet) and is different than the default. For example, if a parking lot structure is known to be 200,000 sq ft with 6 elevators, then using the 7,000 annual kWh/elevator x 6 elevators is 42,000 annual kWh/200,000 sq ft equals a new factor of 0.21 annual kWh/sq ft that would be used to replace the CalEEMod default factor of 0.19 annual kWh/sq ft. In addition, if new data is known about kWh usage from a particular elevator (e.g., green elevator technology), the same methodology could be applied replacing the 7,000 annual kWh/elevator with a new known value.

## Endnotes

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<sup>i</sup> [www.energystar.gov/](http://www.energystar.gov/EnergyStarPerformanceRatingsTechnicalMethodologyforParking) *Energy Star Performance Ratings Technical Methodology for Parking*.  
[http://www.energystar.gov/ia/business/evaluate\\_performance/parking\\_tech\\_desc.pdf](http://www.energystar.gov/ia/business/evaluate_performance/parking_tech_desc.pdf).

<sup>ii</sup> Parking and Title 24 standards: We have not adjusted the outdoor parking lighting factors in the Energy Star to meet 2008 or proposed 2013 Title 24 standards, which are lower than 2005 requirements, because additional lighting is often allowed in outdoor zones that are considered in need of additional safety lighting.

<sup>iii</sup> California Energy Commission. <http://www.energy.ca.gov/ceus/>

<sup>iv</sup> For example, see <http://www.thyssenkruppelevator.com/energy%20calculator/energy.aspx> and [http://www.kone.com/media/en\\_US/green/index.html](http://www.kone.com/media/en_US/green/index.html)

<sup>v</sup> Washington State University and Western Area Power Administration. [Energyexperts.org](http://energyexperts.org/EnergySolutionsDatabase/ResourceDetail.aspx?id=1709).  
<http://energyexperts.org/EnergySolutionsDatabase/ResourceDetail.aspx?id=1709>

<sup>vi</sup> CEC 2013 Nonresidential ACM Manual – Draft Version (CEC Alternative Calculation Method – June 2011).  
[http://www.energy.ca.gov/title24/2013standards/prerulemaking/documents/2011-06-21\\_workshop/review/2013\\_NACM\\_Approval\\_Manual\\_Draft.pdf](http://www.energy.ca.gov/title24/2013standards/prerulemaking/documents/2011-06-21_workshop/review/2013_NACM_Approval_Manual_Draft.pdf). The CEC website reports the final document will be released in January 2013.

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<sup>vii</sup> TIAX LLC. *Commercial and Residential Spector Miscellaneous Electricity Consumption: Y2005 and Projections to 2030*. September 22, 2006. [http://wpui.wisc.edu/news/EIA%20Posts/TIAX\\_EIA\\_MiscElecReport.pdf](http://wpui.wisc.edu/news/EIA%20Posts/TIAX_EIA_MiscElecReport.pdf)

<sup>viii</sup> Kone. *Kone Eco-efficient Solutions* (Brochure); *Elevator Energy Calculation Report*, 10/11/2011. Provided by Kone, Inc.

<sup>ix</sup> Email communication with the US Access Board (tel: 800-872-2253 email: ta@access-board.gov). The US Access Board referred us to local building codes to determine elevator requirements.

<sup>x</sup> Table 4 above presents the 2003 energy use average projected to 2005. The TIAX Report projects elevator energy use rates out in 5 year increments to 2030, however, the estimated decrease in energy use is slight between year 2005 and 2030 and unlikely to affect model results.

## **7 Studies on Amount of Parking Lot Area Painted**



**Three Studies were Conducted in 2012 on the Amount of Parking Lot Area Painted (for parking stalls, markings, etc)**

Since the release of CalEEMod v2011.1.1, the percentage of space in parking lots that is painted has been questioned, so it was decided to re-evaluate the default currently used. A literature search was performed, but no studies were identified that provided information on the amount of coatings used for parking lots. As a result, contractors were contacted to assist in this research effort. It was determined that most contractors contacted use large volume containers of coatings and do not keep record of the specific amount used on individual parking lot jobs. Consequently, three of the California air district provided data on their own lots and the size of area painted to generate the following data. The compilation relies on the assumption that only one coat of paint was used to make the markings (e.g., stall lines, handicap symbols, no-parking curbs, traffic direction arrows, etc.). The results of the three studies showed a range in percentage of coatings applied. Because the sample size is so small, it was decided to set the default at the highest percentage of the 3 studies (6 percent of total square footage area). Using the highest percentage would also generate a more conservative impact evaluation of VOC emissions from coatings on parking lots. As additional information is obtained the default will be reevaluated and modified as necessary.

***SMAQMD Parking Garage Painted Area Calculation (May 15, 2012)***

|        |                                                                                       |            |                                         |
|--------|---------------------------------------------------------------------------------------|------------|-----------------------------------------|
| 19,000 | Gross square footage of parking garage                                                | 4 inches   | - width of stall painted line           |
| 1,000  | Subtract office, storage cage, etc.                                                   | 192 inches | - length of side stall line             |
| 18,000 | Net parking garage square footage                                                     | 96 inches  | - length of top stall line              |
| 17     | 2 deep parking stalls                                                                 | 4 inches   | - width of stall painted line           |
| 3456   | square inches for a 2 deep parking stall paint                                        | 216 inches | - length of side stall line handicapped |
| 407.7  | square feet for 17 2 deep parking stalls paint                                        | 108 inches | - length of top stall line handicapped  |
| 12     | 3 deep parking stalls                                                                 |            |                                         |
| 5376   | square inches for a 3 deep parking stall paint                                        |            |                                         |
| 447.7  | square feet for 12 3 deep parking stalls paint                                        |            |                                         |
| 4      | disabled parking stalls                                                               |            |                                         |
| 2160   | square inches for 1 handicapped parking stall paint                                   |            |                                         |
| 60.0   | square feet for 4 handicapped parking stalls paint                                    |            |                                         |
| 36.0   | square feet of paint for handicapped square parking signs (4 of them)                 |            | (3 feet x 3 feet squares)               |
| 14.0   | square feet of no parking signs next to handicapped stalls (4 of them)                |            | (3.5 feet x 1 feet rectangles)          |
| 77.0   | square feet of extra space/diagonals handicapped area next to and above parking stall |            |                                         |
|        | (5 8 feet diagonals, 4 11 feet diagonals, 5 6 feet diagonals, 13 9 feet diagonals)    |            |                                         |
| 1042.4 | square feet for paint in SMAQMD parking garage                                        |            |                                         |
| 5.8%   | percent of total square footage of parking garage                                     |            |                                         |

### Actual Surface Area Painted & Emissions - SCAQMD Parking Lot (June 2012)

| Line Type                                                                                                                                               | Width (ft) | Length (ft) | Quantity | Total Painted Surface Area (sq ft) |                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|----------|------------------------------------|-------------------------------------------|
| Parking Stall Lines                                                                                                                                     | 0.33       | 18          | 224      | 1343.87                            |                                           |
| "Compact" Denotation                                                                                                                                    | 1.00       | 5           | 7        | 35.00                              |                                           |
| Arrows                                                                                                                                                  | 4.00       | 3.5         | 6        | 84.00                              |                                           |
| "Slow 5 MPH" Denotation                                                                                                                                 | 5.00       | 6           | 2        | 60.00                              |                                           |
| Handicap Lines                                                                                                                                          | 0.33       | 18          | 8        | 48.00                              |                                           |
| Handicap Symbol                                                                                                                                         | 3.00       | 3           | 4        | 36.00                              |                                           |
| No Parking Red Curbs                                                                                                                                    | 0.50       | 32          | 4        | 64.00                              |                                           |
| No Parking Red Curbs                                                                                                                                    | 0.50       | 13          | 2        | 13.00                              |                                           |
| No Parking Red Curbs                                                                                                                                    | 1.00       | 20          | 1        | 20.00                              |                                           |
| No Parking Red Curbs                                                                                                                                    | 0.50       | 11          | 2        | 11.00                              |                                           |
| "Stop" Denotation                                                                                                                                       | 6.00       | 8           | 1        | 48.00                              |                                           |
| $A_{\text{actual}} =$                                                                                                                                   |            |             |          | 1763                               | Total Actual Painted Surface Area (sq ft) |
| <i>NOTE: the SCAQMD parking stalls were separated by single lines (112), however, most commercial/recreational parking lots use double lines (224).</i> |            |             |          | 37,869                             | SCAQMD Repaved Parking Lot Area (sq ft)   |
|                                                                                                                                                         |            |             |          | <b>4.7%</b>                        | <b>% Painted Using Single Coat</b>        |

### Actual Surface Area Painted & Emissions - SLO County APCD Parking Lot (June 2012)

| Line Type                    | Width (ft) | Length (ft) | Quantity | Total Painted Surface Area (sq ft) | Width (inches)                            |
|------------------------------|------------|-------------|----------|------------------------------------|-------------------------------------------|
| Parking Place                | 0.33       | 18          | 29       | 174.00                             | 4                                         |
| Handicap Lines               | 0.33       | 9           | 5        | 15.00                              | 4                                         |
| Handicap Symbol              | 3.50       | 3.5         | 1        | 12.25                              | -                                         |
| Bike Locker Protection       | 0.33       | 4           | 7        | 9.33                               | 4                                         |
| Red Curbs - Horizontal Paint | 0.33       | 232         | 1        | 77.33                              | 4                                         |
| Red Curbs - Vertical Paint   | 0.50       | 232         | 1        | 116.00                             | 6                                         |
| $A_{\text{actual}} =$        |            |             |          | 404                                | Total Actual Painted Surface Area (sq ft) |
|                              |            |             |          | 14,900                             | APCD Parking Lot Size (sq ft)             |
|                              |            |             |          | <b>2.7%</b>                        | <b>% Painted Using Single Coat</b>        |

## **8 Default Water Use for Industrial Land Uses**

## Default Water Use Determination for Industrial Land Uses *(for version 2013.2)*

Since the release of CalEEMod v2011.1.1, the default water usage from industrial land uses has been questioned, so it was decided to re-evaluate the default currently used. The following are the assumptions used to determine the operation period of a typical industrial facility and the published water usage values (see web link). Specifically for industrial land use categories, the default water use rate is 925 gallons/workday/thousand square feet. This value was computed by dividing the annual water use in California industry (Table ES-6 in Gleick et al. 2002) by the industrial work area in California (Dun & Bradstreet, Business Population Report aggregated by Standard Industrial Classification (SIC) and Census Block, May 2002) where 225 was the annual number of workdays in a year.

|             |                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | 365 days/year                                                                                                                                                      |
|             | 7 days/week                                                                                                                                                        |
|             | 52.14 weeks/year                                                                                                                                                   |
|             | 5 Workdays/week                                                                                                                                                    |
| 260.71      | Potential Workdays/year                                                                                                                                            |
|             | 36 Average Holidays + Maintenance Shutdowns/year                                                                                                                   |
| 225         | Probable Days/year of Industrial Operations                                                                                                                        |
|             | AF Acre-foot                                                                                                                                                       |
|             | SF Square-foot                                                                                                                                                     |
| 225         | Industrial Work Days - see <i>CalEEMod User Manual Appendix A</i>                                                                                                  |
|             | TAF; <i>Best Estimate of Water Use/year by California Industry - As identified in Table ES-</i>                                                                    |
| 665         | <i>6 of Gleick et al. 2003 :</i>                                                                                                                                   |
|             | <a href="http://www.pacinst.org/reports/urban_usage/waste_not_want_not_full_report.pdf">www.pacinst.org/reports/urban_usage/waste_not_want_not_full_report.pdf</a> |
| 2,955.6     | AF/Work Day ; <i>Best Estimate of Water Used by CA Industry/Industrial Work Day</i>                                                                                |
| 325,851.4   | Gal/AF ( <i>conversion</i> )                                                                                                                                       |
| 963,071,916 | Gal Used by CA Industry/Industrial Work Day                                                                                                                        |
|             | TSF of Industrial Work Area in CA - <i>As identified by: Dun &amp; Bradstreet, Business</i>                                                                        |
| 1,041,386   | <i>Population Report aggregated by Standard Industrial Classification (SIC) and Census</i>                                                                         |
|             | <i>Block, May 2002, the Industrial component reference identified in the CalEEMod User</i>                                                                         |
|             | <i>Manual Appendix E on Consumer Products.</i>                                                                                                                     |

**925 Gals/WorkDay/TSF**

## **9 Default Solid Waste Generation from Industrial Land Uses**

## Default Solid Waste Generation for Industrial Land Uses *(for version 2013.2)*

Since the release of CalEEMod v2011.1.1, the default solid waste generation from industrial land uses has been questioned, so it was decided to re-evaluate the default currently used. There is limited information available linking employment and solid waste generation for the various individual industrial land uses types as analyzed in CalEEMod. However, the Southern California Association of Governments (SCAG) that represents the six-county region of Los Angeles, Orange, Ventura, Riverside, San Bernardino and Imperial counties conducted a study in 2001 called the 'Employment Density Study' ([http://www.scag.ca.gov/forecast/downloads/employ\\_den.pdf](http://www.scag.ca.gov/forecast/downloads/employ_den.pdf)). Given the known challenge in locating statewide data and the fact that SCAG data represents close to half the state's population, the information is quasi-applicable to the state. In the study, SCAG identifies the following region-wide median employment densities for these specific industrial land use types:

Light manufacturing = 924 square foot (sq ft)/employee  
Warehouse = 1,225 sq ft/employee

Using the 1999 CalRecycle Waste Characterization generation rate of 1.15 tons/employee/year, it has been determined to modify the current default of solid waste generation for industrial land use types using the following rates in CalEEMod:

Warehouses (all types) = 0.94 tons/1000 sq ft/year  
All other industrial = 1.24 tons/1000 sq ft/year

Employee based rate for all industrial uses = 1.15 tons/employee/year

These rates seem more in line with other land use generation rates and also have the advantage of using employment densities that correspond more closely with trip generation rates.

## **10 Default N Load Factor for Wastewater Calculations**

## Default N Load Factor for Wastewater Calculations (for version 2013.2)

Since the release of CalEEMod v2011.1.1, the Sanitation Districts of Sacramento and Los Angeles have raised a concern that the default N load factor of 40mg/L from USEPA's database (2008) is too high. The N load is the mass of nitrogen discharged per volume of wastewater effluent. The factor is used in calculating nitrous oxide emissions produced when treated wastewater is discharged in aquatic environments such as rivers and estuaries. A high N load factor will overestimate the GHG emission throughout much of the State. US EPA has provided an online database ([http://cfpub.epa.gov/dmr/ez\\_search.cfm](http://cfpub.epa.gov/dmr/ez_search.cfm)) for plant-specific effluent results for various pollutants including nitrogen. Performing a query just for California, calculations show that the statewide average would be **26 mg/l** instead of 40 mg/l (current default). CalEEMod does not, at this time, allow the user to enter plant-specific numbers, so the default offers a more representative number for the state.

The following equation was used to determine statewide average:

$$\text{Flow-weighted effluent Nitrogen in California (mg/L)} = 203,953,373 \text{ (N-lbs)/year} \\ * (2586502000 \text{ Gals/day})^{(-1)} * (1 \text{ year} / (365.25 \text{ days})) * (453592.37 \text{ mg/lb}) * (1 \text{ Gal} / 3.785 \text{ l}) = \mathbf{25.87 \text{ mg/l}}$$

The following data was retrieved from the USEPA database (2013) for the equation:

Source: [http://cfpub.epa.gov/dmr/ez\\_search.cfm](http://cfpub.epa.gov/dmr/ez_search.cfm)

Statewide Sum: 203,953,373 lb/yr 2,586,502,000 gal/day

| Calif POTWs | Total Pounds (lbs/yr) | Average Flow (MGD) |                                                                                         |
|-------------|-----------------------|--------------------|-----------------------------------------------------------------------------------------|
| CA0107417*  | 1,020,535             | 17.4               | *Corrected to reflect actual plant effluent as per discussion with plant facility staff |
| CA0107611*  | 755,263               | 15.4               |                                                                                         |
| CA0053813   | 47,848,683            | 273                |                                                                                         |
| CA0109991   | 46,073,447            | 267                |                                                                                         |
| CA0107409   | 15,195,624            | 267                |                                                                                         |
| CA0110604   | 12,660,447            | 152                |                                                                                         |
| CA0077682   | 12,360,199            | 146                |                                                                                         |
| CA0037664   | 9,556,191             | 148                |                                                                                         |
| CA0037702   | 7,402,404             | 66.25              |                                                                                         |
| CA0037869   | 5,197,299             | 61.4               |                                                                                         |
| CA0038008   | 5,197,299             | 61.4               |                                                                                         |
| CA0037613   | 4,822,150             | 57.3               |                                                                                         |
| CA0037648   | 3,237,605             | 39.5               |                                                                                         |
| CA0107395   | 2,620,463             | 24.6               |                                                                                         |
| CA0054097   | 2,102,347             | 21.6               |                                                                                         |
| CA0037681   | 1,886,655             | 32.4               |                                                                                         |
| CA0053911   | 1,450,084             | 57.01              |                                                                                         |
| CA0038318   | 1,284,429             | 1.18               |                                                                                         |
| CA0107433   | 1,113,164             | 12.4               |                                                                                         |
| CA0037737   | 962,571               | 6.88               |                                                                                         |
| CA0048551   | 949,029               | 8.038              |                                                                                         |



|           |         |       |
|-----------|---------|-------|
| CA0037541 | 913,876 | 12.2  |
| CA0048194 | 904,330 | 8.46  |
| CA0038130 | 860,572 | 9.29  |
| CA0038547 | 778,946 | 8.77  |
| CA0038628 | 762,472 | 9.31  |
| CA0056227 | 727,201 | 27.7  |
| CA8000304 | 709,805 | 34.8  |
| CA0105350 | 683,282 | 29.4  |
| CA8000409 | 608,790 | 26.7  |
| CA0038024 | 562,781 | 4.606 |
| CA0054011 | 553,291 | 19.6  |
| CA0104523 | 525,445 | 3.69  |
| CA0079189 | 504,795 | 8.46  |
| CA0038539 | 484,861 | 8.94  |
| CA0048216 | 479,712 | 5.09  |
| CA0048160 | 456,062 | 4.054 |
| CA0053856 | 417,294 | 13.09 |
| CA0048143 | 367,016 | 15.2  |
| CA0054119 | 362,093 | 12.2  |
| CA0053953 | 352,926 | 14.2  |
| CA0049224 | 349,790 | 3.89  |
| CA0107981 | 349,112 | 10.3  |
| CA0079103 | 344,510 | 10.6  |
| CA0079260 | 333,956 | 3.069 |
| CA0104973 | 316,751 | 4.015 |
| CA0056294 | 285,797 | 9.77  |
| CA7000009 | 283,784 | 2.73  |
| CA0037788 | 262,829 | 3.41  |
| CA0079219 | 261,626 | 8.013 |
| CA0037796 | 255,924 | 3.082 |
| CA0108031 | 254,610 | 1.21  |
| CA0037842 | 244,169 | 100   |
| CA0055221 | 241,546 | 8.83  |
| CA0054216 | 202,111 | 14.5  |
| CA0104426 | 196,783 | 3.54  |
| CA0053651 | 194,981 | 5.63  |
| CA0053716 | 190,189 | 8.047 |
| CA0038091 | 182,140 | 2.52  |
| CA0079138 | 168,719 | 26.6  |
| CA0105295 | 165,877 | 5.89  |
| CA8000188 | 162,763 | 6.23  |
| CA0037532 | 160,569 | 1.53  |
| CA0055531 | 154,954 | 6.71  |
| CA0104400 | 145,679 | 1.24  |
| CA0053619 | 142,296 | 4.83  |
| CA0022764 | 115,563 | 4.27  |
| CA0054313 | 110,962 | 4.97  |

|           |         |       |
|-----------|---------|-------|
| CA0084573 | 100,294 | 6.54  |
| CA0053597 | 97,150  | 3.18  |
| CA0082589 | 94,621  | 3.37  |
| CA0047996 | 92,294  | 0.71  |
| CA8000316 | 86,643  | 5.74  |
| CA0079235 | 84,324  | 2.97  |
| CA0082660 | 80,744  | 3.23  |
| CA0105015 | 76,603  | 0.72  |
| CA8000027 | 74,164  | 8.066 |
| CA0079651 | 73,795  | 1.15  |
| CA0037575 | 71,906  | 8.35  |
| CA0056014 | 67,209  | 3.36  |
| CA0079154 | 63,785  | 9.06  |
| CA8000383 | 59,920  | 2.81  |
| CA0079731 | 59,579  | 7.42  |
| CA0037621 | 58,350  | 11.05 |
| CA0079197 | 57,484  | 3.92  |
| CA0079049 | 52,185  | 4.65  |
| CA8000326 | 47,842  | 3.42  |
| CA0038067 | 40,548  | 1.54  |
| CA0079111 | 36,353  | 49.2  |
| CA0102695 | 35,497  | 0.96  |
| CA0022888 | 35,088  | 1.93  |
| CA0077704 | 34,804  | 1.22  |
| CA0085235 | 34,282  | 1.96  |
| CA0038598 | 30,598  | 1.68  |
| CA0037753 | 30,300  | 0.63  |
| CA0078671 | 29,039  | 1.601 |
| CA0102822 | 28,556  | 8.65  |
| CA0037826 | 27,040  | 0.74  |
| CA0037711 | 26,202  | 2.76  |
| CA0053961 | 25,767  | 1.99  |
| CA0109045 | 24,679  | 3.54  |
| CA0079022 | 23,671  | 0.89  |
| CA0105619 | 19,761  | 3.77  |
| CA0023345 | 19,753  | 0.91  |
| CA0079511 | 18,563  | 0.97  |
| CA0037834 | 18,079  | 20.1  |
| CA0079243 | 16,843  | 3.025 |
| CA0048127 | 15,525  | 2.83  |
| CA0037810 | 13,909  | 4.104 |
| CA0022756 | 13,284  | 1.67  |
| CA0037851 | 12,955  | 2.25  |
| CA0081434 | 12,534  | 1.209 |
| CA0079316 | 12,134  | 2.201 |
| CA0023060 | 12,025  | 0.74  |
| CA0081558 | 11,221  | 5.702 |

|           |        |          |
|-----------|--------|----------|
| CA0078981 | 10,228 | 0.54     |
| CA0085260 | 9,257  | 0.34     |
| CA0105376 | 8,569  | 2.82     |
| CA0037800 | 7,266  | 2.18     |
| CA8000395 | 6,652  | 0.58     |
| CA0024449 | 6,336  | 9.048    |
| CA0054372 | 6,277  | 0.38     |
| CA8000100 | 5,890  | 0.81     |
| CA0078891 | 4,768  | 1.48     |
| CA0038776 | 4,591  | 3.017    |
| CA0084727 | 4,292  | 0.107    |
| CA0077712 | 4,075  | 1.56     |
| CA0107492 | 3,943  | 0.84     |
| CA0022730 | 3,912  | 0.42     |
| CA0038768 | 2,485  | 3.019    |
| CA0084239 | 2,480  | 0.063    |
| CA0078948 | 2,146  | 9.86     |
| CA0025135 | 1,521  | 1.12     |
| CA0078662 | 1,493  | 4.71     |
| CA0037770 | 1,309  | 1.72     |
| CA0084271 | 1,252  | 0.54     |
| CA0048151 | 1,059  | 1.074    |
| CA0079898 | 787    | 2.25     |
| CA0079081 | 749    | 6.54     |
| CA0047364 | 743    | 1.33     |
| CA0079502 | 706    | 9.209    |
| CA0078956 | 613    | 0.74     |
| CA0078590 | 481    | 1.65     |
| CA0083771 | 480    | 0.19     |
| CA0004995 | 418    | 0.71     |
| CA0047899 | 248    | 0.95     |
| CA0084476 | 216    | 2.15     |
| CA0078034 | 194    | 0.73     |
| CA0107999 | 191    | 1.77     |
| CA0077828 | 184    | 0.38     |
| CA0085201 | 117    | 0.095    |
| CA0077836 | 115    | 1.57     |
| CA0024490 | 0.033  | 4.40E-07 |
| CA0005241 | 0      | 0        |
| CA0022977 | 0      | 0        |
| CA0023355 | 0      | 0        |
| CA0048828 | 0      | 0.71     |
| CA0049675 | 0      | 0        |
| CA0059501 | 0      | 0        |
| CA0064556 | 0      | 0        |
| CA0077691 | 0      | 8.45     |
| CA0077950 | 0      | 5.078    |

|           |                    |                |
|-----------|--------------------|----------------|
| CA0081485 | 0                  | 0              |
| CA0108944 | 0                  | 0              |
| CA0110116 | 0                  | 0.34           |
|           | <b>203,953,373</b> | <b>2586.50</b> |

## 11 Additional References

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**California Emissions Estimator Model<sup>®</sup>**

## Appendix F Climate Zones Lookup

Prepared for:  
**California Air Pollution Control Officers  
Association (CAPCOA)**

Prepared by:  
**ENVIRON International Corporation  
San Francisco, California  
and  
California Air Districts**

Revised:  
**Sept 2013  
CalEEMod v.2013.2  
(Previous version February 2011)**

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**Table 1: Forecast Climate Zones by Postal Code**

| <b>Postal Code</b> | <b>Forecast Climate Zone</b> | <b>City Name</b>             | <b>County Name</b> |
|--------------------|------------------------------|------------------------------|--------------------|
| 00012              | 1                            | Mt Meadows Area              | Lassen             |
| 00012              | 14                           | Mt Meadows Area              | Lassen             |
| 00016              | 7                            | Sequoia National Forest      | Kern               |
| 00017              | 3                            | Northeast Fresno County      | Fresno             |
| 00018              | 8                            | Los Padres NTL Forest        | Ventura            |
| 00019              | 1                            | Lassen NTL Forest            | Lassen             |
| 00019              | 14                           | Lassen NTL Forest            | Lassen             |
| 00020              | 3                            | Sierra National Forest       | Madera             |
| 00022              | 1                            | Jackson St Forest            | Mendocino          |
| 00026              | 3                            | East Tulare County           | Tulare             |
| 00026              | 7                            | East Tulare County           | Tulare             |
| 00026              | 9                            | East Tulare County           | Tulare             |
| 00028              | 14                           | Plumas NTL Forest            | Plumas             |
| 00029              | 1                            | Tahoe National Forest        | Placer             |
| 00029              | 3                            | Tahoe National Forest        | Placer             |
| 00031              | 1                            | Lassen National Forest       | Plumas             |
| 00032              | 4                            | Los Padres NTL Forest        | Santa Barbara      |
| 00032              | 8                            | Los Padres NTL Forest        | Santa Barbara      |
| 00033              | 14                           | Tahoe National Forest        | Sierra             |
| 00034              | 14                           | Klamath National Forest      | Siskiyou           |
| 00035              | 14                           | Modoc/Shasta/Klamath for     | Siskiyou           |
| 00037              | 3                            | West Tehama County           | Tehama             |
| 00038              | 1                            | East Tehama County           | Tehama             |
| 00038              | 3                            | East Tehama County           | Tehama             |
| 00039              | 1                            | Southeast Trinity County     | Trinity            |
| 00039              | 3                            | Southeast Trinity County     | Trinity            |
| 00040              | 1                            | Yosemite NTL Park            | Tuolumne           |
| 00044              | 1                            | South Alpine County          | Alpine             |
| 00044              | 14                           | South Alpine County          | Alpine             |
| 00047              | 3                            | West Glenn County            | Glenn              |
| 00048              | 1                            | Mendocino NTL Forest         | Lake               |
| 00048              | 3                            | Mendocino NTL Forest         | Lake               |
| 00049              | 14                           | Six Rivers National Fore     | Siskiyou           |
| 00050              | 1                            | Six Rivers NTL Forest        | Humboldt           |
| 00051              | 1                            | Eldorado NTL Forest          | El Dorado          |
| 00051              | 14                           | Eldorado NTL Forest          | El Dorado          |
| 00052              | 1                            | Eldorado NTL Forest          | El Dorado          |
| 00054              | 1                            | Six Rivers NTL Forest        | Humboldt           |
| 00055              | 1                            | Trinity NTL Forest           | Trinity            |
| 00058              | 1                            | Yosemite NTL Park            | Mariposa           |
| 00061              | 8                            | Channel Is Air Guard Station | Ventura            |
| 00065              | 1                            | Plumas National Park         | Sierra             |
| 00065              | 3                            | Plumas National Park         | Sierra             |
| 90001              | 11                           | Los Angeles                  | Los Angeles        |
| 90002              | 9                            | Los Angeles                  | Los Angeles        |

|       |    |             |             |
|-------|----|-------------|-------------|
| 90002 | 11 | Los Angeles | Los Angeles |
| 90003 | 11 | Los Angeles | Los Angeles |
| 90004 | 11 | Los Angeles | Los Angeles |
| 90006 | 11 | Los Angeles | Los Angeles |
| 90007 | 11 | Los Angeles | Los Angeles |
| 90008 | 11 | Los Angeles | Los Angeles |
| 90011 | 11 | Los Angeles | Los Angeles |
| 90011 | 12 | Los Angeles | Los Angeles |
| 90012 | 12 | Los Angeles | Los Angeles |
| 90013 | 12 | Los Angeles | Los Angeles |
| 90014 | 12 | Los Angeles | Los Angeles |
| 90015 | 11 | Los Angeles | Los Angeles |
| 90016 | 11 | Los Angeles | Los Angeles |
| 90017 | 11 | Los Angeles | Los Angeles |
| 90018 | 11 | Los Angeles | Los Angeles |
| 90019 | 11 | Los Angeles | Los Angeles |
| 90020 | 11 | Los Angeles | Los Angeles |
| 90021 | 12 | Los Angeles | Los Angeles |
| 90022 | 9  | Los Angeles | Los Angeles |
| 90022 | 12 | Los Angeles | Los Angeles |
| 90023 | 12 | Los Angeles | Los Angeles |
| 90024 | 11 | Los Angeles | Los Angeles |
| 90025 | 11 | Los Angeles | Los Angeles |
| 90026 | 11 | Los Angeles | Los Angeles |
| 90026 | 12 | Los Angeles | Los Angeles |
| 90027 | 11 | Los Angeles | Los Angeles |
| 90027 | 12 | Los Angeles | Los Angeles |
| 90028 | 11 | Los Angeles | Los Angeles |
| 90029 | 11 | Los Angeles | Los Angeles |
| 90031 | 12 | Los Angeles | Los Angeles |
| 90032 | 9  | Los Angeles | Los Angeles |
| 90032 | 12 | Los Angeles | Los Angeles |
| 90033 | 12 | Los Angeles | Los Angeles |
| 90034 | 11 | Los Angeles | Los Angeles |
| 90035 | 11 | Los Angeles | Los Angeles |
| 90036 | 11 | Los Angeles | Los Angeles |
| 90037 | 11 | Los Angeles | Los Angeles |
| 90038 | 11 | Los Angeles | Los Angeles |
| 90039 | 12 | Los Angeles | Los Angeles |
| 90040 | 9  | Los Angeles | Los Angeles |
| 90041 | 12 | Los Angeles | Los Angeles |
| 90042 | 12 | Los Angeles | Los Angeles |
| 90043 | 8  | Los Angeles | Los Angeles |
| 90043 | 11 | Los Angeles | Los Angeles |
| 90044 | 8  | Los Angeles | Los Angeles |
| 90044 | 11 | Los Angeles | Los Angeles |
| 90045 | 8  | Los Angeles | Los Angeles |
| 90045 | 11 | Los Angeles | Los Angeles |
| 90046 | 11 | Los Angeles | Los Angeles |



|       |    |                 |             |
|-------|----|-----------------|-------------|
| 90047 | 8  | Los Angeles     | Los Angeles |
| 90047 | 11 | Los Angeles     | Los Angeles |
| 90048 | 11 | Los Angeles     | Los Angeles |
| 90049 | 11 | Los Angeles     | Los Angeles |
| 90056 | 11 | Los Angeles     | Los Angeles |
| 90057 | 11 | Los Angeles     | Los Angeles |
| 90058 | 12 | Los Angeles     | Los Angeles |
| 90059 | 9  | Los Angeles     | Los Angeles |
| 90059 | 11 | Los Angeles     | Los Angeles |
| 90061 | 11 | Los Angeles     | Los Angeles |
| 90062 | 11 | Los Angeles     | Los Angeles |
| 90063 | 12 | Los Angeles     | Los Angeles |
| 90064 | 11 | Los Angeles     | Los Angeles |
| 90065 | 12 | Los Angeles     | Los Angeles |
| 90066 | 11 | Los Angeles     | Los Angeles |
| 90068 | 11 | Los Angeles     | Los Angeles |
| 90068 | 12 | Los Angeles     | Los Angeles |
| 90069 | 11 | West Hollywood  | Los Angeles |
| 90077 | 11 | Los Angeles     | Los Angeles |
| 90094 | 11 | Los Angeles     | Los Angeles |
| 90201 | 9  | Bell            | Los Angeles |
| 90201 | 12 | Bell            | Los Angeles |
| 90210 | 11 | Beverly Hills   | Los Angeles |
| 90212 | 11 | Beverly Hills   | Los Angeles |
| 90220 | 9  | Compton         | Los Angeles |
| 90220 | 11 | Compton         | Los Angeles |
| 90221 | 9  | Compton         | Los Angeles |
| 90222 | 9  | Compton         | Los Angeles |
| 90222 | 11 | Compton         | Los Angeles |
| 90230 | 11 | Culver City     | Los Angeles |
| 90232 | 11 | Culver City     | Los Angeles |
| 90240 | 9  | Downey          | Los Angeles |
| 90241 | 9  | Downey          | Los Angeles |
| 90242 | 9  | Downey          | Los Angeles |
| 90245 | 8  | El Segundo      | Los Angeles |
| 90245 | 11 | El Segundo      | Los Angeles |
| 90247 | 8  | Gardena         | Los Angeles |
| 90248 | 8  | Gardena         | Los Angeles |
| 90248 | 11 | Gardena         | Los Angeles |
| 90249 | 8  | Gardena         | Los Angeles |
| 90250 | 8  | Hawthorne       | Los Angeles |
| 90254 | 8  | Hermosa Beach   | Los Angeles |
| 90255 | 9  | Huntington Park | Los Angeles |
| 90255 | 12 | Huntington Park | Los Angeles |
| 90260 | 8  | Lawndale        | Los Angeles |
| 90262 | 9  | Lynwood         | Los Angeles |
| 90265 | 8  | Malibu          | Los Angeles |
| 90266 | 8  | Manhattan Beach | Los Angeles |
| 90270 | 9  | Maywood         | Los Angeles |

|       |    |                        |             |
|-------|----|------------------------|-------------|
| 90270 | 12 | Maywood                | Los Angeles |
| 90272 | 8  | Pacific Palisades      | Los Angeles |
| 90272 | 11 | Pacific Palisades      | Los Angeles |
| 90274 | 8  | Palos Verdes Peninsula | Los Angeles |
| 90275 | 8  | Rancho Palos Verdes    | Los Angeles |
| 90277 | 8  | Redondo Beach          | Los Angeles |
| 90278 | 8  | Redondo Beach          | Los Angeles |
| 90280 | 9  | South Gate             | Los Angeles |
| 90290 | 8  | Topanga                | Los Angeles |
| 90291 | 11 | Venice                 | Los Angeles |
| 90292 | 11 | Marina del Rey         | Los Angeles |
| 90293 | 11 | Playa del Rey          | Los Angeles |
| 90301 | 8  | Inglewood              | Los Angeles |
| 90301 | 11 | Inglewood              | Los Angeles |
| 90302 | 11 | Inglewood              | Los Angeles |
| 90303 | 8  | Inglewood              | Los Angeles |
| 90304 | 8  | Inglewood              | Los Angeles |
| 90304 | 11 | Inglewood              | Los Angeles |
| 90305 | 8  | Inglewood              | Los Angeles |
| 90401 | 11 | Santa Monica           | Los Angeles |
| 90402 | 11 | Santa Monica           | Los Angeles |
| 90404 | 11 | Santa Monica           | Los Angeles |
| 90405 | 11 | Santa Monica           | Los Angeles |
| 90501 | 8  | Torrance               | Los Angeles |
| 90502 | 11 | Torrance               | Los Angeles |
| 90503 | 8  | Torrance               | Los Angeles |
| 90504 | 8  | Torrance               | Los Angeles |
| 90505 | 8  | Torrance               | Los Angeles |
| 90601 | 9  | Whittier               | Los Angeles |
| 90602 | 9  | Whittier               | Los Angeles |
| 90603 | 9  | Whittier               | Los Angeles |
| 90604 | 9  | Whittier               | Los Angeles |
| 90605 | 9  | Whittier               | Los Angeles |
| 90606 | 9  | Whittier               | Los Angeles |
| 90620 | 8  | Buena Park             | Orange      |
| 90621 | 8  | Buena Park             | Orange      |
| 90623 | 8  | La Palma               | Orange      |
| 90630 | 8  | Cypress                | Orange      |
| 90631 | 8  | La Habra               | Orange      |
| 90631 | 9  | La Habra               | Orange      |
| 90638 | 9  | La Mirada              | Los Angeles |
| 90640 | 9  | Montebello             | Los Angeles |
| 90650 | 9  | Norwalk                | Los Angeles |
| 90660 | 9  | Pico Rivera            | Los Angeles |
| 90670 | 9  | Santa Fe Springs       | Los Angeles |
| 90680 | 8  | Stanton                | Orange      |
| 90701 | 9  | Artesia                | Los Angeles |
| 90703 | 9  | Cerritos               | Los Angeles |
| 90706 | 9  | Bellflower             | Los Angeles |

|       |    |                      |             |
|-------|----|----------------------|-------------|
| 90710 | 11 | Harbor City          | Los Angeles |
| 90712 | 9  | Lakewood             | Los Angeles |
| 90713 | 9  | Lakewood             | Los Angeles |
| 90715 | 9  | Lakewood             | Los Angeles |
| 90716 | 9  | Hawaiian Gardens     | Los Angeles |
| 90717 | 8  | Lomita               | Los Angeles |
| 90720 | 8  | Los Alamitos         | Orange      |
| 90723 | 9  | Paramount            | Los Angeles |
| 90731 | 11 | San Pedro            | Los Angeles |
| 90732 | 11 | San Pedro            | Los Angeles |
| 90740 | 8  | Seal Beach           | Orange      |
| 90744 | 11 | Wilmington           | Los Angeles |
| 90745 | 11 | Carson               | Los Angeles |
| 90746 | 11 | Carson               | Los Angeles |
| 90747 | 11 | Carson               | Los Angeles |
| 90755 | 9  | Signal Hill          | Los Angeles |
| 90802 | 9  | Long Beach           | Los Angeles |
| 90802 | 11 | Long Beach           | Los Angeles |
| 90803 | 9  | Long Beach           | Los Angeles |
| 90804 | 9  | Long Beach           | Los Angeles |
| 90805 | 9  | Long Beach           | Los Angeles |
| 90806 | 9  | Long Beach           | Los Angeles |
| 90807 | 9  | Long Beach           | Los Angeles |
| 90808 | 9  | Long Beach           | Los Angeles |
| 90810 | 9  | Long Beach           | Los Angeles |
| 90810 | 11 | Long Beach           | Los Angeles |
| 90813 | 9  | Long Beach           | Los Angeles |
| 90813 | 11 | Long Beach           | Los Angeles |
| 90814 | 9  | Long Beach           | Los Angeles |
| 90815 | 9  | Long Beach           | Los Angeles |
| 91001 | 9  | Altadena             | Los Angeles |
| 91001 | 12 | Altadena             | Los Angeles |
| 91006 | 9  | Arcadia              | Los Angeles |
| 91007 | 9  | Arcadia              | Los Angeles |
| 91010 | 9  | Duarte               | Los Angeles |
| 91011 | 9  | La Canada Flintridge | Los Angeles |
| 91011 | 12 | La Canada Flintridge | Los Angeles |
| 91016 | 9  | Monrovia             | Los Angeles |
| 91020 | 12 | Montrose             | Los Angeles |
| 91024 | 9  | Sierra Madre         | Los Angeles |
| 91030 | 9  | South Pasadena       | Los Angeles |
| 91030 | 12 | South Pasadena       | Los Angeles |
| 91040 | 9  | Sunland              | Los Angeles |
| 91040 | 12 | Sunland              | Los Angeles |
| 91042 | 9  | Tujunga              | Los Angeles |
| 91042 | 12 | Tujunga              | Los Angeles |
| 91101 | 12 | Pasadena             | Los Angeles |
| 91103 | 12 | Pasadena             | Los Angeles |
| 91104 | 12 | Pasadena             | Los Angeles |

|       |    |                |             |
|-------|----|----------------|-------------|
| 91105 | 9  | Pasadena       | Los Angeles |
| 91105 | 12 | Pasadena       | Los Angeles |
| 91106 | 9  | Pasadena       | Los Angeles |
| 91106 | 12 | Pasadena       | Los Angeles |
| 91107 | 9  | Pasadena       | Los Angeles |
| 91107 | 12 | Pasadena       | Los Angeles |
| 91108 | 9  | San Marino     | Los Angeles |
| 91201 | 12 | Glendale       | Los Angeles |
| 91202 | 12 | Glendale       | Los Angeles |
| 91203 | 12 | Glendale       | Los Angeles |
| 91204 | 12 | Glendale       | Los Angeles |
| 91205 | 12 | Glendale       | Los Angeles |
| 91206 | 12 | Glendale       | Los Angeles |
| 91207 | 12 | Glendale       | Los Angeles |
| 91208 | 12 | Glendale       | Los Angeles |
| 91214 | 9  | La Crescenta   | Los Angeles |
| 91214 | 12 | La Crescenta   | Los Angeles |
| 91301 | 8  | Agoura Hills   | Los Angeles |
| 91302 | 8  | Calabasas      | Los Angeles |
| 91303 | 12 | Canoga Park    | Los Angeles |
| 91304 | 8  | Canoga Park    | Los Angeles |
| 91304 | 12 | Canoga Park    | Los Angeles |
| 91306 | 12 | Winnetka       | Los Angeles |
| 91307 | 8  | West Hills     | Ventura     |
| 91307 | 12 | West Hills     | Ventura     |
| 91311 | 8  | Chatsworth     | Los Angeles |
| 91311 | 9  | Chatsworth     | Los Angeles |
| 91311 | 12 | Chatsworth     | Los Angeles |
| 91316 | 12 | Encino         | Los Angeles |
| 91320 | 8  | Newbury Park   | Ventura     |
| 91321 | 9  | Newhall        | Los Angeles |
| 91321 | 12 | Newhall        | Los Angeles |
| 91324 | 12 | Northridge     | Los Angeles |
| 91325 | 12 | Northridge     | Los Angeles |
| 91326 | 12 | Porter Ranch   | Los Angeles |
| 91331 | 12 | Pacoima        | Los Angeles |
| 91335 | 12 | Reseda         | Los Angeles |
| 91340 | 12 | San Fernando   | Los Angeles |
| 91342 | 9  | Sylmar         | Los Angeles |
| 91342 | 12 | Sylmar         | Los Angeles |
| 91343 | 12 | North Hills    | Los Angeles |
| 91344 | 12 | Granada Hills  | Los Angeles |
| 91345 | 12 | Mission Hills  | Los Angeles |
| 91350 | 9  | Santa Clarita  | Los Angeles |
| 91351 | 9  | Canyon Country | Los Angeles |
| 91352 | 12 | Sun Valley     | Los Angeles |
| 91354 | 9  | Valencia       | Los Angeles |
| 91355 | 9  | Valencia       | Los Angeles |
| 91356 | 11 | Tarzana        | Los Angeles |

|       |    |                  |                |
|-------|----|------------------|----------------|
| 91356 | 12 | Tarzana          | Los Angeles    |
| 91360 | 8  | Thousand Oaks    | Ventura        |
| 91361 | 8  | Westlake Village | Ventura        |
| 91362 | 8  | Thousand Oaks    | Ventura        |
| 91364 | 8  | Woodland Hills   | Los Angeles    |
| 91364 | 12 | Woodland Hills   | Los Angeles    |
| 91367 | 12 | Woodland Hills   | Los Angeles    |
| 91371 | 12 | Woodland Hills   | Los Angeles    |
| 91377 | 8  | Oak Park         | Ventura        |
| 91381 | 9  | Stevenson Ranch  | Los Angeles    |
| 91381 | 12 | Stevenson Ranch  | Los Angeles    |
| 91384 | 8  | Castaic          | Los Angeles    |
| 91384 | 9  | Castaic          | Los Angeles    |
| 91387 | 9  | Canyon Country   | Los Angeles    |
| 91390 | 9  | Santa Clarita    | Los Angeles    |
| 91401 | 12 | Van Nuys         | Los Angeles    |
| 91402 | 12 | Panorama City    | Los Angeles    |
| 91403 | 11 | Sherman Oaks     | Los Angeles    |
| 91403 | 12 | Sherman Oaks     | Los Angeles    |
| 91405 | 12 | Van Nuys         | Los Angeles    |
| 91406 | 12 | Van Nuys         | Los Angeles    |
| 91411 | 12 | Van Nuys         | Los Angeles    |
| 91423 | 11 | Sherman Oaks     | Los Angeles    |
| 91423 | 12 | Sherman Oaks     | Los Angeles    |
| 91436 | 11 | Encino           | Los Angeles    |
| 91436 | 12 | Encino           | Los Angeles    |
| 91501 | 12 | Burbank          | Los Angeles    |
| 91502 | 12 | Burbank          | Los Angeles    |
| 91504 | 12 | Burbank          | Los Angeles    |
| 91505 | 12 | Burbank          | Los Angeles    |
| 91506 | 12 | Burbank          | Los Angeles    |
| 91601 | 12 | North Hollywood  | Los Angeles    |
| 91602 | 12 | North Hollywood  | Los Angeles    |
| 91604 | 11 | Studio City      | Los Angeles    |
| 91604 | 12 | Studio City      | Los Angeles    |
| 91605 | 12 | North Hollywood  | Los Angeles    |
| 91606 | 12 | North Hollywood  | Los Angeles    |
| 91607 | 12 | Valley Village   | Los Angeles    |
| 91608 | 12 | Universal City   | Los Angeles    |
| 91701 | 10 | Rancho Cucamonga | San Bernardino |
| 91702 | 9  | Azusa            | Los Angeles    |
| 91706 | 9  | Baldwin Park     | Los Angeles    |
| 91708 | 10 | Chino            | San Bernardino |
| 91709 | 10 | Chino Hills      | San Bernardino |
| 91710 | 10 | Chino            | San Bernardino |
| 91711 | 9  | Claremont        | Los Angeles    |
| 91722 | 9  | Covina           | Los Angeles    |
| 91723 | 9  | Covina           | Los Angeles    |
| 91724 | 9  | Covina           | Los Angeles    |

|       |    |                  |                |
|-------|----|------------------|----------------|
| 91730 | 10 | Rancho Cucamonga | San Bernardino |
| 91731 | 9  | El Monte         | Los Angeles    |
| 91732 | 9  | El Monte         | Los Angeles    |
| 91733 | 9  | South El Monte   | Los Angeles    |
| 91737 | 10 | Rancho Cucamonga | San Bernardino |
| 91739 | 10 | Rancho Cucamonga | San Bernardino |
| 91740 | 9  | Glendora         | Los Angeles    |
| 91741 | 9  | Glendora         | Los Angeles    |
| 91744 | 9  | La Puente        | Los Angeles    |
| 91745 | 9  | Hacienda Heights | Los Angeles    |
| 91746 | 9  | La Puente        | Los Angeles    |
| 91748 | 9  | Rowland Heights  | Los Angeles    |
| 91750 | 9  | La Verne         | Los Angeles    |
| 91752 | 10 | Mira Loma        | Riverside      |
| 91754 | 9  | Monterey Park    | Los Angeles    |
| 91754 | 12 | Monterey Park    | Los Angeles    |
| 91755 | 9  | Monterey Park    | Los Angeles    |
| 91759 | 10 | Mt Baldy         | San Bernardino |
| 91761 | 10 | Ontario          | San Bernardino |
| 91762 | 10 | Ontario          | San Bernardino |
| 91763 | 10 | Montclair        | San Bernardino |
| 91764 | 10 | Ontario          | San Bernardino |
| 91765 | 9  | Diamond Bar      | Los Angeles    |
| 91765 | 10 | Diamond Bar      | Los Angeles    |
| 91766 | 9  | Pomona           | Los Angeles    |
| 91766 | 10 | Pomona           | Los Angeles    |
| 91767 | 9  | Pomona           | Los Angeles    |
| 91768 | 9  | Pomona           | Los Angeles    |
| 91770 | 9  | Rosemead         | Los Angeles    |
| 91773 | 9  | San Dimas        | Los Angeles    |
| 91775 | 9  | San Gabriel      | Los Angeles    |
| 91776 | 9  | San Gabriel      | Los Angeles    |
| 91780 | 9  | Temple City      | Los Angeles    |
| 91784 | 10 | Upland           | San Bernardino |
| 91786 | 10 | Upland           | San Bernardino |
| 91789 | 9  | Walnut           | Los Angeles    |
| 91790 | 9  | West Covina      | Los Angeles    |
| 91791 | 9  | West Covina      | Los Angeles    |
| 91792 | 9  | West Covina      | Los Angeles    |
| 91801 | 9  | Alhambra         | Los Angeles    |
| 91803 | 9  | Alhambra         | Los Angeles    |
| 91803 | 12 | Alhambra         | Los Angeles    |
| 91901 | 13 | Alpine           | San Diego      |
| 91902 | 13 | Bonita           | San Diego      |
| 91905 | 13 | Boulevard        | San Diego      |
| 91906 | 13 | Campo            | San Diego      |
| 91910 | 13 | Chula Vista      | San Diego      |
| 91911 | 13 | Chula Vista      | San Diego      |
| 91913 | 13 | Chula Vista      | San Diego      |

|       |    |                    |           |
|-------|----|--------------------|-----------|
| 91914 | 13 | Chula Vista        | San Diego |
| 91915 | 13 | Chula Vista        | San Diego |
| 91916 | 13 | Descanso           | San Diego |
| 91917 | 13 | Dulzura            | San Diego |
| 91932 | 13 | Imperial Beach     | San Diego |
| 91934 | 13 | Jacumba            | San Diego |
| 91935 | 13 | Jamul              | San Diego |
| 91941 | 13 | La Mesa            | San Diego |
| 91942 | 13 | La Mesa            | San Diego |
| 91945 | 13 | Lemon Grove        | San Diego |
| 91950 | 13 | National City      | San Diego |
| 91962 | 13 | Pine Valley        | San Diego |
| 91963 | 13 | Potrero            | San Diego |
| 91977 | 13 | Spring Valley      | San Diego |
| 91978 | 13 | Spring Valley      | San Diego |
| 91980 | 13 | Tecate             | San Diego |
| 92003 | 13 | Bonsall            | San Diego |
| 92004 | 13 | Borrego Springs    | San Diego |
| 92004 | 15 | Borrego Springs    | San Diego |
| 92007 | 13 | Cardiff By the Sea | San Diego |
| 92008 | 13 | Carlsbad           | San Diego |
| 92009 | 13 | Carlsbad           | San Diego |
| 92010 | 13 | Carlsbad           | San Diego |
| 92011 | 13 | Carlsbad           | San Diego |
| 92014 | 13 | Del Mar            | San Diego |
| 92019 | 13 | El Cajon           | San Diego |
| 92020 | 13 | El Cajon           | San Diego |
| 92021 | 13 | El Cajon           | San Diego |
| 92024 | 13 | Encinitas          | San Diego |
| 92025 | 13 | Escondido          | San Diego |
| 92026 | 13 | Escondido          | San Diego |
| 92027 | 13 | Escondido          | San Diego |
| 92028 | 10 | Fallbrook          | San Diego |
| 92028 | 13 | Fallbrook          | San Diego |
| 92029 | 13 | Escondido          | San Diego |
| 92036 | 13 | Julian             | San Diego |
| 92036 | 15 | Julian             | San Diego |
| 92037 | 13 | La Jolla           | San Diego |
| 92040 | 13 | Lakeside           | San Diego |
| 92054 | 13 | Oceanside          | San Diego |
| 92055 | 13 | Camp Pendleton     | San Diego |
| 92056 | 13 | Oceanside          | San Diego |
| 92057 | 13 | Oceanside          | San Diego |
| 92059 | 10 | Pala               | San Diego |
| 92059 | 13 | Pala               | San Diego |
| 92061 | 13 | Pauma Valley       | San Diego |
| 92064 | 13 | Poway              | San Diego |
| 92065 | 13 | Ramona             | San Diego |
| 92066 | 13 | Ranchita           | San Diego |

|       |    |                 |           |
|-------|----|-----------------|-----------|
| 92067 | 13 | Rancho Santa Fe | San Diego |
| 92069 | 13 | San Marcos      | San Diego |
| 92070 | 13 | Santa Ysabel    | San Diego |
| 92071 | 13 | Santee          | San Diego |
| 92075 | 13 | Solana Beach    | San Diego |
| 92078 | 13 | San Marcos      | San Diego |
| 92081 | 13 | Vista           | San Diego |
| 92082 | 13 | Valley Center   | San Diego |
| 92083 | 13 | Vista           | San Diego |
| 92084 | 13 | Vista           | San Diego |
| 92086 | 13 | Warner Springs  | San Diego |
| 92091 | 13 | Rancho Santa Fe | San Diego |
| 92101 | 13 | San Diego       | San Diego |
| 92102 | 13 | San Diego       | San Diego |
| 92103 | 13 | San Diego       | San Diego |
| 92104 | 13 | San Diego       | San Diego |
| 92105 | 13 | San Diego       | San Diego |
| 92106 | 13 | San Diego       | San Diego |
| 92107 | 13 | San Diego       | San Diego |
| 92108 | 13 | San Diego       | San Diego |
| 92109 | 13 | San Diego       | San Diego |
| 92110 | 13 | San Diego       | San Diego |
| 92111 | 13 | San Diego       | San Diego |
| 92113 | 13 | San Diego       | San Diego |
| 92114 | 13 | San Diego       | San Diego |
| 92115 | 13 | San Diego       | San Diego |
| 92116 | 13 | San Diego       | San Diego |
| 92117 | 13 | San Diego       | San Diego |
| 92118 | 13 | Coronado        | San Diego |
| 92119 | 13 | San Diego       | San Diego |
| 92120 | 13 | San Diego       | San Diego |
| 92121 | 13 | San Diego       | San Diego |
| 92122 | 13 | San Diego       | San Diego |
| 92123 | 13 | San Diego       | San Diego |
| 92124 | 13 | San Diego       | San Diego |
| 92126 | 13 | San Diego       | San Diego |
| 92127 | 13 | San Diego       | San Diego |
| 92128 | 13 | San Diego       | San Diego |
| 92129 | 13 | San Diego       | San Diego |
| 92130 | 13 | San Diego       | San Diego |
| 92131 | 13 | San Diego       | San Diego |
| 92135 | 13 | San Diego       | San Diego |
| 92136 | 13 | San Diego       | San Diego |
| 92139 | 13 | San Diego       | San Diego |
| 92140 | 13 | San Diego       | San Diego |
| 92145 | 13 | San Diego       | San Diego |
| 92154 | 13 | San Diego       | San Diego |
| 92155 | 13 | San Diego       | San Diego |
| 92173 | 13 | San Ysidro      | San Diego |



|       |    |                    |                |
|-------|----|--------------------|----------------|
| 92201 | 15 | Indio              | Riverside      |
| 92203 | 10 | Indio              | Riverside      |
| 92203 | 15 | Indio              | Riverside      |
| 92210 | 10 | Indian Wells       | Riverside      |
| 92210 | 15 | Indian Wells       | Riverside      |
| 92211 | 10 | Palm Desert        | Riverside      |
| 92211 | 15 | Palm Desert        | Riverside      |
| 92220 | 10 | Banning            | Riverside      |
| 92223 | 10 | Beaumont           | Riverside      |
| 92225 | 10 | Blythe             | Riverside      |
| 92227 | 15 | Brawley            | Imperial       |
| 92230 | 10 | Cabazon            | Riverside      |
| 92231 | 15 | Calexico           | Imperial       |
| 92233 | 15 | Calipatria         | Imperial       |
| 92234 | 10 | Cathedral City     | Riverside      |
| 92236 | 15 | Coachella          | Riverside      |
| 92239 | 10 | Desert Center      | Riverside      |
| 92239 | 15 | Desert Center      | Riverside      |
| 92240 | 10 | Desert Hot Springs | Riverside      |
| 92241 | 10 | Desert Hot Springs | Riverside      |
| 92241 | 15 | Desert Hot Springs | Riverside      |
| 92242 | 10 | Earp               | San Bernardino |
| 92243 | 15 | El Centro          | Imperial       |
| 92249 | 15 | Heber              | Imperial       |
| 92250 | 15 | Holtville          | Imperial       |
| 92251 | 15 | Imperial           | Imperial       |
| 92252 | 10 | Joshua Tree        | San Bernardino |
| 92253 | 10 | La Quinta          | Riverside      |
| 92253 | 15 | La Quinta          | Riverside      |
| 92254 | 15 | Mecca              | Riverside      |
| 92256 | 10 | Morongo Valley     | San Bernardino |
| 92257 | 15 | Niland             | Imperial       |
| 92259 | 15 | Ocotillo           | Imperial       |
| 92260 | 10 | Palm Desert        | Riverside      |
| 92260 | 15 | Palm Desert        | Riverside      |
| 92262 | 10 | Palm Springs       | Riverside      |
| 92264 | 10 | Palm Springs       | Riverside      |
| 92267 | 10 | Parker Dam         | San Bernardino |
| 92270 | 10 | Rancho Mirage      | Riverside      |
| 92270 | 15 | Rancho Mirage      | Riverside      |
| 92274 | 15 | Thermal            | Imperial       |
| 92276 | 10 | Thousand Palms     | Riverside      |
| 92276 | 15 | Thousand Palms     | Riverside      |
| 92277 | 10 | Twentynine Palms   | San Bernardino |
| 92277 | 15 | Twentynine Palms   | San Bernardino |
| 92278 | 10 | Twentynine Palms   | San Bernardino |
| 92280 | 10 | Vidal              | San Bernardino |
| 92281 | 15 | Westmorland        | Imperial       |
| 92282 | 10 | White Water        | Riverside      |

|       |    |                  |                |
|-------|----|------------------|----------------|
| 92283 | 10 | Winterhaven      | Imperial       |
| 92283 | 15 | Winterhaven      | Imperial       |
| 92284 | 10 | Yucca Valley     | San Bernardino |
| 92285 | 10 | Landers          | San Bernardino |
| 92301 | 10 | Adelanto         | San Bernardino |
| 92304 | 10 | Amboy            | San Bernardino |
| 92305 | 10 | Angelus Oaks     | San Bernardino |
| 92307 | 10 | Apple Valley     | San Bernardino |
| 92308 | 10 | Apple Valley     | San Bernardino |
| 92309 | 10 | Baker            | San Bernardino |
| 92310 | 10 | Fort Irwin       | San Bernardino |
| 92311 | 10 | Barstow          | San Bernardino |
| 92313 | 10 | Grand Terrace    | San Bernardino |
| 92314 | 10 | Big Bear City    | San Bernardino |
| 92315 | 10 | Big Bear Lake    | San Bernardino |
| 92316 | 10 | Bloomington      | San Bernardino |
| 92320 | 10 | Calimesa         | Riverside      |
| 92321 | 10 | Cedar Glen       | San Bernardino |
| 92322 | 10 | Cedarpines Park  | San Bernardino |
| 92324 | 10 | Colton           | San Bernardino |
| 92325 | 10 | Crestline        | San Bernardino |
| 92327 | 10 | Daggett          | San Bernardino |
| 92328 | 9  | Death Valley     | Inyo           |
| 92332 | 10 | Essex            | San Bernardino |
| 92335 | 10 | Fontana          | San Bernardino |
| 92336 | 10 | Fontana          | San Bernardino |
| 92337 | 10 | Fontana          | San Bernardino |
| 92338 | 10 | Ludlow           | San Bernardino |
| 92339 | 10 | Forest Falls     | San Bernardino |
| 92342 | 10 | Helendale        | San Bernardino |
| 92344 | 10 | Hesperia         | San Bernardino |
| 92345 | 10 | Hesperia         | San Bernardino |
| 92346 | 10 | Highland         | San Bernardino |
| 92347 | 10 | Hinkley          | San Bernardino |
| 92352 | 10 | Lake Arrowhead   | San Bernardino |
| 92354 | 10 | Loma Linda       | San Bernardino |
| 92356 | 10 | Lucerne Valley   | San Bernardino |
| 92358 | 10 | Lytle Creek      | San Bernardino |
| 92359 | 10 | Mentone          | San Bernardino |
| 92363 | 10 | Needles          | San Bernardino |
| 92364 | 10 | Nipton           | San Bernardino |
| 92365 | 10 | Newberry Springs | San Bernardino |
| 92368 | 10 | Oro Grande       | San Bernardino |
| 92371 | 10 | Phelan           | San Bernardino |
| 92372 | 10 | Pinon Hills      | San Bernardino |
| 92373 | 10 | Redlands         | San Bernardino |
| 92374 | 10 | Redlands         | San Bernardino |
| 92376 | 10 | Rialto           | San Bernardino |
| 92377 | 10 | Rialto           | San Bernardino |

|       |    |                        |                |
|-------|----|------------------------|----------------|
| 92382 | 10 | Running Springs        | San Bernardino |
| 92384 | 9  | Shoshone               | Inyo           |
| 92385 | 10 | Skyforest              | San Bernardino |
| 92389 | 9  | Tecopa                 | Inyo           |
| 92389 | 10 | Tecopa                 | Inyo           |
| 92392 | 10 | Victorville            | San Bernardino |
| 92394 | 10 | Victorville            | San Bernardino |
| 92395 | 10 | Victorville            | San Bernardino |
| 92397 | 10 | Wrightwood             | San Bernardino |
| 92399 | 10 | Yucaipa                | San Bernardino |
| 92404 | 10 | San Bernardino         | San Bernardino |
| 92405 | 10 | San Bernardino         | San Bernardino |
| 92407 | 10 | San Bernardino         | San Bernardino |
| 92408 | 10 | San Bernardino         | San Bernardino |
| 92410 | 10 | San Bernardino         | San Bernardino |
| 92411 | 10 | San Bernardino         | San Bernardino |
| 92501 | 10 | Riverside              | Riverside      |
| 92503 | 10 | Riverside              | Riverside      |
| 92504 | 10 | Riverside              | Riverside      |
| 92505 | 10 | Riverside              | Riverside      |
| 92506 | 10 | Riverside              | Riverside      |
| 92507 | 10 | Riverside              | Riverside      |
| 92508 | 10 | Riverside              | Riverside      |
| 92509 | 10 | Riverside              | Riverside      |
| 92518 | 10 | March Air Reserve Base | Riverside      |
| 92521 | 10 | Riverside              | Riverside      |
| 92530 | 10 | Lake Elsinore          | Riverside      |
| 92532 | 10 | Lake Elsinore          | Riverside      |
| 92536 | 10 | Aguanga                | Riverside      |
| 92539 | 10 | Anza                   | Riverside      |
| 92543 | 10 | Hemet                  | Riverside      |
| 92544 | 10 | Hemet                  | Riverside      |
| 92545 | 10 | Hemet                  | Riverside      |
| 92548 | 10 | Homeland               | Riverside      |
| 92549 | 10 | Idyllwild              | Riverside      |
| 92551 | 10 | Moreno Valley          | Riverside      |
| 92553 | 10 | Moreno Valley          | Riverside      |
| 92555 | 10 | Moreno Valley          | Riverside      |
| 92557 | 10 | Moreno Valley          | Riverside      |
| 92561 | 10 | Mountain Center        | Riverside      |
| 92561 | 13 | Mountain Center        | Riverside      |
| 92561 | 15 | Mountain Center        | Riverside      |
| 92562 | 10 | Murrieta               | Riverside      |
| 92562 | 13 | Murrieta               | Riverside      |
| 92563 | 10 | Murrieta               | Riverside      |
| 92567 | 10 | Nuevo                  | Riverside      |
| 92570 | 10 | Perris                 | Riverside      |
| 92571 | 10 | Perris                 | Riverside      |
| 92582 | 10 | San Jacinto            | Riverside      |

|       |    |                     |           |
|-------|----|---------------------|-----------|
| 92583 | 10 | San Jacinto         | Riverside |
| 92584 | 10 | Menifee             | Riverside |
| 92585 | 10 | Sun City            | Riverside |
| 92586 | 10 | Sun City            | Riverside |
| 92587 | 10 | Sun City            | Riverside |
| 92590 | 10 | Temecula            | Riverside |
| 92591 | 10 | Temecula            | Riverside |
| 92592 | 10 | Temecula            | Riverside |
| 92595 | 10 | Wildomar            | Riverside |
| 92596 | 10 | Winchester          | Riverside |
| 92602 | 8  | Irvine              | Orange    |
| 92603 | 8  | Irvine              | Orange    |
| 92604 | 8  | Irvine              | Orange    |
| 92606 | 8  | Irvine              | Orange    |
| 92610 | 8  | Foothill Ranch      | Orange    |
| 92612 | 8  | Irvine              | Orange    |
| 92614 | 8  | Irvine              | Orange    |
| 92617 | 8  | Irvine              | Orange    |
| 92618 | 8  | Irvine              | Orange    |
| 92620 | 8  | Irvine              | Orange    |
| 92624 | 8  | Capistrano Beach    | Orange    |
| 92624 | 13 | Capistrano Beach    | Orange    |
| 92625 | 8  | Corona del Mar      | Orange    |
| 92626 | 8  | Costa Mesa          | Orange    |
| 92627 | 8  | Costa Mesa          | Orange    |
| 92629 | 8  | Dana Point          | Orange    |
| 92629 | 13 | Dana Point          | Orange    |
| 92630 | 8  | Lake Forest         | Orange    |
| 92637 | 8  | Laguna Woods        | Orange    |
| 92646 | 8  | Huntington Beach    | Orange    |
| 92647 | 8  | Huntington Beach    | Orange    |
| 92648 | 8  | Huntington Beach    | Orange    |
| 92649 | 8  | Huntington Beach    | Orange    |
| 92651 | 8  | Laguna Beach        | Orange    |
| 92653 | 8  | Laguna Hills        | Orange    |
| 92653 | 13 | Laguna Hills        | Orange    |
| 92655 | 8  | Midway City         | Orange    |
| 92656 | 8  | Aliso Viejo         | Orange    |
| 92656 | 13 | Aliso Viejo         | Orange    |
| 92657 | 8  | Newport Coast       | Orange    |
| 92660 | 8  | Newport Beach       | Orange    |
| 92663 | 8  | Newport Beach       | Orange    |
| 92672 | 8  | San Clemente        | San Diego |
| 92672 | 13 | San Clemente        | San Diego |
| 92673 | 8  | San Clemente        | Orange    |
| 92673 | 13 | San Clemente        | Orange    |
| 92675 | 8  | San Juan Capistrano | Orange    |
| 92675 | 13 | San Juan Capistrano | Orange    |
| 92676 | 8  | Silverado           | Orange    |

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|-------|----|------------------------|-----------|
| 92676 | 10 | Silverado              | Orange    |
| 92677 | 8  | Laguna Niguel          | Orange    |
| 92677 | 13 | Laguna Niguel          | Orange    |
| 92679 | 8  | Trabuco Canyon         | Orange    |
| 92679 | 13 | Trabuco Canyon         | Orange    |
| 92683 | 8  | Westminster            | Orange    |
| 92688 | 8  | Rancho Santa Margarita | Orange    |
| 92688 | 13 | Rancho Santa Margarita | Orange    |
| 92691 | 8  | Mission Viejo          | Orange    |
| 92691 | 13 | Mission Viejo          | Orange    |
| 92692 | 8  | Mission Viejo          | Orange    |
| 92692 | 13 | Mission Viejo          | Orange    |
| 92694 | 8  | Ladera Ranch           | Orange    |
| 92694 | 13 | Ladera Ranch           | Orange    |
| 92701 | 8  | Santa Ana              | Orange    |
| 92703 | 8  | Santa Ana              | Orange    |
| 92704 | 8  | Santa Ana              | Orange    |
| 92705 | 8  | Santa Ana              | Orange    |
| 92706 | 8  | Santa Ana              | Orange    |
| 92707 | 8  | Santa Ana              | Orange    |
| 92708 | 8  | Fountain Valley        | Orange    |
| 92780 | 8  | Tustin                 | Orange    |
| 92782 | 8  | Tustin                 | Orange    |
| 92801 | 8  | Anaheim                | Orange    |
| 92802 | 8  | Anaheim                | Orange    |
| 92804 | 8  | Anaheim                | Orange    |
| 92805 | 8  | Anaheim                | Orange    |
| 92806 | 8  | Anaheim                | Orange    |
| 92807 | 8  | Anaheim                | Orange    |
| 92808 | 8  | Anaheim                | Orange    |
| 92821 | 8  | Brea                   | Orange    |
| 92823 | 8  | Brea                   | Orange    |
| 92831 | 8  | Fullerton              | Orange    |
| 92832 | 8  | Fullerton              | Orange    |
| 92833 | 8  | Fullerton              | Orange    |
| 92835 | 8  | Fullerton              | Orange    |
| 92840 | 8  | Garden Grove           | Orange    |
| 92841 | 8  | Garden Grove           | Orange    |
| 92843 | 8  | Garden Grove           | Orange    |
| 92844 | 8  | Garden Grove           | Orange    |
| 92845 | 8  | Garden Grove           | Orange    |
| 92860 | 10 | Norco                  | Riverside |
| 92861 | 8  | Villa Park             | Orange    |
| 92862 | 8  | Orange                 | Orange    |
| 92862 | 10 | Orange                 | Orange    |
| 92865 | 8  | Orange                 | Orange    |
| 92866 | 8  | Orange                 | Orange    |
| 92867 | 8  | Orange                 | Orange    |
| 92868 | 8  | Orange                 | Orange    |

|       |    |                        |               |
|-------|----|------------------------|---------------|
| 92869 | 8  | Orange                 | Orange        |
| 92870 | 8  | Placentia              | Orange        |
| 92879 | 10 | Corona                 | Riverside     |
| 92880 | 10 | Corona                 | Riverside     |
| 92881 | 10 | Corona                 | Riverside     |
| 92882 | 10 | Corona                 | Riverside     |
| 92883 | 10 | Corona                 | Riverside     |
| 92886 | 8  | Yorba Linda            | Orange        |
| 92887 | 8  | Yorba Linda            | Orange        |
| 93001 | 8  | Ventura                | Ventura       |
| 93003 | 8  | Ventura                | Ventura       |
| 93004 | 8  | Ventura                | Ventura       |
| 93010 | 8  | Camarillo              | Ventura       |
| 93012 | 8  | Camarillo              | Ventura       |
| 93013 | 8  | Carpinteria            | Santa Barbara |
| 93015 | 8  | Fillmore               | Ventura       |
| 93021 | 8  | Moorpark               | Ventura       |
| 93022 | 8  | Oak View               | Ventura       |
| 93023 | 8  | Ojai                   | Ventura       |
| 93030 | 8  | Oxnard                 | Ventura       |
| 93033 | 8  | Oxnard                 | Ventura       |
| 93035 | 8  | Oxnard                 | Ventura       |
| 93036 | 8  | Oxnard                 | Ventura       |
| 93041 | 8  | Port Hueneme           | Ventura       |
| 93042 | 8  | Point Mugu Nawc        | Ventura       |
| 93043 | 8  | Port Hueneme CBC Base  | Ventura       |
| 93060 | 8  | Santa Paula            | Ventura       |
| 93063 | 8  | Simi Valley            | Ventura       |
| 93065 | 8  | Simi Valley            | Ventura       |
| 93066 | 8  | Somis                  | Ventura       |
| 93101 | 8  | Santa Barbara          | Santa Barbara |
| 93103 | 8  | Santa Barbara          | Santa Barbara |
| 93105 | 4  | Santa Barbara          | Santa Barbara |
| 93105 | 8  | Santa Barbara          | Santa Barbara |
| 93106 | 8  | Santa Barbara          | Santa Barbara |
| 93108 | 8  | Santa Barbara          | Santa Barbara |
| 93109 | 8  | Santa Barbara          | Santa Barbara |
| 93110 | 8  | Santa Barbara          | Santa Barbara |
| 93111 | 8  | Santa Barbara          | Santa Barbara |
| 93117 | 4  | Goleta                 | Santa Barbara |
| 93117 | 8  | Goleta                 | Santa Barbara |
| 93203 | 3  | Arvin                  | Kern          |
| 93203 | 7  | Arvin                  | Kern          |
| 93204 | 3  | Avenal                 | Kings         |
| 93205 | 7  | Bodfish                | Kern          |
| 93206 | 3  | Buttonwillow           | Kern          |
| 93207 | 7  | California Hot Springs | Tulare        |
| 93210 | 3  | Coalinga               | Fresno        |
| 93212 | 3  | Corcoran               | Tulare        |

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|-------|---|-----------------------|---------------|
| 93212 | 7 | Corcoran              | Tulare        |
| 93215 | 3 | Delano                | Kern          |
| 93215 | 7 | Delano                | Kern          |
| 93219 | 3 | Earlimart             | Tulare        |
| 93219 | 7 | Earlimart             | Tulare        |
| 93221 | 7 | Exeter                | Tulare        |
| 93223 | 7 | Farmersville          | Tulare        |
| 93224 | 3 | Fellows               | Kern          |
| 93225 | 3 | Frazier Park          | Kern          |
| 93225 | 8 | Frazier Park          | Kern          |
| 93226 | 7 | Glennville            | Kern          |
| 93230 | 3 | Hanford               | Kings         |
| 93234 | 3 | Huron                 | Fresno        |
| 93235 | 7 | Ivanhoe               | Tulare        |
| 93238 | 7 | Kernville             | Kern          |
| 93239 | 3 | Kettleman City        | Kings         |
| 93240 | 7 | Lake Isabella         | Kern          |
| 93241 | 3 | Lamont                | Kern          |
| 93242 | 3 | Laton                 | Fresno        |
| 93243 | 3 | Lebec                 | Ventura       |
| 93243 | 7 | Lebec                 | Ventura       |
| 93243 | 8 | Lebec                 | Ventura       |
| 93243 | 9 | Lebec                 | Ventura       |
| 93244 | 7 | Lemon Cove            | Tulare        |
| 93245 | 3 | Lemoore               | Kings         |
| 93247 | 7 | Lindsay               | Tulare        |
| 93249 | 3 | Lost Hills            | Kern          |
| 93250 | 3 | MC Farland            | Kern          |
| 93250 | 7 | MC Farland            | Kern          |
| 93251 | 3 | MC Kittrick           | Kern          |
| 93252 | 3 | Maricopa              | Ventura       |
| 93252 | 4 | Maricopa              | Ventura       |
| 93252 | 8 | Maricopa              | Ventura       |
| 93254 | 4 | New Cuyama            | Santa Barbara |
| 93255 | 7 | Onyx                  | Kern          |
| 93256 | 3 | Pixley                | Tulare        |
| 93256 | 7 | Pixley                | Tulare        |
| 93257 | 7 | Porterville           | Tulare        |
| 93260 | 7 | Posey                 | Tulare        |
| 93262 | 3 | Sequoia National Park | Tulare        |
| 93262 | 7 | Sequoia National Park | Tulare        |
| 93263 | 3 | Shafter               | Kern          |
| 93265 | 7 | Springville           | Tulare        |
| 93266 | 3 | Stratford             | Kings         |
| 93267 | 7 | Strathmore            | Tulare        |
| 93268 | 3 | Taft                  | Kern          |
| 93270 | 7 | Terra Bella           | Tulare        |
| 93271 | 7 | Three Rivers          | Tulare        |
| 93272 | 7 | Tipton                | Tulare        |

|       |   |                 |                 |
|-------|---|-----------------|-----------------|
| 93274 | 3 | Tulare          | Tulare          |
| 93274 | 7 | Tulare          | Tulare          |
| 93276 | 3 | Tupman          | Kern            |
| 93277 | 7 | Visalia         | Tulare          |
| 93280 | 3 | Wasco           | Kern            |
| 93280 | 7 | Wasco           | Kern            |
| 93283 | 7 | Weldon          | Kern            |
| 93285 | 7 | Wofford Heights | Kern            |
| 93286 | 3 | Woodlake        | Tulare          |
| 93286 | 7 | Woodlake        | Tulare          |
| 93287 | 7 | Woody           | Kern            |
| 93291 | 3 | Visalia         | Tulare          |
| 93291 | 7 | Visalia         | Tulare          |
| 93292 | 3 | Visalia         | Tulare          |
| 93292 | 7 | Visalia         | Tulare          |
| 93301 | 3 | Bakersfield     | Kern            |
| 93304 | 3 | Bakersfield     | Kern            |
| 93305 | 3 | Bakersfield     | Kern            |
| 93306 | 3 | Bakersfield     | Kern            |
| 93306 | 7 | Bakersfield     | Kern            |
| 93307 | 3 | Bakersfield     | Kern            |
| 93308 | 3 | Bakersfield     | Kern            |
| 93308 | 7 | Bakersfield     | Kern            |
| 93309 | 3 | Bakersfield     | Kern            |
| 93311 | 3 | Bakersfield     | Kern            |
| 93312 | 3 | Bakersfield     | Kern            |
| 93313 | 3 | Bakersfield     | Kern            |
| 93314 | 3 | Bakersfield     | Kern            |
| 93401 | 4 | San Luis Obispo | San Luis Obispo |
| 93402 | 4 | Los Osos        | San Luis Obispo |
| 93405 | 4 | San Luis Obispo | San Luis Obispo |
| 93420 | 4 | Arroyo Grande   | San Luis Obispo |
| 93422 | 4 | Atascadero      | San Luis Obispo |
| 93426 | 4 | Bradley         | Monterey        |
| 93427 | 4 | Buellton        | Santa Barbara   |
| 93428 | 4 | Cambria         | San Luis Obispo |
| 93429 | 4 | Casmalia        | Santa Barbara   |
| 93430 | 4 | Cayucos         | San Luis Obispo |
| 93432 | 4 | Creston         | San Luis Obispo |
| 93433 | 4 | Grover Beach    | San Luis Obispo |
| 93434 | 4 | Guadalupe       | Santa Barbara   |
| 93436 | 4 | Lompoc          | Santa Barbara   |
| 93437 | 4 | Lompoc          | Santa Barbara   |
| 93441 | 4 | Los Olivos      | Santa Barbara   |
| 93442 | 4 | Morro Bay       | San Luis Obispo |
| 93444 | 4 | Nipomo          | San Luis Obispo |
| 93445 | 4 | Oceano          | San Luis Obispo |
| 93446 | 4 | Paso Robles     | San Luis Obispo |
| 93449 | 4 | Pismo Beach     | San Luis Obispo |



|       |    |                 |                 |
|-------|----|-----------------|-----------------|
| 93450 | 3  | San Ardo        | Monterey        |
| 93450 | 4  | San Ardo        | Monterey        |
| 93451 | 3  | San Miguel      | Monterey        |
| 93451 | 4  | San Miguel      | Monterey        |
| 93452 | 4  | San Simeon      | San Luis Obispo |
| 93453 | 3  | Santa Margarita | San Luis Obispo |
| 93453 | 4  | Santa Margarita | San Luis Obispo |
| 93454 | 4  | Santa Maria     | Santa Barbara   |
| 93455 | 4  | Santa Maria     | Santa Barbara   |
| 93458 | 4  | Santa Maria     | Santa Barbara   |
| 93460 | 4  | Santa Ynez      | Santa Barbara   |
| 93461 | 3  | Shandon         | San Luis Obispo |
| 93461 | 4  | Shandon         | San Luis Obispo |
| 93463 | 4  | Solvang         | Santa Barbara   |
| 93465 | 4  | Templeton       | San Luis Obispo |
| 93501 | 7  | Mojave          | Kern            |
| 93505 | 7  | California City | Kern            |
| 93510 | 9  | Acton           | Los Angeles     |
| 93512 | 1  | Benton          | Mono            |
| 93513 | 9  | Big Pine        | Inyo            |
| 93514 | 1  | Bishop          | Mono            |
| 93514 | 3  | Bishop          | Mono            |
| 93514 | 9  | Bishop          | Mono            |
| 93516 | 7  | Boron           | Kern            |
| 93517 | 1  | Bridgeport      | Mono            |
| 93518 | 3  | Caliente        | Kern            |
| 93518 | 7  | Caliente        | Kern            |
| 93519 | 7  | Cantil          | Kern            |
| 93523 | 7  | Edwards         | Kern            |
| 93524 | 7  | Edwards         | Kern            |
| 93524 | 10 | Edwards         | Kern            |
| 93526 | 3  | Independence    | Inyo            |
| 93526 | 9  | Independence    | Inyo            |
| 93527 | 7  | Inyokern        | Kern            |
| 93527 | 9  | Inyokern        | Kern            |
| 93528 | 7  | Johannesburg    | Kern            |
| 93529 | 1  | June Lake       | Mono            |
| 93529 | 3  | June Lake       | Mono            |
| 93531 | 7  | Keene           | Kern            |
| 93532 | 9  | Lake Hughes     | Los Angeles     |
| 93534 | 9  | Lancaster       | Los Angeles     |
| 93535 | 7  | Lancaster       | Los Angeles     |
| 93535 | 9  | Lancaster       | Los Angeles     |
| 93536 | 7  | Lancaster       | Los Angeles     |
| 93536 | 9  | Lancaster       | Los Angeles     |
| 93541 | 1  | Lee Vining      | Mono            |
| 93543 | 9  | Littlerock      | Los Angeles     |
| 93544 | 9  | Llano           | Los Angeles     |
| 93545 | 7  | Lone Pine       | Inyo            |

|       |    |                          |                |
|-------|----|--------------------------|----------------|
| 93545 | 9  | Lone Pine                | Inyo           |
| 93546 | 1  | Mammoth Lakes            | Mono           |
| 93546 | 3  | Mammoth Lakes            | Mono           |
| 93550 | 9  | Palmdale                 | Los Angeles    |
| 93551 | 9  | Palmdale                 | Los Angeles    |
| 93552 | 9  | Palmdale                 | Los Angeles    |
| 93553 | 9  | Pearblossom              | Los Angeles    |
| 93554 | 7  | Randsburg                | Kern           |
| 93555 | 7  | Ridgecrest               | San Bernardino |
| 93555 | 9  | Ridgecrest               | San Bernardino |
| 93555 | 10 | Ridgecrest               | San Bernardino |
| 93560 | 3  | Rosamond                 | Kern           |
| 93560 | 7  | Rosamond                 | Kern           |
| 93560 | 9  | Rosamond                 | Kern           |
| 93561 | 3  | Tehachapi                | Kern           |
| 93561 | 7  | Tehachapi                | Kern           |
| 93562 | 10 | Trona                    | San Bernardino |
| 93563 | 9  | Valyermo                 | Los Angeles    |
| 93591 | 9  | Palmdale                 | Los Angeles    |
| 93601 | 1  | Ahwahnee                 | Madera         |
| 93601 | 3  | Ahwahnee                 | Madera         |
| 93602 | 3  | Auberry                  | Fresno         |
| 93604 | 3  | Bass Lake                | Madera         |
| 93608 | 3  | Cantua Creek             | Fresno         |
| 93609 | 3  | Caruthers                | Fresno         |
| 93610 | 3  | Chowchilla               | Madera         |
| 93611 | 3  | Clovis                   | Fresno         |
| 93612 | 3  | Clovis                   | Fresno         |
| 93614 | 3  | Coarsegold               | Madera         |
| 93615 | 3  | Cutler                   | Tulare         |
| 93616 | 3  | Del Rey                  | Fresno         |
| 93618 | 3  | Dinuba                   | Tulare         |
| 93619 | 3  | Clovis                   | Fresno         |
| 93620 | 3  | Dos Palos                | Merced         |
| 93621 | 3  | Dunlap                   | Fresno         |
| 93622 | 3  | Firebaugh                | Fresno         |
| 93623 | 1  | Fish Camp                | Mariposa       |
| 93623 | 3  | Fish Camp                | Mariposa       |
| 93625 | 3  | Fowler                   | Fresno         |
| 93626 | 3  | Friant                   | Madera         |
| 93627 | 3  | Helm                     | Fresno         |
| 93630 | 3  | Kerman                   | Fresno         |
| 93631 | 3  | Kingsburg                | Tulare         |
| 93631 | 7  | Kingsburg                | Tulare         |
| 93633 | 3  | Kings Canyon National PK | Fresno         |
| 93635 | 3  | Los Banos                | Merced         |
| 93636 | 3  | Madera                   | Madera         |
| 93637 | 3  | Madera                   | Madera         |
| 93638 | 3  | Madera                   | Madera         |

|       |   |               |          |
|-------|---|---------------|----------|
| 93640 | 3 | Mendota       | Fresno   |
| 93641 | 3 | Miramonte     | Fresno   |
| 93643 | 3 | North Fork    | Madera   |
| 93644 | 3 | Oakhurst      | Madera   |
| 93645 | 3 | O Neals       | Madera   |
| 93646 | 3 | Orange Cove   | Tulare   |
| 93647 | 3 | Orosi         | Tulare   |
| 93648 | 3 | Parlier       | Fresno   |
| 93650 | 3 | Fresno        | Fresno   |
| 93651 | 3 | Prather       | Fresno   |
| 93652 | 3 | Raisin City   | Fresno   |
| 93653 | 1 | Raymond       | Mariposa |
| 93653 | 3 | Raymond       | Mariposa |
| 93654 | 3 | Reedley       | Fresno   |
| 93656 | 3 | Riverdale     | Fresno   |
| 93657 | 3 | Sanger        | Fresno   |
| 93660 | 3 | San Joaquin   | Fresno   |
| 93662 | 3 | Selma         | Fresno   |
| 93664 | 3 | Shaver Lake   | Fresno   |
| 93667 | 3 | Tollhouse     | Fresno   |
| 93668 | 3 | Tranquillity  | Fresno   |
| 93669 | 3 | Wishon        | Madera   |
| 93675 | 3 | Squaw Valley  | Fresno   |
| 93701 | 3 | Fresno        | Fresno   |
| 93702 | 3 | Fresno        | Fresno   |
| 93703 | 3 | Fresno        | Fresno   |
| 93704 | 3 | Fresno        | Fresno   |
| 93705 | 3 | Fresno        | Fresno   |
| 93706 | 3 | Fresno        | Fresno   |
| 93710 | 3 | Fresno        | Fresno   |
| 93711 | 3 | Fresno        | Fresno   |
| 93720 | 3 | Fresno        | Fresno   |
| 93721 | 3 | Fresno        | Fresno   |
| 93722 | 3 | Fresno        | Fresno   |
| 93723 | 3 | Fresno        | Fresno   |
| 93725 | 3 | Fresno        | Fresno   |
| 93726 | 3 | Fresno        | Fresno   |
| 93727 | 3 | Fresno        | Fresno   |
| 93728 | 3 | Fresno        | Fresno   |
| 93730 | 3 | Fresno        | Fresno   |
| 93901 | 4 | Salinas       | Monterey |
| 93905 | 4 | Salinas       | Monterey |
| 93906 | 4 | Salinas       | Monterey |
| 93907 | 4 | Salinas       | Monterey |
| 93908 | 4 | Salinas       | Monterey |
| 93920 | 4 | Big sur       | Monterey |
| 93923 | 4 | Carmel        | Monterey |
| 93924 | 4 | Carmel Valley | Monterey |
| 93925 | 4 | Chualar       | Monterey |

|       |   |                     |               |
|-------|---|---------------------|---------------|
| 93926 | 4 | Gonzales            | Monterey      |
| 93927 | 4 | Greenfield          | Monterey      |
| 93930 | 4 | King City           | Monterey      |
| 93932 | 4 | Lockwood            | Monterey      |
| 93933 | 4 | Marina              | Monterey      |
| 93940 | 4 | Monterey            | Monterey      |
| 93950 | 4 | Pacific Grove       | Monterey      |
| 93953 | 4 | Pebble Beach        | Monterey      |
| 93955 | 4 | Seaside             | Monterey      |
| 93960 | 4 | Soledad             | Monterey      |
| 94002 | 5 | Belmont             | San Mateo     |
| 94005 | 5 | Brisbane            | San Mateo     |
| 94010 | 5 | Burlingame          | San Mateo     |
| 94014 | 5 | Daly City           | San Mateo     |
| 94015 | 5 | Daly City           | San Mateo     |
| 94019 | 5 | Half Moon Bay       | San Mateo     |
| 94020 | 5 | La Honda            | San Mateo     |
| 94021 | 5 | Loma Mar            | San Mateo     |
| 94022 | 4 | Los Altos           | Santa Clara   |
| 94024 | 4 | Los Altos           | Santa Clara   |
| 94025 | 5 | Menlo Park          | San Mateo     |
| 94027 | 5 | Atherton            | San Mateo     |
| 94028 | 4 | Portola Valley      | San Mateo     |
| 94028 | 5 | Portola Valley      | San Mateo     |
| 94030 | 5 | Millbrae            | San Mateo     |
| 94035 | 4 | Mountain View       | Santa Clara   |
| 94038 | 5 | Moss Beach          | San Mateo     |
| 94040 | 4 | Mountain View       | Santa Clara   |
| 94041 | 4 | Mountain View       | Santa Clara   |
| 94043 | 4 | Mountain View       | Santa Clara   |
| 94044 | 5 | Pacifica            | San Mateo     |
| 94060 | 5 | Pescadero           | San Mateo     |
| 94061 | 5 | Redwood City        | San Mateo     |
| 94062 | 5 | Redwood City        | San Mateo     |
| 94063 | 5 | Redwood City        | San Mateo     |
| 94065 | 5 | Redwood City        | San Mateo     |
| 94066 | 5 | San Bruno           | San Mateo     |
| 94070 | 5 | San Carlos          | San Mateo     |
| 94074 | 5 | San Gregorio        | San Mateo     |
| 94080 | 5 | South San Francisco | San Mateo     |
| 94085 | 4 | Sunnyvale           | Santa Clara   |
| 94086 | 4 | Sunnyvale           | Santa Clara   |
| 94087 | 4 | Sunnyvale           | Santa Clara   |
| 94089 | 4 | Sunnyvale           | Santa Clara   |
| 94103 | 5 | San Francisco       | San Francisco |
| 94107 | 5 | San Francisco       | San Francisco |
| 94109 | 5 | San Francisco       | San Francisco |
| 94110 | 5 | San Francisco       | San Francisco |
| 94112 | 5 | San Francisco       | San Francisco |

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|-------|---|-----------------|---------------|
| 94114 | 5 | San Francisco   | San Francisco |
| 94115 | 5 | San Francisco   | San Francisco |
| 94116 | 5 | San Francisco   | San Francisco |
| 94117 | 5 | San Francisco   | San Francisco |
| 94118 | 5 | San Francisco   | San Francisco |
| 94121 | 5 | San Francisco   | San Francisco |
| 94122 | 5 | San Francisco   | San Francisco |
| 94123 | 5 | San Francisco   | San Francisco |
| 94124 | 5 | San Francisco   | San Francisco |
| 94127 | 5 | San Francisco   | San Francisco |
| 94128 | 5 | San Francisco   | San Mateo     |
| 94129 | 5 | San Francisco   | San Francisco |
| 94130 | 5 | San Francisco   | San Francisco |
| 94131 | 5 | San Francisco   | San Francisco |
| 94132 | 5 | San Francisco   | San Francisco |
| 94133 | 5 | San Francisco   | San Francisco |
| 94134 | 5 | San Francisco   | San Francisco |
| 94158 | 5 | San Francisco   | San Francisco |
| 94301 | 4 | Palo Alto       | Santa Clara   |
| 94303 | 4 | Palo Alto       | Santa Clara   |
| 94303 | 5 | Palo Alto       | Santa Clara   |
| 94304 | 4 | Palo Alto       | Santa Clara   |
| 94305 | 4 | Stanford        | Santa Clara   |
| 94306 | 4 | Palo Alto       | Santa Clara   |
| 94401 | 5 | San Mateo       | San Mateo     |
| 94402 | 5 | San Mateo       | San Mateo     |
| 94403 | 5 | San Mateo       | San Mateo     |
| 94404 | 5 | San Mateo       | San Mateo     |
| 94501 | 5 | Alameda         | Alameda       |
| 94502 | 5 | Alameda         | Alameda       |
| 94503 | 4 | American Canyon | Napa          |
| 94506 | 4 | Danville        | Contra Costa  |
| 94507 | 4 | Alamo           | Contra Costa  |
| 94507 | 5 | Alamo           | Contra Costa  |
| 94508 | 4 | Angwin          | Napa          |
| 94509 | 4 | Antioch         | Contra Costa  |
| 94510 | 4 | Benicia         | Solano        |
| 94512 | 4 | Birds Landing   | Solano        |
| 94513 | 4 | Brentwood       | Contra Costa  |
| 94514 | 4 | Byron           | Contra Costa  |
| 94515 | 4 | Calistoga       | Napa          |
| 94517 | 4 | Clayton         | Contra Costa  |
| 94518 | 4 | Concord         | Contra Costa  |
| 94518 | 5 | Concord         | Contra Costa  |
| 94519 | 4 | Concord         | Contra Costa  |
| 94520 | 4 | Concord         | Contra Costa  |
| 94520 | 5 | Concord         | Contra Costa  |
| 94521 | 4 | Concord         | Contra Costa  |
| 94523 | 5 | Pleasant Hill   | Contra Costa  |

|       |   |               |              |
|-------|---|---------------|--------------|
| 94525 | 5 | Crockett      | Contra Costa |
| 94526 | 4 | Danville      | Contra Costa |
| 94528 | 4 | Diablo        | Contra Costa |
| 94530 | 5 | El Cerrito    | Contra Costa |
| 94531 | 4 | Antioch       | Contra Costa |
| 94533 | 4 | Fairfield     | Solano       |
| 94534 | 4 | Fairfield     | Solano       |
| 94535 | 4 | Travis AFB    | Solano       |
| 94536 | 5 | Fremont       | Alameda      |
| 94538 | 5 | Fremont       | Alameda      |
| 94539 | 4 | Fremont       | Alameda      |
| 94539 | 5 | Fremont       | Alameda      |
| 94541 | 5 | Hayward       | Alameda      |
| 94542 | 5 | Hayward       | Alameda      |
| 94544 | 5 | Hayward       | Alameda      |
| 94545 | 5 | Hayward       | Alameda      |
| 94546 | 5 | Castro Valley | Alameda      |
| 94547 | 5 | Hercules      | Contra Costa |
| 94548 | 4 | Knightsen     | Contra Costa |
| 94549 | 4 | Lafayette     | Contra Costa |
| 94549 | 5 | Lafayette     | Contra Costa |
| 94550 | 3 | Livermore     | Alameda      |
| 94550 | 4 | Livermore     | Alameda      |
| 94551 | 4 | Livermore     | Alameda      |
| 94552 | 4 | Castro Valley | Alameda      |
| 94552 | 5 | Castro Valley | Alameda      |
| 94553 | 5 | Martinez      | Contra Costa |
| 94555 | 5 | Fremont       | Alameda      |
| 94556 | 5 | Moraga        | Contra Costa |
| 94558 | 4 | Napa          | Napa         |
| 94559 | 4 | Napa          | Napa         |
| 94560 | 5 | Newark        | Alameda      |
| 94561 | 4 | Oakley        | Contra Costa |
| 94563 | 5 | Orinda        | Contra Costa |
| 94564 | 5 | Pinole        | Contra Costa |
| 94565 | 4 | Pittsburg     | Contra Costa |
| 94566 | 4 | Pleasanton    | Alameda      |
| 94567 | 4 | Pope Valley   | Napa         |
| 94568 | 4 | Dublin        | Alameda      |
| 94568 | 5 | Dublin        | Alameda      |
| 94569 | 5 | Port Costa    | Contra Costa |
| 94571 | 4 | Rio Vista     | Solano       |
| 94571 | 6 | Rio Vista     | Solano       |
| 94572 | 4 | Rodeo         | Contra Costa |
| 94572 | 5 | Rodeo         | Contra Costa |
| 94574 | 4 | Saint Helena  | Napa         |
| 94576 | 4 | Deer Park     | Napa         |
| 94577 | 5 | San Leandro   | Alameda      |
| 94578 | 5 | San Leandro   | Alameda      |

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|-------|---|--------------|--------------|
| 94579 | 5 | San Leandro  | Alameda      |
| 94580 | 5 | San Lorenzo  | Alameda      |
| 94582 | 4 | San Ramon    | Contra Costa |
| 94583 | 4 | San Ramon    | Contra Costa |
| 94583 | 5 | San Ramon    | Contra Costa |
| 94585 | 4 | Suisun City  | Solano       |
| 94586 | 4 | Sunol        | Alameda      |
| 94586 | 5 | Sunol        | Alameda      |
| 94587 | 5 | Union City   | Alameda      |
| 94588 | 4 | Pleasanton   | Alameda      |
| 94588 | 5 | Pleasanton   | Alameda      |
| 94589 | 4 | Vallejo      | Solano       |
| 94590 | 4 | Vallejo      | Solano       |
| 94591 | 4 | Vallejo      | Solano       |
| 94592 | 4 | Vallejo      | Solano       |
| 94595 | 5 | Walnut Creek | Contra Costa |
| 94596 | 4 | Walnut Creek | Contra Costa |
| 94596 | 5 | Walnut Creek | Contra Costa |
| 94597 | 5 | Walnut Creek | Contra Costa |
| 94598 | 4 | Walnut Creek | Contra Costa |
| 94598 | 5 | Walnut Creek | Contra Costa |
| 94599 | 4 | Yountville   | Napa         |
| 94601 | 5 | Oakland      | Alameda      |
| 94602 | 5 | Oakland      | Alameda      |
| 94603 | 5 | Oakland      | Alameda      |
| 94605 | 5 | Oakland      | Alameda      |
| 94606 | 5 | Oakland      | Alameda      |
| 94607 | 5 | Oakland      | Alameda      |
| 94608 | 5 | Emeryville   | Alameda      |
| 94609 | 5 | Oakland      | Alameda      |
| 94610 | 5 | Oakland      | Alameda      |
| 94611 | 5 | Oakland      | Alameda      |
| 94612 | 5 | Oakland      | Alameda      |
| 94618 | 5 | Oakland      | Alameda      |
| 94619 | 5 | Oakland      | Alameda      |
| 94621 | 5 | Oakland      | Alameda      |
| 94702 | 5 | Berkeley     | Alameda      |
| 94703 | 5 | Berkeley     | Alameda      |
| 94704 | 5 | Berkeley     | Alameda      |
| 94705 | 5 | Berkeley     | Alameda      |
| 94706 | 5 | Albany       | Alameda      |
| 94707 | 5 | Berkeley     | Alameda      |
| 94708 | 5 | Berkeley     | Contra Costa |
| 94709 | 5 | Berkeley     | Alameda      |
| 94710 | 5 | Berkeley     | Alameda      |
| 94720 | 5 | Berkeley     | Alameda      |
| 94801 | 5 | Richmond     | Contra Costa |
| 94803 | 5 | El Sobrante  | Contra Costa |
| 94804 | 5 | Richmond     | Contra Costa |

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|-------|---|---------------------|--------------|
| 94805 | 5 | Richmond            | Contra Costa |
| 94806 | 5 | San Pablo           | Contra Costa |
| 94901 | 5 | San Rafael          | Marin        |
| 94903 | 5 | San Rafael          | Marin        |
| 94904 | 5 | Greenbrae           | Marin        |
| 94920 | 5 | Belvedere Tiburon   | Marin        |
| 94922 | 4 | Bodega              | Sonoma       |
| 94923 | 4 | Bodega Bay          | Sonoma       |
| 94924 | 5 | Bolinas             | Marin        |
| 94925 | 5 | Corte Madera        | Marin        |
| 94928 | 4 | Rohnert Park        | Sonoma       |
| 94929 | 5 | Dillon Beach        | Marin        |
| 94930 | 5 | Fairfax             | Marin        |
| 94931 | 4 | Cotati              | Sonoma       |
| 94933 | 5 | Forest Knolls       | Marin        |
| 94937 | 5 | Inverness           | Marin        |
| 94938 | 5 | Lagunitas           | Marin        |
| 94939 | 5 | Larkspur            | Marin        |
| 94940 | 5 | Marshall            | Marin        |
| 94941 | 5 | Mill Valley         | Marin        |
| 94945 | 5 | Novato              | Marin        |
| 94946 | 5 | Nicasio             | Marin        |
| 94947 | 5 | Novato              | Marin        |
| 94949 | 5 | Novato              | Marin        |
| 94951 | 4 | Penngrove           | Sonoma       |
| 94952 | 4 | Petaluma            | Marin        |
| 94952 | 5 | Petaluma            | Marin        |
| 94954 | 4 | Petaluma            | Sonoma       |
| 94956 | 5 | Point Reyes Station | Marin        |
| 94960 | 5 | San Anselmo         | Marin        |
| 94963 | 5 | San Geronimo        | Marin        |
| 94965 | 5 | Sausalito           | Marin        |
| 94970 | 5 | Stinson Beach       | Marin        |
| 94971 | 5 | Tomaes              | Marin        |
| 94972 | 4 | Valley Ford         | Sonoma       |
| 94973 | 5 | Woodacre            | Marin        |
| 95002 | 4 | Alviso              | Santa Clara  |
| 95003 | 5 | Aptos               | Santa Cruz   |
| 95004 | 4 | Aromas              | Monterey     |
| 95005 | 5 | Ben Lomond          | Santa Cruz   |
| 95006 | 5 | Boulder Creek       | Santa Cruz   |
| 95008 | 4 | Campbell            | Santa Clara  |
| 95010 | 5 | Capitola            | Santa Cruz   |
| 95012 | 4 | Castroville         | Monterey     |
| 95013 | 4 | Coyote              | Santa Clara  |
| 95014 | 4 | Cupertino           | Santa Clara  |
| 95017 | 5 | Davenport           | Santa Cruz   |
| 95018 | 5 | Felton              | Santa Cruz   |
| 95020 | 4 | Gilroy              | Santa Clara  |



|       |   |                   |             |
|-------|---|-------------------|-------------|
| 95023 | 3 | Hollister         | San Benito  |
| 95023 | 4 | Hollister         | San Benito  |
| 95030 | 4 | Los Gatos         | Santa Clara |
| 95032 | 4 | Los Gatos         | Santa Clara |
| 95033 | 4 | Los Gatos         | Santa Cruz  |
| 95033 | 5 | Los Gatos         | Santa Cruz  |
| 95035 | 4 | Milpitas          | Santa Clara |
| 95037 | 3 | Morgan Hill       | Santa Clara |
| 95037 | 4 | Morgan Hill       | Santa Clara |
| 95039 | 4 | Moss Landing      | Monterey    |
| 95043 | 3 | Paicines          | San Benito  |
| 95043 | 4 | Paicines          | San Benito  |
| 95045 | 4 | San Juan Bautista | San Benito  |
| 95046 | 4 | San Martin        | Santa Clara |
| 95050 | 4 | Santa Clara       | Santa Clara |
| 95051 | 4 | Santa Clara       | Santa Clara |
| 95054 | 4 | Santa Clara       | Santa Clara |
| 95060 | 5 | Santa Cruz        | Santa Cruz  |
| 95062 | 5 | Santa Cruz        | Santa Cruz  |
| 95064 | 5 | Santa Cruz        | Santa Cruz  |
| 95065 | 5 | Santa Cruz        | Santa Cruz  |
| 95066 | 5 | Scotts Valley     | Santa Cruz  |
| 95070 | 4 | Saratoga          | Santa Clara |
| 95073 | 5 | Soquel            | Santa Cruz  |
| 95076 | 4 | Watsonville       | Santa Cruz  |
| 95076 | 5 | Watsonville       | Santa Cruz  |
| 95110 | 4 | San Jose          | Santa Clara |
| 95111 | 4 | San Jose          | Santa Clara |
| 95112 | 4 | San Jose          | Santa Clara |
| 95116 | 4 | San Jose          | Santa Clara |
| 95117 | 4 | San Jose          | Santa Clara |
| 95118 | 4 | San Jose          | Santa Clara |
| 95119 | 4 | San Jose          | Santa Clara |
| 95120 | 4 | San Jose          | Santa Clara |
| 95121 | 4 | San Jose          | Santa Clara |
| 95122 | 4 | San Jose          | Santa Clara |
| 95123 | 4 | San Jose          | Santa Clara |
| 95124 | 4 | San Jose          | Santa Clara |
| 95125 | 4 | San Jose          | Santa Clara |
| 95126 | 4 | San Jose          | Santa Clara |
| 95127 | 4 | San Jose          | Santa Clara |
| 95128 | 4 | San Jose          | Santa Clara |
| 95129 | 4 | San Jose          | Santa Clara |
| 95130 | 4 | San Jose          | Santa Clara |
| 95131 | 4 | San Jose          | Santa Clara |
| 95132 | 4 | San Jose          | Santa Clara |
| 95133 | 4 | San Jose          | Santa Clara |
| 95134 | 4 | San Jose          | Santa Clara |
| 95135 | 4 | San Jose          | Santa Clara |

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|-------|---|----------------|-------------|
| 95136 | 4 | San Jose       | Santa Clara |
| 95138 | 4 | San Jose       | Santa Clara |
| 95139 | 4 | San Jose       | Santa Clara |
| 95140 | 4 | Mount Hamilton | Santa Clara |
| 95148 | 4 | San Jose       | Santa Clara |
| 95202 | 2 | Stockton       | San Joaquin |
| 95203 | 2 | Stockton       | San Joaquin |
| 95204 | 2 | Stockton       | San Joaquin |
| 95205 | 2 | Stockton       | San Joaquin |
| 95206 | 2 | Stockton       | San Joaquin |
| 95206 | 4 | Stockton       | San Joaquin |
| 95207 | 2 | Stockton       | San Joaquin |
| 95209 | 2 | Stockton       | San Joaquin |
| 95210 | 2 | Stockton       | San Joaquin |
| 95212 | 2 | Stockton       | San Joaquin |
| 95215 | 2 | Stockton       | San Joaquin |
| 95219 | 2 | Stockton       | San Joaquin |
| 95220 | 2 | Acampo         | San Joaquin |
| 95222 | 1 | Angels Camp    | Calaveras   |
| 95223 | 1 | Arnold         | Calaveras   |
| 95228 | 1 | Copperopolis   | Calaveras   |
| 95230 | 1 | Farmington     | Stanislaus  |
| 95230 | 2 | Farmington     | Stanislaus  |
| 95230 | 3 | Farmington     | Stanislaus  |
| 95231 | 2 | French Camp    | San Joaquin |
| 95232 | 1 | Glencoe        | Calaveras   |
| 95236 | 1 | Linden         | San Joaquin |
| 95236 | 2 | Linden         | San Joaquin |
| 95237 | 2 | Lockeford      | San Joaquin |
| 95240 | 2 | Lodi           | San Joaquin |
| 95242 | 2 | Lodi           | San Joaquin |
| 95245 | 1 | Mokelumne Hill | Calaveras   |
| 95246 | 1 | Mountain Ranch | Calaveras   |
| 95247 | 1 | Murphys        | Calaveras   |
| 95249 | 1 | San Andreas    | Calaveras   |
| 95252 | 1 | Valley Springs | Calaveras   |
| 95255 | 1 | West Point     | Calaveras   |
| 95257 | 1 | Wilseyville    | Calaveras   |
| 95258 | 2 | Woodbridge     | San Joaquin |
| 95301 | 3 | Atwater        | Merced      |
| 95303 | 3 | Ballico        | Merced      |
| 95304 | 2 | Tracy          | San Joaquin |
| 95306 | 1 | Catheys Valley | Mariposa    |
| 95306 | 3 | Catheys Valley | Mariposa    |
| 95307 | 3 | Ceres          | Stanislaus  |
| 95309 | 1 | Chinese Camp   | Tuolumne    |
| 95310 | 1 | Columbia       | Tuolumne    |
| 95311 | 1 | Coulterville   | Mariposa    |
| 95313 | 3 | Crows Landing  | Stanislaus  |

|       |   |                |             |
|-------|---|----------------|-------------|
| 95315 | 3 | Delhi          | Merced      |
| 95316 | 3 | Denair         | Stanislaus  |
| 95317 | 3 | El Nido        | Merced      |
| 95318 | 1 | El Portal      | Mariposa    |
| 95320 | 2 | Escalon        | San Joaquin |
| 95320 | 3 | Escalon        | San Joaquin |
| 95321 | 1 | Groveland      | Tuolumne    |
| 95322 | 3 | Gustine        | Merced      |
| 95323 | 3 | Hickman        | Stanislaus  |
| 95324 | 3 | Hilmar         | Merced      |
| 95325 | 1 | Hornitos       | Mariposa    |
| 95325 | 3 | Hornitos       | Mariposa    |
| 95326 | 3 | Hughson        | Stanislaus  |
| 95327 | 1 | Jamestown      | Tuolumne    |
| 95329 | 1 | La Grange      | Tuolumne    |
| 95329 | 3 | La Grange      | Tuolumne    |
| 95330 | 2 | Lathrop        | San Joaquin |
| 95333 | 3 | Le Grand       | Merced      |
| 95334 | 3 | Livingston     | Merced      |
| 95335 | 1 | Long Barn      | Tuolumne    |
| 95336 | 2 | Manteca        | San Joaquin |
| 95337 | 2 | Manteca        | San Joaquin |
| 95338 | 1 | Mariposa       | Mariposa    |
| 95340 | 3 | Merced         | Merced      |
| 95345 | 1 | Midpines       | Mariposa    |
| 95346 | 1 | MI Wuk Village | Tuolumne    |
| 95348 | 3 | Merced         | Merced      |
| 95350 | 3 | Modesto        | Stanislaus  |
| 95351 | 3 | Modesto        | Stanislaus  |
| 95354 | 3 | Modesto        | Stanislaus  |
| 95355 | 3 | Modesto        | Stanislaus  |
| 95356 | 3 | Modesto        | Stanislaus  |
| 95357 | 3 | Modesto        | Stanislaus  |
| 95358 | 3 | Modesto        | Stanislaus  |
| 95360 | 3 | Newman         | Stanislaus  |
| 95361 | 2 | Oakdale        | Stanislaus  |
| 95361 | 3 | Oakdale        | Stanislaus  |
| 95363 | 3 | Patterson      | Stanislaus  |
| 95364 | 1 | Pinecrest      | Tuolumne    |
| 95366 | 2 | Ripon          | San Joaquin |
| 95366 | 3 | Ripon          | San Joaquin |
| 95367 | 3 | Riverbank      | Stanislaus  |
| 95368 | 3 | Salida         | Stanislaus  |
| 95369 | 1 | Snelling       | Merced      |
| 95369 | 3 | Snelling       | Merced      |
| 95370 | 1 | Sonora         | Tuolumne    |
| 95372 | 1 | Soulsbyville   | Tuolumne    |
| 95374 | 3 | Stevinson      | Merced      |
| 95376 | 2 | Tracy          | San Joaquin |

|       |   |                        |             |
|-------|---|------------------------|-------------|
| 95377 | 2 | Tracy                  | San Joaquin |
| 95379 | 1 | Tuolumne               | Tuolumne    |
| 95380 | 3 | Turlock                | Stanislaus  |
| 95382 | 3 | Turlock                | Stanislaus  |
| 95383 | 1 | Twain Harte            | Tuolumne    |
| 95385 | 3 | Vernalis               | Stanislaus  |
| 95386 | 3 | Waterford              | Stanislaus  |
| 95388 | 3 | Winton                 | Merced      |
| 95389 | 1 | Yosemite National Park | Mariposa    |
| 95391 | 2 | Tracy                  | San Joaquin |
| 95391 | 4 | Tracy                  | San Joaquin |
| 95401 | 4 | Santa Rosa             | Sonoma      |
| 95403 | 4 | Santa Rosa             | Sonoma      |
| 95404 | 4 | Santa Rosa             | Sonoma      |
| 95405 | 4 | Santa Rosa             | Sonoma      |
| 95407 | 4 | Santa Rosa             | Sonoma      |
| 95409 | 4 | Santa Rosa             | Sonoma      |
| 95410 | 1 | Albion                 | Mendocino   |
| 95412 | 4 | Annapolis              | Sonoma      |
| 95415 | 1 | Boonville              | Mendocino   |
| 95417 | 1 | Branscomb              | Mendocino   |
| 95420 | 1 | Caspar                 | Mendocino   |
| 95421 | 4 | Cazadero               | Sonoma      |
| 95422 | 1 | Clearlake              | Lake        |
| 95423 | 1 | Clearlake Oaks         | Lake        |
| 95423 | 3 | Clearlake Oaks         | Lake        |
| 95425 | 4 | Cloverdale             | Sonoma      |
| 95427 | 1 | Comptche               | Mendocino   |
| 95428 | 1 | Covelo                 | Mendocino   |
| 95428 | 3 | Covelo                 | Mendocino   |
| 95429 | 1 | Dos Rios               | Mendocino   |
| 95432 | 1 | Elk                    | Mendocino   |
| 95436 | 4 | Forestville            | Sonoma      |
| 95437 | 1 | Fort Bragg             | Mendocino   |
| 95439 | 4 | Fulton                 | Sonoma      |
| 95441 | 4 | Geyserville            | Sonoma      |
| 95442 | 4 | Glen Ellen             | Sonoma      |
| 95443 | 1 | Glenhaven              | Lake        |
| 95444 | 4 | Graton                 | Sonoma      |
| 95445 | 1 | Gualala                | Mendocino   |
| 95446 | 4 | Guerneville            | Sonoma      |
| 95448 | 4 | Healdsburg             | Sonoma      |
| 95449 | 1 | Hopland                | Mendocino   |
| 95450 | 4 | Jenner                 | Sonoma      |
| 95451 | 1 | Kelseyville            | Lake        |
| 95452 | 4 | Kenwood                | Sonoma      |
| 95453 | 1 | Lakeport               | Lake        |
| 95454 | 1 | Laytonville            | Mendocino   |
| 95456 | 1 | Littleriver            | Mendocino   |

|       |    |                    |           |
|-------|----|--------------------|-----------|
| 95457 | 1  | Lower Lake         | Lake      |
| 95458 | 1  | Lucerne            | Lake      |
| 95459 | 1  | Manchester         | Mendocino |
| 95460 | 1  | Mendocino          | Mendocino |
| 95461 | 1  | Middletown         | Lake      |
| 95461 | 4  | Middletown         | Lake      |
| 95462 | 4  | Monte Rio          | Sonoma    |
| 95464 | 1  | Nice               | Lake      |
| 95465 | 4  | Occidental         | Sonoma    |
| 95466 | 1  | Philo              | Mendocino |
| 95467 | 1  | Hidden Valley Lake | Lake      |
| 95468 | 1  | Point Arena        | Mendocino |
| 95469 | 1  | Potter Valley      | Mendocino |
| 95470 | 1  | Redwood Valley     | Mendocino |
| 95472 | 4  | Sebastopol         | Sonoma    |
| 95476 | 4  | Sonoma             | Sonoma    |
| 95480 | 4  | Stewarts Point     | Sonoma    |
| 95482 | 1  | Ukiah              | Mendocino |
| 95485 | 1  | Upper Lake         | Lake      |
| 95488 | 1  | Westport           | Mendocino |
| 95490 | 1  | Willits            | Mendocino |
| 95492 | 4  | Windsor            | Sonoma    |
| 95493 | 1  | Witter Springs     | Lake      |
| 95494 | 1  | Yorkville          | Mendocino |
| 95497 | 4  | The Sea Ranch      | Sonoma    |
| 95501 | 1  | Eureka             | Humboldt  |
| 95503 | 1  | Eureka             | Humboldt  |
| 95511 | 1  | Alderpoint         | Humboldt  |
| 95514 | 1  | Blocksburg         | Humboldt  |
| 95519 | 1  | McKinleyville      | Humboldt  |
| 95521 | 1  | Arcata             | Humboldt  |
| 95524 | 1  | Bayside            | Humboldt  |
| 95525 | 1  | Blue Lake          | Humboldt  |
| 95526 | 1  | Bridgeville        | Humboldt  |
| 95527 | 1  | Burnt Ranch        | Trinity   |
| 95528 | 1  | Carlotta           | Humboldt  |
| 95531 | 14 | Crescent City      | Del Norte |
| 95536 | 1  | Ferndale           | Humboldt  |
| 95540 | 1  | Fortuna            | Humboldt  |
| 95542 | 1  | Garberville        | Humboldt  |
| 95543 | 14 | Gasquet            | Del Norte |
| 95546 | 1  | Hoopa              | Humboldt  |
| 95547 | 1  | Hydesville         | Humboldt  |
| 95548 | 14 | Klamath            | Del Norte |
| 95549 | 1  | Kneeland           | Humboldt  |
| 95550 | 1  | Korbel             | Humboldt  |
| 95551 | 1  | Loleta             | Humboldt  |
| 95552 | 1  | Mad River          | Trinity   |
| 95554 | 1  | Myers Flat         | Humboldt  |

|       |    |                 |            |
|-------|----|-----------------|------------|
| 95555 | 1  | Orick           | Humboldt   |
| 95556 | 1  | Orleans         | Humboldt   |
| 95558 | 1  | Petrolia        | Humboldt   |
| 95560 | 1  | Redway          | Humboldt   |
| 95562 | 1  | Rio Dell        | Humboldt   |
| 95563 | 1  | Salyer          | Humboldt   |
| 95564 | 1  | Samoa           | Humboldt   |
| 95565 | 1  | Scotia          | Humboldt   |
| 95567 | 14 | Smith River     | Del Norte  |
| 95568 | 14 | Somes Bar       | Siskiyou   |
| 95569 | 1  | Redcrest        | Humboldt   |
| 95570 | 1  | Trinidad        | Humboldt   |
| 95573 | 1  | Willow Creek    | Humboldt   |
| 95585 | 1  | Leggett         | Mendocino  |
| 95587 | 1  | Piercy          | Mendocino  |
| 95589 | 1  | Whitethorn      | Humboldt   |
| 95595 | 1  | Zenia           | Trinity    |
| 95602 | 1  | Auburn          | Placer     |
| 95602 | 2  | Auburn          | Placer     |
| 95603 | 2  | Auburn          | Placer     |
| 95605 | 2  | West Sacramento | Yolo       |
| 95606 | 2  | Brooks          | Yolo       |
| 95607 | 2  | Capay           | Yolo       |
| 95608 | 6  | Carmichael      | Sacramento |
| 95610 | 6  | Citrus Heights  | Sacramento |
| 95612 | 2  | Clarksburg      | Yolo       |
| 95614 | 1  | Cool            | El Dorado  |
| 95615 | 2  | Courtland       | Sacramento |
| 95615 | 6  | Courtland       | Sacramento |
| 95616 | 2  | Davis           | Yolo       |
| 95616 | 4  | Davis           | Yolo       |
| 95618 | 2  | Davis           | Yolo       |
| 95618 | 4  | Davis           | Yolo       |
| 95619 | 1  | Diamond Springs | El Dorado  |
| 95620 | 2  | Dixon           | Solano     |
| 95620 | 4  | Dixon           | Solano     |
| 95621 | 6  | Citrus Heights  | Sacramento |
| 95623 | 1  | El Dorado       | El Dorado  |
| 95624 | 6  | Elk Grove       | Sacramento |
| 95626 | 2  | Elverta         | Sacramento |
| 95626 | 3  | Elverta         | Sacramento |
| 95626 | 6  | Elverta         | Sacramento |
| 95627 | 2  | Esparto         | Yolo       |
| 95628 | 6  | Fair Oaks       | Sacramento |
| 95629 | 1  | Fiddletown      | Amador     |
| 95629 | 2  | Fiddletown      | Amador     |
| 95630 | 6  | Folsom          | Sacramento |
| 95631 | 1  | Foresthill      | Placer     |
| 95631 | 2  | Foresthill      | Placer     |

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|-------|---|-----------------|------------|
| 95632 | 2 | Galt            | Sacramento |
| 95632 | 6 | Galt            | Sacramento |
| 95633 | 1 | Garden Valley   | El Dorado  |
| 95634 | 1 | Georgetown      | El Dorado  |
| 95635 | 1 | Greenwood       | El Dorado  |
| 95636 | 1 | Grizzly Flats   | El Dorado  |
| 95637 | 2 | Guinda          | Yolo       |
| 95638 | 6 | Herald          | Sacramento |
| 95640 | 2 | Ione            | Amador     |
| 95641 | 6 | Isleton         | Sacramento |
| 95642 | 2 | Jackson         | Amador     |
| 95645 | 2 | Knights Landing | Sutter     |
| 95645 | 3 | Knights Landing | Sutter     |
| 95648 | 2 | Lincoln         | Placer     |
| 95650 | 2 | Loomis          | Placer     |
| 95651 | 1 | Lotus           | El Dorado  |
| 95652 | 6 | McClellan       | Sacramento |
| 95653 | 2 | Madison         | Yolo       |
| 95655 | 6 | Mather          | Sacramento |
| 95658 | 2 | Newcastle       | Placer     |
| 95659 | 3 | Nicolaus        | Sutter     |
| 95660 | 6 | North Highlands | Sacramento |
| 95661 | 2 | Roseville       | Placer     |
| 95662 | 6 | Orangevale      | Sacramento |
| 95663 | 2 | Penryn          | Placer     |
| 95664 | 1 | Pilot Hill      | El Dorado  |
| 95665 | 2 | Pine Grove      | Amador     |
| 95666 | 1 | Pioneer         | Amador     |
| 95666 | 2 | Pioneer         | Amador     |
| 95667 | 1 | Placerville     | El Dorado  |
| 95668 | 2 | Pleasant Grove  | Sutter     |
| 95668 | 3 | Pleasant Grove  | Sutter     |
| 95669 | 1 | Plymouth        | Amador     |
| 95669 | 2 | Plymouth        | Amador     |
| 95670 | 6 | Rancho Cordova  | Sacramento |
| 95672 | 1 | Rescue          | El Dorado  |
| 95673 | 6 | Rio Linda       | Sacramento |
| 95674 | 3 | Rio Oso         | Sutter     |
| 95677 | 2 | Rocklin         | Placer     |
| 95678 | 2 | Roseville       | Placer     |
| 95679 | 2 | Rumsey          | Yolo       |
| 95681 | 2 | Sheridan        | Placer     |
| 95682 | 1 | Shingle Springs | El Dorado  |
| 95683 | 6 | Sloughhouse     | Sacramento |
| 95684 | 1 | Somerset        | El Dorado  |
| 95685 | 2 | Sutter Creek    | Amador     |
| 95687 | 4 | Vacaville       | Solano     |
| 95688 | 4 | Vacaville       | Solano     |
| 95689 | 2 | Volcano         | Amador     |

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|-------|----|-----------------|------------|
| 95690 | 2  | Walnut Grove    | Sacramento |
| 95690 | 4  | Walnut Grove    | Sacramento |
| 95690 | 6  | Walnut Grove    | Sacramento |
| 95691 | 2  | West Sacramento | Yolo       |
| 95691 | 3  | West Sacramento | Yolo       |
| 95692 | 1  | Wheatland       | Yuba       |
| 95692 | 2  | Wheatland       | Yuba       |
| 95692 | 3  | Wheatland       | Yuba       |
| 95693 | 6  | Wilton          | Sacramento |
| 95694 | 2  | Winters         | Yolo       |
| 95694 | 4  | Winters         | Yolo       |
| 95695 | 2  | Woodland        | Yolo       |
| 95698 | 2  | Zamora          | Yolo       |
| 95701 | 1  | Alta            | Placer     |
| 95701 | 2  | Alta            | Placer     |
| 95703 | 2  | Applegate       | Placer     |
| 95709 | 1  | Camino          | El Dorado  |
| 95713 | 1  | Colfax          | Placer     |
| 95713 | 2  | Colfax          | Placer     |
| 95714 | 1  | Dutch Flat      | Placer     |
| 95714 | 2  | Dutch Flat      | Placer     |
| 95715 | 2  | Emigrant Gap    | Placer     |
| 95717 | 2  | Gold Run        | Placer     |
| 95720 | 1  | Kyburz          | El Dorado  |
| 95721 | 1  | Echo Lake       | El Dorado  |
| 95721 | 14 | Echo Lake       | El Dorado  |
| 95722 | 2  | Meadow Vista    | Placer     |
| 95724 | 2  | Norden          | Placer     |
| 95726 | 1  | Pollock Pines   | El Dorado  |
| 95728 | 1  | Soda Springs    | Nevada     |
| 95728 | 14 | Soda Springs    | Nevada     |
| 95742 | 6  | Rancho Cordova  | Sacramento |
| 95746 | 1  | Granite Bay     | Placer     |
| 95746 | 2  | Granite Bay     | Placer     |
| 95747 | 2  | Roseville       | Placer     |
| 95757 | 6  | Elk Grove       | Sacramento |
| 95758 | 6  | Elk Grove       | Sacramento |
| 95762 | 1  | El Dorado Hills | El Dorado  |
| 95762 | 6  | El Dorado Hills | El Dorado  |
| 95765 | 2  | Rocklin         | Placer     |
| 95776 | 2  | Woodland        | Yolo       |
| 95776 | 3  | Woodland        | Yolo       |
| 95814 | 6  | Sacramento      | Sacramento |
| 95815 | 6  | Sacramento      | Sacramento |
| 95816 | 6  | Sacramento      | Sacramento |
| 95817 | 6  | Sacramento      | Sacramento |
| 95818 | 6  | Sacramento      | Sacramento |
| 95819 | 6  | Sacramento      | Sacramento |
| 95820 | 6  | Sacramento      | Sacramento |



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| 95821 | 6 | Sacramento     | Sacramento |
| 95822 | 6 | Sacramento     | Sacramento |
| 95823 | 6 | Sacramento     | Sacramento |
| 95824 | 6 | Sacramento     | Sacramento |
| 95825 | 6 | Sacramento     | Sacramento |
| 95826 | 6 | Sacramento     | Sacramento |
| 95827 | 6 | Sacramento     | Sacramento |
| 95828 | 6 | Sacramento     | Sacramento |
| 95829 | 6 | Sacramento     | Sacramento |
| 95830 | 6 | Sacramento     | Sacramento |
| 95831 | 6 | Sacramento     | Sacramento |
| 95832 | 6 | Sacramento     | Sacramento |
| 95833 | 6 | Sacramento     | Sacramento |
| 95834 | 6 | Sacramento     | Sacramento |
| 95835 | 6 | Sacramento     | Sacramento |
| 95836 | 3 | Sacramento     | Sacramento |
| 95836 | 6 | Sacramento     | Sacramento |
| 95837 | 3 | Sacramento     | Sacramento |
| 95837 | 6 | Sacramento     | Sacramento |
| 95838 | 6 | Sacramento     | Sacramento |
| 95841 | 6 | Sacramento     | Sacramento |
| 95842 | 6 | Sacramento     | Sacramento |
| 95843 | 6 | Antelope       | Sacramento |
| 95864 | 6 | Sacramento     | Sacramento |
| 95901 | 3 | Marysville     | Yuba       |
| 95903 | 3 | Beale AFB      | Yuba       |
| 95910 | 1 | Alleghany      | Sierra     |
| 95912 | 3 | Arbuckle       | Colusa     |
| 95914 | 3 | Bangor         | Butte      |
| 95915 | 1 | Belden         | Plumas     |
| 95915 | 3 | Belden         | Plumas     |
| 95916 | 1 | Berry Creek    | Butte      |
| 95916 | 3 | Berry Creek    | Butte      |
| 95917 | 3 | Biggs          | Butte      |
| 95918 | 1 | Browns Valley  | Yuba       |
| 95918 | 3 | Browns Valley  | Yuba       |
| 95919 | 3 | Brownsville    | Yuba       |
| 95920 | 3 | Butte City     | Glenn      |
| 95922 | 1 | Camptonville   | Sierra     |
| 95922 | 3 | Camptonville   | Sierra     |
| 95923 | 1 | Canyon Dam     | Plumas     |
| 95925 | 3 | Challenge      | Yuba       |
| 95926 | 3 | Chico          | Butte      |
| 95928 | 3 | Chico          | Butte      |
| 95932 | 3 | Colusa         | Colusa     |
| 95934 | 1 | Crescent Mills | Plumas     |
| 95935 | 1 | Dobbins        | Yuba       |
| 95935 | 3 | Dobbins        | Yuba       |
| 95936 | 1 | Downieville    | Sierra     |

|       |    |                   |        |
|-------|----|-------------------|--------|
| 95937 | 2  | Dunnigan          | Yolo   |
| 95938 | 3  | Durham            | Butte  |
| 95939 | 3  | Elk Creek         | Glenn  |
| 95941 | 1  | Forbestown        | Butte  |
| 95941 | 3  | Forbestown        | Butte  |
| 95942 | 1  | Forest Ranch      | Butte  |
| 95942 | 3  | Forest Ranch      | Butte  |
| 95943 | 3  | Glenn             | Glenn  |
| 95944 | 1  | Goodyears Bar     | Sierra |
| 95945 | 1  | Grass Valley      | Nevada |
| 95946 | 1  | Penn Valley       | Nevada |
| 95947 | 1  | Greenville        | Plumas |
| 95947 | 14 | Greenville        | Plumas |
| 95948 | 3  | Gridley           | Butte  |
| 95949 | 1  | Grass Valley      | Nevada |
| 95951 | 3  | Hamilton City     | Glenn  |
| 95953 | 3  | Live Oak          | Sutter |
| 95954 | 1  | Magalia           | Butte  |
| 95954 | 3  | Magalia           | Butte  |
| 95955 | 3  | Maxwell           | Colusa |
| 95956 | 1  | Meadow Valley     | Plumas |
| 95956 | 14 | Meadow Valley     | Plumas |
| 95957 | 3  | Meridian          | Sutter |
| 95959 | 1  | Nevada City       | Nevada |
| 95960 | 1  | North San Juan    | Nevada |
| 95960 | 3  | North San Juan    | Nevada |
| 95961 | 3  | Olivehurst        | Yuba   |
| 95962 | 1  | Oregon House      | Yuba   |
| 95962 | 3  | Oregon House      | Yuba   |
| 95963 | 3  | Orland            | Glenn  |
| 95965 | 1  | Oroville          | Butte  |
| 95965 | 3  | Oroville          | Butte  |
| 95966 | 3  | Oroville          | Butte  |
| 95968 | 3  | Palermo           | Butte  |
| 95969 | 3  | Paradise          | Butte  |
| 95970 | 3  | Princeton         | Colusa |
| 95971 | 1  | Quincy            | Plumas |
| 95971 | 14 | Quincy            | Plumas |
| 95972 | 3  | Rackerby          | Yuba   |
| 95973 | 3  | Chico             | Butte  |
| 95975 | 1  | Rough and Ready   | Nevada |
| 95977 | 1  | Smartville        | Nevada |
| 95977 | 3  | Smartville        | Nevada |
| 95979 | 3  | Stonyford         | Colusa |
| 95981 | 1  | Strawberry Valley | Plumas |
| 95981 | 3  | Strawberry Valley | Plumas |
| 95981 | 14 | Strawberry Valley | Plumas |
| 95982 | 3  | Sutter            | Sutter |
| 95983 | 1  | Taylorsville      | Plumas |

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|-------|----|------------------|----------|
| 95983 | 14 | Taylorsville     | Plumas   |
| 95984 | 1  | Twain            | Plumas   |
| 95987 | 3  | Williams         | Colusa   |
| 95988 | 3  | Willows          | Glenn    |
| 95991 | 3  | Yuba City        | Sutter   |
| 95993 | 3  | Yuba City        | Sutter   |
| 96001 | 3  | Redding          | Shasta   |
| 96002 | 3  | Redding          | Shasta   |
| 96003 | 3  | Redding          | Shasta   |
| 96006 | 14 | Adin             | Modoc    |
| 96007 | 3  | Anderson         | Shasta   |
| 96008 | 3  | Bella Vista      | Shasta   |
| 96010 | 1  | Big Bar          | Trinity  |
| 96013 | 3  | Burney           | Shasta   |
| 96013 | 14 | Burney           | Shasta   |
| 96014 | 14 | Callahan         | Siskiyou |
| 96015 | 14 | Canby            | Modoc    |
| 96016 | 3  | Cassel           | Shasta   |
| 96019 | 3  | Shasta Lake      | Shasta   |
| 96020 | 1  | Chester          | Plumas   |
| 96020 | 3  | Chester          | Plumas   |
| 96021 | 3  | Corning          | Tehama   |
| 96022 | 3  | Cottonwood       | Tehama   |
| 96023 | 14 | Dorris           | Siskiyou |
| 96024 | 1  | Douglas City     | Trinity  |
| 96025 | 14 | Dunsmuir         | Siskiyou |
| 96027 | 14 | Etna             | Siskiyou |
| 96028 | 3  | Fall River Mills | Shasta   |
| 96031 | 14 | Forks of Salmon  | Siskiyou |
| 96032 | 14 | Fort Jones       | Siskiyou |
| 96033 | 3  | French Gulch     | Shasta   |
| 96034 | 14 | Gazelle          | Siskiyou |
| 96035 | 3  | Gerber           | Tehama   |
| 96038 | 14 | Grenada          | Siskiyou |
| 96039 | 14 | Happy Camp       | Siskiyou |
| 96040 | 3  | Hat Creek        | Shasta   |
| 96041 | 1  | Hayfork          | Trinity  |
| 96044 | 14 | Hornbrook        | Siskiyou |
| 96046 | 1  | Hyampom          | Trinity  |
| 96047 | 3  | Igo              | Shasta   |
| 96048 | 1  | Junction City    | Trinity  |
| 96050 | 14 | Klamath River    | Siskiyou |
| 96051 | 3  | Lakehead         | Shasta   |
| 96051 | 14 | Lakehead         | Shasta   |
| 96052 | 1  | Lewiston         | Trinity  |
| 96052 | 3  | Lewiston         | Trinity  |
| 96054 | 14 | Lookout          | Modoc    |
| 96055 | 3  | Los Molinos      | Tehama   |
| 96056 | 1  | McArthur         | Lassen   |

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|-------|----|--------------------|----------|
| 96056 | 3  | McArthur           | Lassen   |
| 96056 | 14 | McArthur           | Lassen   |
| 96057 | 14 | McCloud            | Siskiyou |
| 96058 | 14 | Macdoel            | Siskiyou |
| 96059 | 3  | Manton             | Shasta   |
| 96062 | 3  | Millville          | Shasta   |
| 96063 | 3  | Mineral            | Tehama   |
| 96064 | 14 | Montague           | Siskiyou |
| 96065 | 3  | Montgomery Creek   | Shasta   |
| 96065 | 14 | Montgomery Creek   | Shasta   |
| 96067 | 14 | Mount Shasta       | Siskiyou |
| 96069 | 3  | Oak Run            | Shasta   |
| 96071 | 3  | Old Station        | Shasta   |
| 96073 | 3  | Palo Cedro         | Shasta   |
| 96075 | 3  | Paynes Creek       | Tehama   |
| 96076 | 1  | Platina            | Trinity  |
| 96076 | 3  | Platina            | Trinity  |
| 96080 | 3  | Red Bluff          | Tehama   |
| 96085 | 14 | Scott Bar          | Siskiyou |
| 96086 | 14 | Seiad Valley       | Siskiyou |
| 96087 | 3  | Shasta             | Shasta   |
| 96088 | 3  | Shingletown        | Shasta   |
| 96091 | 1  | Trinity Center     | Trinity  |
| 96093 | 1  | Weaverville        | Trinity  |
| 96094 | 14 | Weed               | Siskiyou |
| 96096 | 3  | Whitmore           | Shasta   |
| 96097 | 14 | Yreka              | Siskiyou |
| 96101 | 14 | Alturas            | Modoc    |
| 96103 | 1  | Blairsden-Graeagle | Plumas   |
| 96103 | 14 | Blairsden-Graeagle | Plumas   |
| 96104 | 14 | Cedarville         | Modoc    |
| 96105 | 14 | Chilcoot           | Plumas   |
| 96106 | 14 | Clio               | Plumas   |
| 96107 | 1  | Coleville          | Mono     |
| 96108 | 14 | Davis Creek        | Modoc    |
| 96109 | 14 | Doyle              | Lassen   |
| 96111 | 14 | Floriston          | Nevada   |
| 96112 | 14 | Fort Bidwell       | Modoc    |
| 96113 | 14 | Herlong            | Lassen   |
| 96114 | 1  | Janesville         | Plumas   |
| 96114 | 14 | Janesville         | Plumas   |
| 96115 | 14 | Lake City          | Modoc    |
| 96116 | 14 | Likely             | Modoc    |
| 96117 | 1  | Litchfield         | Lassen   |
| 96117 | 14 | Litchfield         | Lassen   |
| 96118 | 14 | Loyalton           | Sierra   |
| 96119 | 1  | Madeline           | Lassen   |
| 96120 | 1  | Markleeville       | Alpine   |
| 96120 | 14 | Markleeville       | Alpine   |

|       |    |                  |           |
|-------|----|------------------|-----------|
| 96121 | 14 | Milford          | Lassen    |
| 96122 | 1  | Portola          | Plumas    |
| 96122 | 14 | Portola          | Plumas    |
| 96123 | 1  | Ravendale        | Lassen    |
| 96124 | 1  | Calpine          | Sierra    |
| 96124 | 14 | Calpine          | Sierra    |
| 96125 | 1  | Sierra City      | Sierra    |
| 96126 | 14 | Sierraville      | Sierra    |
| 96128 | 1  | Standish         | Lassen    |
| 96128 | 14 | Standish         | Lassen    |
| 96130 | 1  | Susanville       | Lassen    |
| 96130 | 14 | Susanville       | Lassen    |
| 96132 | 1  | Termo            | Lassen    |
| 96133 | 1  | Topaz            | Mono      |
| 96134 | 14 | Tulelake         | Siskiyou  |
| 96135 | 14 | Vinton           | Plumas    |
| 96136 | 1  | Wendel           | Lassen    |
| 96136 | 14 | Wendel           | Lassen    |
| 96137 | 1  | Westwood         | Plumas    |
| 96137 | 14 | Westwood         | Plumas    |
| 96140 | 14 | Carnelian Bay    | Placer    |
| 96141 | 2  | Homewood         | Placer    |
| 96141 | 14 | Homewood         | Placer    |
| 96142 | 14 | Tahoma           | Placer    |
| 96143 | 14 | Kings Beach      | Placer    |
| 96145 | 2  | Tahoe City       | Placer    |
| 96145 | 14 | Tahoe City       | Placer    |
| 96146 | 14 | Olympic Valley   | Placer    |
| 96148 | 14 | Tahoe Vista      | Placer    |
| 96150 | 1  | South Lake Tahoe | El Dorado |
| 96150 | 14 | South Lake Tahoe | El Dorado |
| 96161 | 1  | Truckee          | Nevada    |
| 96161 | 2  | Truckee          | Nevada    |
| 96161 | 14 | Truckee          | Nevada    |
| 96162 | 1  | Truckee          | Nevada    |

Source: Forecast Climate Zone data from California Energy Commission- Energy Facilities Siting Division - Cartography Unit, 1516 9th Street, MS48, Sacramento, CA 95814, October 11, 2010 shape files.

**Table 2: Forecast Climate Zones by City Name**

| <b>Postal Code</b> | <b>Forecast Climate Zone</b> | <b>City Name</b> | <b>County Name</b> |
|--------------------|------------------------------|------------------|--------------------|
| 95220              | 2                            | Acampo           | San Joaquin        |
| 93510              | 9                            | Acton            | Los Angeles        |
| 92301              | 10                           | Adelanto         | San Bernardino     |
| 96006              | 14                           | Adin             | Modoc              |
| 91301              | 8                            | Agoura Hills     | Los Angeles        |
| 92536              | 10                           | Aguanga          | Riverside          |
| 93601              | 1                            | Ahwahnee         | Madera             |
| 93601              | 3                            | Ahwahnee         | Madera             |
| 94501              | 5                            | Alameda          | Alameda            |
| 94502              | 5                            | Alameda          | Alameda            |
| 94507              | 4                            | Alamo            | Contra Costa       |
| 94507              | 5                            | Alamo            | Contra Costa       |
| 94706              | 5                            | Albany           | Alameda            |
| 95410              | 1                            | Albion           | Mendocino          |
| 95511              | 1                            | Alderpoint       | Humboldt           |
| 91801              | 9                            | Alhambra         | Los Angeles        |
| 91803              | 9                            | Alhambra         | Los Angeles        |
| 91803              | 12                           | Alhambra         | Los Angeles        |
| 92656              | 8                            | Aliso Viejo      | Orange             |
| 92656              | 13                           | Aliso Viejo      | Orange             |
| 95910              | 1                            | Alleghany        | Sierra             |
| 91901              | 13                           | Alpine           | San Diego          |
| 95701              | 1                            | Alta             | Placer             |
| 95701              | 2                            | Alta             | Placer             |
| 91001              | 9                            | Altadena         | Los Angeles        |
| 91001              | 12                           | Altadena         | Los Angeles        |
| 96101              | 14                           | Alturas          | Modoc              |
| 95002              | 4                            | Alviso           | Santa Clara        |
| 92304              | 10                           | Amboy            | San Bernardino     |
| 94503              | 4                            | American Canyon  | Napa               |
| 92801              | 8                            | Anaheim          | Orange             |
| 92802              | 8                            | Anaheim          | Orange             |
| 92804              | 8                            | Anaheim          | Orange             |
| 92805              | 8                            | Anaheim          | Orange             |
| 92806              | 8                            | Anaheim          | Orange             |
| 92807              | 8                            | Anaheim          | Orange             |
| 92808              | 8                            | Anaheim          | Orange             |
| 96007              | 3                            | Anderson         | Shasta             |
| 95222              | 1                            | Angels Camp      | Calaveras          |
| 92305              | 10                           | Angelus Oaks     | San Bernardino     |
| 94508              | 4                            | Angwin           | Napa               |
| 95412              | 4                            | Annapolis        | Sonoma             |
| 95843              | 6                            | Antelope         | Sacramento         |
| 94509              | 4                            | Antioch          | Contra Costa       |
| 94531              | 4                            | Antioch          | Contra Costa       |

|       |    |               |                 |
|-------|----|---------------|-----------------|
| 92539 | 10 | Anza          | Riverside       |
| 92307 | 10 | Apple Valley  | San Bernardino  |
| 92308 | 10 | Apple Valley  | San Bernardino  |
| 95703 | 2  | Applegate     | Placer          |
| 95003 | 5  | Aptos         | Santa Cruz      |
| 95912 | 3  | Arbuckle      | Colusa          |
| 91006 | 9  | Arcadia       | Los Angeles     |
| 91007 | 9  | Arcadia       | Los Angeles     |
| 95521 | 1  | Arcata        | Humboldt        |
| 95223 | 1  | Arnold        | Calaveras       |
| 95004 | 4  | Aromas        | Monterey        |
| 93420 | 4  | Arroyo Grande | San Luis Obispo |
| 90701 | 9  | Artesia       | Los Angeles     |
| 93203 | 3  | Arvin         | Kern            |
| 93203 | 7  | Arvin         | Kern            |
| 93422 | 4  | Atascadero    | San Luis Obispo |
| 94027 | 5  | Atherton      | San Mateo       |
| 95301 | 3  | Atwater       | Merced          |
| 93602 | 3  | Auberry       | Fresno          |
| 95602 | 1  | Auburn        | Placer          |
| 95602 | 2  | Auburn        | Placer          |
| 95603 | 2  | Auburn        | Placer          |
| 93204 | 3  | Avenal        | Kings           |
| 91702 | 9  | Azusa         | Los Angeles     |
| 92309 | 10 | Baker         | San Bernardino  |
| 93301 | 3  | Bakersfield   | Kern            |
| 93304 | 3  | Bakersfield   | Kern            |
| 93305 | 3  | Bakersfield   | Kern            |
| 93306 | 3  | Bakersfield   | Kern            |
| 93306 | 7  | Bakersfield   | Kern            |
| 93307 | 3  | Bakersfield   | Kern            |
| 93308 | 3  | Bakersfield   | Kern            |
| 93308 | 7  | Bakersfield   | Kern            |
| 93309 | 3  | Bakersfield   | Kern            |
| 93311 | 3  | Bakersfield   | Kern            |
| 93312 | 3  | Bakersfield   | Kern            |
| 93313 | 3  | Bakersfield   | Kern            |
| 93314 | 3  | Bakersfield   | Kern            |
| 91706 | 9  | Baldwin Park  | Los Angeles     |
| 95303 | 3  | Ballico       | Merced          |
| 95914 | 3  | Bangor        | Butte           |
| 92220 | 10 | Banning       | Riverside       |
| 92311 | 10 | Barstow       | San Bernardino  |
| 93604 | 3  | Bass Lake     | Madera          |
| 95524 | 1  | Bayside       | Humboldt        |
| 95903 | 3  | Beale AFB     | Yuba            |
| 92223 | 10 | Beaumont      | Riverside       |
| 95915 | 1  | Belden        | Plumas          |
| 95915 | 3  | Belden        | Plumas          |

|       |    |                    |                |
|-------|----|--------------------|----------------|
| 90201 | 9  | Bell               | Los Angeles    |
| 90201 | 12 | Bell               | Los Angeles    |
| 96008 | 3  | Bella Vista        | Shasta         |
| 90706 | 9  | Bellflower         | Los Angeles    |
| 94002 | 5  | Belmont            | San Mateo      |
| 94920 | 5  | Belvedere Tiburon  | Marin          |
| 95005 | 5  | Ben Lomond         | Santa Cruz     |
| 94510 | 4  | Benicia            | Solano         |
| 93512 | 1  | Benton             | Mono           |
| 94702 | 5  | Berkeley           | Alameda        |
| 94703 | 5  | Berkeley           | Alameda        |
| 94704 | 5  | Berkeley           | Alameda        |
| 94705 | 5  | Berkeley           | Alameda        |
| 94707 | 5  | Berkeley           | Alameda        |
| 94708 | 5  | Berkeley           | Contra Costa   |
| 94709 | 5  | Berkeley           | Alameda        |
| 94710 | 5  | Berkeley           | Alameda        |
| 94720 | 5  | Berkeley           | Alameda        |
| 95916 | 1  | Berry Creek        | Butte          |
| 95916 | 3  | Berry Creek        | Butte          |
| 90210 | 11 | Beverly Hills      | Los Angeles    |
| 90212 | 11 | Beverly Hills      | Los Angeles    |
| 96010 | 1  | Big Bar            | Trinity        |
| 92314 | 10 | Big Bear City      | San Bernardino |
| 92315 | 10 | Big Bear Lake      | San Bernardino |
| 93513 | 9  | Big Pine           | Inyo           |
| 93920 | 4  | Big sur            | Monterey       |
| 95917 | 3  | Biggs              | Butte          |
| 94512 | 4  | Birds Landing      | Solano         |
| 93514 | 1  | Bishop             | Mono           |
| 93514 | 3  | Bishop             | Mono           |
| 93514 | 9  | Bishop             | Mono           |
| 96103 | 1  | Blairsden-Graeagle | Plumas         |
| 96103 | 14 | Blairsden-Graeagle | Plumas         |
| 95514 | 1  | Blocksburg         | Humboldt       |
| 92316 | 10 | Bloomington        | San Bernardino |
| 95525 | 1  | Blue Lake          | Humboldt       |
| 92225 | 10 | Blythe             | Riverside      |
| 94922 | 4  | Bodega             | Sonoma         |
| 94923 | 4  | Bodega Bay         | Sonoma         |
| 93205 | 7  | Bodfish            | Kern           |
| 94924 | 5  | Bolinas            | Marin          |
| 91902 | 13 | Bonita             | San Diego      |
| 92003 | 13 | Bonsall            | San Diego      |
| 95415 | 1  | Boonville          | Mendocino      |
| 93516 | 7  | Boron              | Kern           |
| 92004 | 13 | Borrego Springs    | San Diego      |
| 92004 | 15 | Borrego Springs    | San Diego      |
| 95006 | 5  | Boulder Creek      | Santa Cruz     |



|       |    |                        |                 |
|-------|----|------------------------|-----------------|
| 91905 | 13 | Boulevard              | San Diego       |
| 93426 | 4  | Bradley                | Monterey        |
| 95417 | 1  | Branscomb              | Mendocino       |
| 92227 | 15 | Brawley                | Imperial        |
| 92821 | 8  | Brea                   | Orange          |
| 92823 | 8  | Brea                   | Orange          |
| 94513 | 4  | Brentwood              | Contra Costa    |
| 93517 | 1  | Bridgeport             | Mono            |
| 95526 | 1  | Bridgeville            | Humboldt        |
| 94005 | 5  | Brisbane               | San Mateo       |
| 95606 | 2  | Brooks                 | Yolo            |
| 95918 | 1  | Browns Valley          | Yuba            |
| 95918 | 3  | Browns Valley          | Yuba            |
| 95919 | 3  | Brownsville            | Yuba            |
| 93427 | 4  | Buellton               | Santa Barbara   |
| 90620 | 8  | Buena Park             | Orange          |
| 90621 | 8  | Buena Park             | Orange          |
| 91501 | 12 | Burbank                | Los Angeles     |
| 91502 | 12 | Burbank                | Los Angeles     |
| 91504 | 12 | Burbank                | Los Angeles     |
| 91505 | 12 | Burbank                | Los Angeles     |
| 91506 | 12 | Burbank                | Los Angeles     |
| 94010 | 5  | Burlingame             | San Mateo       |
| 96013 | 3  | Burney                 | Shasta          |
| 96013 | 14 | Burney                 | Shasta          |
| 95527 | 1  | Burnt Ranch            | Trinity         |
| 95920 | 3  | Butte City             | Glenn           |
| 93206 | 3  | Buttonwillow           | Kern            |
| 94514 | 4  | Byron                  | Contra Costa    |
| 92230 | 10 | Cabazon                | Riverside       |
| 91302 | 8  | Calabasas              | Los Angeles     |
| 92231 | 15 | Calexico               | Imperial        |
| 93518 | 3  | Caliente               | Kern            |
| 93518 | 7  | Caliente               | Kern            |
| 93505 | 7  | California City        | Kern            |
| 93207 | 7  | California Hot Springs | Tulare          |
| 92320 | 10 | Calimesa               | Riverside       |
| 92233 | 15 | Calipatria             | Imperial        |
| 94515 | 4  | Calistoga              | Napa            |
| 96014 | 14 | Callahan               | Siskiyou        |
| 96124 | 1  | Calpine                | Sierra          |
| 96124 | 14 | Calpine                | Sierra          |
| 93010 | 8  | Camarillo              | Ventura         |
| 93012 | 8  | Camarillo              | Ventura         |
| 93428 | 4  | Cambria                | San Luis Obispo |
| 95709 | 1  | Camino                 | El Dorado       |
| 92055 | 13 | Camp Pendleton         | San Diego       |
| 95008 | 4  | Campbell               | Santa Clara     |
| 91906 | 13 | Campo                  | San Diego       |

|       |    |                    |                 |
|-------|----|--------------------|-----------------|
| 95922 | 1  | Camptonville       | Sierra          |
| 95922 | 3  | Camptonville       | Sierra          |
| 96015 | 14 | Canby              | Modoc           |
| 91303 | 12 | Canoga Park        | Los Angeles     |
| 91304 | 8  | Canoga Park        | Los Angeles     |
| 91304 | 12 | Canoga Park        | Los Angeles     |
| 93519 | 7  | Cantil             | Kern            |
| 93608 | 3  | Cantua Creek       | Fresno          |
| 91351 | 9  | Canyon Country     | Los Angeles     |
| 91387 | 9  | Canyon Country     | Los Angeles     |
| 95923 | 1  | Canyon Dam         | Plumas          |
| 95607 | 2  | Capay              | Yolo            |
| 92624 | 8  | Capistrano Beach   | Orange          |
| 92624 | 13 | Capistrano Beach   | Orange          |
| 95010 | 5  | Capitola           | Santa Cruz      |
| 92007 | 13 | Cardiff By the Sea | San Diego       |
| 95528 | 1  | Carlotta           | Humboldt        |
| 92008 | 13 | Carlsbad           | San Diego       |
| 92009 | 13 | Carlsbad           | San Diego       |
| 92010 | 13 | Carlsbad           | San Diego       |
| 92011 | 13 | Carlsbad           | San Diego       |
| 93923 | 4  | Carmel             | Monterey        |
| 93924 | 4  | Carmel Valley      | Monterey        |
| 95608 | 6  | Carmichael         | Sacramento      |
| 96140 | 14 | Carnelian Bay      | Placer          |
| 93013 | 8  | Carpinteria        | Santa Barbara   |
| 90745 | 11 | Carson             | Los Angeles     |
| 90746 | 11 | Carson             | Los Angeles     |
| 90747 | 11 | Carson             | Los Angeles     |
| 93609 | 3  | Caruthers          | Fresno          |
| 93429 | 4  | Casmalia           | Santa Barbara   |
| 95420 | 1  | Caspar             | Mendocino       |
| 96016 | 3  | Cassel             | Shasta          |
| 91384 | 8  | Castaic            | Los Angeles     |
| 91384 | 9  | Castaic            | Los Angeles     |
| 94546 | 5  | Castro Valley      | Alameda         |
| 94552 | 4  | Castro Valley      | Alameda         |
| 94552 | 5  | Castro Valley      | Alameda         |
| 95012 | 4  | Castroville        | Monterey        |
| 92234 | 10 | Cathedral City     | Riverside       |
| 95306 | 1  | Catheys Valley     | Mariposa        |
| 95306 | 3  | Catheys Valley     | Mariposa        |
| 93430 | 4  | Cayucos            | San Luis Obispo |
| 95421 | 4  | Cazadero           | Sonoma          |
| 92321 | 10 | Cedar Glen         | San Bernardino  |
| 92322 | 10 | Cedarpines Park    | San Bernardino  |
| 96104 | 14 | Cedarville         | Modoc           |
| 95307 | 3  | Ceres              | Stanislaus      |
| 90703 | 9  | Cerritos           | Los Angeles     |

|       |    |                              |                |
|-------|----|------------------------------|----------------|
| 95925 | 3  | Challenge                    | Yuba           |
| 00061 | 8  | Channel Is Air Guard Station | Ventura        |
| 91311 | 8  | Chatsworth                   | Los Angeles    |
| 91311 | 9  | Chatsworth                   | Los Angeles    |
| 91311 | 12 | Chatsworth                   | Los Angeles    |
| 96020 | 1  | Chester                      | Plumas         |
| 96020 | 3  | Chester                      | Plumas         |
| 95926 | 3  | Chico                        | Butte          |
| 95928 | 3  | Chico                        | Butte          |
| 95973 | 3  | Chico                        | Butte          |
| 96105 | 14 | Chilcoot                     | Plumas         |
| 95309 | 1  | Chinese Camp                 | Tuolumne       |
| 91708 | 10 | Chino                        | San Bernardino |
| 91710 | 10 | Chino                        | San Bernardino |
| 91709 | 10 | Chino Hills                  | San Bernardino |
| 93610 | 3  | Chowchilla                   | Madera         |
| 93925 | 4  | Chualar                      | Monterey       |
| 91910 | 13 | Chula Vista                  | San Diego      |
| 91911 | 13 | Chula Vista                  | San Diego      |
| 91913 | 13 | Chula Vista                  | San Diego      |
| 91914 | 13 | Chula Vista                  | San Diego      |
| 91915 | 13 | Chula Vista                  | San Diego      |
| 95610 | 6  | Citrus Heights               | Sacramento     |
| 95621 | 6  | Citrus Heights               | Sacramento     |
| 91711 | 9  | Claremont                    | Los Angeles    |
| 95612 | 2  | Clarksburg                   | Yolo           |
| 94517 | 4  | Clayton                      | Contra Costa   |
| 95422 | 1  | Clearlake                    | Lake           |
| 95423 | 1  | Clearlake Oaks               | Lake           |
| 95423 | 3  | Clearlake Oaks               | Lake           |
| 96106 | 14 | Clio                         | Plumas         |
| 95425 | 4  | Cloverdale                   | Sonoma         |
| 93611 | 3  | Clovis                       | Fresno         |
| 93612 | 3  | Clovis                       | Fresno         |
| 93619 | 3  | Clovis                       | Fresno         |
| 92236 | 15 | Coachella                    | Riverside      |
| 93210 | 3  | Coalinga                     | Fresno         |
| 93614 | 3  | Coarsegold                   | Madera         |
| 96107 | 1  | Coleville                    | Mono           |
| 95713 | 1  | Colfax                       | Placer         |
| 95713 | 2  | Colfax                       | Placer         |
| 92324 | 10 | Colton                       | San Bernardino |
| 95310 | 1  | Columbia                     | Tuolumne       |
| 95932 | 3  | Colusa                       | Colusa         |
| 95427 | 1  | Comptche                     | Mendocino      |
| 90220 | 9  | Compton                      | Los Angeles    |
| 90220 | 11 | Compton                      | Los Angeles    |
| 90221 | 9  | Compton                      | Los Angeles    |
| 90222 | 9  | Compton                      | Los Angeles    |

|       |    |                |                 |
|-------|----|----------------|-----------------|
| 90222 | 11 | Compton        | Los Angeles     |
| 94518 | 4  | Concord        | Contra Costa    |
| 94518 | 5  | Concord        | Contra Costa    |
| 94519 | 4  | Concord        | Contra Costa    |
| 94520 | 4  | Concord        | Contra Costa    |
| 94520 | 5  | Concord        | Contra Costa    |
| 94521 | 4  | Concord        | Contra Costa    |
| 95614 | 1  | Cool           | El Dorado       |
| 95228 | 1  | Copperopolis   | Calaveras       |
| 93212 | 3  | Corcoran       | Tulare          |
| 93212 | 7  | Corcoran       | Tulare          |
| 96021 | 3  | Corning        | Tehama          |
| 92879 | 10 | Corona         | Riverside       |
| 92880 | 10 | Corona         | Riverside       |
| 92881 | 10 | Corona         | Riverside       |
| 92882 | 10 | Corona         | Riverside       |
| 92883 | 10 | Corona         | Riverside       |
| 92625 | 8  | Corona del Mar | Orange          |
| 92118 | 13 | Coronado       | San Diego       |
| 94925 | 5  | Corte Madera   | Marin           |
| 92626 | 8  | Costa Mesa     | Orange          |
| 92627 | 8  | Costa Mesa     | Orange          |
| 94931 | 4  | Cotati         | Sonoma          |
| 96022 | 3  | Cottonwood     | Tehama          |
| 95311 | 1  | Coulterville   | Mariposa        |
| 95615 | 2  | Courtland      | Sacramento      |
| 95615 | 6  | Courtland      | Sacramento      |
| 95428 | 1  | Covelo         | Mendocino       |
| 95428 | 3  | Covelo         | Mendocino       |
| 91722 | 9  | Covina         | Los Angeles     |
| 91723 | 9  | Covina         | Los Angeles     |
| 91724 | 9  | Covina         | Los Angeles     |
| 95013 | 4  | Coyote         | Santa Clara     |
| 95531 | 14 | Crescent City  | Del Norte       |
| 95934 | 1  | Crescent Mills | Plumas          |
| 92325 | 10 | Crestline      | San Bernardino  |
| 93432 | 4  | Creston        | San Luis Obispo |
| 94525 | 5  | Crockett       | Contra Costa    |
| 95313 | 3  | Crows Landing  | Stanislaus      |
| 90230 | 11 | Culver City    | Los Angeles     |
| 90232 | 11 | Culver City    | Los Angeles     |
| 95014 | 4  | Cupertino      | Santa Clara     |
| 93615 | 3  | Cutler         | Tulare          |
| 90630 | 8  | Cypress        | Orange          |
| 92327 | 10 | Daggett        | San Bernardino  |
| 94014 | 5  | Daly City      | San Mateo       |
| 94015 | 5  | Daly City      | San Mateo       |
| 92629 | 8  | Dana Point     | Orange          |
| 92629 | 13 | Dana Point     | Orange          |

|       |    |                    |              |
|-------|----|--------------------|--------------|
| 94506 | 4  | Danville           | Contra Costa |
| 94526 | 4  | Danville           | Contra Costa |
| 95017 | 5  | Davenport          | Santa Cruz   |
| 95616 | 2  | Davis              | Yolo         |
| 95616 | 4  | Davis              | Yolo         |
| 95618 | 2  | Davis              | Yolo         |
| 95618 | 4  | Davis              | Yolo         |
| 96108 | 14 | Davis Creek        | Modoc        |
| 92328 | 9  | Death Valley       | Inyo         |
| 94576 | 4  | Deer Park          | Napa         |
| 92014 | 13 | Del Mar            | San Diego    |
| 93616 | 3  | Del Rey            | Fresno       |
| 93215 | 3  | Delano             | Kern         |
| 93215 | 7  | Delano             | Kern         |
| 95315 | 3  | Delhi              | Merced       |
| 95316 | 3  | Denair             | Stanislaus   |
| 91916 | 13 | Descanso           | San Diego    |
| 92239 | 10 | Desert Center      | Riverside    |
| 92239 | 15 | Desert Center      | Riverside    |
| 92240 | 10 | Desert Hot Springs | Riverside    |
| 92241 | 10 | Desert Hot Springs | Riverside    |
| 92241 | 15 | Desert Hot Springs | Riverside    |
| 94528 | 4  | Diablo             | Contra Costa |
| 91765 | 9  | Diamond Bar        | Los Angeles  |
| 91765 | 10 | Diamond Bar        | Los Angeles  |
| 95619 | 1  | Diamond Springs    | El Dorado    |
| 94929 | 5  | Dillon Beach       | Marin        |
| 93618 | 3  | Dinuba             | Tulare       |
| 95620 | 2  | Dixon              | Solano       |
| 95620 | 4  | Dixon              | Solano       |
| 95935 | 1  | Dobbins            | Yuba         |
| 95935 | 3  | Dobbins            | Yuba         |
| 96023 | 14 | Dorris             | Siskiyou     |
| 93620 | 3  | Dos Palos          | Merced       |
| 95429 | 1  | Dos Rios           | Mendocino    |
| 96024 | 1  | Douglas City       | Trinity      |
| 90240 | 9  | Downey             | Los Angeles  |
| 90241 | 9  | Downey             | Los Angeles  |
| 90242 | 9  | Downey             | Los Angeles  |
| 95936 | 1  | Downieville        | Sierra       |
| 96109 | 14 | Doyle              | Lassen       |
| 91010 | 9  | Duarte             | Los Angeles  |
| 94568 | 4  | Dublin             | Alameda      |
| 94568 | 5  | Dublin             | Alameda      |
| 91917 | 13 | Dulzura            | San Diego    |
| 93621 | 3  | Dunlap             | Fresno       |
| 95937 | 2  | Dunnigan           | Yolo         |
| 96025 | 14 | Dunsmuir           | Siskiyou     |
| 95938 | 3  | Durham             | Butte        |

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|-------|----|---------------------|----------------|
| 95714 | 1  | Dutch Flat          | Placer         |
| 95714 | 2  | Dutch Flat          | Placer         |
| 93219 | 3  | Earlimart           | Tulare         |
| 93219 | 7  | Earlimart           | Tulare         |
| 92242 | 10 | Earp                | San Bernardino |
| 00038 | 1  | East Tehama County  | Tehama         |
| 00038 | 3  | East Tehama County  | Tehama         |
| 00026 | 3  | East Tulare County  | Tulare         |
| 00026 | 7  | East Tulare County  | Tulare         |
| 00026 | 9  | East Tulare County  | Tulare         |
| 95721 | 1  | Echo Lake           | El Dorado      |
| 95721 | 14 | Echo Lake           | El Dorado      |
| 93523 | 7  | Edwards             | Kern           |
| 93524 | 7  | Edwards             | Kern           |
| 93524 | 10 | Edwards             | Kern           |
| 92019 | 13 | El Cajon            | San Diego      |
| 92020 | 13 | El Cajon            | San Diego      |
| 92021 | 13 | El Cajon            | San Diego      |
| 92243 | 15 | El Centro           | Imperial       |
| 94530 | 5  | El Cerrito          | Contra Costa   |
| 95623 | 1  | El Dorado           | El Dorado      |
| 95762 | 1  | El Dorado Hills     | El Dorado      |
| 95762 | 6  | El Dorado Hills     | El Dorado      |
| 91731 | 9  | El Monte            | Los Angeles    |
| 91732 | 9  | El Monte            | Los Angeles    |
| 95317 | 3  | El Nido             | Merced         |
| 95318 | 1  | El Portal           | Mariposa       |
| 90245 | 8  | El Segundo          | Los Angeles    |
| 90245 | 11 | El Segundo          | Los Angeles    |
| 94803 | 5  | El Sobrante         | Contra Costa   |
| 00051 | 1  | Eldorado NTL Forest | El Dorado      |
| 00051 | 14 | Eldorado NTL Forest | El Dorado      |
| 00052 | 1  | Eldorado NTL Forest | El Dorado      |
| 95432 | 1  | Elk                 | Mendocino      |
| 95939 | 3  | Elk Creek           | Glenn          |
| 95624 | 6  | Elk Grove           | Sacramento     |
| 95757 | 6  | Elk Grove           | Sacramento     |
| 95758 | 6  | Elk Grove           | Sacramento     |
| 95626 | 2  | Elverta             | Sacramento     |
| 95626 | 3  | Elverta             | Sacramento     |
| 95626 | 6  | Elverta             | Sacramento     |
| 94608 | 5  | Emeryville          | Alameda        |
| 95715 | 2  | Emigrant Gap        | Placer         |
| 92024 | 13 | Encinitas           | San Diego      |
| 91316 | 12 | Encino              | Los Angeles    |
| 91436 | 11 | Encino              | Los Angeles    |
| 91436 | 12 | Encino              | Los Angeles    |
| 95320 | 2  | Escalon             | San Joaquin    |
| 95320 | 3  | Escalon             | San Joaquin    |

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|-------|----|------------------|----------------|
| 92025 | 13 | Escondido        | San Diego      |
| 92026 | 13 | Escondido        | San Diego      |
| 92027 | 13 | Escondido        | San Diego      |
| 92029 | 13 | Escondido        | San Diego      |
| 95627 | 2  | Esparto          | Yolo           |
| 92332 | 10 | Essex            | San Bernardino |
| 96027 | 14 | Etna             | Siskiyou       |
| 95501 | 1  | Eureka           | Humboldt       |
| 95503 | 1  | Eureka           | Humboldt       |
| 93221 | 7  | Exeter           | Tulare         |
| 95628 | 6  | Fair Oaks        | Sacramento     |
| 94930 | 5  | Fairfax          | Marin          |
| 94533 | 4  | Fairfield        | Solano         |
| 94534 | 4  | Fairfield        | Solano         |
| 96028 | 3  | Fall River Mills | Shasta         |
| 92028 | 10 | Fallbrook        | San Diego      |
| 92028 | 13 | Fallbrook        | San Diego      |
| 93223 | 7  | Farmersville     | Tulare         |
| 95230 | 1  | Farmington       | Stanislaus     |
| 95230 | 2  | Farmington       | Stanislaus     |
| 95230 | 3  | Farmington       | Stanislaus     |
| 93224 | 3  | Fellows          | Kern           |
| 95018 | 5  | Felton           | Santa Cruz     |
| 95536 | 1  | Ferndale         | Humboldt       |
| 95629 | 1  | Fiddletown       | Amador         |
| 95629 | 2  | Fiddletown       | Amador         |
| 93015 | 8  | Fillmore         | Ventura        |
| 93622 | 3  | Firebaugh        | Fresno         |
| 93623 | 1  | Fish Camp        | Mariposa       |
| 93623 | 3  | Fish Camp        | Mariposa       |
| 96111 | 14 | Floriston        | Nevada         |
| 95630 | 6  | Folsom           | Sacramento     |
| 92335 | 10 | Fontana          | San Bernardino |
| 92336 | 10 | Fontana          | San Bernardino |
| 92337 | 10 | Fontana          | San Bernardino |
| 92610 | 8  | Foothill Ranch   | Orange         |
| 95941 | 1  | Forbestown       | Butte          |
| 95941 | 3  | Forbestown       | Butte          |
| 92339 | 10 | Forest Falls     | San Bernardino |
| 94933 | 5  | Forest Knolls    | Marin          |
| 95942 | 1  | Forest Ranch     | Butte          |
| 95942 | 3  | Forest Ranch     | Butte          |
| 95631 | 1  | Foresthill       | Placer         |
| 95631 | 2  | Foresthill       | Placer         |
| 95436 | 4  | Forestville      | Sonoma         |
| 96031 | 14 | Forks of Salmon  | Siskiyou       |
| 96112 | 14 | Fort Bidwell     | Modoc          |
| 95437 | 1  | Fort Bragg       | Mendocino      |
| 92310 | 10 | Fort Irwin       | San Bernardino |

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|-------|----|-----------------|-------------|
| 96032 | 14 | Fort Jones      | Siskiyou    |
| 95540 | 1  | Fortuna         | Humboldt    |
| 92708 | 8  | Fountain Valley | Orange      |
| 93625 | 3  | Fowler          | Fresno      |
| 93225 | 3  | Frazier Park    | Kern        |
| 93225 | 8  | Frazier Park    | Kern        |
| 94536 | 5  | Fremont         | Alameda     |
| 94538 | 5  | Fremont         | Alameda     |
| 94539 | 4  | Fremont         | Alameda     |
| 94539 | 5  | Fremont         | Alameda     |
| 94555 | 5  | Fremont         | Alameda     |
| 95231 | 2  | French Camp     | San Joaquin |
| 96033 | 3  | French Gulch    | Shasta      |
| 93650 | 3  | Fresno          | Fresno      |
| 93701 | 3  | Fresno          | Fresno      |
| 93702 | 3  | Fresno          | Fresno      |
| 93703 | 3  | Fresno          | Fresno      |
| 93704 | 3  | Fresno          | Fresno      |
| 93705 | 3  | Fresno          | Fresno      |
| 93706 | 3  | Fresno          | Fresno      |
| 93710 | 3  | Fresno          | Fresno      |
| 93711 | 3  | Fresno          | Fresno      |
| 93720 | 3  | Fresno          | Fresno      |
| 93721 | 3  | Fresno          | Fresno      |
| 93722 | 3  | Fresno          | Fresno      |
| 93723 | 3  | Fresno          | Fresno      |
| 93725 | 3  | Fresno          | Fresno      |
| 93726 | 3  | Fresno          | Fresno      |
| 93727 | 3  | Fresno          | Fresno      |
| 93728 | 3  | Fresno          | Fresno      |
| 93730 | 3  | Fresno          | Fresno      |
| 93626 | 3  | Friant          | Madera      |
| 92831 | 8  | Fullerton       | Orange      |
| 92832 | 8  | Fullerton       | Orange      |
| 92833 | 8  | Fullerton       | Orange      |
| 92835 | 8  | Fullerton       | Orange      |
| 95439 | 4  | Fulton          | Sonoma      |
| 95632 | 2  | Galt            | Sacramento  |
| 95632 | 6  | Galt            | Sacramento  |
| 95542 | 1  | Garberville     | Humboldt    |
| 92840 | 8  | Garden Grove    | Orange      |
| 92841 | 8  | Garden Grove    | Orange      |
| 92843 | 8  | Garden Grove    | Orange      |
| 92844 | 8  | Garden Grove    | Orange      |
| 92845 | 8  | Garden Grove    | Orange      |
| 95633 | 1  | Garden Valley   | El Dorado   |
| 90247 | 8  | Gardena         | Los Angeles |
| 90248 | 8  | Gardena         | Los Angeles |
| 90248 | 11 | Gardena         | Los Angeles |



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|-------|----|---------------|-----------------|
| 90249 | 8  | Gardena       | Los Angeles     |
| 95543 | 14 | Gasquet       | Del Norte       |
| 96034 | 14 | Gazelle       | Siskiyou        |
| 95634 | 1  | Georgetown    | El Dorado       |
| 96035 | 3  | Gerber        | Tehama          |
| 95441 | 4  | Geyserville   | Sonoma          |
| 95020 | 4  | Gilroy        | Santa Clara     |
| 95442 | 4  | Glen Ellen    | Sonoma          |
| 95232 | 1  | Glencoe       | Calaveras       |
| 91201 | 12 | Glendale      | Los Angeles     |
| 91202 | 12 | Glendale      | Los Angeles     |
| 91203 | 12 | Glendale      | Los Angeles     |
| 91204 | 12 | Glendale      | Los Angeles     |
| 91205 | 12 | Glendale      | Los Angeles     |
| 91206 | 12 | Glendale      | Los Angeles     |
| 91207 | 12 | Glendale      | Los Angeles     |
| 91208 | 12 | Glendale      | Los Angeles     |
| 91740 | 9  | Glendora      | Los Angeles     |
| 91741 | 9  | Glendora      | Los Angeles     |
| 95443 | 1  | Glenhaven     | Lake            |
| 95943 | 3  | Glenn         | Glenn           |
| 93226 | 7  | Glennville    | Kern            |
| 95717 | 2  | Gold Run      | Placer          |
| 93117 | 4  | Goleta        | Santa Barbara   |
| 93117 | 8  | Goleta        | Santa Barbara   |
| 93926 | 4  | Gonzales      | Monterey        |
| 95944 | 1  | Goodyears Bar | Sierra          |
| 91344 | 12 | Granada Hills | Los Angeles     |
| 92313 | 10 | Grand Terrace | San Bernardino  |
| 95746 | 1  | Granite Bay   | Placer          |
| 95746 | 2  | Granite Bay   | Placer          |
| 95945 | 1  | Grass Valley  | Nevada          |
| 95949 | 1  | Grass Valley  | Nevada          |
| 95444 | 4  | Graton        | Sonoma          |
| 94904 | 5  | Greenbrae     | Marin           |
| 93927 | 4  | Greenfield    | Monterey        |
| 95947 | 1  | Greenville    | Plumas          |
| 95947 | 14 | Greenville    | Plumas          |
| 95635 | 1  | Greenwood     | El Dorado       |
| 96038 | 14 | Grenada       | Siskiyou        |
| 95948 | 3  | Gridley       | Butte           |
| 95636 | 1  | Grizzly Flats | El Dorado       |
| 95321 | 1  | Groveland     | Tuolumne        |
| 93433 | 4  | Grover Beach  | San Luis Obispo |
| 93434 | 4  | Guadalupe     | Santa Barbara   |
| 95445 | 1  | Gualala       | Mendocino       |
| 95446 | 4  | Guerneville   | Sonoma          |
| 95637 | 2  | Guinda        | Yolo            |
| 95322 | 3  | Gustine       | Merced          |

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|-------|----|--------------------|----------------|
| 91745 | 9  | Hacienda Heights   | Los Angeles    |
| 94019 | 5  | Half Moon Bay      | San Mateo      |
| 95951 | 3  | Hamilton City      | Glenn          |
| 93230 | 3  | Hanford            | Kings          |
| 96039 | 14 | Happy Camp         | Siskiyou       |
| 90710 | 11 | Harbor City        | Los Angeles    |
| 96040 | 3  | Hat Creek          | Shasta         |
| 90716 | 9  | Hawaiian Gardens   | Los Angeles    |
| 90250 | 8  | Hawthorne          | Los Angeles    |
| 96041 | 1  | Hayfork            | Trinity        |
| 94541 | 5  | Hayward            | Alameda        |
| 94542 | 5  | Hayward            | Alameda        |
| 94544 | 5  | Hayward            | Alameda        |
| 94545 | 5  | Hayward            | Alameda        |
| 95448 | 4  | Healdsburg         | Sonoma         |
| 92249 | 15 | Heber              | Imperial       |
| 92342 | 10 | Helendale          | San Bernardino |
| 93627 | 3  | Helm               | Fresno         |
| 92543 | 10 | Hemet              | Riverside      |
| 92544 | 10 | Hemet              | Riverside      |
| 92545 | 10 | Hemet              | Riverside      |
| 95638 | 6  | Herald             | Sacramento     |
| 94547 | 5  | Hercules           | Contra Costa   |
| 96113 | 14 | Herlong            | Lassen         |
| 90254 | 8  | Hermosa Beach      | Los Angeles    |
| 92344 | 10 | Hesperia           | San Bernardino |
| 92345 | 10 | Hesperia           | San Bernardino |
| 95323 | 3  | Hickman            | Stanislaus     |
| 95467 | 1  | Hidden Valley Lake | Lake           |
| 92346 | 10 | Highland           | San Bernardino |
| 95324 | 3  | Hilmar             | Merced         |
| 92347 | 10 | Hinkley            | San Bernardino |
| 95023 | 3  | Hollister          | San Benito     |
| 95023 | 4  | Hollister          | San Benito     |
| 92250 | 15 | Holtville          | Imperial       |
| 92548 | 10 | Homeland           | Riverside      |
| 96141 | 2  | Homewood           | Placer         |
| 96141 | 14 | Homewood           | Placer         |
| 95546 | 1  | Hoopa              | Humboldt       |
| 95449 | 1  | Hopland            | Mendocino      |
| 96044 | 14 | Hornbrook          | Siskiyou       |
| 95325 | 1  | Hornitos           | Mariposa       |
| 95325 | 3  | Hornitos           | Mariposa       |
| 95326 | 3  | Hughson            | Stanislaus     |
| 92646 | 8  | Huntington Beach   | Orange         |
| 92647 | 8  | Huntington Beach   | Orange         |
| 92648 | 8  | Huntington Beach   | Orange         |
| 92649 | 8  | Huntington Beach   | Orange         |
| 90255 | 9  | Huntington Park    | Los Angeles    |

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| 90255 | 12 | Huntington Park   | Los Angeles    |
| 93234 | 3  | Huron             | Fresno         |
| 96046 | 1  | Hyampom           | Trinity        |
| 95547 | 1  | Hydesville        | Humboldt       |
| 92549 | 10 | Idyllwild         | Riverside      |
| 96047 | 3  | Igo               | Shasta         |
| 92251 | 15 | Imperial          | Imperial       |
| 91932 | 13 | Imperial Beach    | San Diego      |
| 93526 | 3  | Independence      | Inyo           |
| 93526 | 9  | Independence      | Inyo           |
| 92210 | 10 | Indian Wells      | Riverside      |
| 92210 | 15 | Indian Wells      | Riverside      |
| 92201 | 15 | Indio             | Riverside      |
| 92203 | 10 | Indio             | Riverside      |
| 92203 | 15 | Indio             | Riverside      |
| 90301 | 8  | Inglewood         | Los Angeles    |
| 90301 | 11 | Inglewood         | Los Angeles    |
| 90302 | 11 | Inglewood         | Los Angeles    |
| 90303 | 8  | Inglewood         | Los Angeles    |
| 90304 | 8  | Inglewood         | Los Angeles    |
| 90304 | 11 | Inglewood         | Los Angeles    |
| 90305 | 8  | Inglewood         | Los Angeles    |
| 94937 | 5  | Inverness         | Marin          |
| 93527 | 7  | Inyokern          | Kern           |
| 93527 | 9  | Inyokern          | Kern           |
| 95640 | 2  | Ione              | Amador         |
| 92602 | 8  | Irvine            | Orange         |
| 92603 | 8  | Irvine            | Orange         |
| 92604 | 8  | Irvine            | Orange         |
| 92606 | 8  | Irvine            | Orange         |
| 92612 | 8  | Irvine            | Orange         |
| 92614 | 8  | Irvine            | Orange         |
| 92617 | 8  | Irvine            | Orange         |
| 92618 | 8  | Irvine            | Orange         |
| 92620 | 8  | Irvine            | Orange         |
| 95641 | 6  | Isleton           | Sacramento     |
| 93235 | 7  | Ivanhoe           | Tulare         |
| 95642 | 2  | Jackson           | Amador         |
| 00022 | 1  | Jackson St Forest | Mendocino      |
| 91934 | 13 | Jacumba           | San Diego      |
| 95327 | 1  | Jamestown         | Tuolumne       |
| 91935 | 13 | Jamul             | San Diego      |
| 96114 | 1  | Janesville        | Plumas         |
| 96114 | 14 | Janesville        | Plumas         |
| 95450 | 4  | Jenner            | Sonoma         |
| 93528 | 7  | Johannesburg      | Kern           |
| 92252 | 10 | Joshua Tree       | San Bernardino |
| 92036 | 13 | Julian            | San Diego      |
| 92036 | 15 | Julian            | San Diego      |

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| 96048 | 1  | Junction City            | Trinity      |
| 93529 | 1  | June Lake                | Mono         |
| 93529 | 3  | June Lake                | Mono         |
| 93531 | 7  | Keene                    | Kern         |
| 95451 | 1  | Kelseyville              | Lake         |
| 95452 | 4  | Kenwood                  | Sonoma       |
| 93630 | 3  | Kerman                   | Fresno       |
| 93238 | 7  | Kernville                | Kern         |
| 93239 | 3  | Kettleman City           | Kings        |
| 93930 | 4  | King City                | Monterey     |
| 96143 | 14 | Kings Beach              | Placer       |
| 93633 | 3  | Kings Canyon National PK | Fresno       |
| 93631 | 3  | Kingsburg                | Tulare       |
| 93631 | 7  | Kingsburg                | Tulare       |
| 95548 | 14 | Klamath                  | Del Norte    |
| 00034 | 14 | Klamath National Forest  | Siskiyou     |
| 96050 | 14 | Klamath River            | Siskiyou     |
| 95549 | 1  | Kneeland                 | Humboldt     |
| 95645 | 2  | Knights Landing          | Sutter       |
| 95645 | 3  | Knights Landing          | Sutter       |
| 94548 | 4  | Knightsen                | Contra Costa |
| 95550 | 1  | Korbel                   | Humboldt     |
| 95720 | 1  | Kyburz                   | El Dorado    |
| 91011 | 9  | La Canada Flintridge     | Los Angeles  |
| 91011 | 12 | La Canada Flintridge     | Los Angeles  |
| 91214 | 9  | La Crescenta             | Los Angeles  |
| 91214 | 12 | La Crescenta             | Los Angeles  |
| 95329 | 1  | La Grange                | Tuolumne     |
| 95329 | 3  | La Grange                | Tuolumne     |
| 90631 | 8  | La Habra                 | Orange       |
| 90631 | 9  | La Habra                 | Orange       |
| 94020 | 5  | La Honda                 | San Mateo    |
| 92037 | 13 | La Jolla                 | San Diego    |
| 91941 | 13 | La Mesa                  | San Diego    |
| 91942 | 13 | La Mesa                  | San Diego    |
| 90638 | 9  | La Mirada                | Los Angeles  |
| 90623 | 8  | La Palma                 | Orange       |
| 91744 | 9  | La Puente                | Los Angeles  |
| 91746 | 9  | La Puente                | Los Angeles  |
| 92253 | 10 | La Quinta                | Riverside    |
| 92253 | 15 | La Quinta                | Riverside    |
| 91750 | 9  | La Verne                 | Los Angeles  |
| 92694 | 8  | Ladera Ranch             | Orange       |
| 92694 | 13 | Ladera Ranch             | Orange       |
| 94549 | 4  | Lafayette                | Contra Costa |
| 94549 | 5  | Lafayette                | Contra Costa |
| 92651 | 8  | Laguna Beach             | Orange       |
| 92653 | 8  | Laguna Hills             | Orange       |
| 92653 | 13 | Laguna Hills             | Orange       |

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|-------|----|------------------------|----------------|
| 92677 | 8  | Laguna Niguel          | Orange         |
| 92677 | 13 | Laguna Niguel          | Orange         |
| 92637 | 8  | Laguna Woods           | Orange         |
| 94938 | 5  | Lagunitas              | Marin          |
| 92352 | 10 | Lake Arrowhead         | San Bernardino |
| 96115 | 14 | Lake City              | Modoc          |
| 92530 | 10 | Lake Elsinore          | Riverside      |
| 92532 | 10 | Lake Elsinore          | Riverside      |
| 92630 | 8  | Lake Forest            | Orange         |
| 93532 | 9  | Lake Hughes            | Los Angeles    |
| 93240 | 7  | Lake Isabella          | Kern           |
| 96051 | 3  | Lakehead               | Shasta         |
| 96051 | 14 | Lakehead               | Shasta         |
| 95453 | 1  | Lakeport               | Lake           |
| 92040 | 13 | Lakeside               | San Diego      |
| 90712 | 9  | Lakewood               | Los Angeles    |
| 90713 | 9  | Lakewood               | Los Angeles    |
| 90715 | 9  | Lakewood               | Los Angeles    |
| 93241 | 3  | Lamont                 | Kern           |
| 93534 | 9  | Lancaster              | Los Angeles    |
| 93535 | 7  | Lancaster              | Los Angeles    |
| 93535 | 9  | Lancaster              | Los Angeles    |
| 93536 | 7  | Lancaster              | Los Angeles    |
| 93536 | 9  | Lancaster              | Los Angeles    |
| 92285 | 10 | Landers                | San Bernardino |
| 94939 | 5  | Larkspur               | Marin          |
| 00031 | 1  | Lassen National Forest | Plumas         |
| 00019 | 1  | Lassen NTL Forest      | Lassen         |
| 00019 | 14 | Lassen NTL Forest      | Lassen         |
| 95330 | 2  | Lathrop                | San Joaquin    |
| 93242 | 3  | Laton                  | Fresno         |
| 90260 | 8  | Lawndale               | Los Angeles    |
| 95454 | 1  | Laytonville            | Mendocino      |
| 95333 | 3  | Le Grand               | Merced         |
| 93243 | 3  | Lebec                  | Ventura        |
| 93243 | 7  | Lebec                  | Ventura        |
| 93243 | 8  | Lebec                  | Ventura        |
| 93243 | 9  | Lebec                  | Ventura        |
| 93541 | 1  | Lee Vining             | Mono           |
| 95585 | 1  | Leggett                | Mendocino      |
| 93244 | 7  | Lemon Cove             | Tulare         |
| 91945 | 13 | Lemon Grove            | San Diego      |
| 93245 | 3  | Lemoore                | Kings          |
| 96052 | 1  | Lewiston               | Trinity        |
| 96052 | 3  | Lewiston               | Trinity        |
| 96116 | 14 | Likely                 | Modoc          |
| 95648 | 2  | Lincoln                | Placer         |
| 95236 | 1  | Linden                 | San Joaquin    |
| 95236 | 2  | Linden                 | San Joaquin    |

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|-------|----|--------------|----------------|
| 93247 | 7  | Lindsay      | Tulare         |
| 96117 | 1  | Litchfield   | Lassen         |
| 96117 | 14 | Litchfield   | Lassen         |
| 95456 | 1  | Littleriver  | Mendocino      |
| 93543 | 9  | Littlerock   | Los Angeles    |
| 95953 | 3  | Live Oak     | Sutter         |
| 94550 | 3  | Livermore    | Alameda        |
| 94550 | 4  | Livermore    | Alameda        |
| 94551 | 4  | Livermore    | Alameda        |
| 95334 | 3  | Livingston   | Merced         |
| 93544 | 9  | Llano        | Los Angeles    |
| 95237 | 2  | Lockeford    | San Joaquin    |
| 93932 | 4  | Lockwood     | Monterey       |
| 95240 | 2  | Lodi         | San Joaquin    |
| 95242 | 2  | Lodi         | San Joaquin    |
| 95551 | 1  | Loleta       | Humboldt       |
| 92354 | 10 | Loma Linda   | San Bernardino |
| 94021 | 5  | Loma Mar     | San Mateo      |
| 90717 | 8  | Lomita       | Los Angeles    |
| 93436 | 4  | Lompoc       | Santa Barbara  |
| 93437 | 4  | Lompoc       | Santa Barbara  |
| 93545 | 7  | Lone Pine    | Inyo           |
| 93545 | 9  | Lone Pine    | Inyo           |
| 95335 | 1  | Long Barn    | Tuolumne       |
| 90802 | 9  | Long Beach   | Los Angeles    |
| 90802 | 11 | Long Beach   | Los Angeles    |
| 90803 | 9  | Long Beach   | Los Angeles    |
| 90804 | 9  | Long Beach   | Los Angeles    |
| 90805 | 9  | Long Beach   | Los Angeles    |
| 90806 | 9  | Long Beach   | Los Angeles    |
| 90807 | 9  | Long Beach   | Los Angeles    |
| 90808 | 9  | Long Beach   | Los Angeles    |
| 90810 | 9  | Long Beach   | Los Angeles    |
| 90810 | 11 | Long Beach   | Los Angeles    |
| 90813 | 9  | Long Beach   | Los Angeles    |
| 90813 | 11 | Long Beach   | Los Angeles    |
| 90814 | 9  | Long Beach   | Los Angeles    |
| 90815 | 9  | Long Beach   | Los Angeles    |
| 96054 | 14 | Lookout      | Modoc          |
| 95650 | 2  | Loomis       | Placer         |
| 90720 | 8  | Los Alamitos | Orange         |
| 94022 | 4  | Los Altos    | Santa Clara    |
| 94024 | 4  | Los Altos    | Santa Clara    |
| 90001 | 11 | Los Angeles  | Los Angeles    |
| 90002 | 9  | Los Angeles  | Los Angeles    |
| 90002 | 11 | Los Angeles  | Los Angeles    |
| 90003 | 11 | Los Angeles  | Los Angeles    |
| 90004 | 11 | Los Angeles  | Los Angeles    |
| 90006 | 11 | Los Angeles  | Los Angeles    |

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| 90007 | 11 | Los Angeles | Los Angeles |
| 90008 | 11 | Los Angeles | Los Angeles |
| 90011 | 11 | Los Angeles | Los Angeles |
| 90011 | 12 | Los Angeles | Los Angeles |
| 90012 | 12 | Los Angeles | Los Angeles |
| 90013 | 12 | Los Angeles | Los Angeles |
| 90014 | 12 | Los Angeles | Los Angeles |
| 90015 | 11 | Los Angeles | Los Angeles |
| 90016 | 11 | Los Angeles | Los Angeles |
| 90017 | 11 | Los Angeles | Los Angeles |
| 90018 | 11 | Los Angeles | Los Angeles |
| 90019 | 11 | Los Angeles | Los Angeles |
| 90020 | 11 | Los Angeles | Los Angeles |
| 90021 | 12 | Los Angeles | Los Angeles |
| 90022 | 9  | Los Angeles | Los Angeles |
| 90022 | 12 | Los Angeles | Los Angeles |
| 90023 | 12 | Los Angeles | Los Angeles |
| 90024 | 11 | Los Angeles | Los Angeles |
| 90025 | 11 | Los Angeles | Los Angeles |
| 90026 | 11 | Los Angeles | Los Angeles |
| 90026 | 12 | Los Angeles | Los Angeles |
| 90027 | 11 | Los Angeles | Los Angeles |
| 90027 | 12 | Los Angeles | Los Angeles |
| 90028 | 11 | Los Angeles | Los Angeles |
| 90029 | 11 | Los Angeles | Los Angeles |
| 90031 | 12 | Los Angeles | Los Angeles |
| 90032 | 9  | Los Angeles | Los Angeles |
| 90032 | 12 | Los Angeles | Los Angeles |
| 90033 | 12 | Los Angeles | Los Angeles |
| 90034 | 11 | Los Angeles | Los Angeles |
| 90035 | 11 | Los Angeles | Los Angeles |
| 90036 | 11 | Los Angeles | Los Angeles |
| 90037 | 11 | Los Angeles | Los Angeles |
| 90038 | 11 | Los Angeles | Los Angeles |
| 90039 | 12 | Los Angeles | Los Angeles |
| 90040 | 9  | Los Angeles | Los Angeles |
| 90041 | 12 | Los Angeles | Los Angeles |
| 90042 | 12 | Los Angeles | Los Angeles |
| 90043 | 8  | Los Angeles | Los Angeles |
| 90043 | 11 | Los Angeles | Los Angeles |
| 90044 | 8  | Los Angeles | Los Angeles |
| 90044 | 11 | Los Angeles | Los Angeles |
| 90045 | 8  | Los Angeles | Los Angeles |
| 90045 | 11 | Los Angeles | Los Angeles |
| 90046 | 11 | Los Angeles | Los Angeles |
| 90047 | 8  | Los Angeles | Los Angeles |
| 90047 | 11 | Los Angeles | Los Angeles |
| 90048 | 11 | Los Angeles | Los Angeles |
| 90049 | 11 | Los Angeles | Los Angeles |

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| 90056 | 11 | Los Angeles           | Los Angeles     |
| 90057 | 11 | Los Angeles           | Los Angeles     |
| 90058 | 12 | Los Angeles           | Los Angeles     |
| 90059 | 9  | Los Angeles           | Los Angeles     |
| 90059 | 11 | Los Angeles           | Los Angeles     |
| 90061 | 11 | Los Angeles           | Los Angeles     |
| 90062 | 11 | Los Angeles           | Los Angeles     |
| 90063 | 12 | Los Angeles           | Los Angeles     |
| 90064 | 11 | Los Angeles           | Los Angeles     |
| 90065 | 12 | Los Angeles           | Los Angeles     |
| 90066 | 11 | Los Angeles           | Los Angeles     |
| 90068 | 11 | Los Angeles           | Los Angeles     |
| 90068 | 12 | Los Angeles           | Los Angeles     |
| 90077 | 11 | Los Angeles           | Los Angeles     |
| 90094 | 11 | Los Angeles           | Los Angeles     |
| 93635 | 3  | Los Banos             | Merced          |
| 95030 | 4  | Los Gatos             | Santa Clara     |
| 95032 | 4  | Los Gatos             | Santa Clara     |
| 95033 | 4  | Los Gatos             | Santa Cruz      |
| 95033 | 5  | Los Gatos             | Santa Cruz      |
| 96055 | 3  | Los Molinos           | Tehama          |
| 93441 | 4  | Los Olivos            | Santa Barbara   |
| 93402 | 4  | Los Osos              | San Luis Obispo |
| 00018 | 8  | Los Padres NTL Forest | Ventura         |
| 00032 | 4  | Los Padres NTL Forest | Santa Barbara   |
| 00032 | 8  | Los Padres NTL Forest | Santa Barbara   |
| 93249 | 3  | Lost Hills            | Kern            |
| 95651 | 1  | Lotus                 | El Dorado       |
| 95457 | 1  | Lower Lake            | Lake            |
| 96118 | 14 | Loyalton              | Sierra          |
| 95458 | 1  | Lucerne               | Lake            |
| 92356 | 10 | Lucerne Valley        | San Bernardino  |
| 92338 | 10 | Ludlow                | San Bernardino  |
| 90262 | 9  | Lynwood               | Los Angeles     |
| 92358 | 10 | Lytle Creek           | San Bernardino  |
| 96058 | 14 | Macdoel               | Siskiyou        |
| 95552 | 1  | Mad River             | Trinity         |
| 96119 | 1  | Madeline              | Lassen          |
| 93636 | 3  | Madera                | Madera          |
| 93637 | 3  | Madera                | Madera          |
| 93638 | 3  | Madera                | Madera          |
| 95653 | 2  | Madison               | Yolo            |
| 95954 | 1  | Magalia               | Butte           |
| 95954 | 3  | Magalia               | Butte           |
| 90265 | 8  | Malibu                | Los Angeles     |
| 93546 | 1  | Mammoth Lakes         | Mono            |
| 93546 | 3  | Mammoth Lakes         | Mono            |
| 95459 | 1  | Manchester            | Mendocino       |
| 90266 | 8  | Manhattan Beach       | Los Angeles     |



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|-------|----|------------------------|----------------|
| 95336 | 2  | Manteca                | San Joaquin    |
| 95337 | 2  | Manteca                | San Joaquin    |
| 96059 | 3  | Manton                 | Shasta         |
| 92518 | 10 | March Air Reserve Base | Riverside      |
| 93252 | 3  | Maricopa               | Ventura        |
| 93252 | 4  | Maricopa               | Ventura        |
| 93252 | 8  | Maricopa               | Ventura        |
| 93933 | 4  | Marina                 | Monterey       |
| 90292 | 11 | Marina del Rey         | Los Angeles    |
| 95338 | 1  | Mariposa               | Mariposa       |
| 96120 | 1  | Markleeville           | Alpine         |
| 96120 | 14 | Markleeville           | Alpine         |
| 94940 | 5  | Marshall               | Marin          |
| 94553 | 5  | Martinez               | Contra Costa   |
| 95901 | 3  | Marysville             | Yuba           |
| 95655 | 6  | Mather                 | Sacramento     |
| 95955 | 3  | Maxwell                | Colusa         |
| 90270 | 9  | Maywood                | Los Angeles    |
| 90270 | 12 | Maywood                | Los Angeles    |
| 93250 | 3  | MC Farland             | Kern           |
| 93250 | 7  | MC Farland             | Kern           |
| 93251 | 3  | MC Kittrick            | Kern           |
| 96056 | 1  | McArthur               | Lassen         |
| 96056 | 3  | McArthur               | Lassen         |
| 96056 | 14 | McArthur               | Lassen         |
| 95652 | 6  | McClellan              | Sacramento     |
| 96057 | 14 | McCloud                | Siskiyou       |
| 95519 | 1  | McKinleyville          | Humboldt       |
| 95956 | 1  | Meadow Valley          | Plumas         |
| 95956 | 14 | Meadow Valley          | Plumas         |
| 95722 | 2  | Meadow Vista           | Placer         |
| 92254 | 15 | Mecca                  | Riverside      |
| 95460 | 1  | Mendocino              | Mendocino      |
| 00048 | 1  | Mendocino NTL Forest   | Lake           |
| 00048 | 3  | Mendocino NTL Forest   | Lake           |
| 93640 | 3  | Mendota                | Fresno         |
| 92584 | 10 | Menifee                | Riverside      |
| 94025 | 5  | Menlo Park             | San Mateo      |
| 92359 | 10 | Mentone                | San Bernardino |
| 95340 | 3  | Merced                 | Merced         |
| 95348 | 3  | Merced                 | Merced         |
| 95957 | 3  | Meridian               | Sutter         |
| 95346 | 1  | MI Wuk Village         | Tuolumne       |
| 95461 | 1  | Middletown             | Lake           |
| 95461 | 4  | Middletown             | Lake           |
| 95345 | 1  | Midpines               | Mariposa       |
| 92655 | 8  | Midway City            | Orange         |
| 96121 | 14 | Milford                | Lassen         |
| 94941 | 5  | Mill Valley            | Marin          |

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|-------|----|--------------------------|-----------------|
| 94030 | 5  | Millbrae                 | San Mateo       |
| 96062 | 3  | Millville                | Shasta          |
| 95035 | 4  | Milpitas                 | Santa Clara     |
| 96063 | 3  | Mineral                  | Tehama          |
| 91752 | 10 | Mira Loma                | Riverside       |
| 93641 | 3  | Miramonte                | Fresno          |
| 91345 | 12 | Mission Hills            | Los Angeles     |
| 92691 | 8  | Mission Viejo            | Orange          |
| 92691 | 13 | Mission Viejo            | Orange          |
| 92692 | 8  | Mission Viejo            | Orange          |
| 92692 | 13 | Mission Viejo            | Orange          |
| 95350 | 3  | Modesto                  | Stanislaus      |
| 95351 | 3  | Modesto                  | Stanislaus      |
| 95354 | 3  | Modesto                  | Stanislaus      |
| 95355 | 3  | Modesto                  | Stanislaus      |
| 95356 | 3  | Modesto                  | Stanislaus      |
| 95357 | 3  | Modesto                  | Stanislaus      |
| 95358 | 3  | Modesto                  | Stanislaus      |
| 00035 | 14 | Modoc/Shasta/Klamath for | Siskiyou        |
| 93501 | 7  | Mojave                   | Kern            |
| 95245 | 1  | Mokelumne Hill           | Calaveras       |
| 91016 | 9  | Monrovia                 | Los Angeles     |
| 96064 | 14 | Montague                 | Siskiyou        |
| 91763 | 10 | Montclair                | San Bernardino  |
| 95462 | 4  | Monte Rio                | Sonoma          |
| 90640 | 9  | Montebello               | Los Angeles     |
| 93940 | 4  | Monterey                 | Monterey        |
| 91754 | 9  | Monterey Park            | Los Angeles     |
| 91754 | 12 | Monterey Park            | Los Angeles     |
| 91755 | 9  | Monterey Park            | Los Angeles     |
| 96065 | 3  | Montgomery Creek         | Shasta          |
| 96065 | 14 | Montgomery Creek         | Shasta          |
| 91020 | 12 | Montrose                 | Los Angeles     |
| 93021 | 8  | Moorpark                 | Ventura         |
| 94556 | 5  | Moraga                   | Contra Costa    |
| 92551 | 10 | Moreno Valley            | Riverside       |
| 92553 | 10 | Moreno Valley            | Riverside       |
| 92555 | 10 | Moreno Valley            | Riverside       |
| 92557 | 10 | Moreno Valley            | Riverside       |
| 95037 | 3  | Morgan Hill              | Santa Clara     |
| 95037 | 4  | Morgan Hill              | Santa Clara     |
| 92256 | 10 | Morongo Valley           | San Bernardino  |
| 93442 | 4  | Morro Bay                | San Luis Obispo |
| 94038 | 5  | Moss Beach               | San Mateo       |
| 95039 | 4  | Moss Landing             | Monterey        |
| 95140 | 4  | Mount Hamilton           | Santa Clara     |
| 96067 | 14 | Mount Shasta             | Siskiyou        |
| 92561 | 10 | Mountain Center          | Riverside       |
| 92561 | 13 | Mountain Center          | Riverside       |

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| 92561 | 15 | Mountain Center         | Riverside       |
| 95246 | 1  | Mountain Ranch          | Calaveras       |
| 94035 | 4  | Mountain View           | Santa Clara     |
| 94040 | 4  | Mountain View           | Santa Clara     |
| 94041 | 4  | Mountain View           | Santa Clara     |
| 94043 | 4  | Mountain View           | Santa Clara     |
| 91759 | 10 | Mt Baldy                | San Bernardino  |
| 00012 | 1  | Mt Meadows Area         | Lassen          |
| 00012 | 14 | Mt Meadows Area         | Lassen          |
| 95247 | 1  | Murphys                 | Calaveras       |
| 92562 | 10 | Murrieta                | Riverside       |
| 92562 | 13 | Murrieta                | Riverside       |
| 92563 | 10 | Murrieta                | Riverside       |
| 95554 | 1  | Myers Flat              | Humboldt        |
| 94558 | 4  | Napa                    | Napa            |
| 94559 | 4  | Napa                    | Napa            |
| 91950 | 13 | National City           | San Diego       |
| 92363 | 10 | Needles                 | San Bernardino  |
| 95959 | 1  | Nevada City             | Nevada          |
| 93254 | 4  | New Cuyama              | Santa Barbara   |
| 94560 | 5  | Newark                  | Alameda         |
| 92365 | 10 | Newberry Springs        | San Bernardino  |
| 91320 | 8  | Newbury Park            | Ventura         |
| 95658 | 2  | Newcastle               | Placer          |
| 91321 | 9  | Newhall                 | Los Angeles     |
| 91321 | 12 | Newhall                 | Los Angeles     |
| 95360 | 3  | Newman                  | Stanislaus      |
| 92660 | 8  | Newport Beach           | Orange          |
| 92663 | 8  | Newport Beach           | Orange          |
| 92657 | 8  | Newport Coast           | Orange          |
| 94946 | 5  | Nicasio                 | Marin           |
| 95464 | 1  | Nice                    | Lake            |
| 95659 | 3  | Nicolaus                | Sutter          |
| 92257 | 15 | Niland                  | Imperial        |
| 93444 | 4  | Nipomo                  | San Luis Obispo |
| 92364 | 10 | Nipton                  | San Bernardino  |
| 92860 | 10 | Norco                   | Riverside       |
| 95724 | 2  | Norden                  | Placer          |
| 93643 | 3  | North Fork              | Madera          |
| 95660 | 6  | North Highlands         | Sacramento      |
| 91343 | 12 | North Hills             | Los Angeles     |
| 91601 | 12 | North Hollywood         | Los Angeles     |
| 91602 | 12 | North Hollywood         | Los Angeles     |
| 91605 | 12 | North Hollywood         | Los Angeles     |
| 91606 | 12 | North Hollywood         | Los Angeles     |
| 95960 | 1  | North San Juan          | Nevada          |
| 95960 | 3  | North San Juan          | Nevada          |
| 00017 | 3  | Northeast Fresno County | Fresno          |
| 91324 | 12 | Northridge              | Los Angeles     |

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| 91325 | 12 | Northridge     | Los Angeles     |
| 90650 | 9  | Norwalk        | Los Angeles     |
| 94945 | 5  | Novato         | Marin           |
| 94947 | 5  | Novato         | Marin           |
| 94949 | 5  | Novato         | Marin           |
| 92567 | 10 | Nuevo          | Riverside       |
| 93645 | 3  | O Neals        | Madera          |
| 91377 | 8  | Oak Park       | Ventura         |
| 96069 | 3  | Oak Run        | Shasta          |
| 93022 | 8  | Oak View       | Ventura         |
| 95361 | 2  | Oakdale        | Stanislaus      |
| 95361 | 3  | Oakdale        | Stanislaus      |
| 93644 | 3  | Oakhurst       | Madera          |
| 94601 | 5  | Oakland        | Alameda         |
| 94602 | 5  | Oakland        | Alameda         |
| 94603 | 5  | Oakland        | Alameda         |
| 94605 | 5  | Oakland        | Alameda         |
| 94606 | 5  | Oakland        | Alameda         |
| 94607 | 5  | Oakland        | Alameda         |
| 94609 | 5  | Oakland        | Alameda         |
| 94610 | 5  | Oakland        | Alameda         |
| 94611 | 5  | Oakland        | Alameda         |
| 94612 | 5  | Oakland        | Alameda         |
| 94618 | 5  | Oakland        | Alameda         |
| 94619 | 5  | Oakland        | Alameda         |
| 94621 | 5  | Oakland        | Alameda         |
| 94561 | 4  | Oakley         | Contra Costa    |
| 95465 | 4  | Occidental     | Sonoma          |
| 93445 | 4  | Oceano         | San Luis Obispo |
| 92054 | 13 | Oceanside      | San Diego       |
| 92056 | 13 | Oceanside      | San Diego       |
| 92057 | 13 | Oceanside      | San Diego       |
| 92259 | 15 | Ocotillo       | Imperial        |
| 93023 | 8  | Ojai           | Ventura         |
| 96071 | 3  | Old Station    | Shasta          |
| 95961 | 3  | Olivehurst     | Yuba            |
| 96146 | 14 | Olympic Valley | Placer          |
| 91761 | 10 | Ontario        | San Bernardino  |
| 91762 | 10 | Ontario        | San Bernardino  |
| 91764 | 10 | Ontario        | San Bernardino  |
| 93255 | 7  | Onyx           | Kern            |
| 92862 | 8  | Orange         | Orange          |
| 92862 | 10 | Orange         | Orange          |
| 92865 | 8  | Orange         | Orange          |
| 92866 | 8  | Orange         | Orange          |
| 92867 | 8  | Orange         | Orange          |
| 92868 | 8  | Orange         | Orange          |
| 92869 | 8  | Orange         | Orange          |
| 93646 | 3  | Orange Cove    | Tulare          |

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| 95662 | 6  | Orangevale             | Sacramento     |
| 95962 | 1  | Oregon House           | Yuba           |
| 95962 | 3  | Oregon House           | Yuba           |
| 95555 | 1  | Orick                  | Humboldt       |
| 94563 | 5  | Orinda                 | Contra Costa   |
| 95963 | 3  | Orland                 | Glenn          |
| 95556 | 1  | Orleans                | Humboldt       |
| 92368 | 10 | Oro Grande             | San Bernardino |
| 93647 | 3  | Orosi                  | Tulare         |
| 95965 | 1  | Oroville               | Butte          |
| 95965 | 3  | Oroville               | Butte          |
| 95966 | 3  | Oroville               | Butte          |
| 93030 | 8  | Oxnard                 | Ventura        |
| 93033 | 8  | Oxnard                 | Ventura        |
| 93035 | 8  | Oxnard                 | Ventura        |
| 93036 | 8  | Oxnard                 | Ventura        |
| 93950 | 4  | Pacific Grove          | Monterey       |
| 90272 | 8  | Pacific Palisades      | Los Angeles    |
| 90272 | 11 | Pacific Palisades      | Los Angeles    |
| 94044 | 5  | Pacifica               | San Mateo      |
| 91331 | 12 | Pacoima                | Los Angeles    |
| 95043 | 3  | Paicines               | San Benito     |
| 95043 | 4  | Paicines               | San Benito     |
| 92059 | 10 | Pala                   | San Diego      |
| 92059 | 13 | Pala                   | San Diego      |
| 95968 | 3  | Palermo                | Butte          |
| 92211 | 10 | Palm Desert            | Riverside      |
| 92211 | 15 | Palm Desert            | Riverside      |
| 92260 | 10 | Palm Desert            | Riverside      |
| 92260 | 15 | Palm Desert            | Riverside      |
| 92262 | 10 | Palm Springs           | Riverside      |
| 92264 | 10 | Palm Springs           | Riverside      |
| 93550 | 9  | Palmdale               | Los Angeles    |
| 93551 | 9  | Palmdale               | Los Angeles    |
| 93552 | 9  | Palmdale               | Los Angeles    |
| 93591 | 9  | Palmdale               | Los Angeles    |
| 94301 | 4  | Palo Alto              | Santa Clara    |
| 94303 | 4  | Palo Alto              | Santa Clara    |
| 94303 | 5  | Palo Alto              | Santa Clara    |
| 94304 | 4  | Palo Alto              | Santa Clara    |
| 94306 | 4  | Palo Alto              | Santa Clara    |
| 96073 | 3  | Palo Cedro             | Shasta         |
| 90274 | 8  | Palos Verdes Peninsula | Los Angeles    |
| 91402 | 12 | Panorama City          | Los Angeles    |
| 95969 | 3  | Paradise               | Butte          |
| 90723 | 9  | Paramount              | Los Angeles    |
| 92267 | 10 | Parker Dam             | San Bernardino |
| 93648 | 3  | Parlier                | Fresno         |
| 91101 | 12 | Pasadena               | Los Angeles    |

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| 91103 | 12 | Pasadena       | Los Angeles     |
| 91104 | 12 | Pasadena       | Los Angeles     |
| 91105 | 9  | Pasadena       | Los Angeles     |
| 91105 | 12 | Pasadena       | Los Angeles     |
| 91106 | 9  | Pasadena       | Los Angeles     |
| 91106 | 12 | Pasadena       | Los Angeles     |
| 91107 | 9  | Pasadena       | Los Angeles     |
| 91107 | 12 | Pasadena       | Los Angeles     |
| 93446 | 4  | Paso Robles    | San Luis Obispo |
| 95363 | 3  | Patterson      | Stanislaus      |
| 92061 | 13 | Pauma Valley   | San Diego       |
| 96075 | 3  | Paynes Creek   | Tehama          |
| 93553 | 9  | Pearblossom    | Los Angeles     |
| 93953 | 4  | Pebble Beach   | Monterey        |
| 95946 | 1  | Penn Valley    | Nevada          |
| 94951 | 4  | Penngrove      | Sonoma          |
| 95663 | 2  | Penryn         | Placer          |
| 92570 | 10 | Perris         | Riverside       |
| 92571 | 10 | Perris         | Riverside       |
| 94060 | 5  | Pescadero      | San Mateo       |
| 94952 | 4  | Petaluma       | Marin           |
| 94952 | 5  | Petaluma       | Marin           |
| 94954 | 4  | Petaluma       | Sonoma          |
| 95558 | 1  | Petrolia       | Humboldt        |
| 92371 | 10 | Phelan         | San Bernardino  |
| 95466 | 1  | Philo          | Mendocino       |
| 90660 | 9  | Pico Rivera    | Los Angeles     |
| 95587 | 1  | Piercy         | Mendocino       |
| 95664 | 1  | Pilot Hill     | El Dorado       |
| 95665 | 2  | Pine Grove     | Amador          |
| 91962 | 13 | Pine Valley    | San Diego       |
| 95364 | 1  | Pinecrest      | Tuolumne        |
| 94564 | 5  | Pinole         | Contra Costa    |
| 92372 | 10 | Pinon Hills    | San Bernardino  |
| 95666 | 1  | Pioneer        | Amador          |
| 95666 | 2  | Pioneer        | Amador          |
| 93449 | 4  | Pismo Beach    | San Luis Obispo |
| 94565 | 4  | Pittsburg      | Contra Costa    |
| 93256 | 3  | Pixley         | Tulare          |
| 93256 | 7  | Pixley         | Tulare          |
| 92870 | 8  | Placentia      | Orange          |
| 95667 | 1  | Placerville    | El Dorado       |
| 96076 | 1  | Platina        | Trinity         |
| 96076 | 3  | Platina        | Trinity         |
| 90293 | 11 | Playa del Rey  | Los Angeles     |
| 95668 | 2  | Pleasant Grove | Sutter          |
| 95668 | 3  | Pleasant Grove | Sutter          |
| 94523 | 5  | Pleasant Hill  | Contra Costa    |
| 94566 | 4  | Pleasanton     | Alameda         |

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|-------|----|------------------------|----------------|
| 94588 | 4  | Pleasanton             | Alameda        |
| 94588 | 5  | Pleasanton             | Alameda        |
| 00065 | 1  | Plumas National Park   | Sierra         |
| 00065 | 3  | Plumas National Park   | Sierra         |
| 00028 | 14 | Plumas NTL Forest      | Plumas         |
| 95669 | 1  | Plymouth               | Amador         |
| 95669 | 2  | Plymouth               | Amador         |
| 95468 | 1  | Point Arena            | Mendocino      |
| 93042 | 8  | Point Mugu Nawc        | Ventura        |
| 94956 | 5  | Point Reyes Station    | Marin          |
| 95726 | 1  | Pollock Pines          | El Dorado      |
| 91766 | 9  | Pomona                 | Los Angeles    |
| 91766 | 10 | Pomona                 | Los Angeles    |
| 91767 | 9  | Pomona                 | Los Angeles    |
| 91768 | 9  | Pomona                 | Los Angeles    |
| 94567 | 4  | Pope Valley            | Napa           |
| 94569 | 5  | Port Costa             | Contra Costa   |
| 93041 | 8  | Port Hueneme           | Ventura        |
| 93043 | 8  | Port Hueneme CBC Base  | Ventura        |
| 91326 | 12 | Porter Ranch           | Los Angeles    |
| 93257 | 7  | Porterville            | Tulare         |
| 96122 | 1  | Portola                | Plumas         |
| 96122 | 14 | Portola                | Plumas         |
| 94028 | 4  | Portola Valley         | San Mateo      |
| 94028 | 5  | Portola Valley         | San Mateo      |
| 93260 | 7  | Posey                  | Tulare         |
| 91963 | 13 | Potrero                | San Diego      |
| 95469 | 1  | Potter Valley          | Mendocino      |
| 92064 | 13 | Poway                  | San Diego      |
| 93651 | 3  | Prather                | Fresno         |
| 95970 | 3  | Princeton              | Colusa         |
| 95971 | 1  | Quincy                 | Plumas         |
| 95971 | 14 | Quincy                 | Plumas         |
| 95972 | 3  | Rackerby               | Yuba           |
| 93652 | 3  | Raisin City            | Fresno         |
| 92065 | 13 | Ramona                 | San Diego      |
| 92066 | 13 | Ranchita               | San Diego      |
| 95670 | 6  | Rancho Cordova         | Sacramento     |
| 95742 | 6  | Rancho Cordova         | Sacramento     |
| 91701 | 10 | Rancho Cucamonga       | San Bernardino |
| 91730 | 10 | Rancho Cucamonga       | San Bernardino |
| 91737 | 10 | Rancho Cucamonga       | San Bernardino |
| 91739 | 10 | Rancho Cucamonga       | San Bernardino |
| 92270 | 10 | Rancho Mirage          | Riverside      |
| 92270 | 15 | Rancho Mirage          | Riverside      |
| 90275 | 8  | Rancho Palos Verdes    | Los Angeles    |
| 92067 | 13 | Rancho Santa Fe        | San Diego      |
| 92091 | 13 | Rancho Santa Fe        | San Diego      |
| 92688 | 8  | Rancho Santa Margarita | Orange         |

|       |    |                        |                |
|-------|----|------------------------|----------------|
| 92688 | 13 | Rancho Santa Margarita | Orange         |
| 93554 | 7  | Randsburg              | Kern           |
| 96123 | 1  | Ravendale              | Lassen         |
| 93653 | 1  | Raymond                | Mariposa       |
| 93653 | 3  | Raymond                | Mariposa       |
| 96080 | 3  | Red Bluff              | Tehama         |
| 95569 | 1  | Redcrest               | Humboldt       |
| 96001 | 3  | Redding                | Shasta         |
| 96002 | 3  | Redding                | Shasta         |
| 96003 | 3  | Redding                | Shasta         |
| 92373 | 10 | Redlands               | San Bernardino |
| 92374 | 10 | Redlands               | San Bernardino |
| 90277 | 8  | Redondo Beach          | Los Angeles    |
| 90278 | 8  | Redondo Beach          | Los Angeles    |
| 95560 | 1  | Redway                 | Humboldt       |
| 94061 | 5  | Redwood City           | San Mateo      |
| 94062 | 5  | Redwood City           | San Mateo      |
| 94063 | 5  | Redwood City           | San Mateo      |
| 94065 | 5  | Redwood City           | San Mateo      |
| 95470 | 1  | Redwood Valley         | Mendocino      |
| 93654 | 3  | Reedley                | Fresno         |
| 95672 | 1  | Rescue                 | El Dorado      |
| 91335 | 12 | Reseda                 | Los Angeles    |
| 92376 | 10 | Rialto                 | San Bernardino |
| 92377 | 10 | Rialto                 | San Bernardino |
| 94801 | 5  | Richmond               | Contra Costa   |
| 94804 | 5  | Richmond               | Contra Costa   |
| 94805 | 5  | Richmond               | Contra Costa   |
| 93555 | 7  | Ridgecrest             | San Bernardino |
| 93555 | 9  | Ridgecrest             | San Bernardino |
| 93555 | 10 | Ridgecrest             | San Bernardino |
| 95562 | 1  | Rio Dell               | Humboldt       |
| 95673 | 6  | Rio Linda              | Sacramento     |
| 95674 | 3  | Rio Oso                | Sutter         |
| 94571 | 4  | Rio Vista              | Solano         |
| 94571 | 6  | Rio Vista              | Solano         |
| 95366 | 2  | Ripon                  | San Joaquin    |
| 95366 | 3  | Ripon                  | San Joaquin    |
| 95367 | 3  | Riverbank              | Stanislaus     |
| 93656 | 3  | Riverdale              | Fresno         |
| 92501 | 10 | Riverside              | Riverside      |
| 92503 | 10 | Riverside              | Riverside      |
| 92504 | 10 | Riverside              | Riverside      |
| 92505 | 10 | Riverside              | Riverside      |
| 92506 | 10 | Riverside              | Riverside      |
| 92507 | 10 | Riverside              | Riverside      |
| 92508 | 10 | Riverside              | Riverside      |
| 92509 | 10 | Riverside              | Riverside      |
| 92521 | 10 | Riverside              | Riverside      |



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|-------|----|-----------------|----------------|
| 95677 | 2  | Rocklin         | Placer         |
| 95765 | 2  | Rocklin         | Placer         |
| 94572 | 4  | Rodeo           | Contra Costa   |
| 94572 | 5  | Rodeo           | Contra Costa   |
| 94928 | 4  | Rohnert Park    | Sonoma         |
| 93560 | 3  | Rosamond        | Kern           |
| 93560 | 7  | Rosamond        | Kern           |
| 93560 | 9  | Rosamond        | Kern           |
| 91770 | 9  | Rosemead        | Los Angeles    |
| 95661 | 2  | Roseville       | Placer         |
| 95678 | 2  | Roseville       | Placer         |
| 95747 | 2  | Roseville       | Placer         |
| 95975 | 1  | Rough and Ready | Nevada         |
| 91748 | 9  | Rowland Heights | Los Angeles    |
| 95679 | 2  | Rumsey          | Yolo           |
| 92382 | 10 | Running Springs | San Bernardino |
| 95814 | 6  | Sacramento      | Sacramento     |
| 95815 | 6  | Sacramento      | Sacramento     |
| 95816 | 6  | Sacramento      | Sacramento     |
| 95817 | 6  | Sacramento      | Sacramento     |
| 95818 | 6  | Sacramento      | Sacramento     |
| 95819 | 6  | Sacramento      | Sacramento     |
| 95820 | 6  | Sacramento      | Sacramento     |
| 95821 | 6  | Sacramento      | Sacramento     |
| 95822 | 6  | Sacramento      | Sacramento     |
| 95823 | 6  | Sacramento      | Sacramento     |
| 95824 | 6  | Sacramento      | Sacramento     |
| 95825 | 6  | Sacramento      | Sacramento     |
| 95826 | 6  | Sacramento      | Sacramento     |
| 95827 | 6  | Sacramento      | Sacramento     |
| 95828 | 6  | Sacramento      | Sacramento     |
| 95829 | 6  | Sacramento      | Sacramento     |
| 95830 | 6  | Sacramento      | Sacramento     |
| 95831 | 6  | Sacramento      | Sacramento     |
| 95832 | 6  | Sacramento      | Sacramento     |
| 95833 | 6  | Sacramento      | Sacramento     |
| 95834 | 6  | Sacramento      | Sacramento     |
| 95835 | 6  | Sacramento      | Sacramento     |
| 95836 | 3  | Sacramento      | Sacramento     |
| 95836 | 6  | Sacramento      | Sacramento     |
| 95837 | 3  | Sacramento      | Sacramento     |
| 95837 | 6  | Sacramento      | Sacramento     |
| 95838 | 6  | Sacramento      | Sacramento     |
| 95841 | 6  | Sacramento      | Sacramento     |
| 95842 | 6  | Sacramento      | Sacramento     |
| 95864 | 6  | Sacramento      | Sacramento     |
| 94574 | 4  | Saint Helena    | Napa           |
| 95368 | 3  | Salida          | Stanislaus     |
| 93901 | 4  | Salinas         | Monterey       |

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|-------|----|----------------|----------------|
| 93905 | 4  | Salinas        | Monterey       |
| 93906 | 4  | Salinas        | Monterey       |
| 93907 | 4  | Salinas        | Monterey       |
| 93908 | 4  | Salinas        | Monterey       |
| 95563 | 1  | Salyer         | Humboldt       |
| 95564 | 1  | Samoa          | Humboldt       |
| 95249 | 1  | San Andreas    | Calaveras      |
| 94960 | 5  | San Anselmo    | Marin          |
| 93450 | 3  | San Ardo       | Monterey       |
| 93450 | 4  | San Ardo       | Monterey       |
| 92404 | 10 | San Bernardino | San Bernardino |
| 92405 | 10 | San Bernardino | San Bernardino |
| 92407 | 10 | San Bernardino | San Bernardino |
| 92408 | 10 | San Bernardino | San Bernardino |
| 92410 | 10 | San Bernardino | San Bernardino |
| 92411 | 10 | San Bernardino | San Bernardino |
| 94066 | 5  | San Bruno      | San Mateo      |
| 94070 | 5  | San Carlos     | San Mateo      |
| 92672 | 8  | San Clemente   | San Diego      |
| 92672 | 13 | San Clemente   | San Diego      |
| 92673 | 8  | San Clemente   | Orange         |
| 92673 | 13 | San Clemente   | Orange         |
| 92101 | 13 | San Diego      | San Diego      |
| 92102 | 13 | San Diego      | San Diego      |
| 92103 | 13 | San Diego      | San Diego      |
| 92104 | 13 | San Diego      | San Diego      |
| 92105 | 13 | San Diego      | San Diego      |
| 92106 | 13 | San Diego      | San Diego      |
| 92107 | 13 | San Diego      | San Diego      |
| 92108 | 13 | San Diego      | San Diego      |
| 92109 | 13 | San Diego      | San Diego      |
| 92110 | 13 | San Diego      | San Diego      |
| 92111 | 13 | San Diego      | San Diego      |
| 92113 | 13 | San Diego      | San Diego      |
| 92114 | 13 | San Diego      | San Diego      |
| 92115 | 13 | San Diego      | San Diego      |
| 92116 | 13 | San Diego      | San Diego      |
| 92117 | 13 | San Diego      | San Diego      |
| 92119 | 13 | San Diego      | San Diego      |
| 92120 | 13 | San Diego      | San Diego      |
| 92121 | 13 | San Diego      | San Diego      |
| 92122 | 13 | San Diego      | San Diego      |
| 92123 | 13 | San Diego      | San Diego      |
| 92124 | 13 | San Diego      | San Diego      |
| 92126 | 13 | San Diego      | San Diego      |
| 92127 | 13 | San Diego      | San Diego      |
| 92128 | 13 | San Diego      | San Diego      |
| 92129 | 13 | San Diego      | San Diego      |
| 92130 | 13 | San Diego      | San Diego      |

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| 92131 | 13 | San Diego     | San Diego     |
| 92135 | 13 | San Diego     | San Diego     |
| 92136 | 13 | San Diego     | San Diego     |
| 92139 | 13 | San Diego     | San Diego     |
| 92140 | 13 | San Diego     | San Diego     |
| 92145 | 13 | San Diego     | San Diego     |
| 92154 | 13 | San Diego     | San Diego     |
| 92155 | 13 | San Diego     | San Diego     |
| 91773 | 9  | San Dimas     | Los Angeles   |
| 91340 | 12 | San Fernando  | Los Angeles   |
| 94103 | 5  | San Francisco | San Francisco |
| 94107 | 5  | San Francisco | San Francisco |
| 94109 | 5  | San Francisco | San Francisco |
| 94110 | 5  | San Francisco | San Francisco |
| 94112 | 5  | San Francisco | San Francisco |
| 94114 | 5  | San Francisco | San Francisco |
| 94115 | 5  | San Francisco | San Francisco |
| 94116 | 5  | San Francisco | San Francisco |
| 94117 | 5  | San Francisco | San Francisco |
| 94118 | 5  | San Francisco | San Francisco |
| 94121 | 5  | San Francisco | San Francisco |
| 94122 | 5  | San Francisco | San Francisco |
| 94123 | 5  | San Francisco | San Francisco |
| 94124 | 5  | San Francisco | San Francisco |
| 94127 | 5  | San Francisco | San Francisco |
| 94128 | 5  | San Francisco | San Mateo     |
| 94129 | 5  | San Francisco | San Francisco |
| 94130 | 5  | San Francisco | San Francisco |
| 94131 | 5  | San Francisco | San Francisco |
| 94132 | 5  | San Francisco | San Francisco |
| 94133 | 5  | San Francisco | San Francisco |
| 94134 | 5  | San Francisco | San Francisco |
| 94158 | 5  | San Francisco | San Francisco |
| 91775 | 9  | San Gabriel   | Los Angeles   |
| 91776 | 9  | San Gabriel   | Los Angeles   |
| 94963 | 5  | San Geronimo  | Marin         |
| 94074 | 5  | San Gregorio  | San Mateo     |
| 92582 | 10 | San Jacinto   | Riverside     |
| 92583 | 10 | San Jacinto   | Riverside     |
| 93660 | 3  | San Joaquin   | Fresno        |
| 95110 | 4  | San Jose      | Santa Clara   |
| 95111 | 4  | San Jose      | Santa Clara   |
| 95112 | 4  | San Jose      | Santa Clara   |
| 95116 | 4  | San Jose      | Santa Clara   |
| 95117 | 4  | San Jose      | Santa Clara   |
| 95118 | 4  | San Jose      | Santa Clara   |
| 95119 | 4  | San Jose      | Santa Clara   |
| 95120 | 4  | San Jose      | Santa Clara   |
| 95121 | 4  | San Jose      | Santa Clara   |

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| 95122 | 4  | San Jose            | Santa Clara     |
| 95123 | 4  | San Jose            | Santa Clara     |
| 95124 | 4  | San Jose            | Santa Clara     |
| 95125 | 4  | San Jose            | Santa Clara     |
| 95126 | 4  | San Jose            | Santa Clara     |
| 95127 | 4  | San Jose            | Santa Clara     |
| 95128 | 4  | San Jose            | Santa Clara     |
| 95129 | 4  | San Jose            | Santa Clara     |
| 95130 | 4  | San Jose            | Santa Clara     |
| 95131 | 4  | San Jose            | Santa Clara     |
| 95132 | 4  | San Jose            | Santa Clara     |
| 95133 | 4  | San Jose            | Santa Clara     |
| 95134 | 4  | San Jose            | Santa Clara     |
| 95135 | 4  | San Jose            | Santa Clara     |
| 95136 | 4  | San Jose            | Santa Clara     |
| 95138 | 4  | San Jose            | Santa Clara     |
| 95139 | 4  | San Jose            | Santa Clara     |
| 95148 | 4  | San Jose            | Santa Clara     |
| 95045 | 4  | San Juan Bautista   | San Benito      |
| 92675 | 8  | San Juan Capistrano | Orange          |
| 92675 | 13 | San Juan Capistrano | Orange          |
| 94577 | 5  | San Leandro         | Alameda         |
| 94578 | 5  | San Leandro         | Alameda         |
| 94579 | 5  | San Leandro         | Alameda         |
| 94580 | 5  | San Lorenzo         | Alameda         |
| 93401 | 4  | San Luis Obispo     | San Luis Obispo |
| 93405 | 4  | San Luis Obispo     | San Luis Obispo |
| 92069 | 13 | San Marcos          | San Diego       |
| 92078 | 13 | San Marcos          | San Diego       |
| 91108 | 9  | San Marino          | Los Angeles     |
| 95046 | 4  | San Martin          | Santa Clara     |
| 94401 | 5  | San Mateo           | San Mateo       |
| 94402 | 5  | San Mateo           | San Mateo       |
| 94403 | 5  | San Mateo           | San Mateo       |
| 94404 | 5  | San Mateo           | San Mateo       |
| 93451 | 3  | San Miguel          | Monterey        |
| 93451 | 4  | San Miguel          | Monterey        |
| 94806 | 5  | San Pablo           | Contra Costa    |
| 90731 | 11 | San Pedro           | Los Angeles     |
| 90732 | 11 | San Pedro           | Los Angeles     |
| 94901 | 5  | San Rafael          | Marin           |
| 94903 | 5  | San Rafael          | Marin           |
| 94582 | 4  | San Ramon           | Contra Costa    |
| 94583 | 4  | San Ramon           | Contra Costa    |
| 94583 | 5  | San Ramon           | Contra Costa    |
| 93452 | 4  | San Simeon          | San Luis Obispo |
| 92173 | 13 | San Ysidro          | San Diego       |
| 93657 | 3  | Sanger              | Fresno          |
| 92701 | 8  | Santa Ana           | Orange          |

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| 92703 | 8  | Santa Ana        | Orange          |
| 92704 | 8  | Santa Ana        | Orange          |
| 92705 | 8  | Santa Ana        | Orange          |
| 92706 | 8  | Santa Ana        | Orange          |
| 92707 | 8  | Santa Ana        | Orange          |
| 93101 | 8  | Santa Barbara    | Santa Barbara   |
| 93103 | 8  | Santa Barbara    | Santa Barbara   |
| 93105 | 4  | Santa Barbara    | Santa Barbara   |
| 93105 | 8  | Santa Barbara    | Santa Barbara   |
| 93106 | 8  | Santa Barbara    | Santa Barbara   |
| 93108 | 8  | Santa Barbara    | Santa Barbara   |
| 93109 | 8  | Santa Barbara    | Santa Barbara   |
| 93110 | 8  | Santa Barbara    | Santa Barbara   |
| 93111 | 8  | Santa Barbara    | Santa Barbara   |
| 95050 | 4  | Santa Clara      | Santa Clara     |
| 95051 | 4  | Santa Clara      | Santa Clara     |
| 95054 | 4  | Santa Clara      | Santa Clara     |
| 91350 | 9  | Santa Clarita    | Los Angeles     |
| 91390 | 9  | Santa Clarita    | Los Angeles     |
| 95060 | 5  | Santa Cruz       | Santa Cruz      |
| 95062 | 5  | Santa Cruz       | Santa Cruz      |
| 95064 | 5  | Santa Cruz       | Santa Cruz      |
| 95065 | 5  | Santa Cruz       | Santa Cruz      |
| 90670 | 9  | Santa Fe Springs | Los Angeles     |
| 93453 | 3  | Santa Margarita  | San Luis Obispo |
| 93453 | 4  | Santa Margarita  | San Luis Obispo |
| 93454 | 4  | Santa Maria      | Santa Barbara   |
| 93455 | 4  | Santa Maria      | Santa Barbara   |
| 93458 | 4  | Santa Maria      | Santa Barbara   |
| 90401 | 11 | Santa Monica     | Los Angeles     |
| 90402 | 11 | Santa Monica     | Los Angeles     |
| 90404 | 11 | Santa Monica     | Los Angeles     |
| 90405 | 11 | Santa Monica     | Los Angeles     |
| 93060 | 8  | Santa Paula      | Ventura         |
| 95401 | 4  | Santa Rosa       | Sonoma          |
| 95403 | 4  | Santa Rosa       | Sonoma          |
| 95404 | 4  | Santa Rosa       | Sonoma          |
| 95405 | 4  | Santa Rosa       | Sonoma          |
| 95407 | 4  | Santa Rosa       | Sonoma          |
| 95409 | 4  | Santa Rosa       | Sonoma          |
| 93460 | 4  | Santa Ynez       | Santa Barbara   |
| 92070 | 13 | Santa Ysabel     | San Diego       |
| 92071 | 13 | Santee           | San Diego       |
| 95070 | 4  | Saratoga         | Santa Clara     |
| 94965 | 5  | Sausalito        | Marin           |
| 95565 | 1  | Scotia           | Humboldt        |
| 96085 | 14 | Scott Bar        | Siskiyou        |
| 95066 | 5  | Scotts Valley    | Santa Cruz      |
| 90740 | 8  | Seal Beach       | Orange          |

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|-------|----|--------------------------|-----------------|
| 93955 | 4  | Seaside                  | Monterey        |
| 95472 | 4  | Sebastopol               | Sonoma          |
| 96086 | 14 | Seiad Valley             | Siskiyou        |
| 93662 | 3  | Selma                    | Fresno          |
| 00016 | 7  | Sequoia National Forest  | Kern            |
| 93262 | 3  | Sequoia National Park    | Tulare          |
| 93262 | 7  | Sequoia National Park    | Tulare          |
| 93263 | 3  | Shafter                  | Kern            |
| 93461 | 3  | Shandon                  | San Luis Obispo |
| 93461 | 4  | Shandon                  | San Luis Obispo |
| 96087 | 3  | Shasta                   | Shasta          |
| 96019 | 3  | Shasta Lake              | Shasta          |
| 93664 | 3  | Shaver Lake              | Fresno          |
| 95681 | 2  | Sheridan                 | Placer          |
| 91403 | 11 | Sherman Oaks             | Los Angeles     |
| 91403 | 12 | Sherman Oaks             | Los Angeles     |
| 91423 | 11 | Sherman Oaks             | Los Angeles     |
| 91423 | 12 | Sherman Oaks             | Los Angeles     |
| 95682 | 1  | Shingle Springs          | El Dorado       |
| 96088 | 3  | Shingletown              | Shasta          |
| 92384 | 9  | Shoshone                 | Inyo            |
| 96125 | 1  | Sierra City              | Sierra          |
| 91024 | 9  | Sierra Madre             | Los Angeles     |
| 00020 | 3  | Sierra National Forest   | Madera          |
| 96126 | 14 | Sierraville              | Sierra          |
| 90755 | 9  | Signal Hill              | Los Angeles     |
| 92676 | 8  | Silverado                | Orange          |
| 92676 | 10 | Silverado                | Orange          |
| 93063 | 8  | Simi Valley              | Ventura         |
| 93065 | 8  | Simi Valley              | Ventura         |
| 00049 | 14 | Six Rivers National Fore | Siskiyou        |
| 00050 | 1  | Six Rivers NTL Forest    | Humboldt        |
| 00054 | 1  | Six Rivers NTL Forest    | Humboldt        |
| 92385 | 10 | Skyforest                | San Bernardino  |
| 95683 | 6  | Sloughhouse              | Sacramento      |
| 95977 | 1  | Smartville               | Nevada          |
| 95977 | 3  | Smartville               | Nevada          |
| 95567 | 14 | Smith River              | Del Norte       |
| 95369 | 1  | Snelling                 | Merced          |
| 95369 | 3  | Snelling                 | Merced          |
| 95728 | 1  | Soda Springs             | Nevada          |
| 95728 | 14 | Soda Springs             | Nevada          |
| 92075 | 13 | Solana Beach             | San Diego       |
| 93960 | 4  | Soledad                  | Monterey        |
| 93463 | 4  | Solvang                  | Santa Barbara   |
| 95684 | 1  | Somerset                 | El Dorado       |
| 95568 | 14 | Somes Bar                | Siskiyou        |
| 93066 | 8  | Somis                    | Ventura         |
| 95476 | 4  | Sonoma                   | Sonoma          |

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| 95370 | 1  | Sonora                   | Tuolumne    |
| 95073 | 5  | Soquel                   | Santa Cruz  |
| 95372 | 1  | Soulsbyville             | Tuolumne    |
| 00044 | 1  | South Alpine County      | Alpine      |
| 00044 | 14 | South Alpine County      | Alpine      |
| 91733 | 9  | South El Monte           | Los Angeles |
| 90280 | 9  | South Gate               | Los Angeles |
| 96150 | 1  | South Lake Tahoe         | El Dorado   |
| 96150 | 14 | South Lake Tahoe         | El Dorado   |
| 91030 | 9  | South Pasadena           | Los Angeles |
| 91030 | 12 | South Pasadena           | Los Angeles |
| 94080 | 5  | South San Francisco      | San Mateo   |
| 00039 | 1  | Southeast Trinity County | Trinity     |
| 00039 | 3  | Southeast Trinity County | Trinity     |
| 91977 | 13 | Spring Valley            | San Diego   |
| 91978 | 13 | Spring Valley            | San Diego   |
| 93265 | 7  | Springville              | Tulare      |
| 93675 | 3  | Squaw Valley             | Fresno      |
| 96128 | 1  | Standish                 | Lassen      |
| 96128 | 14 | Standish                 | Lassen      |
| 94305 | 4  | Stanford                 | Santa Clara |
| 90680 | 8  | Stanton                  | Orange      |
| 91381 | 9  | Stevenson Ranch          | Los Angeles |
| 91381 | 12 | Stevenson Ranch          | Los Angeles |
| 95374 | 3  | Stevinson                | Merced      |
| 95480 | 4  | Stewarts Point           | Sonoma      |
| 94970 | 5  | Stinson Beach            | Marin       |
| 95202 | 2  | Stockton                 | San Joaquin |
| 95203 | 2  | Stockton                 | San Joaquin |
| 95204 | 2  | Stockton                 | San Joaquin |
| 95205 | 2  | Stockton                 | San Joaquin |
| 95206 | 2  | Stockton                 | San Joaquin |
| 95206 | 4  | Stockton                 | San Joaquin |
| 95207 | 2  | Stockton                 | San Joaquin |
| 95209 | 2  | Stockton                 | San Joaquin |
| 95210 | 2  | Stockton                 | San Joaquin |
| 95212 | 2  | Stockton                 | San Joaquin |
| 95215 | 2  | Stockton                 | San Joaquin |
| 95219 | 2  | Stockton                 | San Joaquin |
| 95979 | 3  | Stonyford                | Colusa      |
| 93266 | 3  | Stratford                | Kings       |
| 93267 | 7  | Strathmore               | Tulare      |
| 95981 | 1  | Strawberry Valley        | Plumas      |
| 95981 | 3  | Strawberry Valley        | Plumas      |
| 95981 | 14 | Strawberry Valley        | Plumas      |
| 91604 | 11 | Studio City              | Los Angeles |
| 91604 | 12 | Studio City              | Los Angeles |
| 94585 | 4  | Suisun City              | Solano      |
| 92585 | 10 | Sun City                 | Riverside   |

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| 92586 | 10 | Sun City              | Riverside       |
| 92587 | 10 | Sun City              | Riverside       |
| 91352 | 12 | Sun Valley            | Los Angeles     |
| 91040 | 9  | Sunland               | Los Angeles     |
| 91040 | 12 | Sunland               | Los Angeles     |
| 94085 | 4  | Sunnyvale             | Santa Clara     |
| 94086 | 4  | Sunnyvale             | Santa Clara     |
| 94087 | 4  | Sunnyvale             | Santa Clara     |
| 94089 | 4  | Sunnyvale             | Santa Clara     |
| 94586 | 4  | Sunol                 | Alameda         |
| 94586 | 5  | Sunol                 | Alameda         |
| 96130 | 1  | Susanville            | Lassen          |
| 96130 | 14 | Susanville            | Lassen          |
| 95982 | 3  | Sutter                | Sutter          |
| 95685 | 2  | Sutter Creek          | Amador          |
| 91342 | 9  | Sylmar                | Los Angeles     |
| 91342 | 12 | Sylmar                | Los Angeles     |
| 93268 | 3  | Taft                  | Kern            |
| 96145 | 2  | Tahoe City            | Placer          |
| 96145 | 14 | Tahoe City            | Placer          |
| 00029 | 1  | Tahoe National Forest | Placer          |
| 00029 | 3  | Tahoe National Forest | Placer          |
| 00033 | 14 | Tahoe National Forest | Sierra          |
| 96148 | 14 | Tahoe Vista           | Placer          |
| 96142 | 14 | Tahoma                | Placer          |
| 91356 | 11 | Tarzana               | Los Angeles     |
| 91356 | 12 | Tarzana               | Los Angeles     |
| 95983 | 1  | Taylorsville          | Plumas          |
| 95983 | 14 | Taylorsville          | Plumas          |
| 91980 | 13 | Tecate                | San Diego       |
| 92389 | 9  | Tecopa                | Inyo            |
| 92389 | 10 | Tecopa                | Inyo            |
| 93561 | 3  | Tehachapi             | Kern            |
| 93561 | 7  | Tehachapi             | Kern            |
| 92590 | 10 | Temecula              | Riverside       |
| 92591 | 10 | Temecula              | Riverside       |
| 92592 | 10 | Temecula              | Riverside       |
| 91780 | 9  | Temple City           | Los Angeles     |
| 93465 | 4  | Templeton             | San Luis Obispo |
| 96132 | 1  | Termo                 | Lassen          |
| 93270 | 7  | Terra Bella           | Tulare          |
| 95497 | 4  | The Sea Ranch         | Sonoma          |
| 92274 | 15 | Thermal               | Imperial        |
| 91360 | 8  | Thousand Oaks         | Ventura         |
| 91362 | 8  | Thousand Oaks         | Ventura         |
| 92276 | 10 | Thousand Palms        | Riverside       |
| 92276 | 15 | Thousand Palms        | Riverside       |
| 93271 | 7  | Three Rivers          | Tulare          |
| 93272 | 7  | Tipton                | Tulare          |



|       |    |                    |                |
|-------|----|--------------------|----------------|
| 93667 | 3  | Tollhouse          | Fresno         |
| 94971 | 5  | Tomales            | Marin          |
| 90290 | 8  | Topanga            | Los Angeles    |
| 96133 | 1  | Topaz              | Mono           |
| 90501 | 8  | Torrance           | Los Angeles    |
| 90502 | 11 | Torrance           | Los Angeles    |
| 90503 | 8  | Torrance           | Los Angeles    |
| 90504 | 8  | Torrance           | Los Angeles    |
| 90505 | 8  | Torrance           | Los Angeles    |
| 92679 | 8  | Trabuco Canyon     | Orange         |
| 92679 | 13 | Trabuco Canyon     | Orange         |
| 95304 | 2  | Tracy              | San Joaquin    |
| 95376 | 2  | Tracy              | San Joaquin    |
| 95377 | 2  | Tracy              | San Joaquin    |
| 95391 | 2  | Tracy              | San Joaquin    |
| 95391 | 4  | Tracy              | San Joaquin    |
| 93668 | 3  | Tranquillity       | Fresno         |
| 94535 | 4  | Travis AFB         | Solano         |
| 95570 | 1  | Trinidad           | Humboldt       |
| 96091 | 1  | Trinity Center     | Trinity        |
| 00055 | 1  | Trinity NTL Forest | Trinity        |
| 93562 | 10 | Trona              | San Bernardino |
| 96161 | 1  | Truckee            | Nevada         |
| 96161 | 2  | Truckee            | Nevada         |
| 96161 | 14 | Truckee            | Nevada         |
| 96162 | 1  | Truckee            | Nevada         |
| 91042 | 9  | Tujunga            | Los Angeles    |
| 91042 | 12 | Tujunga            | Los Angeles    |
| 93274 | 3  | Tulare             | Tulare         |
| 93274 | 7  | Tulare             | Tulare         |
| 96134 | 14 | Tulelake           | Siskiyou       |
| 95379 | 1  | Tuolumne           | Tuolumne       |
| 93276 | 3  | Tupman             | Kern           |
| 95380 | 3  | Turlock            | Stanislaus     |
| 95382 | 3  | Turlock            | Stanislaus     |
| 92780 | 8  | Tustin             | Orange         |
| 92782 | 8  | Tustin             | Orange         |
| 95984 | 1  | Twain              | Plumas         |
| 95383 | 1  | Twain Harte        | Tuolumne       |
| 92277 | 10 | Twentynine Palms   | San Bernardino |
| 92277 | 15 | Twentynine Palms   | San Bernardino |
| 92278 | 10 | Twentynine Palms   | San Bernardino |
| 95482 | 1  | Ukiah              | Mendocino      |
| 94587 | 5  | Union City         | Alameda        |
| 91608 | 12 | Universal City     | Los Angeles    |
| 91784 | 10 | Upland             | San Bernardino |
| 91786 | 10 | Upland             | San Bernardino |
| 95485 | 1  | Upper Lake         | Lake           |
| 95687 | 4  | Vacaville          | Solano         |

|       |    |                |                |
|-------|----|----------------|----------------|
| 95688 | 4  | Vacaville      | Solano         |
| 91354 | 9  | Valencia       | Los Angeles    |
| 91355 | 9  | Valencia       | Los Angeles    |
| 94589 | 4  | Vallejo        | Solano         |
| 94590 | 4  | Vallejo        | Solano         |
| 94591 | 4  | Vallejo        | Solano         |
| 94592 | 4  | Vallejo        | Solano         |
| 92082 | 13 | Valley Center  | San Diego      |
| 94972 | 4  | Valley Ford    | Sonoma         |
| 95252 | 1  | Valley Springs | Calaveras      |
| 91607 | 12 | Valley Village | Los Angeles    |
| 93563 | 9  | Valyermo       | Los Angeles    |
| 91401 | 12 | Van Nuys       | Los Angeles    |
| 91405 | 12 | Van Nuys       | Los Angeles    |
| 91406 | 12 | Van Nuys       | Los Angeles    |
| 91411 | 12 | Van Nuys       | Los Angeles    |
| 90291 | 11 | Venice         | Los Angeles    |
| 93001 | 8  | Ventura        | Ventura        |
| 93003 | 8  | Ventura        | Ventura        |
| 93004 | 8  | Ventura        | Ventura        |
| 95385 | 3  | Vernalis       | Stanislaus     |
| 92392 | 10 | Victorville    | San Bernardino |
| 92394 | 10 | Victorville    | San Bernardino |
| 92395 | 10 | Victorville    | San Bernardino |
| 92280 | 10 | Vidal          | San Bernardino |
| 92861 | 8  | Villa Park     | Orange         |
| 96135 | 14 | Vinton         | Plumas         |
| 93277 | 7  | Visalia        | Tulare         |
| 93291 | 3  | Visalia        | Tulare         |
| 93291 | 7  | Visalia        | Tulare         |
| 93292 | 3  | Visalia        | Tulare         |
| 93292 | 7  | Visalia        | Tulare         |
| 92081 | 13 | Vista          | San Diego      |
| 92083 | 13 | Vista          | San Diego      |
| 92084 | 13 | Vista          | San Diego      |
| 95689 | 2  | Volcano        | Amador         |
| 91789 | 9  | Walnut         | Los Angeles    |
| 94595 | 5  | Walnut Creek   | Contra Costa   |
| 94596 | 4  | Walnut Creek   | Contra Costa   |
| 94596 | 5  | Walnut Creek   | Contra Costa   |
| 94597 | 5  | Walnut Creek   | Contra Costa   |
| 94598 | 4  | Walnut Creek   | Contra Costa   |
| 94598 | 5  | Walnut Creek   | Contra Costa   |
| 95690 | 2  | Walnut Grove   | Sacramento     |
| 95690 | 4  | Walnut Grove   | Sacramento     |
| 95690 | 6  | Walnut Grove   | Sacramento     |
| 92086 | 13 | Warner Springs | San Diego      |
| 93280 | 3  | Wasco          | Kern           |
| 93280 | 7  | Wasco          | Kern           |

|       |    |                    |             |
|-------|----|--------------------|-------------|
| 95386 | 3  | Waterford          | Stanislaus  |
| 95076 | 4  | Watsonville        | Santa Cruz  |
| 95076 | 5  | Watsonville        | Santa Cruz  |
| 96093 | 1  | Weaverville        | Trinity     |
| 96094 | 14 | Weed               | Siskiyou    |
| 93283 | 7  | Weldon             | Kern        |
| 96136 | 1  | Wendel             | Lassen      |
| 96136 | 14 | Wendel             | Lassen      |
| 91790 | 9  | West Covina        | Los Angeles |
| 91791 | 9  | West Covina        | Los Angeles |
| 91792 | 9  | West Covina        | Los Angeles |
| 00047 | 3  | West Glenn County  | Glenn       |
| 91307 | 8  | West Hills         | Ventura     |
| 91307 | 12 | West Hills         | Ventura     |
| 90069 | 11 | West Hollywood     | Los Angeles |
| 95255 | 1  | West Point         | Calaveras   |
| 95605 | 2  | West Sacramento    | Yolo        |
| 95691 | 2  | West Sacramento    | Yolo        |
| 95691 | 3  | West Sacramento    | Yolo        |
| 00037 | 3  | West Tehama County | Tehama      |
| 91361 | 8  | Westlake Village   | Ventura     |
| 92683 | 8  | Westminster        | Orange      |
| 92281 | 15 | Westmorland        | Imperial    |
| 95488 | 1  | Westport           | Mendocino   |
| 96137 | 1  | Westwood           | Plumas      |
| 96137 | 14 | Westwood           | Plumas      |
| 95692 | 1  | Wheatland          | Yuba        |
| 95692 | 2  | Wheatland          | Yuba        |
| 95692 | 3  | Wheatland          | Yuba        |
| 92282 | 10 | White Water        | Riverside   |
| 95589 | 1  | Whitethorn         | Humboldt    |
| 96096 | 3  | Whitmore           | Shasta      |
| 90601 | 9  | Whittier           | Los Angeles |
| 90602 | 9  | Whittier           | Los Angeles |
| 90603 | 9  | Whittier           | Los Angeles |
| 90604 | 9  | Whittier           | Los Angeles |
| 90605 | 9  | Whittier           | Los Angeles |
| 90606 | 9  | Whittier           | Los Angeles |
| 92595 | 10 | Wildomar           | Riverside   |
| 95987 | 3  | Williams           | Colusa      |
| 95490 | 1  | Willits            | Mendocino   |
| 95573 | 1  | Willow Creek       | Humboldt    |
| 95988 | 3  | Willows            | Glenn       |
| 90744 | 11 | Wilmington         | Los Angeles |
| 95257 | 1  | Wilseyville        | Calaveras   |
| 95693 | 6  | Wilton             | Sacramento  |
| 92596 | 10 | Winchester         | Riverside   |
| 95492 | 4  | Windsor            | Sonoma      |
| 91306 | 12 | Winnetka           | Los Angeles |

|       |    |                        |                |
|-------|----|------------------------|----------------|
| 92283 | 10 | Winterhaven            | Imperial       |
| 92283 | 15 | Winterhaven            | Imperial       |
| 95694 | 2  | Winters                | Yolo           |
| 95694 | 4  | Winters                | Yolo           |
| 95388 | 3  | Winton                 | Merced         |
| 93669 | 3  | Wishon                 | Madera         |
| 95493 | 1  | Witter Springs         | Lake           |
| 93285 | 7  | Wofford Heights        | Kern           |
| 94973 | 5  | Woodacre               | Marin          |
| 95258 | 2  | Woodbridge             | San Joaquin    |
| 93286 | 3  | Woodlake               | Tulare         |
| 93286 | 7  | Woodlake               | Tulare         |
| 95695 | 2  | Woodland               | Yolo           |
| 95776 | 2  | Woodland               | Yolo           |
| 95776 | 3  | Woodland               | Yolo           |
| 91364 | 8  | Woodland Hills         | Los Angeles    |
| 91364 | 12 | Woodland Hills         | Los Angeles    |
| 91367 | 12 | Woodland Hills         | Los Angeles    |
| 91371 | 12 | Woodland Hills         | Los Angeles    |
| 93287 | 7  | Woody                  | Kern           |
| 92397 | 10 | Wrightwood             | San Bernardino |
| 92886 | 8  | Yorba Linda            | Orange         |
| 92887 | 8  | Yorba Linda            | Orange         |
| 95494 | 1  | Yorkville              | Mendocino      |
| 95389 | 1  | Yosemite National Park | Mariposa       |
| 00040 | 1  | Yosemite NTL Park      | Tuolumne       |
| 00058 | 1  | Yosemite NTL Park      | Mariposa       |
| 94599 | 4  | Yountville             | Napa           |
| 96097 | 14 | Yreka                  | Siskiyou       |
| 95991 | 3  | Yuba City              | Sutter         |
| 95993 | 3  | Yuba City              | Sutter         |
| 92399 | 10 | Yucaipa                | San Bernardino |
| 92284 | 10 | Yucca Valley           | San Bernardino |
| 95698 | 2  | Zamora                 | Yolo           |
| 95595 | 1  | Zenia                  | Trinity        |

Source: Forecast Climate Zone data from California Energy Commission- Energy Facilities Siting Division - Cartography Unit, 1516 9th Street, MS48, Sacramento, CA 95814, October 11, 2010 shape files.