

APPENDIX 8



Murrieta Apartments Greenhouse Gas Analysis City of Murrieta

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LIST OF ABBREVIATED TERMS

%	percent
°F	degrees Fahrenheit
AB	Assembly Bill
AB 1881	California Water Conservation in Landscaping Act of 2006
AB 32	Global Warming Solutions Act of 2006
ACC	Advanced Clean Cars
C ₂ F ₆	hexafluoroethane
C ₂ H ₆	ethane
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGAPS	California LBNL GHG Analysis of Policies Spreadsheet
CALGreen	California Green Building Standards Code
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CCR	California Code of Regulations
CDFA	Department of Food and Agriculture
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CF ₄	tetrafluoromethane
CFCs	Chlorofluorocarbons
CH ₂ FCF	1,1,1,2-tetrafluoroethane
CH ₃ CF ₂	1,1-difluoroethane
CH ₄	methane
CHF ₃	fluoroform
CNRA	California Natural Resources Agency
CNRA 2009	2009 California Climate Adaptation Strategy
CO ₂	carbon dioxide
CO ₂ e	CO ₂ equivalent
CPUC	California Public Utility Commission
CTC	California Transportation Commission
EMFAC	EMissions FACtor model

EPA	U.S. Environmental Protection Agency
EV	electric vehicles
GCC	Global Climate Change
GHG	greenhouse gas
GHGA	Murrieta Apartments Greenhouse Gas Analysis
GO-Biz	Governor's Office of Business and Economic Development
GWP	global warming potential
HDT	heavy-duty trucks
HFCs	hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Planning
LBNL	Lawrence Berkeley National Laboratory
lbs	pounds
LCA	life-cycle analysis
LCFS	Low Carbon Fuel Standard
MD	medium duty
MMT CO ₂ e	million metric tons of CO ₂ e
Mpg	miles per gallon
MT	metric tons
MT CO ₂	metric tons of CO ₂ e
MT CO ₂ e/yr	MT CO ₂ e per year
/yr	per year
MW	megawatts
MWELO	Model Water Efficient Landscape Ordinance
MWh	MW-hour
MY	model year
N ₂ O	nitrous oxide
NF ₃	Nitrogen Trifluoride
NHTSA	National Highway Traffic Safety Administration
NIOSH	National Institute for Occupational Safety and Health
PFCs	perfluorocarbons
Ppb	parts per billion
Ppm	parts per million
Ppt	parts per trillion
Project	Murrieta Apartments Project
SAFE Rule	<i>Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks</i>
SB	Senate Bill

SB 1078	Renewable Portfolio Standards
SB 1368	Retail Provider Emissions Performance Standards
SB 32	California Global Warming Solutions Act of 2006
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SF ₆	sulfur hexafluoride
SGC	Strategic Growth Council
SP	service population
U.S. Court	United States Supreme Court
VMT	vehicle miles traveled
WCI	Western Climate Initiative
WRI	World Resources Institute
ZEV	zero-emission vehicles

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EXECUTIVE SUMMARY

ES.1 SUMMARY OF FINDINGS

The results of this Murrieta Apartments Greenhouse Gas Analysis (GHGA) is summarized below based on the significance criteria in Section 3 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1). Table ES-1 shows the findings of significance for potential greenhouse gas (GHG) impacts under CEQA.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
GHG Impact #1: Would the Project generate direct or indirect GHG emission that would result in a significant impact on the environment?	3.8	<i>Less Than Significant</i>	<i>N/A</i>
GHG Impact #2: Would the Project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?	3.8	<i>Less Than Significant</i>	<i>N/A</i>

ES.2 PROJECT REQUIREMENTS

The Project would be required to comply with regulations imposed by the State of California and the South Coast Air Quality Management District (SCAQMD) aimed at the reduction of air pollutant emissions. Those that are directly and indirectly applicable to the Project and that would assist in the reduction of GHG emissions include:

- Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32) (2).
- Regional GHG Emissions Reduction Targets/Sustainable Communities Strategies (Senate Bill (SB) 375) (3).
- Pavley Fuel Efficiency Standards (AB 1493). Establishes fuel efficiency ratings for new vehicles (4).
- California Building Code (Title 24 California Code of Regulations (CCR)). Establishes energy efficiency requirements for new construction (5).
- Appliance Energy Efficiency Standards (Title 20 CCR). Establishes energy efficiency requirements for appliances (6).
- Low Carbon Fuel Standard (LCFS). Requires carbon content of fuel sold in California to be 10% less by 2020 (7).
- California Water Conservation in Landscaping Act of 2006 (AB 1881). Requires local agencies to adopt the Department of Water Resources updated Water Efficient Landscape Ordinance or equivalent by January 1, 2010, to ensure efficient landscapes in new development and reduced water waste in existing landscapes (8).

- Statewide Retail Provider Emissions Performance Standards (SB 1368). Requires energy generators to achieve performance standards for GHG emissions (9).
- Renewable Portfolio Standards (SB 1078 – also referred to as RPS). Requires electric corporations to increase the amount of energy obtained from eligible renewable energy resources to 20 percent (%) by 2010 and 33% by 2020 (10).
- California Global Warming Solutions Act of 2006 (SB 32). Requires the state to reduce statewide GHG emissions to 40% below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15 (11).

Promulgated regulations that will affect the Project's emissions are accounted for in the Project's GHG calculations provided in this report. In particular, AB 1493, LCFS, and RPS, and therefore are accounted for in the Project's emission calculations.

1 INTRODUCTION

This report presents the results of the Greenhouse Gas Analysis (GHGA) prepared by Urban Crossroads, Inc., for the proposed Murrieta Apartments Project (Project). The purpose of this GHGA is to evaluate Project-related construction and operational emissions and determine the level of GHG impacts as a result of constructing and operating the proposed Project.

1.1 SITE LOCATION

This report presents the results of the GHGA for the proposed Murrieta Apartments (“Project”), which is located at the southeast corner of Whitewood Road and Clinton Keith Road in the City of Murrieta. The Project’s location in relation to the surrounding area is shown on Exhibit 1-A.

The Project site is generally surrounded by residential land uses, educational land uses, and open space, with the nearest residential land use is northwest of the Project site and the Vista Murrieta High School is located the west of the Project site. The Project site is designated Multiple-Family Residential on the City of Murrieta General Plan Land Use Map.

1.2 PROJECT DESCRIPTION

Exhibit 1-B illustrates the preliminary Project site plan. The Project is proposed to consist of 153 condominium dwelling units and 330 apartment dwelling units, 3.5 acres landscaped area, and associated parking. It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2023. The proposed Project is anticipated to generate 2,916 two-way trips per day (12).

EXHIBIT 1-A: LOCATION MAP

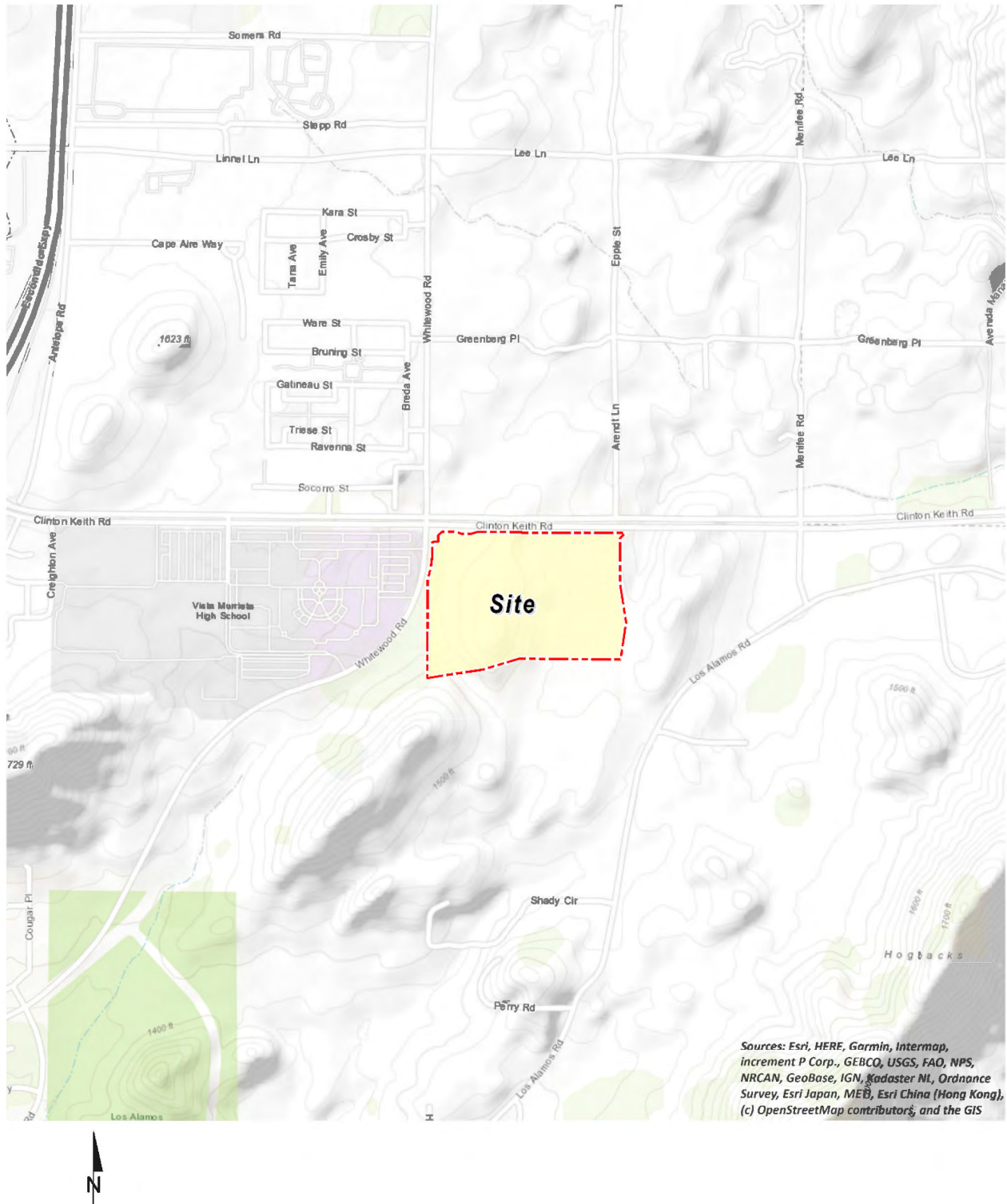


EXHIBIT 1-B: SITE PLAN



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2 CLIMATE CHANGE SETTING

2.1 INTRODUCTION TO GLOBAL CLIMATE CHANGE

Global Climate Change (GCC) is defined as the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. The majority of scientists believe that the climate shift taking place since the Industrial Revolution is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that GCC is the result of increased concentrations of GHGs in the earth's atmosphere, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases. The majority of scientists believe that this increased rate of climate change is the result of GHGs resulting from human activity and industrialization over the past 200 years.

An individual project like the proposed Project evaluated in this GHGA cannot generate enough GHG emissions to affect a discernible change in global climate. However, the proposed Project may participate in the potential for GCC by its incremental contribution of GHGs combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on GCC. Because these changes may have serious environmental consequences, Section 3.0 will evaluate the potential for the proposed Project to have a significant effect upon the environment as a result of its potential contribution to the greenhouse effect.

2.2 GLOBAL CLIMATE CHANGE DEFINED

GCC refers to the change in average meteorological conditions on the earth with respect to temperature, wind patterns, precipitation, and storms. Global temperatures are regulated by naturally occurring atmospheric gases such as water vapor, CO₂, N₂O, CH₄, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). These particular gases are important due to their residence time (duration they stay) in the atmosphere, which ranges from 10 years to more than 100 years. These gases allow solar radiation into the earth's atmosphere, but prevent radioactive heat from escaping, thus warming the earth's atmosphere. GCC can occur naturally as it has in the past with the previous ice ages.

Gases that trap heat in the atmosphere are often referred to as GHGs. GHGs are released into the atmosphere by both natural and anthropogenic activity. Without the natural GHG effect, the earth's average temperature would be approximately 61 degrees Fahrenheit (°F) cooler than it is currently. The cumulative accumulation of these gases in the earth's atmosphere is considered to be the cause for the observed increase in the earth's temperature.

2.3 GREENHOUSE GASES

GREENHOUSE GASES AND HEALTH EFFECTS

GHGs trap heat in the atmosphere, creating a GHG effect that results in global warming and climate change. Many gases demonstrate these properties and as discussed in Table 2-1. For the purposes of this analysis, emissions of CO₂, CH₄, and N₂O were evaluated (see Table 3-1 later in

this report) because these gases are the primary contributors to GCC from development projects. Although there are other substances such as fluorinated gases that also contribute to GCC, these fluorinated gases were not evaluated as their sources are not well-defined and do not contain accepted emissions factors or methodology to accurately calculate these gases.

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
Water	<p>Water is the most abundant, important, and variable GHG in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. A climate feedback is an indirect, or secondary, change, either positive or negative, that occurs within the climate system in response to a forcing mechanism. The feedback loop in which water is involved is critically important to projecting future climate change.</p> <p>As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold</p>	<p>The main source of water vapor is evaporation from the oceans (approximately 85%). Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.</p>	<p>There are no known direct health effects related to water vapor at this time. It should be noted however that when some pollutants react with water vapor, the reaction forms a transport mechanism for some of these pollutants to enter the human body through water vapor.</p>

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
	more water vapor and so on and so on. This is referred to as a “positive feedback loop.” The extent to which this positive feedback loop will continue is unknown as there are also dynamics that hold the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the earth’s surface and heat it up) (13).		
CO ₂	CO ₂ is an odorless and colorless GHG. Since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO ₂ concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30%. Left unchecked, the concentration of CO ₂ in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (14).	CO ₂ is emitted from natural and manmade sources. Natural sources include: the decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include: the burning of coal, oil, natural gas, and wood. CO ₂ is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks (15).	Outdoor levels of CO ₂ are not high enough to result in negative health effects. According to the National Institute for Occupational Safety and Health (NIOSH) high concentrations of CO ₂ can result in health effects such as: headaches, dizziness, restlessness, difficulty breathing, sweating, increased heart rate, increased cardiac output, increased blood pressure, coma, asphyxia, and/or convulsions. It should be noted that current concentrations of CO ₂ in the earth’s atmosphere are estimated to be approximately 370 ppm, the actual reference exposure level (level at which adverse health effects typically occur) is at exposure levels of 5,000

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
			ppm averaged over 10 hours in a 40-hour workweek and short-term reference exposure levels of 30,000 ppm averaged over a 15 minute period (16).
CH ₄	CH ₄ is an extremely effective absorber of radiation, although its atmospheric concentration is less than CO ₂ and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs.	CH ₄ has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of CH ₄ . Other anthropogenic sources include fossil-fuel combustion and biomass burning (17).	CH ₄ is extremely reactive with oxidizers, halogens, and other halogen-containing compounds. Exposure to high levels of CH ₄ can cause asphyxiation, loss of consciousness, headache and dizziness, nausea and vomiting, weakness, loss of coordination, and an increased breathing rate.
N ₂ O	N ₂ O, also known as laughing gas, is a colorless GHG. Concentrations of N ₂ O also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb).	N ₂ O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power	N ₂ O can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses, it is considered harmless. However, in some cases, heavy and extended use can cause Olney's Lesions (brain damage) (18).

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
		plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant, i.e., in whipped cream bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. N ₂ O can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction (18).	
Chlorofluorocarbons (CFCs)	CFCs are gases formed synthetically by replacing all hydrogen atoms in CH ₄ or ethane (C ₂ H ₆) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically unreactive in the troposphere (the level of air at the earth's surface).	CFCs have no natural source but were first synthesized in 1928. They were used for refrigerants, aerosol propellants and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs are now remaining steady or declining. However, their long atmospheric lifetimes mean that	In confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too high or too low) or asphyxiation.

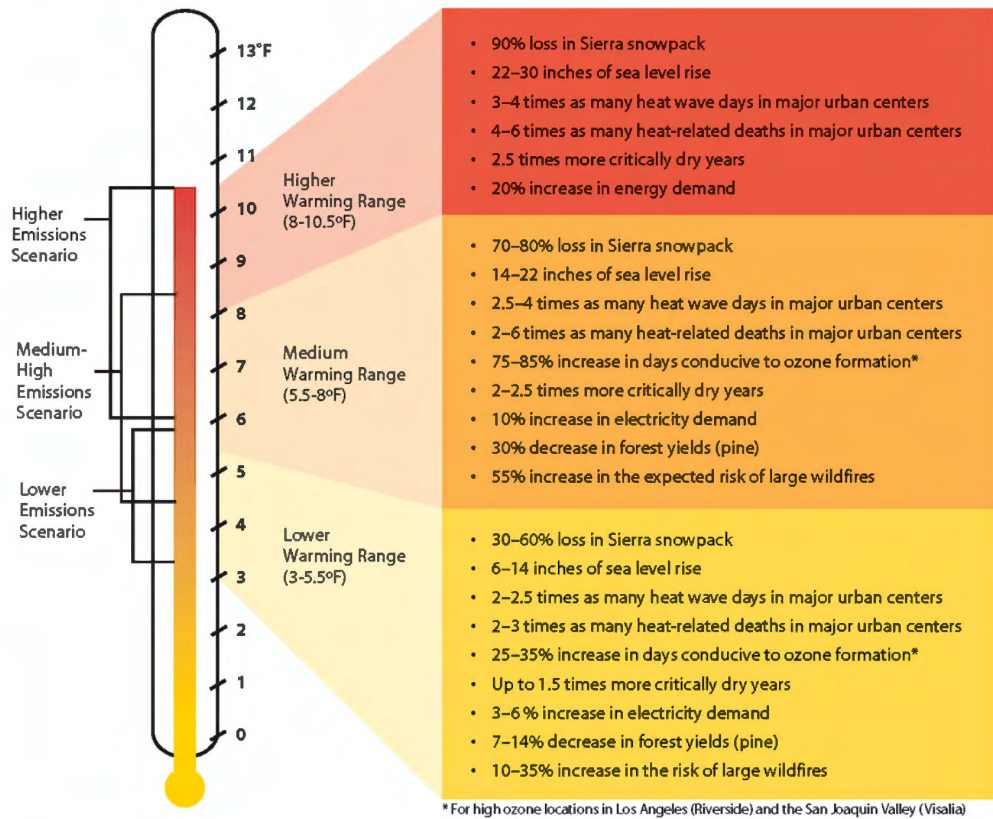
TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
		some of the CFCs will remain in the atmosphere for over 100 years (19).	
HFCs	HFCs are synthetic, man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential (GWP). The HFCs with the largest measured atmospheric abundances are (in order), fluoroform (CHF_3), 1,1,1,2-tetrafluoroethane (CH_2FCF_2), and 1,1-difluoroethane (CH_3CF_2). Prior to 1990, the only significant emissions were of CHF_3 . CH_2FCF_2 emissions are increasing due to its use as a refrigerant.	HFCs are manmade for applications such as automobile air conditioners and refrigerants.	No health effects are known to result from exposure to HFCs.
PFCs	PFCs have stable molecular structures and do not break down through chemical processes in the lower atmosphere. High-energy ultraviolet rays, which occur about 60 kilometers above earth's surface, are able to destroy the compounds. Because of this, PFCs have exceedingly long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF_4) and hexafluoroethane (C_2F_6). The EPA estimates that concentrations of CF_4 in the atmosphere are over 70 parts per trillion (ppt).	The two main sources of PFCs are primary aluminum production and semiconductor manufacture.	No health effects are known to result from exposure to PFCs.
SF_6	SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas evaluated (23,900) (20). The EPA indicates that	SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry,	In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
	concentrations in the 1990s were about 4 ppt.	in semiconductor manufacturing, and as a tracer gas for leak detection.	
Nitrogen Trifluoride (NF ₃)	NF ₃ is a colorless gas with a distinctly moldy odor. The World Resources Institute (WRI) indicates that NF ₃ has a 100-year GWP of 17,200 (21).	NF ₃ is used in industrial processes and is produced in the manufacturing of semiconductors, Liquid Crystal Display panels, types of solar panels, and chemical lasers.	Long-term or repeated exposure may affect the liver and kidneys and may cause fluorosis (22).

The potential health effects related directly to the emissions of CO₂, CH₄, and N₂O as they relate to development projects such as the proposed Project are still being debated in the scientific community. Their cumulative effects to GCC have the potential to cause adverse effects to human health. Increases in Earth's ambient temperatures would result in more intense heat waves, causing more heat-related deaths. Scientists also purport that higher ambient temperatures would increase disease survival rates and result in more widespread disease. Climate change will likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas (23). Exhibit 2-A presents the potential impacts of global warming (24).

EXHIBIT 2-A: SUMMARY OF PROJECTED GLOBAL WARMING IMPACT, 2070-2099 (AS COMPARED WITH 1961-1990)

Source: Barbara H. Allen-Diaz. "Climate change affects us all." *University of California, Agriculture and Natural Resources*, 2009.

2.4 GLOBAL WARMING POTENTIAL

GHGs have varying GWP values. GWP of a GHG indicates the amount of warming a gas causes over a given period of time and represents the potential of a gas to trap heat in the atmosphere. CO₂ is utilized as the reference gas for GWP, and thus has a GWP of 1. CO₂ equivalent (CO₂e) is a term used for describing the difference GHGs in a common unit. CO₂e signifies the amount of CO₂ which would have the equivalent GWP.

The atmospheric lifetime and GWP of selected GHGs are summarized at Table 2-2. As shown in the table below, GWP for the Second Assessment Report, the Intergovernmental Panel on Climate Change (IPCC)'s scientific and socio-economic assessment on climate change, range from 1 for CO₂ to 23,900 for SF₆ and GWP for the IPCC's 5th Assessment Report range from 1 for CO₂ to 23,500 for SF₆ (25).

TABLE 2-2: GWP AND ATMOSPHERIC LIFETIME OF SELECT GHGS

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)	
		Second Assessment Report	5 th Assessment Report
CO ₂	See*	1	1

CH ₄	12.4	21	28
N ₂ O	121	310	265
HFC-23	222	11,700	12,400
HFC-134a	13.4	1,300	1,300
HFC-152a	1.5	140	138
SF ₆	3,200	23,900	23,500

*As per Appendix 8.A. of IPCC's 5th Assessment Report, no single lifetime can be given.

Source: Table 2.14 of the IPCC Fourth Assessment Report, 2007

2.5 GREENHOUSE GAS EMISSIONS INVENTORIES

STATE OF CALIFORNIA

California has significantly slowed the rate of growth of GHG emissions due to the implementation of energy efficiency programs as well as adoption of strict emission controls but is still a substantial contributor to the U.S. emissions inventory total (26). The California Air Resource Board (CARB) compiles GHG inventories for the State of California. Based upon the 2020 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2018 In 2018, emissions from GHG emitting activities statewide were 425 million metric tons of carbon dioxide equivalent (MMT CO₂e), 0.8 MMT CO₂e higher than 2017 levels and 6 MMT CO₂e below the 2020 GHG Limit of 431 MMT CO₂e. (MMT CO₂e/yr) (27).

2.6 EFFECTS OF CLIMATE CHANGE IN CALIFORNIA

PUBLIC HEALTH

Higher temperatures may increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation could increase from 25 to 35% under the lower warming range to 75 to 85% under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances, depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55% more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming range scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures could increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

WATER RESOURCES

A vast network of man-made reservoirs and aqueducts captures and transports water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snowpack to supply water during the dry spring and summer months.

Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

If temperatures continue to increase, more precipitation could fall as rain instead of snow, and the snow that does fall could melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90%. Under the lower warming range scenario, snowpack losses could be only half as large as those possible if temperatures were to rise to the higher warming range. How much snowpack could be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snowpack could pose challenges to water managers and hamper hydropower generation. It could also adversely affect winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as a month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater could degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta – a major fresh water supply.

AGRICULTURE

Increased temperatures could cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25% of the water supply needed. Although higher CO₂ levels can stimulate plant production and increase plant water-use efficiency, California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits, and nuts.

In addition, continued GCC could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the emerging gaps. Continued GCC could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

FORESTS AND LANDSCAPES

GCC has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55%, which is almost twice the increase expected if temperatures stay in the lower

warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. In contrast, wildfires in northern California could increase by up to 90% due to decreased precipitation.

Moreover, continued GCC has the potential to alter natural ecosystems and biological diversity within the state. For example, alpine and subalpine ecosystems could decline by as much as 60 to 80% by the end of the century as a result of increasing temperatures. The productivity of the state's forests has the potential to decrease as a result of GCC.

RISING SEA LEVELS

Rising sea levels, more intense coastal storms, and warmer water temperatures could increasingly threaten the state's coastal regions. Under the higher warming range scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate low-lying coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats. Under the lower warming range scenario, sea level could rise 12-14 inches.

2.7 REGULATORY SETTING

FEDERAL

Prior to the last decade, there have been no concrete federal regulations of GHGs or major planning for climate change adaptation. The following are actions regarding the federal government, GHGs, and fuel efficiency.

GHG Endangerment. In *Massachusetts v. Environmental Protection Agency* 549 U.S. 497 (2007), decided on April 2, 2007, the United States Supreme Court (U.S. Court) found that four GHGs, including CO₂, are air pollutants subject to regulation under Section 202(a)(1) of the Clean Air Act (CAA). The Court held that the EPA Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the CAA:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs— CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section "Clean Vehicles" below. After a lengthy legal challenge, the U.S. Court declined to review an Appeals Court ruling that upheld the EPA Administrator's findings (28).

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the U.S. On April 1, 2010, the EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the U.S.

The first phase of the national program applies to passenger cars, light-duty trucks, and medium-duty (MD) passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of CO₂ per mile, equivalent to 35.5 miles per gallon (mpg) if the automobile industry were to meet this CO₂ level solely through fuel economy improvements. Together, these standards would cut CO₂ emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the NHTSA issued final rules on a second-phase joint rulemaking establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012. The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and MD passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of CO₂ in model year 2025, which is equivalent to 54.5 mpg if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks (HDT) and buses on September 15, 2011, effective November 14, 2011. For combination tractors, the agencies are proposing engine and vehicle standards that begin in the 2014 model year and achieve up to a 20% reduction in CO₂ emissions and fuel consumption by the 2018 model year. For HDT and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10% reduction for gasoline vehicles and a 15% reduction for diesel vehicles by the 2018 model year (12 and 17% respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10% reduction in fuel consumption and CO₂ emissions from the 2014 to 2018 model years.

On April 2, 2018, the EPA signed the Mid-term Evaluation Final Determination, which declared that the Model Year (MY) 2022-2025 GHG standards are not appropriate and should be revised (29). This Final Determination serves to initiate a notice to further consider appropriate standards for MY 2022-2025 light-duty vehicles. On August 2, 2018, the NHTSA in conjunction with the EPA, released a notice of proposed rulemaking, the *Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks* (SAFE Rule). The SAFE Vehicles Rule was proposed to amend existing Corporate Average Fuel Economy (CAFE) and tailpipe CO₂ standards for passenger cars and light trucks and to establish new standards covering model years 2021 through 2026. As of March 31, 2020, the NHTSA and EPA finalized the SAFE Rule which increased stringency of CAFE and CO₂ emissions standards by 1.5% each year through model year 2026 (30).

As of January 2021, Executive Order 13990 directed the U.S. Environmental Protection Agency (EPA) to reconsider the Agency's 2019 action titled "The Safer Affordable Fuel-Efficient Vehicles Rule Part One: One National Program Rule (SAFE-1)" for the purposes of rescinding the action taken by the prior administration. Therefore the U.S. EPA is seeking public comment on its reconsideration of the SAFE-1 and is reviewing public comment on the Notice of Reconsideration (31).

Mandatory Reporting of GHGs. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of GHGs Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the U.S. and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons (MT) per year (/yr) or more of GHG emissions are required to submit annual reports to the EPA.

New Source Review. The EPA issued a final rule on May 13, 2010, that establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these CAA permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the Federal Code of Regulations, the EPA states:

"This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the CAA, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to GHG sources, starting with the largest GHG emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for GHG emissions until at least April 30, 2016."

The EPA estimates that facilities responsible for nearly 70% of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

Standards of Performance for GHG Emissions for New Stationary Sources: Electric Utility Generating Units. As required by a settlement agreement, the EPA proposed new performance standards for emissions of CO₂ for new, affected, fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatts (MW) would be required to meet an output-based standard of 1,000 pounds (lbs) of CO₂ per MW-hour (MWh), based on the performance of widely used natural gas combined cycle technology. It should be noted that on February 9, 2016, the U.S. Court issued a stay of this regulation pending litigation. Additionally, the current EPA Administrator has also signed a measure to repeal the Clean Power Plan, including the CO₂ standards. The Clean Power Plan was officially repealed on June 19, 2019, when

the EPA issued the final Affordable Clean Energy rule. Under the Affordable Clean Energy rule, new state emission guidelines were established that provided existing coal-fired electric utility generating units with achievable standards.

Cap-and-Trade. Cap-and-trade refers to a policy tool where emissions are limited to a certain amount and can be traded or provides flexibility on how the emitter can comply. Successful examples in the U.S. include the Acid Rain Program and the N₂O Budget Trading Program and Clean Air Interstate Rule in the northeast. There is no federal GHG cap-and-trade program currently; however, some states have joined to create initiatives to provide a mechanism for cap-and-trade.

The Regional GHG Initiative is an effort to reduce GHGs among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Each state caps CO₂ emissions from power plants, auctions CO₂ emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. The Initiative began in 2008 and in 2020 has retained all participating states.

The Western Climate Initiative (WCI) partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15% below 2005 levels by 2020. The partners were originally California, British Columbia, Manitoba, Ontario, and Quebec. However, Manitoba and Ontario are not currently participating. California linked with Quebec's cap-and-trade system January 1, 2014, and joint offset auctions took place in 2015. While the WCI has yet to publish whether it has successfully reached the 2020 emissions goal initiative set in 2007, SB 32, requires that California, a major partner in the WCI, adopt the goal of reducing statewide GHG emissions to 40% below the 1990 level by 2030.

SmartWay Program. The SmartWay Program is a public-private initiative between the EPA, large and small trucking companies, rail carriers, logistics companies, commercial manufacturers, retailers, and other federal and state agencies. Its purpose is to improve fuel efficiency and the environmental performance (reduction of both GHG emissions and air pollution) of the goods movement supply chains. SmartWay is comprised of four components (32):

1. SmartWay Transport Partnership: A partnership in which freight carriers and shippers commit to benchmark operations, track fuel consumption, and improve performance annually.
2. SmartWay Technology Program: A testing, verification, and designation program to help freight companies identify equipment, technologies, and strategies that save fuel and lower emissions.
3. SmartWay Vehicles: A program that ranks light-duty cars and small trucks and identifies superior environmental performers with the SmartWay logo.
4. SmartWay International Interests: Guidance and resources for countries seeking to develop freight sustainability programs modeled after SmartWay.

SmartWay effectively refers to requirements geared towards reducing fuel consumption. Most large trucking fleets driving newer vehicles are compliant with SmartWay design requirements. Moreover, over time, all HDTs will have to comply with the CARB GHG Regulation that is designed with the SmartWay Program in mind, to reduce GHG emissions by making them more fuel-efficient. For instance, in 2015, 53 foot or longer dry vans or refrigerated trailers equipped with

a combination of SmartWay-verified low-rolling resistance tires and SmartWay-verified aerodynamic devices would obtain a total of 10% or more fuel savings over traditional trailers.

Through the SmartWay Technology Program, the EPA has evaluated the fuel saving benefits of various devices through grants, cooperative agreements, emissions and fuel economy testing, demonstration projects and technical literature review. As a result, the EPA has determined the following types of technologies provide fuel saving and/or emission reducing benefits when used properly in their designed applications, and has verified certain products:

- Idle reduction technologies – less idling of the engine when it is not needed would reduce fuel consumption.
- Aerodynamic technologies minimize drag and improve airflow over the entire tractor-trailer vehicle. Aerodynamic technologies include gap fairings that reduce turbulence between the tractor and trailer, side skirts that minimize wind under the trailer, and rear fairings that reduce turbulence and pressure drop at the rear of the trailer.
- Low rolling resistance tires can roll longer without slowing down, thereby reducing the amount of fuel used. Rolling resistance (or rolling friction or rolling drag) is the force resisting the motion when a tire rolls on a surface. The wheel will eventually slow down because of this resistance.
- Retrofit technologies include things such as diesel particulate filters, emissions upgrades (to a higher tier), etc., which would reduce emissions.
- Federal excise tax exemptions.

CALIFORNIA

Legislative Actions to Reduce GHGs

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation such as AB 32 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

AB 32. The California State Legislature enacted AB 32, which required that GHGs emitted in California be reduced to 1990 levels by the year 2020 (this goal has been met¹). GHGs as defined under AB 32 include CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The CARB is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

“Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands

¹ Based upon the 2019 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2017 GHG emissions period, California emitted an average 424.1 MMT CO₂e (26). This is less than the 2020 emissions target of 431 MMT CO₂e.

of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.”

SB 32. SB 32 requires the state to reduce statewide GHG emissions to 40% below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15. The new legislation builds upon the AB 32 goal and provides an intermediate goal to achieving S-3-05, which sets a statewide GHG reduction target of 80% below 1990 levels by 2050. AB 197 creates a legislative committee to oversee regulators to ensure that CARB not only responds to the Governor, but also the Legislature (11).

CARB Scoping Plan Update. In November 2017, CARB released the *Final 2017 Scoping Plan Update*, which identifies the State’s post-2020 reduction strategy. The *Final 2017 Scoping Plan Update* reflects the 2030 target of a 40% reduction below 1990 levels, set by Executive Order B-30-15 and codified by SB 32. Key programs that the proposed Second Update builds upon include the Cap-and-Trade Regulation, the LCFS, and much cleaner cars, trucks, and freight movement, utilizing cleaner, renewable energy, and strategies to reduce CH₄ emissions from agricultural and other wastes.

The *Final 2017 Scoping Plan Update* establishes a new emissions limit of 260 MMT CO₂e for the year 2030, which corresponds to a 40% decrease in 1990 levels by 2030 (33).

California’s climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero-emission vehicle technologies; continued investment in renewables, including solar roofs, wind, and other distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (CH₄, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for direct GHG reductions at refineries will further support air quality co-benefits in neighborhoods, including in disadvantaged communities historically located adjacent to these large stationary sources, as well as efforts with California’s local districts to tighten emission limits on a broad spectrum of industrial sources. Major elements of the *Final 2017 Scoping Plan Update* framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing zero-emission vehicles (ZEV) buses and trucks.
- LCFS, with an increased stringency (18% by 2030).
- Implementing SB 350, which expands the RPS to 50% RPS and doubles energy efficiency savings by 2030.
- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of ZEV trucks.
- Implementing the proposed Short-Lived Climate Pollutant Strategy, which focuses on reducing CH₄ and hydrofluorocarbon emissions by 40% and anthropogenic black carbon emissions by 50% by year 2030.
- Continued implementation of SB 375.

- Post-2020 Cap-and-Trade Program that includes declining caps.
- 20% reduction in GHG emissions from refineries by 2030.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

Note, however, that the *Final 2017 Scoping Plan Update* acknowledges that:

"[a]chieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA."

In addition to the statewide strategies listed above, the *Final 2017 Scoping Plan Update* also identifies local governments as essential partners in achieving the State's long-term GHG reduction goals and identifies local actions to reduce GHG emissions. As part of the recommended actions, CARB recommends that local governments achieve a community-wide goal to achieve emissions of no more than 6 metric tons of CO₂e (MT CO₂e) or less per capita by 2030 and 2 MT CO₂e or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the Scoping Plan and the State's long-term GHG goals—and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible; or a performance-based metric using a Climate Action Plan (CAP) or other plan to reduce GHG emissions is appropriate.

According to research conducted by the Lawrence Berkeley National Laboratory (LBNL) and supported by CARB, California, under its existing and proposed GHG reduction policies, could achieve the 2030 goals under SB 32. The research utilized a new, validated model known as the California LBNL GHG Analysis of Policies Spreadsheet (CALGAPS), which simulates GHG and criteria pollutant emissions in California from 2010 to 2050 in accordance to existing and future GHG-reducing policies. The CALGAPS model showed that by 2030, emissions could range from 211 to 428 MT CO₂e per year (MT CO₂e/yr), indicating that "even if all modeled policies are not implemented, reductions could be sufficient to reduce emissions 40% below the 1990 level [of SB 32]." CALGAPS analyzed emissions through 2050 even though it did not generally account for policies that might be put in place after 2030. Although the research indicated that the emissions would not meet the State's 80% reduction goal by 2050, various combinations of policies could allow California's cumulative emissions to remain very low through 2050 (34) (35).

Cap-and-Trade Program. The Scoping Plan identifies a Cap-and-Trade Program as one of the key strategies for California to reduce GHG emissions. According to CARB, a cap-and-trade program will help put California on the path to meet its goal of achieving a 40% reduction in GHG emissions from 1990 levels by 2030. Under cap-and-trade, an overall limit on GHG emissions from capped sectors is established, and facilities subject to the cap will be able to trade permits to emit GHGs within the overall limit.

CARB adopted a California Cap-and-Trade Program pursuant to its authority under AB 32. The Cap-and-Trade Program is designed to reduce GHG emissions from regulated entities by more than 16% between 2013 and 2020, and by an additional 40% by 2030. The statewide cap for GHG

emissions from the capped sectors (e.g., electricity generation, petroleum refining, and cement production) commenced in 2013 and will decline over time, achieving GHG emission reductions throughout the program's duration.

Covered entities that emit more than 25,000 MT CO₂e/yr must comply with the Cap-and-Trade Program. Triggering of the 25,000 MT CO₂e/yr "inclusion threshold" is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of GHG Emissions (Mandatory Reporting Rule).

Under the Cap-and-Trade Program, CARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities. Covered entities are allocated free allowances in whole or part (if eligible), and may buy allowances at auction, purchase allowances from others, or purchase offset credits. Each covered entity with a compliance obligation is required to surrender "compliance instruments" for each MT CO₂e of GHG they emit. There also are requirements to surrender compliance instruments covering 30% of the prior year's compliance obligation by November of each year (36).

The Cap-and-Trade Program provides a firm cap, which provides the highest certainty of achieving the 2030 target. An inherent feature of the Cap-and-Trade program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. As summarized by CARB in the *First Update to the Climate Change Scoping Plan*:

"The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced. In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative." (37)

The Cap-and-Trade Program covered approximately 80% of California's GHG emissions (33). The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects' electricity usage are covered by the Cap-and-Trade Program. The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the Program's first compliance period. The Cap-and-Trade Program covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported.

SB 375 – the Sustainable Communities and Climate Protection Act of 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40% of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the

following: it (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

Concerning CEQA, SB 375, as codified in Public Resources Code Section 21159.28, states that CEQA findings for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts, or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network, if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the CARB accepts as achieving the GHG emission reduction targets.
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies).
3. Incorporates the mitigation measures required by an applicable prior environmental document.

AB 1493. California AB 1493 requires CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the U.S. District Court for the District of Columbia in 2011.

The standards phase in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in about a 22% reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30% reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program or the Advanced Clean Cars program (ACC). The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34% from 2016 levels by 2025. The new rules will clean up gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles (EV) and hydrogen fuel cell cars. The package will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.

SB 350— Clean Energy and Pollution Reduction Act of 2015. SB 350 requires an increase in the RPS, higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for EV charging stations. Provisions for a 50% reduction in the use of petroleum statewide were removed from the Bill because of opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33% to 50% by 2030, with interim targets of 40% by 2024, and 25% by 2027.
- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and local publicly owned utilities.
- Reorganize the Independent System Operator to develop more regional electrify transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States.

EXECUTIVE ORDERS RELATED TO GHG EMISSIONS

California's Executive Branch has taken several actions to reduce GHGs through the use of Executive Orders. Although not regulatory, they set the tone for the state and guide the actions of state agencies.

Executive Order B-55-18 and SB 100. SB 100 raises California's RPS requirement to 50% renewable resources target by December 31, 2026, and to achieve a 60% target by December 31, 2030. SB 100 also requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 44% of retail sales by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030. Executive Order B-55-18 establishes a carbon neutrality goal for the state of California by 2045; and sets a goal to maintain net negative emissions thereafter. The Executive Order directs the California Natural Resources Agency (CNRA), California Environmental Protection Agency (CalEPA), the Department of Food and Agriculture (CDFA), and CARB to include sequestration targets in the Natural and Working Lands Climate Change Implementation Plan consistent with the carbon neutrality goal.

Executive Order S-3-05. Executive Order S-3-05 set the following reduction targets for GHG emissions:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80% below 1990 levels.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. AB 32 as adopted enacts the 2020 GHG reduction goal identified in this Executive Order. However, the Legislature did not include the 2050 GHG reduction goal.

Executive Order S-01-07 – Low Carbon Fuel Standard. Executive Order S-01-07 mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020. The CARB adopted the LCFS on April 23, 2009.

In 2018, the CARB approved amendments to the regulation, which included strengthening the carbon intensity benchmarks through 2030 in compliance with the SB 32 GHG emissions reduction target for 2030. The amendments included crediting opportunities to promote zero emission vehicle adoption, alternative jet fuel, carbon capture and sequestration, and advanced technologies to achieve deep decarbonization in the transportation sector (38).

Executive Order S-13-08. Executive Order S-13-08 states that “climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California’s economy, to the health and welfare of its population and to its natural resources.” Pursuant to the requirements in the Order, the 2009 California Climate Adaptation Strategy (CNRA 2009) was adopted, which is the “...first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States.” Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Executive Order B-30-15. Executive Order B-30-15 sets an interim statewide GHG emission reduction target to reduce GHG emissions to 40% below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80% below 1990 levels by 2050 and directs CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of MMT CO₂e. The Order also requires the state’s climate adaptation plan to be updated every three years, and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this Order is not legally enforceable for local governments and the private sector. However, SB 32 as adopted enacts the 2030 GHG reduction goal identified in this Executive Order but not the 2050 GHG reduction goal.

CALIFORNIA REGULATIONS AND BUILDING CODES

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations, contained in the California Code of Regulations (CCR), have kept California’s energy consumption relatively flat even with rapid population growth.

Title 20 CCR. CCR, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. 23 categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designed and sold exclusively for use in recreational vehicles or other mobile equipment.

Title 24 CCR. CCR Title 24 Part 6: California’s Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California’s energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The 2019 version of Title 24 was adopted by the CEC and became effective on January 1, 2020.

The 2019 Title 24 standards require solar photovoltaic systems for new homes, establish requirements for newly constructed healthcare facilities, encourage demand responsive technologies for residential buildings, update indoor and outdoor lighting for nonresidential buildings. Single-family homes built with the 2019 standards will use approximately 7% less energy compared to the residential homes built under the 2016 standards. Additionally, after implementation of solar photovoltaic systems, homes built under the 2019 standards will about

53% less energy than homes built under the 2016 standards. Nonresidential buildings will use approximately 30% less energy due to lighting upgrades (39).

CCR, Title 24, Part 11: California Green Building Standards Code (CALGreen) is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect on January 1, 2011, and is administered by the California Building Standards Commission. CALGreen is updated on a regular basis along with the rest of Title 24, with the most recent update is the 2019 CALGreen edition. Local jurisdictions are permitted to adopt more stringent requirements, as state law provides methods for local enhancements. CALGreen recognizes that many jurisdictions have developed existing construction and demolition ordinances and defers to them as the ruling guidance provided, they establish a minimum 65% diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. The State Building Code provides the minimum standard that buildings must meet in order to be certified for occupancy, which is generally enforced by the local building official. 2019 CALGreen standards are applicable to the Project and require (40):

- Short-term bicycle parking. If the new project or an additional alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- Long-term bicycle parking. For new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5% of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility (5.106.4.1.2).
- Designated parking. In new projects or additions to alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).
- Construction waste management. Recycle and/or salvage for reuse a minimum of 65% of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.405.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent (5.408.1).
- Excavated soil and land clearing debris. 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phase project, such material may be stockpiled on site until the storage site is developed (5.408.3).
- Recycling by Occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive (5.410.1).
- Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:
 - Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush (5.303.3.1)
 - Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush (5.303.3.2.1). The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush (5.303.3.2.2).

- Showerheads. Single showerheads shall have a minimum flow rate of not more than 1.8 gallons per minute and 80 psi (5.303.3.3.1). When a shower is served by more than one showerhead, the combine flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi (5.303.3.3.2).
- Faucets and fountains. Nonresidential lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi (5.303.3.4.1). Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi (5.303.3.4.2). Wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute (5.303.3.4.3). Metering faucets shall not deliver more than 0.20 gallons per cycle (5.303.3.4.4). Metering faucets for wash fountains shall have a maximum flow rate not more than 0.20 gallons per cycle (5.303.3.4.5).
- Outdoor portable water use in landscaped areas. Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent (5.304.1).
- Water meters. Separate submeters or metering devices shall be installed for new buildings or additions in excess of 50,000 sf or for excess consumption where any tenant within a new building or within an addition that is project to consume more than 1,000 gal/day (5.303.1.1 and 5.303.1.2).
- Outdoor water use in rehabilitated landscape projects equal or greater than 2,500 sf. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 sf requiring a building or landscape permit (5.304.3).
- Commissioning. For new buildings 10,000 sf and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements (5.410.2).

MWELO. The MWELO requirements were updated by AB 1881, the Water Conservation Act. The bill requires local agencies to adopt a local landscape ordinance at least as effective in conserving water as MWELO by January 1, 2010. On April 1, 2015, the Department of Water Resources was ordered by the governor to update MWELO through expedited regulation. The California Water Commission approved the revised MWELO on July 15, 2015, and it became effective December 15, 2015. New development projects that include landscape areas of 500 sf or more are subject to the MWELO. The update requires:

- More efficient irrigation systems;
- Incentives for graywater usage;
- Improvements in on-site stormwater capture;
- Limiting the portion of landscapes that can be planted with high water use plants; and
- Reporting requirements for local agencies.

SB 97 and the CEQA Guidelines Update. SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the OPR shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects

of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the OPR pursuant to subdivision (a).” Section 21097 was also added to the Public Resources Code. It provided CEQA protection until January 1, 2010, for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA.

On December 28, 2018, the Natural Resources Agency announced the OAL approved the amendments to the CEQA Guidelines for implementing the CEQA. The CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

Section 15064.3 was added the CEQA Guidelines and states that in determining the significance of a project’s GHG emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project’s emissions to the effects of climate change. A project’s incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national, or global emissions. The agency’s analysis should consider a timeframe that is appropriate for the project. The agency’s analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes. Additionally, a lead agency may use a model or methodology to estimate GHG emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project’s incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use (41).

REGIONAL

The Project is within the South Coast Air Basin (SCAB), which is under the jurisdiction of the SCAQMD.

SCAQMD

SCAQMD is the agency responsible for air quality planning and regulation in the SCAB. The SCAQMD addresses the impacts to climate change of projects subject to SCAQMD permit as a lead agency if they are the only agency that has discretionary approval for the project and acts as a responsible agency when a land use agency must also approve discretionary permits for the project. The SCAQMD acts as an expert commenting agency for impacts to air quality. This expertise carries over to GHG emissions, so the agency helps local land use agencies through the development of models and emission thresholds that can be used to address GHG emissions.

In 2008, SCAQMD formed a Working Group to identify GHG emissions thresholds for land use projects that could be used by local lead agencies in the SCAB. The Working Group developed several different options that are contained in the SCAQMD Draft Guidance Document – Interim

CEQA GHG Significance Threshold, which could be applied by lead agencies. The working group has not provided additional guidance since release of the interim guidance in 2008 (42). The SCAQMD Board has not approved the thresholds; however, the Guidance Document provides substantial evidence supporting the approaches to significance of GHG emissions that can be considered by the lead agency in adopting its own threshold. The current interim thresholds consist of the following tiered approach:

- Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether the project is consistent with a GHG reduction plan. If a project is consistent with a qualifying local GHG reduction plan, it does not have significant GHG emissions.
- Tier 3 consists of screening values, which the lead agency can choose, but must be consistent with all projects within its jurisdiction. A project's construction emissions are averaged over 30 years and are added to the project's operational emissions. If a project's emissions are below one of the following screening thresholds, then the project is less than significant:
 - Residential and Commercial land use: 3,000 MT CO₂e/yr
 - Industrial land use: 10,000 MT CO₂e/yr
 - Based on land use type: residential: 3,500 MT CO₂e/yr; commercial: 1,400 MT CO₂e/yr; or mixed use: 3,000 MT CO₂e/yr
- Tier 4 has the following options:
 - Option 1: Reduce BAU emissions by a certain percentage; this percentage is currently undefined.
 - Option 2: Early implementation of applicable AB 32 Scoping Plan measures
 - Option 3: 2020 target for service populations (SP), which includes residents and employees: 4.8 MT CO₂e/SP/year for projects and 6.6 MT CO₂e/SP/year for plans;
 - Option 3, 2035 target: 3.0 MT CO₂e/SP/year for projects and 4.1 MT CO₂e/SP/year for plans
- Tier 5 involves mitigation offsets to achieve target significance threshold.

The SCAQMD's interim thresholds used the Executive Order S-3-05-year 2050 goal as the basis for the Tier 3 screening level. Achieving the Executive Order's objective would contribute to worldwide efforts to cap CO₂ concentrations at 450 ppm, thus stabilizing global climate.

SCAQMD only has authority over GHG emissions from development projects that include air quality permits. At this time, it is unknown if the Project would include stationary sources of emissions subject to SCAQMD permits. Notwithstanding, if the Project requires a stationary permit, it would be subject to the applicable SCAQMD regulations.

SCAQMD Regulation XXVII, adopted in 2009 includes the following rules:

- Rule 2700 defines terms and post global warming potentials.
- Rule 2701, SoCal Climate Solutions Exchange, establishes a voluntary program to encourage, quantify, and certify voluntary, high quality certified GHG emission reductions in the SCAQMD.

- Rule 2702, GHG Reduction Program created a program to produce GHG emission reductions within the SCAQMD. The SCAQMD will fund projects through contracts in response to requests for proposals or purchase reductions from other parties.

2.8 CITY OF MURRIETA

CLIMATE ACTION PLAN (CAP)

In order to aggressively address the threats of global climate change, the City has prepared a CAP, which provides a framework for reducing GHG emissions and managing resources to best prepare for a changing climate (43). The CAP recommends GHG emissions targets that are consistent with the reduction targets of the State of California and presents several strategies that will make it possible for the City of Murrieta to meet the recommended targets. Projects that demonstrate consistency with the strategies, actions, and emission reduction targets contained in the CAP would have a less than significant impact on climate change.

The Project will be compliant with the goal and objectives set forth in the City of Murrieta's CAP (as shown on Table 3-6, presented later in the report). Therefore, Project consistency with the CAP would result in a less than significant impact with respect to GHG emissions.

2.9 DISCUSSION ON ESTABLISHMENT OF SIGNIFICANCE THRESHOLDS

The City of Murrieta has not established local CEQA significance thresholds for GHG emissions, as described in Section 15064.7 of the CEQA guidelines. According to the Final Statement of Reasons (FSOR) for Regulatory Action, the revised Section 15064.7 gives lead agencies the discretion to determine their methodology for quantifying GHG emissions (44).

The AEP Climate Change Committee has prepared a white paper to provide guidance to local governments on how to develop thresholds for use in CEQA based on Section 15064.7 and guidance developed by several air quality districts and the CAPCOA guidance on addressing climate change. The AEP white paper identified seven thresholds for operational emissions. The following four methods described are the most widely used evaluation criteria.

- (1) Consistency with a Qualified GHG Reduction Plan. For a project located within a jurisdiction that has adopted a qualified GHG reduction plan (as defined by CEQA Guidelines Section 15183.5), GHG emissions would be less than significant if the project is anticipated by the plan and fully consistent with the plan. However, projects with a horizon year beyond 2020 should not tier from a plan that is qualified up to 2020.
- (2) Bright line Thresholds. There are two types of bright line thresholds: a. Standalone Threshold. Emissions exceeding standalone thresholds would be considered significant. b. Screening Threshold. Emissions exceeding screening thresholds would require evaluation using a second-tier threshold, such as an efficiency threshold or other threshold concept to determine whether project emissions would be considered significant. However, projects with a horizon year beyond 2020 should take into account the type and amount of land use projects and their expected emissions out to the year 2030.

- (3) Efficiency Thresholds. Land use sector efficiency thresholds are currently based on AB 32 targets and should not be used for projects with a horizon year beyond 2020. Projects with a horizon year beyond 2020 should use efficiency metrics that are adjusted for 2030 and include applicable land uses.
- (4) Percent Below “Business as Usual” (BAU). GHG emissions would be less than significant if the project reduces BAU emissions by the same amount as the statewide 2020 reductions. However, this method is no longer recommended following the Newhall Ranch ruling.

The AEP recommendations are similar to the recommendation developed by the SCAQMD Working group. As the City has not adopted a Climate Action Plan or similar qualified GHG reduction plan, method 1 is not applicable. Based on CEQA case law, method 4 is also not applicable. Operational emissions threshold method 2 would be applicable to smaller projects using the SCAQMD screening threshold. However, due to the size of the project method 4 is most applicable to the proposed Project.

The SCAQMD Working Group developed an efficiency thresholds, or SP thresholds, for project level and plan level analysis for 2020 and suggested a potential threshold for 2035. However, these are largely based on the goals and information available in 2008 and have thus been reevaluated based on the emission estimates and goals of the 2017 Scoping Plan.

Efficiency thresholds are thresholds based on the measurement of GHG efficiency for a given project, regardless of the amount of mass emissions. The intent of these thresholds is to identify the level of GHG emissions below which new development would not interfere with the achievement of statewide GHG emission goals. A project that attains a specific efficiency as measured by the SP, would result in less than significant impact under CEQA. A locally appropriate 2030 project-specific threshold is derived from CARB’s recommendations in the 2017 Climate Change Scoping Plan Update, as discussed below.

In the 2017 Scoping Plan, CARB identified the need to balance population growth with GHG emissions reduction goals and in doing so, provided a plan level methodology for target setting that provides consistency with state GHG reduction goals using per capita GHG emissions limits. However, CARB stopped short of identifying a project level threshold, but provided ideas of how they may be developed. A project-specific efficiency threshold can be calculated by dividing statewide GHG emissions by the sum of statewide jobs and residents, similar to how CARB developed the plan level threshold. However, not all statewide emission sources would be impacted by the proposed land use. Accordingly, consistent with the concerns raised in the Golden Door (2018) and Newhall Ranch (2015) decisions regarding the correlation between state and local conditions, the 2030 statewide inventory target was modified based on evidence provided to establish a locally-appropriate, project-specific threshold consistent with the SB 32 target.

To develop this threshold, the local planning area, i.e., the City of Murrieta, was first evaluated to determine emissions sectors that are present and would be directly affected by potential land-use changes. A description of major sources of emissions that are included in the State Scoping Plan emissions sectors and representative sources in City of Murrieta are shown in Table 2-4.

According to the City's General Plan Land Use Map and Zoning Map, there are no existing or planned large scale agricultural land uses within the City. Therefore, the Agricultural Emissions Sector was considered locally inappropriate and was removed from the State 2030 emissions forecast. Furthermore, industrial development within the City is limited to light industrial and limited commercial activities, such as auto repair, food processing and packaging, and art studios. Industrial Sector source emissions (i.e., oil, gas, and hydrogen production; refineries; general fuel use; and mining operations) are not found within the City and would not be directly impacted by the proposed land uses; therefore the Industrial Emissions Sector was removed from the State 2030 emissions forecast to retain a more conservative locally-appropriate target.² Additionally, Cap and Trade emissions reductions occur independent of any local jurisdictional land use decisions and the effects of Cap and Trade excluded from the locally-appropriate target.

After removing Agricultural, Industrial, and the effects of Cap and Trade emissions, the remaining emissions sectors with sources within the City of Murrieta were then used to create a locally appropriate emissions total for projects in City of Murrieta. This locally-appropriate emissions total is divided by the statewide 2030 service person population to determine a project-level threshold of 3.2 MT of CO₂e per SP that is consistent with SB 32 targets, as shown in Table 2-3 and Table 2-4.

TABLE 2-3: STATEWIDE EMISSIONS SECTORS – 2017 SCOPING PLAN

GHG Emissions Sector	2030 State Emissions Target (MMT)¹	Locally Appropriate	Project Specific	Major Sources²
Residential and Commercial Sectors	38	Yes	Yes	Natural gas end users, including space and water heating of buildings
Industrial Sector	83	No	No	Oil, gas, and hydrogen production, refineries, general fuel use, and mining operations.
Agriculture	24	No	No	Enteric fermentation, crop residue burning, and manure management.
Electricity	53	Yes	Yes	Electricity users, including lighting, appliances, machinery, and heating
Recycling and Waste	8	Yes	Yes	Waste generated by all land uses
Transportation	103	Yes	Yes	Passenger vehicles, heavy duty, and other on-road vehicle emissions
High GWP Sources	11	Yes	Yes	SF ₆ from power stations, HFCs from refrigerants, and air conditioning
Cap and Trade ³	-60	No	No	Reductions from facilities emitting more than 10,000 MT CO ₂ e per year
Scoping Plan Target (All Sectors)	260	--	--	All emissions sectors
Sectors Not Applicable	-47			
2030 Locally Applicable Emissions	213	--	--	Emissions applicable to the City of Murrieta

Sectors				
----------------	--	--	--	--

MMT = million metric tons

¹ 2017 Climate Change Scoping Plan.

² CARB GHG Emissions Inventory Scoping Plan Categorization

³ Cap and Trade is excluded as reductions will occur independent of local project land use decisions and are therefore not locally appropriate.

TABLE 2-4: LOCALLY APPROPRIATE PROJECT LEVEL THRESHOLD

California 2017 Climate Change Scoping Plan	California 2030 Population (persons) ¹	43,939,250
	California 2030 Employment Projection (persons) ²	23,459,500
	SP	67,398,750
Locally Appropriate 2030 Project Threshold	2030 Locally Appropriate Emissions Sectors (MT CO ₂ e)	213,000,000
	2030 SP	67,398,750
	2030 SP Target (MT CO ₂ e per SP)	3.2

¹ California Department of Finance 2018² Average of employment range projections under implementation scenario. 2017 Scoping Plan.

The State has codified a target of reducing emissions to 40 percent below 1990 emissions levels by 2030 (SB 32) and has developed the 2017 Scoping Plan to demonstrate how the State will achieve the 2030 target and make substantial progress toward the 2050 goal of an 80 percent reduction in 1990 GHG emission levels set by EO S-3-05. The 2030 goal is currently the only legislatively codified statewide GHG reduction target.

The AEP Climate Change Committee recommends that CEQA GHG analyses evaluate project emissions in light of the trajectory of state climate change legislation and assess their “substantial progress” toward achieving long-term reduction targets identified in available plans, legislation, or EOs (45). Consistent with AEP Climate Change Committee recommendations, GHG impacts are analyzed in terms of whether the anticipated project development would impede “substantial progress” toward meeting the reduction goal identified in SB 32. Avoiding interference with and making substantial progress toward long-term State targets is important because these targets have been set at levels that achieve California’s fair share of international emissions reduction targets that will stabilize global climate change effects.

SERVICE POPULATION

The Project would provide 483 residential dwelling units. As the project is primarily residential the entire SP is based on future residents. Based on the Connect SoCal, Demographics and Growth Projections Technical Report, City of Murrieta has an average of 3.3 persons per household (46). Therefore, the Project is estimated to generate a SP of 1,594 people.

3 PROJECT GREENHOUSE GAS IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will result in a significant GHG impact. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The criteria used to determine the significance of potential Project-related GHG impacts are taken from the Initial Study Checklist in Appendix G of the State CEQA Guidelines (14 California Code of Regulations §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to GHG if it would (46):

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

3.3 CALIFORNIA EMISSIONS ESTIMATOR MODEL™ EMPLOYED TO ANALYZE GHG EMISSIONS

In June, 2021 the SCAQMD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model (CalEEMod) Version 2020.40.0. The purpose of this model is to calculate construction-source and operational-source criteria pollutant and GHG emissions (CO₂, CH₄, and N₂O) from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation (47). Accordingly, the latest version of CalEEMod has been used for this Project to determine construction and operational air quality emissions. CalEEMod output for construction and operational activity are provided in Appendix 3.1.

3.3.1 EMISSION FACTORS MODEL

On August 19, 2019, the EPA approved the 2017 version of the EMISSIONS FACTOR model (EMFAC) web database for use in SIP and transportation conformity analyses. EMFAC2017 is a mathematical model that was developed to calculate emission rates, fuel consumption, VMT from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by the CARB to project changes in future emissions from on-road mobile sources (48). The EMFAC emission factors used in this analysis include adjustment factors for the SAFE Rule and thus represent a conservative scenario (49) (50).

3.4 LIFE-CYCLE ANALYSIS NOT REQUIRED

A full life-cycle analysis (LCA) for construction and operational activity is not included in this analysis due to the lack of consensus guidance on LCA methodology at this time (51). Life-cycle analysis (i.e., assessing economy-wide GHG emissions from the processes in manufacturing and transporting all raw materials used in the project development, infrastructure, and on-going

operations) depends on emission factors or econometric factors that are not well established for all processes. At this time, an LCA would be extremely speculative and thus has not been prepared.

Additionally, the SCAQMD recommends analyzing direct and indirect project GHG emissions generated within California and not life-cycle emissions because the life-cycle effects from a project could occur outside of California, might not be very well understood or documented, and would be challenging to mitigate (52). Additionally, the science to calculate life cycle emissions is not yet established or well defined; therefore, SCAQMD has not recommended, and is not requiring, life-cycle emissions analysis.

3.5 CONSTRUCTION EMISSIONS

Project construction activities would generate CO₂ and CH₄ emissions. The report *Murrieta Apartments Air Quality Impact Analysis Report* contains detailed information regarding Project construction activities (12). Construction related emissions are expected from the following activities:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

3.5.1 CONSTRUCTION DURATION

Construction is expected to commence in February 2022 and will continue through September 2026. The construction schedule utilized in the analysis, shown in Table 3-1, represents a “worst-case” analysis scenario should construction occur any time after the respective dates since emission factors for construction decrease as time passes and the analysis year increases due to emission regulations becoming more stringent.² The duration of construction activity and associated equipment represents a reasonable approximation of the expected construction fleet as required per CEQA Guidelines. The duration of construction activities was based on CalEEMod defaults and an opening year of 2023.

² As shown in the CalEEMod User’s Guide Version 2016.3.2, Section 4.3 “Offroad Equipment” as the analysis year increases, emission factors for the same equipment pieces decrease due to the natural turnover of older equipment being replaced by newer less polluting equipment and new regulatory requirements.

TABLE 3-1: CONSTRUCTION DURATION

Phase Name	Start Date	End Date	Days
Site Preparation	2/7/2022	2/18/2022	10
Grading	2/19/2022	4/8/2022	35
Building Construction	4/9/2022	9/8/2023	370
Paving	7/26/2023	9/8/2023	33
Architectural Coating	7/26/2023	9/8/2023	33

Source: CalEEMod, Appendix 3.1.

3.5.2 CONSTRUCTION EQUIPMENT

Site specific construction fleet may vary due to specific Project needs at the time of construction. The construction equipment estimates are generally based on CalEEMod standard inputs. A detailed summary of construction equipment assumptions by phase is provided at Table 3-2. Please refer to specific detailed modeling inputs/outputs contained in Appendix 3.1.

TABLE 3-2: CONSTRUCTION EQUIPMENT ASSUMPTIONS

Phase Name	Equipment	Amount	Hours Per Day
Site Preparation	Crawler Tractors	4	8
	Rubber Tired Dozers	3	8
Grading	Crawler Tractors	2	8
	Crawler Tractors	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	3	8
	Welders	1	8
Paving	Pavers	2	8
	Paving Equipment	2	8
	Rollers	2	8
Architectural Coating	Air Compressors	1	8

Source: CalEEMod, Appendix 3.1

3.5.3 CONSTRUCTION EMISSIONS SUMMARY

To evaluate Project construction emissions, GHG emissions are quantified and amortized over the life of the Project and added to the operations emissions. To amortize the emissions over the life of the Project, the SCAQMD recommends calculating the total GHG emissions for the construction activities, dividing it by a 30-year project life then adding that number to the annual operational GHG emissions (53). Therefore, Project construction emissions have been amortized

over a 30-year period and added to the annual operational GHG emissions. The amortized construction emissions are presented in Table 3-3.

TABLE 3-3 AMORTIZED ANNUAL CONSTRUCTION EMISSIONS

Year	Emissions (MT/yr)			
	CO ₂	CH ₄	N ₂ O	Total CO ₂ e
2022	1131.13	0.12	0.05	1149.75
2023	995.39	0.09	0.05	1011.71
Total Annual Construction Emissions	2,126.52	0.20	0.10	2,161.45
Amortized Construction Emissions (MTCO₂e)	70.88	0.01	0.00	72.05

Source: CalEEMod, Appendix 3.1

3.6 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of CO₂, CH₄, and N₂O from the following primary sources:

- Area Source Emissions
- Energy Source Emissions
- Mobile Source Emissions
- Water Supply, Treatment, and Distribution
- Solid Waste

3.6.1 AREA SOURCE EMISSIONS

Landscape maintenance equipment are typically the only area sources that would generate emissions GHG emissions, which are primarily due to fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the Project. The emissions associated with landscape maintenance equipment were calculated based on standard assumptions included in CalEEMod.

3.6.2 ENERGY SOURCE EMISSIONS

COMBUSTION EMISSIONS ASSOCIATED WITH NATURAL GAS AND ELECTRICITY

GHGs are emitted from buildings as a result of activities for which electricity and natural gas are typically used as energy sources. Combustion of any type of fuel emits CO₂ and other GHGs directly into the atmosphere; these emissions are considered direct emissions associated with a building; the building energy use emissions do not include street lighting³. GHGs are also emitted during the generation of electricity from fossil fuels; these emissions are indirect emissions. Unless otherwise noted, CalEEMod default parameters were used.

³

RENEWABLE PORTFOLIO STANDARD

Indirect emissions from electricity use were modeled based on electricity intensity factors for the Project utility provider, Southern California Edison (SCE). CalEEMOD derives energy intensity factors from 2019 data, which indicates that in 2019 SCE generated 393 pounds of CO₂e for each megawatt-hour (MWh) of electricity delivered. Projected 2026 energy-intensity factors for SCE were interpolated based on SCE's existing power mix and the requirements of the Renewables Portfolio Standard. As SCE had a power mix with 38% renewables in 2019 and is projected to meet the 44% renewables requirement in 2024 (54).

TITLE 24 ENERGY EFFICIENCY STANDARDS

California's Energy Efficiency Standards for Residential and Nonresidential Buildings was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity. The 2019 version of Title 24 was adopted by the CEC and became effective on January 1, 2020. The 2019 Energy Code is estimated to make non-residential and high-rise residential buildings to be 30% more efficient than the same buildings built under the 2016 Energy Code (5).

3.6.3 MOBILE SOURCE EMISSIONS

Project mobile source GHG impacts are dependent on both overall daily vehicle trip generation and the effect of the Project on peak hour traffic volumes and traffic operations in the vicinity of the Project. The Project-related GHG impacts are derived primarily from vehicle trips generated by the Project. Trip characteristics available from the TIA report were utilized in this analysis (55).

3.6.4 WATER SUPPLY, TREATMENT AND DISTRIBUTION

Indirect GHG emissions result from the production of electricity used to convey, treat, and distribute water and wastewater. The amount of electricity required to convey, treat and distribute water depends on the volume of water as well as the sources of the water. CalEEMod default parameters were reduced by 20% to demonstrate compliance with CalGreen.

3.6.5 SOLID WASTE

Residential land uses will result in the generation and disposal of solid waste. A large percentage of this waste will be diverted from landfills by a variety of means, such as reducing the amount of waste generated, recycling, and/or composting. The remainder of the waste not diverted will be disposed of at a landfill. GHG emissions from landfills are associated with the anaerobic breakdown of material. GHG emissions associated with the disposal of solid waste associated with the proposed Project were calculated by CalEEMod using standard generation rates.

3.7 EMISSIONS SUMMARY

IMPACTS WITHOUT PROJECT DESIGN FEATURES AND MITIGATION

The annual GHG emissions associated with the operation of the proposed Project without mitigation are estimated to be approximately 4,493.12 MT CO₂e/yr as summarized in Table 3-4.

3.8 GREENHOUSE GAS EMISSIONS FINDINGS AND RECOMMENDATIONS

3.8.1 GHG IMPACT 1

The Project could generate direct or indirect GHG emissions that would result in a significant impact on the environment.

IMPACTS WITHOUT PROJECT DESIGN FEATURES AND MITIGATION

The annual GHG emissions associated with the operation of the proposed Project without mitigation are estimated to be approximately 4,493.12 MT CO₂e/yr as summarized in Table 3-4. The Project is estimated to have a SP of 1,594. This would result in an efficiency of 2.82 MT CO₂e/SP. This would be below the 3.2 MT CO₂e/SP threshold used by the City of Murrieta. As such, a less than significant impact is expected.

TABLE 3-4: PROJECT GHG EMISSIONS

Emission Source	Emissions (MT/yr)			
	CO ₂	CH ₄	N ₂ O	Total CO ₂ e
Annual construction-related emissions amortized over 30 years	70.88	0.01	0.00	72.05
Area	112.62	0.01	0.00	113.44
Energy	749.90	0.04	0.01	754.07
Mobile	3,261.62	0.21	0.14	3,309.68
Waste	45.16	2.67	0.00	111.89
Water Use	105.21	0.83	0.02	132.00
Total CO₂e (All Sources)	4,493.12			
Service Population	1,594			
Project Efficiency	2.82			
Efficiency Threshold	3.20			
Exceed Efficiency Threshold?	No			

Source: CalEEMod 2016, Appendix 3.1

-- = Emission factor only provided in MT CO₂e

3.8.2 GHG IMPACT 2

The Project could not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

As previously stated, pursuant to 15604.4 of the *CEQA Guidelines*, a lead agency may rely on qualitative analysis or performance-based standards to determine the significance of impacts from GHG emissions (46). As such, the Project's consistency with SB 32 (2017 Scoping Plan), is discussed below. It Consistency with AB 32 and the 2008 Scoping Plan is not necessary, since the target year for AB 32 and the 2008 Scoping Plan was 2020, and the Project's buildout year for modeling is 2023. As such the 2017 Scoping Plan is the most relevant statewide plan. Project consistency with SB 32 and City's General Plan Measures, Energy Efficiency, and CAS is evaluated in the following discussion.

SB 32/2017 SCOPING PLAN CONSISTENCY

The 2017 Scoping Plan Update reflects the 2030 target of a 40% reduction below 1990 levels, set by Executive Order B-30-15 and codified by SB 32. Table 3-5 summarizes the Project's consistency with the 2017 Scoping Plan. As summarized, the Project will not conflict with any of the provisions of the Scoping Plan and in fact supports seven of the action categories.

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY

Action	Responsible Parties	Consistency
Implement SB 350 by 2030		
Increase the Renewables Portfolio Standard to 50% of retail sales by 2030 and ensure grid reliability.	CPUC, CEC, CARB	Consistent. This measure is not directly applicable to development projects, but the proposed Project would use energy from Southern California Edison, which has committed to diversify its portfolio of energy sources by increasing energy from wind and solar sources.
Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030.		Consistent. Although this measure is directed towards policymakers, the proposed Project would be designed consistent with Title 24 2019, which increases in overall energy efficiency from Title 24 2016.
Reduce GHG emissions in the electricity sector through the implementation of the above measures and other actions as modeled in Integrated Resource Planning (IRP) to meet GHG emissions reductions planning targets in the IRP process. Load-serving entities and publicly- owned utilities meet GHG emissions reductions planning targets through a combination of measures as described in IRPs.		Not applicable. This measure is not within the purview of this Project.
Implement Mobile Source Strategy (Cleaner Technology and Fuels)		
At least 1.5 million zero emission and plug-in hybrid light-duty electric vehicles by 2025.	CARB, California State Transportation Agency (CalSTA), Strategic Growth Council (SGC), California Department of	Consistent. These are CARB enforced standards; vehicles that access the Project that are required to comply with the standards will comply with the strategy.
At least 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030.		Consistent. These are CARB enforced standards; vehicles that access the Project that are required to comply with the standards will comply with the strategy.

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY

Action	Responsible Parties	Consistency
Further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean cars regulations.	Transportation (Caltrans), CEC, OPR, Local Agencies	Consistent. These are CARB enforced standards; vehicles that access the Project that are required to comply with the standards will comply with the strategy.
Medium- and Heavy-Duty GHG Phase 2.		Consistent. These are CARB enforced standards; vehicles that access the Project that are required to comply with the standards will comply with the strategy.
Innovative Clean Transit: Transition to a suite of to-be-determined innovative clean transit options. Assumed 20% of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100% of new sales in 2030. Also, new natural gas buses, starting in 2018, and diesel buses, starting in 2020, meet the optional heavy-duty low-NO _x standard.		Not applicable. This measure is not within the purview of this Project.
Last Mile Delivery: New regulation that would result in the use of low NO _x or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5% of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10% in 2025 and remaining flat through 2030.		Not applicable. This Project is not responsible for implementation of SB 375 and would therefore not conflict with this measure.
Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document “Potential VMT Reduction Strategies for Discussion.”		Not applicable. This Project is not responsible for implementation of SB 375 and would therefore not conflict with this measure.
Increase stringency of SB 375 Sustainable Communities Strategy (2035 targets).	CARB	Not applicable. The Project is not within the purview of SB 375 and would therefore not conflict with this measure.
By 2019, adjust performance measures used to select and design transportation facilities		
Harmonize project performance with emissions reductions and increase competitiveness of transit and active	CalSTA, SGC, OPR, CARB,	Not applicable. Although this is directed towards CARB and Caltrans, the proposed Project would be designed to promote

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY

Action	Responsible Parties	Consistency
transportation modes (e.g., via guideline documents, funding programs, project selection, etc.).	Governor's Office of Business and Economic Development (GO-Biz), California Infrastructure and Economic Development Bank, Department of Finance, California Transportation Commission (CTC), Caltrans	and support pedestrian activity on-site and in the Project Site area.
By 2019, develop pricing policies to support low-GHG transportation (e.g., low-emission vehicle zones for heavy duty, road user, parking pricing, transit discounts).	CalSTA, Caltrans, CTC, OPR, SGC, CARB	Not applicable. Although this measure is directed towards policymakers, the proposed Project would comply with AB 939, which sets a statewide policy that not less than 65% of solid waste generated be source reduced, recycled, or composted. Additionally, the proposed Project would be required to participate in the City of Murrieta recycling program and recycling collection. During construction, the proposed Project shall recycle and reuse construction and demolition waste per City of Murrieta solid waste procedures.
Implement California Sustainable Freight Action Plan		
Improve freight system efficiency.	CalSTA, CalEPA, CNRA, CARB, Caltrans, CEC, GO-Biz	Not applicable. This measure is not within the purview of this Project.
Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030.		Not applicable. This measure is not within the purview of this Project.
Adopt a Low Carbon Fuel Standard with a Carbon Intensity reduction of 18%.	CARB	Consistent. This measure would apply to all fuel purchased and used by the Project in the state.
Implement the Short-Lived Climate Pollutant Strategy by 2030		

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY

Action	Responsible Parties	Consistency
40% reduction in methane and hydrofluorocarbon emissions below 2013 levels.	CARB, CalRecycle, CDFA, SWRCB, Local Air Districts	Not applicable. This measure is not within the purview of this Project.
50% reduction in black carbon emissions below 2013 levels.		Not applicable. This measure is not within the purview of this Project.
By 2019, develop regulations and programs to support organic waste landfill reduction goals in the SLCP and SB 1383.	CARB, CalRecycle, CDFA SWRCB, Local Air Districts	Not applicable. This measure is not within the purview of this Project.
Implement the post-2020 Cap-and-Trade Program with declining annual caps.	CARB	Not applicable. This measure is not within the purview of this Project.
By 2018, develop Integrated Natural and Working Lands Implementation Plan to secure California's land base as a net carbon sink		
Protect land from conversion through conservation easements and other incentives.	CNRA, Departments Within CDFA, CalEPA, CARB	Not applicable. This measure is not within the purview of this Project.
Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity		Not applicable. This measure is not within the purview of this Project.
Utilize wood and agricultural products to increase the amount of carbon stored in the natural and built environments		Not applicable. This measure is not within the purview of this Project.
Establish scenario projections to serve as the foundation for the Implementation Plan		Not applicable. This measure is not within the purview of this Project.
Establish a carbon accounting framework for natural and working lands as described in SB 859 by 2018	CARB	Not applicable. This measure is not within the purview of this Project.
Implement Forest Carbon Plan	CNRA, California Department of Forestry and Fire Protection, CalEPA and Departments Within	Not applicable. This measure is not within the purview of this Project.
Identify and expand funding and financing mechanisms to support GHG reductions across all sectors.	State Agencies & Local Agencies	Not applicable. This measure is not within the purview of this Project.

As shown above, the Project would not conflict with any of the 2017 Scoping Plan elements as any regulations adopted would apply directly or indirectly to the Project. Further, recent studies show that the State's existing and proposed regulatory framework will allow the State to reduce its GHG emissions level to 40% below 1990 levels by 2030 (34).

CITY OF MURRIETA CAP CONSISTENCY

The CAP recommends GHG emissions targets that are consistent with the reduction targets of the State of California and presents a number of strategies that will make it possible for the City of Murrieta to meet the recommended targets (56). The CAP also suggests best practices for implementation and makes recommendations for measuring progress. As indicated in Table 3-6, the proposed Project would be consistent with, or otherwise would not conflict with, the CAP's strategies, goals, and measures.

TABLE 3-6: PROJECT CONSISTENCY WITH THE CITY OF MURRIETA CAP

CAP Strategy	Analysis of Project Consistency
Strategy 1: Community Involvement Strategy	Not Applicable. The CAP's Community Involvement Strategy provides guidance to the City for conducting outreach programs to involve residents and businesses in GHG-reducing activities, assessments, and actions. The proposed Project would not affect the City's ability to conduct community outreach.
Strategy 2: Land Use and Community Vision Strategy	Consistent. The proposed Project would aid in creating a complementary balance of land uses throughout the community.
Strategy 3: Transportation and Mobility Strategy	Consistent. Any potential roadway improvements planned by the Project have been designed to City standards and would safely accommodate pedestrians and bicycles. The remaining goals and measures under the Transportation and Mobility Strategy are not applicable to the proposed Project.
Strategy 4: Energy Use and Conservation Strategy	Consistent. The Project would be required to comply with the California Building Code, which establishes stringent energy efficiency requirements for new development including installation of solar PV systems on dwelling units less than 4 stories high. The remaining goals and measures under the Energy Use and Conservation Strategy are not applicable to the proposed Project.
Strategy 5: Water Use and Efficiency Strategy	Consistent. The Project would be required to comply with Murrieta Municipal Code Section 16.28 (Landscaping Standards and Water Efficient Landscaping), which would reduce the Project's energy demand associated with landscaping and water use. The remaining goals and measures under the Water Use and Efficiency Strategy are not applicable to the proposed Project.
Strategy 6: Waste Reduction and Recycling Strategy	Consistent. The Project has been designed to accommodate adequate infrastructure for water, sewer, storm water, and energy. The remaining goals and measures under the Waste Reduction and Recycling Strategy are not applicable to the proposed Project.
Strategy 7: Open Space Strategy	Consistent. The Project's incorporates a variety of trees, bushes, and groundcover.

SUMMARY

As shown, the Project does not directly conflict with any applicable plans or policies adopted for the purpose of reducing GHG emissions. Additionally, the project would not exceed the locally appropriate evidence-based threshold of 3.2 MT CO₂e/SP, which is based on the 2017 Scoping Plan per capita reduction goal for 2030. Therefore, Project-related emissions would be less than significant relative to GHG reduction plans.

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5 CERTIFICATIONS

The contents of this GHG study report represent an accurate depiction of the GHG impacts associated with the proposed Murrieta Apartments Project. The information contained in this GHG report is based on the best available data at the time of preparation. If you have any questions, please contact me directly (619) 778-1971.

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PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
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AWMA – Air and Waste Management Association

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HARP Model Training – Bluescape Environmental • 2004
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APPENDIX 3.1: CALEEMOD EMISSIONS MODEL OUTPUTS

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Murrieta Apartments - South Coast AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**Murrieta Apartments**
South Coast AQMD Air District, Annual**1.0 Project Characteristics****1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	1,137.00	Space	12.55	454,800.00	0
City Park	3.50	Acre	3.50	152,460.00	0
Apartments Low Rise	153.00	Dwelling Unit	4.59	153,000.00	438
Apartments Mid Rise	330.00	Dwelling Unit	4.17	330,000.00	944

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	10			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	CH4 Intensity (lb/MWhr)	0.033	N2O Intensity (lb/MWhr)	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Based on Site Plan actual building area, open space/landscaped, and parking lot acreage

Construction Phase - Based on Project Applicant Schedule Starting in early 2022 and opening year 2023. Paving and painting extended to provide 1.5 months and then overlapped with building construction.

Off-road Equipment - standard 8-hour day

Off-road Equipment - Standard 8 hour day

Off-road Equipment - tractor/backhoe/loader and excavators replaced with crawler tractors for PM generation crawler tractor LF and HP set same as tractor/backhoe/loader and excavators

Off-road Equipment -

Off-road Equipment - tractor/backhoe/loader replaced with crawler tractor for PM generation crawler tractor LF and HP set same as tractor/backhoe/loader

Murrieta Apartments - South Coast AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading -

Architectural Coating - Based on a total apartments SF of 286,608 square feet

Vehicle Trips - No trip generation for park as it represents landscaping and on-site open space

Woodstoves - No wood burning device per SCAQMD Rule 445. 10% No fire place

Area Coating - Based on a total apartment square footage of 286,608 sf

Water And Wastewater - Outdoor water use for landscaping included in apartment outdoor water use rates, indoor water use reduced 20% to account for CalGreen Code updates in 2013 as water rates are taken from year 2000 survey.

Construction Off-road Equipment Mitigation - Clean Paved roads % taken from SCAQMD Rule 403 workbook

Energy Mitigation - Based on Title 24 solar PV requirements for residential under 4 stories.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Residential_Exterior	326,025.00	193,461.00
tblArchitecturalCoating	ConstArea_Residential_Interior	978,075.00	580,381.00
tblAreaCoating	Area_Residential_Exterior	326025	193461
tblAreaCoating	Area_Residential_Interior	978075	580381
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	46
tblConstructionPhase	NumDays	20.00	33.00
tblConstructionPhase	NumDays	20.00	33.00
tblFireplaces	NumberGas	130.05	138.00
tblFireplaces	NumberGas	280.50	297.00
tblFireplaces	NumberNoFireplace	15.30	14.00
tblFireplaces	NumberWood	7.65	0.00
tblFireplaces	NumberWood	16.50	0.00
tblLandUse	LotAcreage	10.23	12.55
tblLandUse	LotAcreage	9.56	4.59
tblLandUse	LotAcreage	8.68	4.17
tblOffRoadEquipment	HorsePower	212.00	97.00
tblOffRoadEquipment	HorsePower	212.00	158.00
tblOffRoadEquipment	HorsePower	212.00	97.00
tblOffRoadEquipment	LoadFactor	0.43	0.37

Murrieta Apartments - South Coast AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	LoadFactor	0.43	0.38
tblOffRoadEquipment	LoadFactor	0.43	0.37
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblVehicleTrips	ST_TR	1.96	0.00
tblVehicleTrips	SU_TR	2.19	0.00
tblVehicleTrips	WD_TR	0.78	0.00
tblWater	IndoorWaterUseRate	9,968,565.92	7,974,852.74
tblWater	IndoorWaterUseRate	21,500,828.46	17,200,662.77
tblWater	OutdoorWaterUseRate	4,170,184.72	0.00
tblWoodstoves	NumberCatalytic	7.65	0.00
tblWoodstoves	NumberCatalytic	16.50	0.00
tblWoodstoves	NumberNoncatalytic	7.65	0.00
tblWoodstoves	NumberNoncatalytic	16.50	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00

2.0 Emissions Summary

Murrieta Apartments - South Coast AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction
Unmitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
2022	0.4906	3.4601	4.5645	0.0123	1.0123	0.1438	1.1561	0.3119	0.1342	0.4461	0.0000	1,131,126	1,131,126	0.1172	0.0527	1,149,748
2023	1.3392	2.2395	3.8846	0.0108	0.7057	0.0837	0.7895	0.1894	0.0786	0.2680	0.0000	995,3900	995,3900	0.0861	0.0475	1,011,705
Maximum	1.3392	3.4601	4.5645	0.0123	1.0123	0.1438	1.1561	0.3119	0.1342	0.4461	0.0000	1,131,126	1,131,126	0.1172	0.0527	1,149,748
tons/yr											MT/yr					

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
2022	0.4906	3.4601	4.5645	0.0123	0.5543	0.1438	0.6981	0.1709	0.1342	0.3051	0.0000	1,131,126	1,131,126	0.1172	0.0527	1,149,748
2023	1.3392	2.2395	3.8846	0.0108	0.4306	0.0837	0.5143	0.1219	0.0786	0.2005	0.0000	995,3897	995,3897	0.0861	0.0475	1,011,704
Maximum	1.3392	3.4601	4.5645	0.0123	0.5543	0.1438	0.6981	0.1709	0.1342	0.3051	0.0000	1,131,126	1,131,126	0.1172	0.0527	1,149,748
tons/yr											MT/yr					

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	42.68	0.00	37.68	41.59	0.00	29.20	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-7-2022	6-6-2022	1.2222	1.2222
2	6-7-2022	9-6-2022	0.9667	0.9667
3	9-7-2022	12-6-2022	0.9693	0.9693
4	12-7-2022	3-6-2023	0.8821	0.8821
5	3-7-2023	6-6-2023	0.8580	0.8580
6	6-7-2023	9-6-2023	1.9765	1.9765
7	9-7-2023	9-30-2023	0.0708	0.0708
		Highest	1.9765	1.9765

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**2.2 Overall Operational****Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.0341	0.1478	5.0351	8.4000e-004		0.0349	0.0349		0.0349	0.0349	0.0000	112.6244	112.6244	9.9000e-003	1.9200e-003	113.4426
Energy	0.0381	0.3253	0.1384	2.0800e-003		0.0263	0.0263		0.0263	0.0263	0.0000	749.9013	749.9013	0.0387	0.0107	754.0651
Mobile	1.4908	1.8663	15.7277	0.0349	3.6298	0.0257	3.6554	0.9687	0.0239	0.9925	0.0000	3,261.6218	3,261.6218	0.2077	0.1439	3,309.6806
Waste						0.0000	0.0000		0.0000	0.0000	45.1614	0.0000	45.1614	2.6690	0.0000	111.8855
Water						0.0000	0.0000		0.0000	0.0000	7.9870	97.2255	105.2125	0.8286	0.0204	131.9950
Total	3.5630	2.3394	20.9012	0.0378	3.6298	0.0869	3.7166	0.9687	0.0851	1.0537	53.1485	4,221.3729	4,274.5213	3.7538	0.1769	4,421.0688

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.0341	0.1478	5.0351	8.4000e-004		0.0349	0.0349		0.0349	0.0349	0.0000	112.6244	112.6244	9.9000e-003	1.9200e-003	113.4426
Energy	0.0381	0.3253	0.1384	2.0800e-003		0.0263	0.0263		0.0263	0.0263	0.0000	538.7090	538.7090	0.0209	8.5600e-003	541.7833
Mobile	1.4908	1.8663	15.7277	0.0349	3.6298	0.0257	3.6554	0.9687	0.0239	0.9925	0.0000	3,261.6218	3,261.6218	0.2077	0.1439	3,309.6806
Waste						0.0000	0.0000		0.0000	0.0000	45.1614	0.0000	45.1614	2.6690	0.0000	111.8855
Water						0.0000	0.0000		0.0000	0.0000	7.9870	97.2255	105.2125	0.8286	0.0204	131.9950
Total	3.5630	2.3394	20.9012	0.0378	3.6298	0.0869	3.7166	0.9687	0.0851	1.0537	53.1485	4,010.1806	4,063.3290	3.7360	0.1747	4,208.7870

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	4.94	0.47	1.22	4.80

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	2/7/2022	2/18/2022	5	10	
2	Grading	Grading	2/19/2022	4/8/2022	5	35	
3	Building Construction	Building Construction	4/9/2022	9/8/2023	61	370	

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Paving	Paving	7/26/2023	9/8/2023	5	33
5	Architectural Coating	Architectural Coating	7/26/2023	9/8/2023	5	33

Acres of Grading (Site Preparation Phase): 35**Acres of Grading (Grading Phase): 140****Acres of Paving: 12.55****Residential Indoor: 580,381; Residential Outdoor: 193,461; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 27,288 (Architectural Coating – sqft)****OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Crawler Tractors	2	8.00	158	0.38
Grading	Crawler Tractors	2	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	603.00	151.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	121.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1089	0.0000	0.1089	0.0517	0.0000	0.0517	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0202	0.1965	0.1034	1.9000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	16.7211	16.7211	5.4100e-003	0.0000	16.8563
Total	0.0202	0.1965	0.1034	1.9000e-004	0.1089	0.0114	0.1203	0.0517	0.0105	0.0622	0.0000	16.7211	16.7211	5.4100e-003	0.0000	16.8563

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.4000e-004	3.1900e-003	1.0000e-005	9.9000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8036	0.8036	2.0000e-005	2.0000e-005	0.8105
Total	3.0000e-004	2.4000e-004	3.1900e-003	1.0000e-005	9.9000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8036	0.8036	2.0000e-005	2.0000e-005	0.8105

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0425	0.0000	0.0425	0.0202	0.0000	0.0202	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0202	0.1965	0.1034	1.9000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	16.7211	16.7211	5.4100e-003	0.0000	16.8563
Total	0.0202	0.1965	0.1034	1.9000e-004	0.0425	0.0114	0.0539	0.0202	0.0105	0.0307	0.0000	16.7211	16.7211	5.4100e-003	0.0000	16.8563

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.2 Site Preparation - 2022****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.4000e-004	3.1900e-003	1.0000e-005	5.9000e-004	1.0000e-005	6.0000e-004	1.7000e-004	1.0000e-005	1.7000e-004	0.0000	0.8036	0.8036	2.0000e-005	2.0000e-005	0.8105
Total	3.0000e-004	2.4000e-004	3.1900e-003	1.0000e-005	5.9000e-004	1.0000e-005	6.0000e-004	1.7000e-004	1.0000e-005	1.7000e-004	0.0000	0.8036	0.8036	2.0000e-005	2.0000e-005	0.8105

3.3 Grading - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1796	0.0000	0.1796	0.0659	0.0000	0.0659	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0783	0.8138	0.5239	1.0900e-003		0.0394	0.0394		0.0363	0.0363	0.0000	95.4171	95.4171	0.0309	0.0000	96.1886
Total	0.0783	0.8138	0.5239	1.0900e-003	0.1796	0.0394	0.2190	0.0659	0.0363	0.1022	0.0000	95.4171	95.4171	0.0309	0.0000	96.1886

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1800e-003	9.5000e-004	0.0124	3.0000e-005	3.8400e-003	2.0000e-005	3.8600e-003	1.0200e-003	2.0000e-005	1.0400e-003	0.0000	3.1249	3.1249	9.0000e-005	8.0000e-005	3.1520
Total	1.1800e-003	9.5000e-004	0.0124	3.0000e-005	3.8400e-003	2.0000e-005	3.8600e-003	1.0200e-003	2.0000e-005	1.0400e-003	0.0000	3.1249	3.1249	9.0000e-005	8.0000e-005	3.1520

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0701	0.0000	0.0701	0.0257	0.0000	0.0257	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0783	0.8138	0.5239	1.0900e-003		0.0394	0.0394		0.0363	0.0363	0.0000	95.4170	95.4170	0.0309	0.0000	96.1884
Total	0.0783	0.8138	0.5239	1.0900e-003	0.0701	0.0394	0.1095	0.0257	0.0363	0.0620	0.0000	95.4170	95.4170	0.0309	0.0000	96.1884

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.3 Grading - 2022****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1800e-003	9.5000e-004	0.0124	3.0000e-005	2.3100e-003	2.0000e-005	2.3300e-003	6.4000e-004	2.0000e-005	6.7000e-004	0.0000	3.1249	3.1249	9.0000e-005	8.0000e-005	3.1520
Total	1.1800e-003	9.5000e-004	0.0124	3.0000e-005	2.3100e-003	2.0000e-005	2.3300e-003	6.4000e-004	2.0000e-005	6.7000e-004	0.0000	3.1249	3.1249	9.0000e-005	8.0000e-005	3.1520

3.4 Building Construction - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1724	1.5929	1.6567	2.7400e-003		0.0821	0.0821		0.0772	0.0772	0.0000	235.8947	235.8947	0.0578	0.0000	237.3406
Total	0.1724	1.5929	1.6567	2.7400e-003		0.0821	0.0821		0.0772	0.0772	0.0000	235.8947	235.8947	0.0578	0.0000	237.3406

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.4 Building Construction - 2022****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0259	0.7005	0.2326	2.7400e-003	0.0905	6.9900e-003	0.0975	0.0261	6.6900e-003	0.0328	0.0000	267.7058	267.7058	8.9600e-003	0.0388	279.5056
Worker	0.1924	0.1553	2.0323	5.5400e-003	0.6285	3.8300e-003	0.6323	0.1669	3.5200e-003	0.1704	0.0000	511.4594	511.4594	0.0141	0.0137	515.8951
Total	0.2183	0.8558	2.2649	8.2800e-003	0.7190	0.0108	0.7298	0.1930	0.0102	0.2032	0.0000	779.1652	779.1652	0.0230	0.0526	795.4007

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1724	1.5929	1.6567	2.7400e-003		0.0821	0.0821		0.0772	0.0772	0.0000	235.8945	235.8945	0.0578	0.0000	237.3403
Total	0.1724	1.5929	1.6567	2.7400e-003		0.0821	0.0821		0.0772	0.0772	0.0000	235.8945	235.8945	0.0578	0.0000	237.3403

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.4 Building Construction - 2022****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0259	0.7005	0.2326	2.7400e-003	0.0610	6.9900e-003	0.0680	0.0189	6.6900e-003	0.0256	0.0000	267.7058	267.7058	8.9600e-003	0.0388	279.5056
Worker	0.1924	0.1553	2.0323	5.5400e-003	0.3779	3.8300e-003	0.3817	0.1054	3.5200e-003	0.1089	0.0000	511.4594	511.4594	0.0141	0.0137	515.8951
Total	0.2183	0.8558	2.2649	8.2800e-003	0.4389	0.0108	0.4497	0.1243	0.0102	0.1345	0.0000	779.1652	779.1652	0.0230	0.0526	795.4007

3.4 Building Construction - 2023**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1506	1.3894	1.5579	2.6000e-003		0.0673	0.0673		0.0633	0.0633	0.0000	223.5610	223.5610	0.0545	0.0000	224.9225
Total	0.1506	1.3894	1.5579	2.6000e-003		0.0673	0.0673		0.0633	0.0633	0.0000	223.5610	223.5610	0.0545	0.0000	224.9225

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.4 Building Construction - 2023****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0147	0.5177	0.1971	2.4800e-003	0.0857	2.8800e-003	0.0886	0.0247	2.7500e-003	0.0275	0.0000	241.8634	241.8634	8.1100e-003	0.0350	252.5093
Worker	0.1693	0.1301	1.7757	5.0800e-003	0.5954	3.4200e-003	0.5988	0.1581	3.1400e-003	0.1613	0.0000	471.7959	471.7959	0.0120	0.0120	475.6680
Total	0.1839	0.6479	1.9728	7.5600e-003	0.6811	6.3000e-003	0.6874	0.1829	5.8900e-003	0.1888	0.0000	713.6593	713.6593	0.0201	0.0470	728.1772

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1506	1.3894	1.5579	2.6000e-003		0.0673	0.0673		0.0633	0.0633	0.0000	223.5607	223.5607	0.0545	0.0000	224.9222
Total	0.1506	1.3894	1.5579	2.6000e-003		0.0673	0.0673		0.0633	0.0633	0.0000	223.5607	223.5607	0.0545	0.0000	224.9222

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.4 Building Construction - 2023****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0147	0.5177	0.1971	2.4800e-003	0.0578	2.8800e-003	0.0607	0.0179	2.7500e-003	0.0206	0.0000	241.8634	241.8634	8.1100e-003	0.0350	252.5093
Worker	0.1693	0.1301	1.7757	5.0800e-003	0.3580	3.4200e-003	0.3614	0.0999	3.1400e-003	0.1030	0.0000	471.7959	471.7959	0.0120	0.0120	475.6680
Total	0.1839	0.6479	1.9728	7.5600e-003	0.4158	6.3000e-003	0.4221	0.1177	5.8900e-003	0.1236	0.0000	713.6593	713.6593	0.0201	0.0470	728.1772

3.5 Paving - 2023**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0170	0.1682	0.2406	3.8000e-004		8.4200e-003	8.4200e-003		7.7400e-003	7.7400e-003	0.0000	33.0443	33.0443	0.0107	0.0000	33.3115
Paving	0.0164					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0335	0.1682	0.2406	3.8000e-004		8.4200e-003	8.4200e-003		7.7400e-003	7.7400e-003	0.0000	33.0443	33.0443	0.0107	0.0000	33.3115

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-004	5.9000e-004	8.1000e-003	2.0000e-005	2.7200e-003	2.0000e-005	2.7300e-003	7.2000e-004	1.0000e-005	7.4000e-004	0.0000	2.1516	2.1516	5.0000e-005	5.0000e-005	2.1693
Total	7.7000e-004	5.9000e-004	8.1000e-003	2.0000e-005	2.7200e-003	2.0000e-005	2.7300e-003	7.2000e-004	1.0000e-005	7.4000e-004	0.0000	2.1516	2.1516	5.0000e-005	5.0000e-005	2.1693

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0170	0.1682	0.2406	3.8000e-004		8.4200e-003	8.4200e-003		7.7400e-003	7.7400e-003	0.0000	33.0443	33.0443	0.0107	0.0000	33.3115
Paving	0.0164					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0335	0.1682	0.2406	3.8000e-004		8.4200e-003	8.4200e-003		7.7400e-003	7.7400e-003	0.0000	33.0443	33.0443	0.0107	0.0000	33.3115

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.5 Paving - 2023****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-004	5.9000e-004	8.1000e-003	2.0000e-005	1.6300e-003	2.0000e-005	1.6500e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	2.1516	2.1516	5.0000e-005	5.0000e-005	2.1693
Total	7.7000e-004	5.9000e-004	8.1000e-003	2.0000e-005	1.6300e-003	2.0000e-005	1.6500e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	2.1516	2.1516	5.0000e-005	5.0000e-005	2.1693

3.6 Architectural Coating - 2023**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9599					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.2200e-003	0.0287	0.0398	7.0000e-005		1.5600e-003	1.5600e-003		1.5600e-003	1.5600e-003	0.0000	5.6172	5.6172	3.4000e-004	0.0000	5.6256
Total	0.9642	0.0287	0.0398	7.0000e-005		1.5600e-003	1.5600e-003		1.5600e-003	1.5600e-003	0.0000	5.6172	5.6172	3.4000e-004	0.0000	5.6256

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.6 Architectural Coating - 2023****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2300e-003	4.7900e-003	0.0653	1.9000e-004	0.0219	1.3000e-004	0.0220	5.8200e-003	1.2000e-004	5.9300e-003	0.0000	17.3566	17.3566	4.4000e-004	4.4000e-004	17.4990
Total	6.2300e-003	4.7900e-003	0.0653	1.9000e-004	0.0219	1.3000e-004	0.0220	5.8200e-003	1.2000e-004	5.9300e-003	0.0000	17.3566	17.3566	4.4000e-004	4.4000e-004	17.4990

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9599					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.2200e-003	0.0287	0.0398	7.0000e-005		1.5600e-003	1.5600e-003		1.5600e-003	1.5600e-003	0.0000	5.6172	5.6172	3.4000e-004	0.0000	5.6256
Total	0.9642	0.0287	0.0398	7.0000e-005		1.5600e-003	1.5600e-003		1.5600e-003	1.5600e-003	0.0000	5.6172	5.6172	3.4000e-004	0.0000	5.6256

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**3.6 Architectural Coating - 2023****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2300e-003	4.7900e-003	0.0653	1.9000e-004	0.0132	1.3000e-004	0.0133	3.6700e-003	1.2000e-004	3.7900e-003	0.0000	17.3566	17.3566	4.4000e-004	4.4000e-004	17.4990
Total	6.2300e-003	4.7900e-003	0.0653	1.9000e-004	0.0132	1.3000e-004	0.0133	3.6700e-003	1.2000e-004	3.7900e-003	0.0000	17.3566	17.3566	4.4000e-004	4.4000e-004	17.4990

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.4908	1.8663	15.7277	0.0349	3.6298	0.0257	3.6554	0.9687	0.0239	0.9925	0.0000	3,261.6218	3,261.6218	0.2077	0.1439	3,309.6806
Unmitigated	1.4908	1.8663	15.7277	0.0349	3.6298	0.0257	3.6554	0.9687	0.0239	0.9925	0.0000	3,261.6218	3,261.6218	0.2077	0.1439	3,309.6806

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,119.96	1,245.42	960.84	3,810,642	3,810,642
Apartments Mid Rise	1,795.20	1,620.30	1349.70	5,831,614	5,831,614
City Park	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	2,915.16	2,865.72	2,310.54	9,642,256	9,642,256

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.543139	0.060749	0.184760	0.130258	0.023830	0.006353	0.011718	0.009137	0.000812	0.000509	0.024193	0.000750	0.003791
Apartments Mid Rise	0.543139	0.060749	0.184760	0.130258	0.023830	0.006353	0.011718	0.009137	0.000812	0.000509	0.024193	0.000750	0.003791
City Park	0.543139	0.060749	0.184760	0.130258	0.023830	0.006353	0.011718	0.009137	0.000812	0.000509	0.024193	0.000750	0.003791
Parking Lot	0.543139	0.060749	0.184760	0.130258	0.023830	0.006353	0.011718	0.009137	0.000812	0.000509	0.024193	0.000750	0.003791

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Kilowatt Hours of Renewable Electricity Generated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	161.9402	161.9402	0.0137	1.6600e-003	162.7756
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	373.1325	373.1325	0.0315	3.8200e-003	375.0574
NaturalGas Mitigated	0.0381	0.3253	0.1384	2.0800e-003		0.0263	0.0263		0.0263	0.0263	0.0000	376.7688	376.7688	7.2200e-003	6.9100e-003	379.0077
NaturalGas Unmitigated	0.0381	0.3253	0.1384	2.0800e-003		0.0263	0.0263		0.0263	0.0263	0.0000	376.7688	376.7688	7.2200e-003	6.9100e-003	379.0077

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**5.2 Energy by Land Use - NaturalGas****Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.31426e+006	0.0125	0.1066	0.0454	6.8000e-004		8.6200e-003	8.6200e-003		8.6200e-003	8.6200e-003	0.0000	123.4980	123.4980	2.3700e-003	2.2600e-003	124.2318
Apartments Mid Rise	4.74612e+006	0.0256	0.2187	0.0931	1.4000e-003		0.0177	0.0177		0.0177	0.0177	0.0000	253.2708	253.2708	4.8500e-003	4.6400e-003	254.7759
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0381	0.3253	0.1384	2.0800e-003		0.0263	0.0263		0.0263	0.0263	0.0000	376.7688	376.7688	7.2200e-003	6.9000e-003	379.0077

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**5.2 Energy by Land Use - NaturalGas****Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.31426e+006	0.0125	0.1066	0.0454	6.8000e-004		8.6200e-003	8.6200e-003		8.6200e-003	8.6200e-003	0.0000	123.4980	123.4980	2.3700e-003	2.2600e-003	124.2318
Apartments Mid Rise	4.74612e+006	0.0256	0.2187	0.0931	1.4000e-003		0.0177	0.0177		0.0177	0.0177	0.0000	253.2708	253.2708	4.8500e-003	4.6400e-003	254.7759
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0381	0.3253	0.1384	2.0800e-003		0.0263	0.0263		0.0263	0.0263	0.0000	376.7688	376.7688	7.2200e-003	6.9000e-003	379.0077

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**5.3 Energy by Land Use - Electricity****Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	638002	113.1469	9.5500e-003	1.1600e-003	113.7306
Apartments Mid Rise	1.3068e+006	231.7557	0.0196	2.3700e-003	232.9513
City Park	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	159180	28.2299	2.3800e-003	2.9000e-004	28.3755
Total		373.1325	0.0315	3.8200e-003	375.0574

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**5.3 Energy by Land Use - Electricity****Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	340289	60.3488	5.0900e-003	6.2000e-004	60.6601
Apartments Mid Rise	1.00909e+006	178.9577	0.0151	1.8300e-003	179.8809
City Park	-297713	-52.7981	-0.0045	-0.0005	-53.0705
Parking Lot	-138533	-24.5682	-0.0021	-0.0003	-24.6950
Total		161.9402	0.0137	1.6600e-003	162.7756

6.0 Area Detail**6.1 Mitigation Measures Area**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.0341	0.1478	5.0351	8.4000e-004		0.0349	0.0349		0.0349	0.0349	0.0000	112.6244	112.6244	9.9000e-003	1.9200e-003	113.4426
Unmitigated	2.0341	0.1478	5.0351	8.4000e-004		0.0349	0.0349		0.0349	0.0349	0.0000	112.6244	112.6244	9.9000e-003	1.9200e-003	113.4426

6.2 Area by SubCategory**Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0960					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7762					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0106	0.0902	0.0384	5.8000e-004		7.2900e-003	7.2900e-003		7.2900e-003	7.2900e-003	0.0000	104.4597	104.4597	2.0000e-003	1.9200e-003	105.0804
Landscaping	0.1514	0.0576	4.9967	2.6000e-004		0.0276	0.0276		0.0276	0.0276	0.0000	8.1647	8.1647	7.9000e-003	0.0000	8.3622
Total	2.0341	0.1478	5.0351	8.4000e-004		0.0349	0.0349		0.0349	0.0349	0.0000	112.6244	112.6244	9.9000e-003	1.9200e-003	113.4426

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0960					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7762					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0106	0.0902	0.0384	5.8000e-004		7.2900e-003	7.2900e-003		7.2900e-003	7.2900e-003	0.0000	104.4597	104.4597	2.0000e-003	1.9200e-003	105.0804
Landscaping	0.1514	0.0576	4.9967	2.6000e-004		0.0276	0.0276		0.0276	0.0276	0.0000	8.1647	8.1647	7.9000e-003	0.0000	8.3622
Total	2.0341	0.1478	5.0351	8.4000e-004		0.0349	0.0349		0.0349	0.0349	0.0000	112.6244	112.6244	9.9000e-003	1.9200e-003	113.4426

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	105.2125	0.8286	0.0204	131.9950
Unmitigated	105.2125	0.8286	0.0204	131.9950

7.2 Water by Land Use**Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	7.97485 / 6.28453	33.3282	0.2625	6.4500e-003	41.8121
Apartments Mid Rise	17.2007 / 13.5549	71.8843	0.5661	0.0139	90.1829
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		105.2125	0.8286	0.0204	131.9950

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**7.2 Water by Land Use****Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	7.97485 / 6.28453	33.3282	0.2625	6.4500e-003	41.8121
Apartments Mid Rise	17.2007 / 13.5549	71.8843	0.5661	0.0139	90.1829
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		105.2125	0.8286	0.0204	131.9950

8.0 Waste Detail**8.1 Mitigation Measures Waste**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	45.1614	2.6690	0.0000	111.8855
Unmitigated	45.1614	2.6690	0.0000	111.8855

8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	70.38	14.2865	0.8443	0.0000	35.3942
Apartments Mid Rise	151.8	30.8140	1.8211	0.0000	76.3405
City Park	0.3	0.0609	3.6000e-003	0.0000	0.1509
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		45.1614	2.6690	0.0000	111.8855

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Mitigated

	Waste	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartment Low Rise	70.38	14.2865	0.8443	0.0000	35.3942
Apartment Mid Rise	151.8	30.8140	1.8211	0.0000	76.3405
City Park	0.3	0.0609	3.6000e-003	0.0000	0.1509
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		45.1614	2.6690	0.0000	111.8855

9.0 Operational Offroad

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Equipment Type	Number
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11.0 Vegetation
