

Appendix F

Greenhouse Gas Assessment



Buena Park General Plan & Zoning Code Update GREENHOUSE GAS ANALYSIS CITY OF BUENA PARK

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TABLE OF CONTENTS

TABLE OF CONTENTS	I
APPENDICES II	
LIST OF EXHIBITS	II
LIST OF TABLES	II
LIST OF ABBREVIATED TERMS	III
EXECUTIVE SUMMARY	9
ES.1 Summary of Findings.....	9
ES.2 Project Requirements	9
1 INTRODUCTION	12
1.1 Project Description.....	12
2 CLIMATE CHANGE SETTING	15
2.1 Introduction to Global Climate Change (GCC)	15
2.2 Global Climate Change Defined	15
2.3 GHGs	15
2.4 Global Warming Potential.....	22
2.5 GHG Emissions Inventories	22
2.6 Effects of Climate Change in California	24
2.7 Regulatory Setting.....	26
3 PROJECT GHG IMPACT	44
3.1 Introduction	44
3.2 Standards of Significance	44
3.3 Models Employed To Analyze GHGs	46
3.4 Life-Cycle Analysis Not Required	46
3.5 Construction Emissions	46
3.6 Operational Emissions	47
3.7 GHG Emissions Findings and Recommendations.....	49
4 REFERENCES	57
5 CERTIFICATIONS	61

APPENDICES

- APPENDIX 3.1: HOUSING ELEMENT IMPLEMENTATION TABLE**
- APPENDIX 3.2: CALEEMOD EMISSIONS MODEL OUTPUTS**

LIST OF EXHIBITS

EXHIBIT 1-A: HOUSING ELEMENT SITE LOCATION MAP 13
EXHIBIT 2-A: SUMMARY OF PROJECTED GLOBAL WARMING IMPACT, 2070-2099 (AS COMPARED WITH 1961-1990) 21

LIST OF TABLES

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS..... 9
TABLE 2-1: GHGS..... 16
TABLE 2-2: GWP AND ATMOSPHERIC LIFETIME OF SELECT GHGS..... ERROR! BOOKMARK NOT DEFINED.
TABLE 2-3: TOP GHG PRODUCING COUNTRIES AND THE EUROPEAN UNION ERROR! BOOKMARK NOT DEFINED.
TABLE 3-1: PROJECT SCENARIO GHG EMISSIONS 49
TABLE 3-2: 2017 SCOPING PLAN CONSISTENCY SUMMARY..... 50

LIST OF ABBREVIATED TERMS

%	Percent
°C	Degrees Celsius
°F	Degrees Fahrenheit
(1)	Reference
2017 Scoping Plan	Final 2017 Scoping Plan Update
AB	Assembly Bill
AB 32	Global Warming Solutions Act of 2006
AB 1493	Pavley Fuel Efficiency Standards
AB 1881	California Water Conservation Landscaping Act of 2006
ACC	Advanced Clean Cars
Annex I	Industrialized Nations
APA	Administrative Procedure Act
AQIA	<i>Buena Park General Plan & Zoning Code Update Air Quality Impact Analysis</i>
BAU	Business as Usual
C ₂ F ₆	Hexafluoroethane
C ₂ H ₆	Ethane
C ₂ H ₂ F ₄	Tetrafluoroethane
C ₂ H ₄ F ₂	Ethylidene Fluoride
CAA	Federal Clean Air Act
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
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
CBSC	California Building Standards Commission
CEC	California Energy Commission
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
<i>CEQA Guidelines</i>	<i>2019 CEQA Statute and Guidelines</i>
CDFA	California Department of Food and Agriculture

CF ₄	Tetrafluoromethane
CFC	Chlorofluorocarbons
CFC-113	Trichlorotrifluoroethane
CH ₄	Methane
City	City of Buena Park
CNRA	California Natural Resources Agency
<i>CNRA 2009</i>	<i>2009 California Climate Adaptation Strategy</i>
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
Convention	United Nation’s Framework Convention on Climate Change
COP	Conference of the Parties
CPUC	California Public Utilities Commission
CTC	California Transportation Commission
DOF	Department of Finance
DWR	Department of Water Resources
EMFAC	Emission Factor Model
EPA	Environmental Protection Agency
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FED	Functional Equivalent Document
GCC	Global Climate Change
Gg	Gigagram
GHGA	Greenhouse Gas Analysis
GO-Biz	Governor’s Office of Business and Economic Development
gpd	Gallons Per Day
gpm	Gallons Per Minute
GWP	Global Warming Potential
H ₂ O	Water
HFC	Hydrofluorocarbons
HDT	Heavy-Duty Trucks
HFC-23	Fluoroform
HFC-134a	1,1,1,2-tetrafluoroethane
HFC-152a	1,1-difluoroethane
HHDT	Heavy-Heavy-Duty Trucks
hp	Horsepower
I-210	Interstate 210
IBANK	California Infrastructure and Economic Development Bank
IPCC	Intergovernmental Panel on Climate Change

IRP	Integrated Resource Planning
ISO	Independent System Operator
ITE	Institute of Transportation Engineers
kWh	Kilowatt Hours
lbs	Pounds
LBNL	Lawrence Berkeley National Laboratory
LCA	Life-Cycle Analysis
LCD	Liquid Crystal Display
LCFS	Low Carbon Fuel Standard or Executive Order S-01-07
LDA	Light-Duty Auto
LDT1/LDT2	Light-Duty Trucks
LEV III	Low-Emission Vehicle
LHDT1/LHDT2	Light-Heavy-Duty Trucks
LULUCF	Land-Use, Land-Use Change and Forestry
MARB/IPA	March Air Reserve Base/Inland Port Airport
MCY	Motorcycles
MD	Medium Duty
MDT	Medium-Duty Trucks
MDV	Medium-Duty Vehicles
MHDT	Medium-Heavy-Duty Trucks
MRR	Mandatory Reporting Rule
MMTCO ₂ e	Million Metric Ton of Carbon Dioxide Equivalent
mpg	Miles Per Gallon
MPOs	Metropolitan Planning Organizations
MMTCO ₂ e/yr	Million Metric Ton of Carbon Dioxide Equivalent Per Year
MT/yr	Metric Tons Per Year
MTCO ₂ e	Metric Ton of Carbon Dioxide Equivalent
MTCO ₂ e/yr	Metric Ton of Carbon Dioxide Equivalent Per Year
MW	Megawatts
MWh	Megawatts Per Hour
MWELO	California Department of Water Resources' Model Water Efficient
N ₂ O	Nitrous Oxide
NDC	Nationally Determined Contributions
NF ₃	Nitrogen Trifluoride
NHTSA	National Highway Traffic Safety Administration
NIOSH	National Institute for Occupational Safety and Health
NO _x	Nitrogen Oxides

Non-Annex I	Developing Nations
OAL	Office of Administrative Law
OPR	Office of Planning and Research
PFC	Perfluorocarbons
ppb	Parts Per Billion
ppm	Parts Per Million
ppt	Parts Per Trillion
Project	Buena Park General Plan & Zoning Code Update
RMC	Riverside Municipal Code
RPS	Renewable Portfolio Standards
RTP	Regional Transportation Plan
SAFE	Safer Affordable Fuel-Efficient Vehicles Rule
SB	Senate Bill
SB 32	California Global Warming Solutions Act of 2006
SB 375	Regional GHG Emissions Reduction Targets/Sustainable Communities Strategies
SB 1078	Renewable Portfolio Standards
SB 1368	Statewide Retail Provider Emissions Performance Standards
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
Scoping Plan	California Air Resources Board Climate Change Scoping Plan
SCS	Sustainable Communities Strategy
sf	Square Feet
SF ₆	Sulfur Hexafluoride
SGC	Strategic Growth Council
SHGC	Solar Heat Gain Coefficient
SLPS	Short-Lived Climate Pollutant Strategy
SP	Service Population
SWCRB	State Water Resources Control Board
TDM	Transportation Demand Measures
Title 20	Appliance Energy Efficiency Standards
Title 24	California Building Code
TMA	Transportation Management Association
TOD	Transit-Oriented Development
U.N.	United Nations

U.S.	United States
UNFCCC	United Nations' Framework Convention on Climate Change
URBEMIS	Urban Emissions
UTR	Utility Tractors
VFP	Vehicle Fueling Positions
VMT	Vehicle Miles Traveled
WCI	Western Climate Initiative
WRCOG	Western Riverside Council of Governments
WRI	World Resources Institute
WSAB	West Santa Ana Branch
ZE/NZE	Zero and Near-Zero Emissions
ZEV	Zero-Emissions Vehicles

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EXECUTIVE SUMMARY

ES.1 SUMMARY OF FINDINGS

The results of this *Buena Park General Plan & Zoning Code Update 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 (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 GHG emissions either directly or indirectly, that may have a significant impact on the environment?	3.7	<i>Potentially Significant</i>	<i>Significant and Unavoidable</i>
GHG Impact #2: Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?	3.7	<i>Potentially Significant</i>	<i>Significant and Unavoidable</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)) and CALGreen standards. 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 percent (%) 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% 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 are accounted for in the Project’s emission calculations.

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1 INTRODUCTION

This report presents the results of the GHGA prepared by Urban Crossroads, Inc., for the proposed Buena Park General Plan & Zoning Code Update (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 Project.

1.1 PROJECT DESCRIPTION

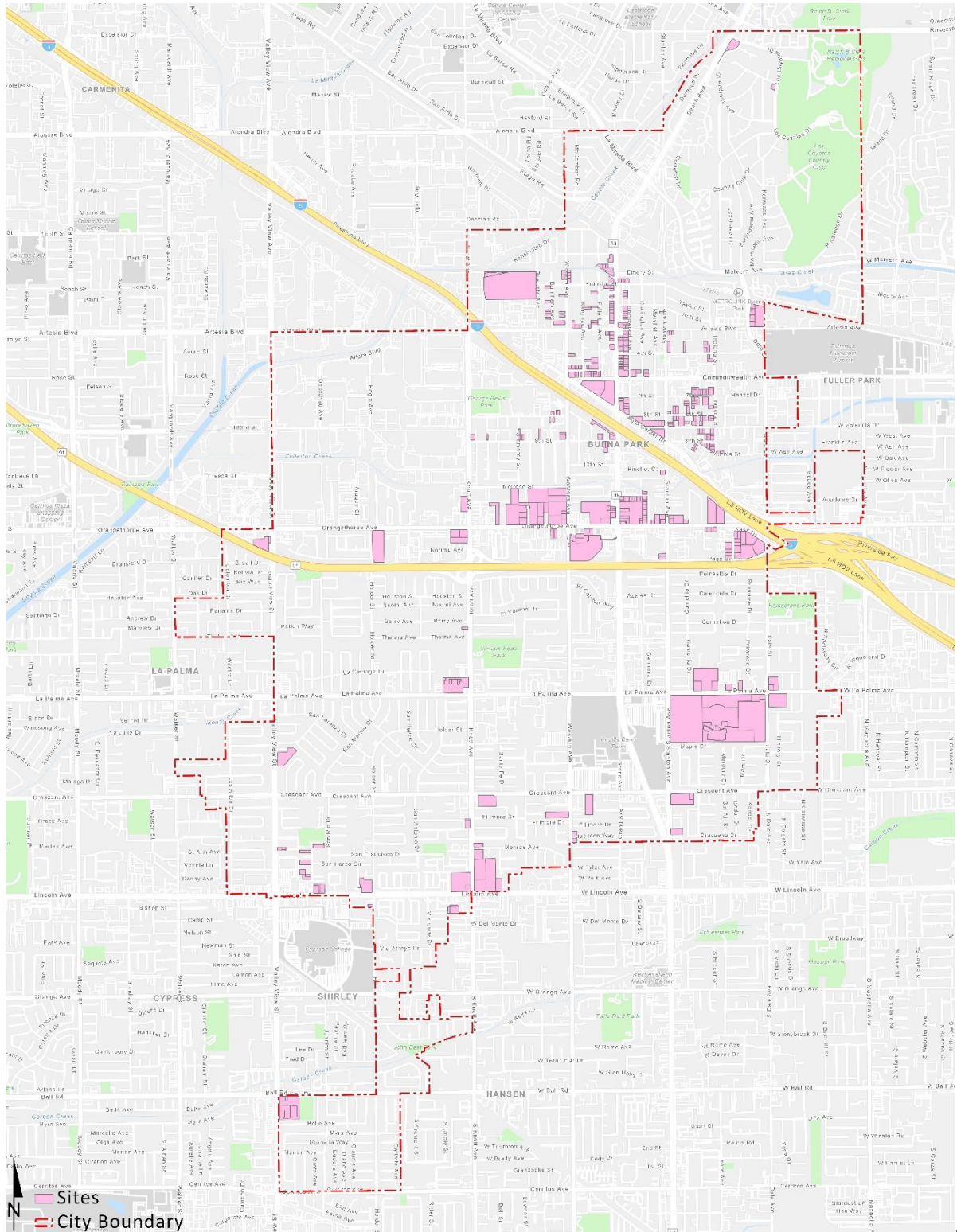
The 6th Cycle Housing Element Update indicates that the City can accommodate approximately 10,322 dwelling units (DU)¹ through pending projects, its inventory of vacant and underutilized land, ADUs, and rezoned and mixed-use overlay sites. The mixed-use overlay sites will permit commercial development with floor-to-area ratios of 1.0, 1.5, and 3.0, which will result in 438,333 square feet (SF) of commercial space at an estimated 60% lot coverage. Through consultation with the City of Buena Park it was determined that the mix of total commercial SF be separated to 80% (350,667 square feet) retail uses and 20% (87,667 square feet) office uses. The commercial intensities within the mixed-use overlays are in addition to the permitted residential densities.

In order to achieve the increased number of housing units, the City must update the Land Use Element, Single Family Residential Zones, and Multifamily Residential Zones to allow increased densities under the land use designations and provide development standards under the zoning ordinance that accommodates increased densities up to 100 dwelling units per acre (du/ac). Housing Element sites summarized on Appendix 3.1. There are a total of 410 parcels identified as part of the 2021-2029 Housing Element Update.

The Greenhouse Gas Analysis will evaluate the proposed development intensities expected for the 341 sites and assess the potential impacts that result from the implementation of the rezoning and changes to land use. Exhibit 1-A identifies the locations of each of the Housing Element sites shown on Appendix 3.1.

¹ Housing units were calculated using the "Buena Park Adopted 6th Cycle HE_SITES INVENTORY".

EXHIBIT 1-A: HOUSING ELEMENT SITE LOCATION MAP



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2 CLIMATE CHANGE SETTING

2.1 INTRODUCTION TO GLOBAL CLIMATE CHANGE (GCC)

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 GHGs

2.3.1 GHGs 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: GHGS

GHGs	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. 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 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 would continue is</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>

GHGs	Description	Sources	Health Effects
	<p>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 would 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) (12).</p>		
<p>CO₂</p>	<p>CO₂ 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, CO₂ 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 CO₂ in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (13).</p>	<p>CO₂ 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. CO₂ is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks (14).</p>	<p>Outdoor levels of CO₂ are not high enough to result in negative health effects.</p> <p>According to the National Institute for Occupational Safety and Health (NIOSH) high concentrations of CO₂ 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 CO₂ 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 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 (15).</p>

GHGs	Description	Sources	Health Effects
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 (16).	CH ₄ is extremely reactive with oxidizers, halogens, and other halogen-containing compounds. Exposure to elevated 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 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	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) (17).

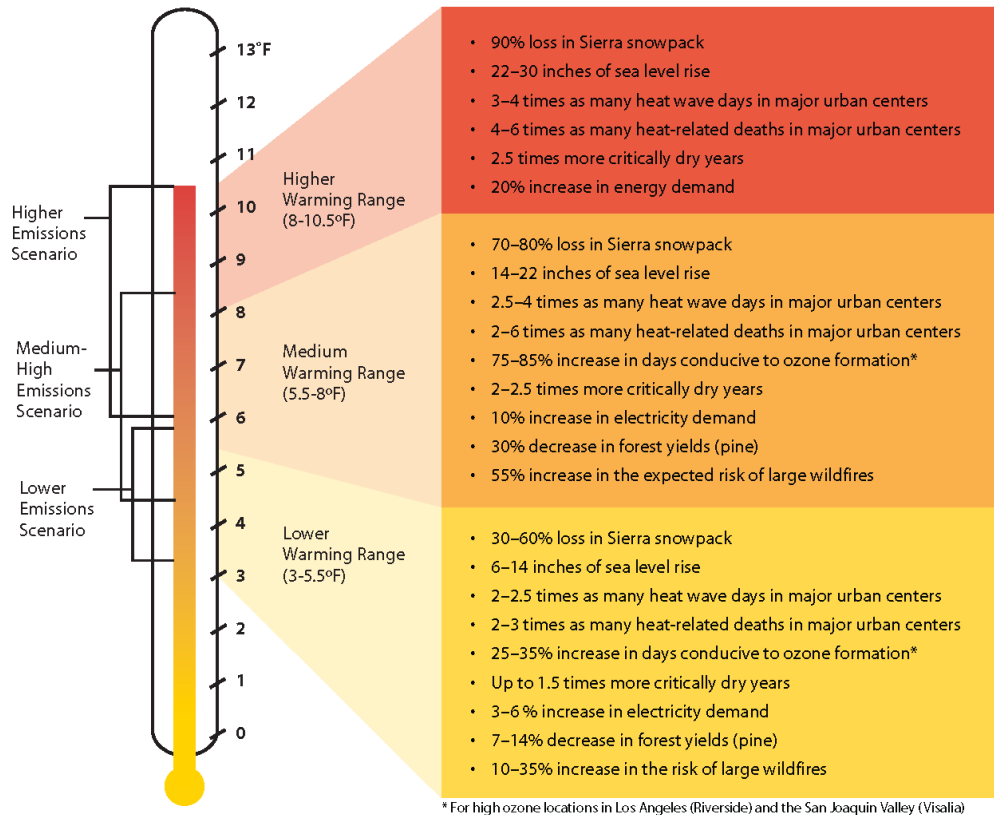
GHGs	Description	Sources	Health Effects
		<p>bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. N₂O can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction (17).</p>	
<p>Chlorofluorocarbons (CFCs)</p>	<p>CFCs are gases formed synthetically by replacing all hydrogen atoms in CH₄ or ethane (C₂H₆) 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).</p>	<p>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 some of the CFCs would remain in the atmosphere for over 100 years (18).</p>	<p>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.</p>

GHGs	Description	Sources	Health Effects
HFCs	<p>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 (HFC-23), 1,1,1,2-tetrafluoroethane (HFC-134a), and 1,1-difluoroethane (HFC-152a). Prior to 1990, the only significant emissions were of HFC-23. HCF-134a emissions are increasing due to its use as a refrigerant.</p>	<p>HFCs are manmade for applications such as automobile air conditioners and refrigerants.</p>	<p>No health effects are known to result from exposure to HFCs.</p>
PFCs	<p>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 exceptionally long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF₄) and hexafluoroethane (C₂F₆). The EPA estimates that concentrations of CF₄ in the atmosphere are over 70 parts per trillion (ppt).</p>	<p>The two main sources of PFCs are primary aluminum production and semiconductor manufacture.</p>	<p>No health effects are known to result from exposure to PFCs.</p>
SF ₆	<p>SF₆ is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas evaluated (23,900) (19). The EPA indicates that concentrations in the 1990s were about 4 ppt.</p>	<p>SF₆ is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.</p>	<p>In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.</p>

GHGs	Description	Sources	Health Effects
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 (20).	NF ₃ is used in industrial processes and is produced in the manufacturing of semiconductors, Liquid Crystal Display (LCD) panels, types of solar panels, and chemical lasers.	Long-term or repeated exposure may affect the liver and kidneys and may cause fluorosis (21).

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 those higher ambient temperatures would increase disease survival rates and result in more widespread disease. Climate change would likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas (22). Exhibit 2-A presents the potential impacts of global warming (23).

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 cause 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 6th Assessment Report, the Intergovernmental Panel on Climate Change (IPCC)'s scientific and socio-economic assessment on climate change, range from 1 for CO₂ to 25,200 for SF₆ (24).

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

Gas	Atmospheric Lifetime (years)	GWP (100-year time horizon)
		6 th Assessment Report
CO ₂	Multiple	1
CH ₄	12 .4	28
N ₂ O	121	273
HFC-23	222	14,600
HFC-134a	13.4	1,526
HFC-152a	1.5	164
SF ₆	3,200	25,200

Source: IPCC Second Assessment Report, 1995 and IPCC Sixth Assessment Report, 2022

2.5 GHG EMISSIONS INVENTORIES

2.5.1 GLOBAL

Worldwide anthropogenic GHG emissions are tracked by the IPCC for industrialized nations (referred to as Annex I) and developing nations (referred to as Non-Annex I). Human GHG emissions data for Annex I nations are available through 2018. Based on the latest available data, the sum of these emissions totaled approximately 28,768,440 gigagram (Gg) CO₂e² (26) (27) as summarized on Table 2-3.

² The global emissions are the sum of Annex I and non-Annex I countries, without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries without 2018 data, the United Nations' Framework Convention on Climate Change (UNFCCC) data for the most recent year were used U.N. Framework Convention on Climate Change, "Annex I Parties – GHG total without LULUCF," The most recent GHG emissions for China and India are from 2014 and 2010, respectively.

2.5.2 UNITED STATES

As noted in Table 2-3, the United States, as a single country, was the number two producer of GHG emissions in 2020.

TABLE 2-3: TOP GHG PRODUCING COUNTRIES AND THE EUROPEAN UNION ³

Emitting Countries	GHG Emissions (Gg CO₂e)
China	12,300,200
United States	5,981,354
European Union (27-member countries)	3,706,110
India	2,839,420
Russian Federation	2,051,437
Japan	1,148,122
Total	28,026,643

2.5.3 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 United States (U.S.) emissions inventory total (28). The California Air Resource Board (CARB) compiles GHG inventories for the State of California. Based upon the 2022 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2020 GHG emissions period, California emitted an average 369.2 million metric tons of CO₂e per year (MMT CO₂e/yr) or 369,200 Gg CO₂e (6.17% of the total United States GHG emissions) (29).

2.6 EFFECTS OF CLIMATE CHANGE IN CALIFORNIA

2.6.1 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. Based on *Our Changing Climate Assessing the Risks to California by the California Climate Change Center*, large wildfires could become up to 55% more frequent if GHG emissions are not significantly reduced (31).

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 significant 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.

³ Used <http://unfccc.int> data for Annex I countries. Consulted the CAIT Climate Data Explorer in <https://www.climatewatchdata.org> site to reference Non-Annex I countries of China and India.

2.6.2 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.

2.6.3 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.

2.6.4 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 would 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.

2.6.5 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

2.7.1 INTERNATIONAL

Climate change is a global issue involving GHG emissions from all around the world; therefore, countries such as the ones discussed below have made an effort to reduce GHGs.

IPCC

In 1988, the United Nations (U.N.) and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

UNITED NATION'S FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

On March 21, 1994, the U.S. joined a number of countries around the world in signing the Convention. Under the UNFCCC, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

INTERNATIONAL CLIMATE CHANGE TREATIES

The Kyoto Protocol is an international agreement linked to the UNFCCC. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions at an average of 5% against 1990 levels over the five-year period 2008–2012. The Convention (as discussed above) encouraged industrialized countries to stabilize emissions; however, the Protocol commits them to do so. Developed countries have contributed more emissions over the last 150 years; therefore, the Protocol places a heavier burden on developed nations under the principle of “common but differentiated responsibilities.”

In 2001, President George W. Bush indicated that he would not submit the treaty to the U.S. Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. In December 2009, international leaders met in Copenhagen to address the future of international climate change commitments post-Kyoto. No binding agreement was reached in Copenhagen; however, the UN Climate Change Committee identified the long-term goal of limiting the maximum global average temperature increase to no more than 2 degrees Celsius (°C) above pre-industrial levels, subject to a review in 2015. The Committee held additional meetings in Durban, South Africa in November 2011; Doha, Qatar in November 2012; and Warsaw, Poland in November 2013. The meetings gradually gained consensus among participants on individual climate change issues.

On September 23, 2014, more than 100 Heads of State and Government and leaders from the private sector and civil society met at the Climate Summit in New York hosted by the U.N. At the Summit, heads of government, business and civil society announced actions in areas that would have the greatest impact on reducing emissions, including climate finance, energy, transport, industry, agriculture, cities, forests, and building resilience.

Parties to the UNFCCC reached a landmark agreement on December 12, 2015, in Paris, charting a fundamentally new course in the two-decade-old global climate effort. Culminating a four-year negotiating round, the new treaty ends the strict differentiation between developed and developing countries that characterized earlier efforts, replacing it with a common framework that commits all countries to put forward their best efforts and to strengthen them in the years ahead. This includes, for the first time, requirements that all parties report regularly on their emissions and implementation efforts and undergo international review.

The agreement and a companion decision by parties were the key outcomes of the conference, known as the 21st session of the UNFCCC Conference of the Parties (COP) 21. Together, the Paris Agreement and the accompanying COP decision:

- Reaffirm the goal of limiting global temperature increase well below 2°C, while urging efforts to limit the increase to 1.5 degrees;
- Establish binding commitments by all parties to make “nationally determined contributions” (NDCs), and to pursue domestic measures aimed at achieving them;
- Commit all countries to report regularly on their emissions and “progress made in implementing and achieving” their NDCs, and to undergo international review;
- Commit all countries to submit new NDCs every five years, with the clear expectation that they would “represent a progression” beyond previous ones;
- Reaffirm the binding obligations of developed countries under the UNFCCC to support the efforts of developing countries, while for the first time encouraging voluntary contributions by developing countries too;
- Extend the current goal of mobilizing \$100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025;
- Extend a mechanism to address “loss and damage” resulting from climate change, which explicitly would not “involve or provide a basis for any liability or compensation;”
- Require parties engaging in international emissions trading to avoid “double counting;” and
- Call for a new mechanism, similar to the Clean Development Mechanism under the Kyoto Protocol, enabling emission reductions in one country to be counted toward another country’s NDC (C2ES 2015a) (32).

Following President Biden’s day one executive order, the United States officially rejoined the landmark Paris Agreement on February 19, 2021, positioning the country to once again be part of the global climate solution. Meanwhile, city, state, business, and civic leaders across the country and around the world have been ramping up efforts to drive the clean energy advances needed to meet the goals of the agreement and put the brakes on dangerous climate change.

2.7.2 NATIONAL

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 (Supreme 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 Supreme 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 Supreme Court declined to review an Appeals Court ruling that upheld the EPA Administrator’s findings (33).

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 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 MY 2022-2025 GHG standards are not appropriate and should be revised (34). 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 Vehicles 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 Vehicle Rule which increased stringency of CAFE and CO₂ emissions standards by 1.5% each year through model year 2026 (35).

2.7.3 CALIFORNIA

2.7.3.1 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 the landmark 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 met⁴). GHGs as defined under AB 32 include CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. Since AB 32 was enacted, a seventh chemical, NF₃, has also been added to the list of GHGs. CARB is the state agency charged with monitoring and regulating sources of GHGs. Pursuant to AB 32, CARB adopted regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. 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 of coastal businesses and residences, damage to marine ecosystems and the natural environment, and

⁴ 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 MMTCO₂e (51). This is less than the 2020 emissions target of 431 MMTCO₂e.

an increase in the incidences of infectious diseases, asthma, and other human health-related problems.”

SB 375

On September 30, 2008, SB 375 was signed by Governor Schwarzenegger. 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 would not be able to achieve the goals of AB 32.” SB 375 does the following: it (1) requires metropolitan planning organizations (MPOs) 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.

SB 375 requires MPOs to prepare a Sustainable Communities Strategy (SCS) within the Regional Transportation Plan (RTP) that guides growth while taking into account the transportation, housing, environmental, and economic needs of the region. SB 375 uses CEQA streamlining as an incentive to encourage residential projects, which help achieve AB 32 goals to reduce GHG emissions. Although SB 375 does not prevent CARB from adopting additional regulations, such actions are not anticipated in the foreseeable future.

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 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 MMs required by an applicable prior environmental document.

AB 1493 - Pavley Fuel Efficiency Standards

Enacted on July 22, 2002, California AB 1493, also known as the Pavley Fuel Efficiency Standards, required 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 MY. 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 (LEV III) or the Advanced Clean Cars (ACC) program. The ACC program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for MY 2017 through 2025. The regulation would reduce GHGs from new cars by 34% from 2016 levels by 2025. The new rules would 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 EVs and hydrogen fuel cell cars. The package would also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.

CLEAN ENERGY AND POLLUTION REDUCTION ACT OF 2015 (SB 350)

In October 2015, the legislature approved, and Governor Jerry Brown signed SB 350, which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include 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 would be achieved through the California Public Utilities Commission (CPUC), the California Energy Commission (CEC), and local publicly owned utilities.
- Reorganize the Independent System Operator (ISO) to develop more regional electrify transmission markets and to improve accessibility in these markets, which would facilitate the growth of renewable energy markets in the western United States.

SB 32

On September 8, 2016, Governor Brown signed SB 32 and its companion bill, AB 197. 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 (2017 Scoping Plan)*, which identifies the State's post-2020 reduction strategy. The *2017 Scoping Plan* 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 *2017 Scoping Plan* establishes a new emissions limit of 260 MMTCO₂e for the year 2030, which corresponds to a 40% decrease in 1990 levels by 2030 (36).

California's climate strategy would require contributions from all sectors of the economy, including the land base, and would include enhanced focus on zero and near-zero emission (ZE/NZE) 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 would 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 air pollution control and air quality management districts (air districts) to tighten emission limits on a broad spectrum of industrial sources. Major elements of the *2017 Scoping Plan* 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 (SLPS), which focuses on reducing CH₄ and HCF 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 *2017 Scoping Plan* 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 *2017 Scoping Plan* 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 (MTCO₂e) or less per capita by 2030 and 2 MTCO₂e or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidence-based bright-line numeric thresholds—consistent with the *2017 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 MMs that avoid or minimize project emissions to the degree feasible; or a performance-based metric using a 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 MTCO₂e per year (MTCO₂e/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 (37) (38).

CAP-AND-TRADE PROGRAM

The *2017 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 would 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 would 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 would decline over time, achieving GHG emission reductions throughout the program’s duration.

Covered entities that emit more than 25,000 MTCO₂e/yr must comply with the Cap-and-Trade Program. Triggering of the 25,000 MTCO₂e/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 or “MRR”).

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

MTCO₂e 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 (39).

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.” (40)

The Cap-and-Trade Program covers approximately 80% of California’s GHG emissions (36). 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.

2.7.3.2 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 S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, 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 would stabilize the climate. The 2020 goal was established to be a mid-term target. Because this

is an executive order, the goals are not legally enforceable for local governments or the private sector.

EXECUTIVE ORDER S-01-07 (LCFS)

Governor Schwarzenegger signed Executive Order S-01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020. CARB adopted the LCFS on April 23, 2009.

The LCFS was challenged in the U.S. District Court in Fresno in 2011. The court's ruling issued on December 29, 2011, included a preliminary injunction against CARB's implementation of the rule. The Ninth Circuit Court of Appeals stayed the injunction on April 23, 2012, pending final ruling on appeal, allowing CARB to continue to implement and enforce the regulation. The Ninth Circuit Court's decision, filed September 18, 2013, vacated the preliminary injunction. In essence, the court held that LCFS adopted by CARB were not in conflict with federal law. On August 8, 2013, the Fifth District Court of Appeal (California) ruled CARB failed to comply with CEQA and the Administrative Procedure Act (APA) when adopting regulations for LCFS. In a partially published opinion, the Court of Appeal reversed the trial court's judgment and directed issuance of a writ of mandate setting aside Resolution 09-31 and two executive orders of CARB approving LCFS regulations promulgated to reduce GHG emissions. However, the court tailored its remedy to protect the public interest by allowing the LCFS regulations to remain operative while CARB complies with the procedural requirements it failed to satisfy.

To address the Court ruling, CARB was required to bring a new LCFS regulation to the Board for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS as well as new provisions designed to foster investments in the production of the low-carbon intensity fuels, offer additional flexibility to regulated parties, update critical technical information, simplify, and streamline program operations, and enhance enforcement. On November 16, 2015, the Office of Administrative Law (OAL) approved the Final Rulemaking Package. The new LCFS regulation became effective on January 1, 2016.

In 2018, 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 (41).

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

On April 29, 2015, Governor Brown issued an executive order to establish a California GHG reduction target of 40% below 1990 levels by 2030. The Governor’s executive order aligned California’s GHG reduction targets with those of leading international governments ahead of the U.N. Climate Change Conference in Paris late 2015. The Order sets a new 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 *2017 Scoping Plan* to express the 2030 target in terms of MMTCO₂e. 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 as to local governments and the private sector. Legislation that would update AB 32 to make post 2020 targets and requirements a mandate is in process in the State Legislature.

EXECUTIVE ORDER B-55-18 AND SB 100

SB 100 and Executive Order B-55-18 were signed by Governor Brown on September 10, 2018. Under the existing RPS, 25% of retail sales of electricity are required to be from renewable sources by December 31, 2016, 33% by December 31, 2020, 40% by December 31, 2024, 45% by December 31, 2027, and 50% by December 31, 2030. 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 (kWh) 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. In addition to targets under AB 32 and SB 32, 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 EPA (CalEPA), the California 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.

2.7.3.3 CALIFORNIA REGULATIONS AND BUILDING CODES

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California’s energy consumption relatively flat even with rapid population growth.

TITLE 20 CCR SECTIONS 1601 ET SEQ. – APPLIANCE EFFICIENCY REGULATIONS

The Appliance Efficiency Regulations regulate 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 (RV) or other mobile equipment (CEC 2012).

TITLE 24 CCR PART 6 – CALIFORNIA ENERGY CODE

The California Energy Code 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.

TITLE 24 CCR PART 11 – CALIFORNIA GREEN BUILDING STANDARDS CODE

California Code of Regulations (CCR) Title 24 Part 6: The California Energy Code 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. 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, 2009, and is administered by the California Building Standards Commission.

CALGreen is updated on a regular basis, with the most recent approved update consisting of the 2022 California Green Building Code Standards that will be effective on January 1, 2023.

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 waste 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 waste 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.

Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas (GHG) emissions. The 2022 version of Title 24 was adopted by the CEC and will be effective on January 1, 2023.

The 2022 Title 24 standards would result in less energy use, thereby reducing air pollutant emissions associated with energy consumption in the SCAB and across the State of California. For example, the 2022 Title 24 standards require solar photovoltaic systems for new homes, encourage the use of heat pumps for space and water heating, and require homes to be electric-ready to ease the adoption of cleaner electric heating, cooking, and EV charging. The CEC anticipates that the 2022 energy code will provide \$1.5 billion in consumer benefits and reduce GHG emissions by 10 million metric tons (42). The Project would be required to comply with the applicable standards in place at the time building permit document submittals are made. These require, among other items (43):

RESIDENTIAL MANDATORY MEASURES

- EV Charging (new one- and two-family dwellings and townhouses with attached private garages). For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device (4.106.4.1).
- 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 ten 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 ten 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 phased 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).
- Residential lavatory faucets shall have a maximum flow rate of not more than 1.2 gallons per minute at 60 psi (4.303.1.4.1). Lavatory faucets in common or public use areas shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi (4.303.1.4.2). Metering faucets shall not deliver more than 0.25 gallons per cycle (4.303.1.4.3). Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi (4.303.1.4.4).
- 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 projected 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).
- Additionally, under California's 2022 Title 24, Part 6 Building Energy Efficiency Standards, solar photovoltaic systems are required for newly constructed low-rise residential buildings and shall be sized sufficient to offset the electricity use of the proposed building as if it was a mixed-fuel building.

SB 97 AND THE CEQA GUIDELINES UPDATE

Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the Office of Planning and Research (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)."

In 2012, Public Resources Code Section 21083.05 was amended to state:

"The Office of Planning and Research and the Natural Resources Agency shall periodically update the guidelines for the mitigation of greenhouse gas emissions"

or the effects of greenhouse gas emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption, to incorporate new information or criteria established by the State Air Resources Board pursuant to Division 25.5 (commencing with Section 38500) of the Health and Safety Code.”

On December 28, 2018, the Natural Resources Agency announced the OAL approved the amendments to the *CEQA Guidelines* for implementing 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 15064.4 was added to 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 insignificant 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 (44).

2.7.4 REGIONAL

The project is within the 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 having 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. 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 proposed Project relies on SCAQMD's Tier 4 threshold as follows:

- Tier 4 has the following options:
 - Option 1: Reduce Business-as-Usual (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 MTCO₂e per SP per year for projects and 6.6 MTCO₂e per SP per year for plans;
 - Option 3, 2035 target: 3.0 MTCO₂e per SP per year for projects and 4.1 MTCO₂e per SP per year for plans

The SCAQMD's interim thresholds used the Executive Order S-3-05-year 2050 goal as the basis for the Tier 4 screening level. Achieving the Executive Order's objective would contribute to worldwide efforts to cap CO₂ concentrations at 450 ppm, thus stabilizing global climate.

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3 PROJECT GHG 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 sections.

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 CCR of Regulations §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to GHG if it would (1):

- 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?

DISCUSSION ON ESTABLISHMENT OF SIGNIFICANCE THRESHOLDS

The SCAQMD defines the Service Population (SP) as the total residents and employees associated with a Project. The origin of the SP is based on CARB's *2008 Scoping Plan*. The *2008 Scoping Plan* identified that based on the GHG emissions inventories for the state, the people of California generate approximately 14 tons of GHG emissions per capita and would need to reduce annual emissions to approximately 10 tons per capita in order to meet the GHG reduction target of AB 32. Because people who live in California generally work in California, the SP metric did not include employees. As CEQA significance thresholds were being determined by air districts, the air districts considered applying this efficiency metric to their air district boundaries. Consistent with methodology provided by the Regional Targets Advisory Committee (RTAC) as part of the SB 375 target setting discussions, the definition of SP was amended to include employees in addition to residents. This is because the transportation sector is the primary source of project-related GHG emissions; and unlike the state as a whole, people who work in one county/air district may not live in the same county/ air district boundary. Also, people who live in a county/air district boundary would also have other trip ends such as school, parks, and retail uses. As such, the air district/county boundary as a whole did not take into account other users within the site.

Relevant to the proposed Project, the SCAQMD Tier 4 Option 3 is to utilize an efficiency target. The SCAQMD has proposed targets for project-level and plan-level analysis. At the September 2010 working group meeting the SCAQMD recommended a project-level efficiency target of 4.8 MTCO₂e/SP as a target⁵.

⁵ It should be noted that SCAQMD identifies a plan-level threshold of 6.6 MTCO₂e per SP. As a conservative measure, the Project utilizes the 4.8 MTCO₂e per SP as the basis of establishing long-term thresholds for buildout conditions.

The calculations behind this option are based on the same inventory calculated by CARB. The 4.8 MT/SP target is based on the same statewide 2020 GHG inventory in the CARB *Scoping Plan*, i.e., 295,530,000 MTCO₂e/yr. To derive the project level SP of 4.8 metric ton, SCAQMD took the 2020 statewide GHG reduction target for land use only (295,530,000 MTCO₂e/yr) and divided it by the total 2020 statewide population plus the total statewide employment for land use only (44,135,923 + 17,064,489) (i.e., $(295,530,000 \text{ MTCO}_2\text{e/yr}) / (44,135,923 + 17,064,489) = 4.8 \text{ MTCO}_2\text{e/yr}$). Thus, SCAQMD's threshold is another metric for assessing compliance with AB 32, just based on using numbers attributable to certain sectors and trying to break down the analysis to a finer grain based on a per person methodology associated with land use-related sectors.

This approach is a widely accepted screening threshold used by numerous cities in the basin and is based on the SCAQMD staff's proposed GHG screening threshold for stationary source emissions for non-industrial projects, as described in the SCAQMD's *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans*. The SCAQMD's *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* identifies a screening threshold to determine whether additional analysis is required (45). As noted by the SCAQMD:

"...the...screening level for stationary sources is based on an emission capture rate of 90 percent for all new or modified projects...the policy objective of [SCAQMD's] recommended interim GHG significance threshold proposal is to achieve an emission capture rate of 90 percent of all new or modified stationary source projects. A GHG significance threshold based on a 90 percent emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change because most projects will be required to implement GHG reduction measures. Further, a 90 percent emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that [SCAQMD] staff estimates that these GHG emissions would account for slightly less than one percent of future 2050 statewide GHG emissions target (85 [MMTCO₂e/yr]). In addition, these small projects may be subject to future applicable GHG control regulations that would further reduce their overall future contribution to the statewide GHG inventory. Finally, these small sources are already subject to [Best Available Control Technology] (BACT) for criteria pollutants and are more likely to be single-permit facilities, so they are more likely to have few opportunities readily available to reduce GHG emissions from other parts of their facility." (45)

Although the SCAQMD's draft significance criteria have not been adopted, the City has determined that the SCAQMD's project-level efficiency threshold methodology can be used to set an appropriate significance criterion by which to determine whether the project emits a significant amount of GHG. As previously noted, the *2017 Scoping Plan* identifies a reduction target of 80% below 1990 levels by 2050. As such, the appropriate reduction target for 2050 would be 0.96 MTCO₂e/yr. For analysis purposes herein, the SP threshold for the Project's buildout year of 2045 was calculated by linear interpolation between the 2020 target of 4.8

MTCO₂e/yr and the 2050 target of 0.96 MTCO₂e/yr. As such, the target for the Project's buildout year of 2045 is 1.44 MTCO₂e/yr.

3.3 MODELS EMPLOYED TO ANALYZE GHGS

3.3.1 CALIFORNIA EMISSIONS ESTIMATOR MODEL (CALEEMOD)

In May 2022 California Air Pollution Control Officers Association (CAPCOA) in conjunction with other California air districts, including SCAQMD, released the latest version of the CalEEMod Version 2022.1. The purpose of this model is to calculate construction-source and operational-source criteria pollutants and GHG emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (46). Accordingly, the latest version of CalEEMod has been used for this Project to determine GHG emissions. Output from the model runs for operational activity are provided in Appendix 3.2. CalEEMod includes GHG emissions from the following source categories: construction, area, energy, mobile, waste, water.

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 (47). 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 (48). 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 *Buena Park General Plan & Zoning Code Update Air Quality Impact Analysis Report* (AQIA) contains detailed information regarding Project construction activities (49). As discussed in the AQIA, Construction related emissions are expected from the following construction activities:

- Demolition
- Site Preparation
- Grading
- Building Construction
- Paving

- Architectural Coating

Specific construction related criteria pollutant emissions will be quantified in future GHG analyses to be conducted for individual CEQA projects. In addition, for projects that are estimated to exceed the construction emissions significance thresholds established by the SCAQMD (after mitigation), the preparation of an Environmental Impact Report (EIR) would be required (pursuant to CEQA) and an analysis of alternatives and other emissions reduction measures would take place.

Construction-related emissions are speculative and cannot be accurately determined at this stage of the planning process. Therefore, such impacts are too speculative to evaluate (see CEQA Guidelines Section 15145). To the extent that specific projects are known, those projects have already been or would be subjected to their own environmental analysis.

3.6 OPERATIONAL EMISSIONS

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

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

3.6.1 AREA SOURCE EMISSIONS

LANDSCAPE MAINTENANCE EQUIPMENT

Landscape maintenance equipment would generate emissions from 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. It should be noted that as October 9, 2021, Governor Gavin Newsom signed AB 1346. The bill aims to ban the sale of new gasoline-powered equipment under 25 gross horsepower (known as small off-road engines [SOREs]) by 2024. For purposes of analysis, the emissions associated with landscape maintenance equipment were calculated based on assumptions provided in CalEEMod.

3.6.2 ENERGY SOURCE EMISSIONS

COMBUSTION EMISSIONS ASSOCIATED WITH NATURAL GAS AND ELECTRICITY

Electricity and natural gas are used by almost every project. Criteria pollutant emissions are emitted through the generation of electricity and consumption of natural gas. However, because electrical generating facilities for the Project area are located either outside the region (state) or offset through the use of pollution credits (RECLAIM) for generation within the SCAB, criteria

pollutant emissions from offsite generation of electricity are generally excluded from the evaluation of significance and only natural gas use is considered.

3.6.3 MOBILE SOURCE EMISSIONS

The Project related operational air quality emissions derive primarily from vehicle miles traveled (VMT) associated with the Project. The Project-generated average weekday daily VMT is 1,283,409 and was obtained from modeling conducted for the *Buena Park General Plan & Zoning Code Update Vehicle Miles Traveled Analysis* (50) which is based on the Orange County Transportation Analysis Model (OCTAM) for the Year 2045. To estimate the Saturday and Sunday VMT for inclusion in CalEEMod, the daily VMT was converted to annual VMT using a factor of 347 days consistent with the California Air Resources Board 2017 Scoping Plan. 347 days is used instead of 365 days to account for reduced daily VMT that occurs on weekends and holidays. In other words, the average weekend VMT represents 95% (347 days ÷ 365 days) of the average weekday daily VMT.

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. Unless otherwise noted, CalEEMod default parameters were used.

3.6.5 SOLID WASTE

Residential land uses will result in the generation and disposal of solid waste. A 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 default parameters.

3.6.6 REFRIGERANTS

Air conditioning (A/C) and refrigeration equipment associated with the building are anticipated to generate GHG emissions. CalEEMod automatically generates a default A/C and refrigeration equipment inventory for each project land use subtype based on industry data from the USEPA (2016b). CalEEMod quantifies refrigerant emissions from leaks during regular operation and routine servicing over the equipment lifetime and then derives average annual emissions from the lifetime estimate. Note that CalEEMod does not quantify emissions from the disposal of refrigeration and A/C equipment at the end of its lifetime. Per 17 CCR 95371, new facilities with air conditioning equipment are prohibited from utilizing refrigerants with a GWP of 150 or greater as of January 1, 2025. As such, it was conservatively assumed that air conditioning systems installed at the residential and commercial portion of the Project would utilize refrigerants with a GWP of 150. Otherwise, GHG emissions associated with refrigerants were calculated by CalEEMod using default parameters.

3.6.7 SERVICE POPULATION

RESIDENTIAL/EMPLOYEES

According to the population generation rates of the VMT analysis, the average persons per household is 3.5 persons per household. The average SF per employee is 399 employees for the office use and 1,086 employees for the retail use. As such, the Project would generate a future population of approximately 37,612 people for the proposed Project (50).

3.6.8 EMISSIONS SUMMARY

The annual GHG emissions associated with the Project are summarized in Table 3-1. As shown in Table 3-1, construction and operation of the Project would generate a total of 4.24 MTCO₂e/SP per year.

TABLE 3-1: PROJECT SCENARIO GHG EMISSIONS

Emission Source	Emissions (MT/yr)				
	CO ₂	CH ₄	N ₂ O	R	Total CO ₂ e
Mobile Source	120,255.00	4.63	4.75	13.00	121,800.00
Area Source	2,405.00	0.05	0.02	0.00	2,412.00
Energy Source	30,236.00	3.02	0.18	0.00	30,365.00
Water Usage	1,684.00	14.10	0.36	0.00	2,143.00
Waste	768.00	76.80	0.00	0.00	2,688.00
Refrigerants	0.00	0.00	0.00	21.60	21.60
Total CO₂e (All Sources)	159,429.60				
Service Population	37,612.00				
Total CO₂e/Service Population	4.24				
Screening Threshold (CO₂e)	1.44				
Threshold Exceeded?	YES				

Source: CalEEMod output, See Appendix 3.2 for detailed model outputs.

3.7 GHG EMISSIONS FINDINGS AND RECOMMENDATIONS

3.7.1 GHG IMPACT 1

Potential to generate direct or indirect GHG emissions that would result in a significant impact on the environment.

The Project would result in 4.24 MTCO₂e/SP per year in 2045 as summarized in Table 3-1 (presented previously). As such, the Project total GHG emissions would exceed the screening threshold of 1.44 MTCO₂e/SP per year. Thus, Project-related emissions would have a potential significant direct or indirect impact on GHG and climate change. In addition, as described in the Air Quality Analysis, there is uncertainty regarding the specific nature of the construction and

operational activities that would be facilitated under implementation of the proposed Project. Mitigation Measure AQ-1 and AQ-2 require the preparation of project-specific construction and operational air quality analysis and incorporation of mitigation if emissions levels are shown to be above SCAQMD-recommended thresholds of significance. Resulting mitigation would not only reduce criteria pollutant emissions but would also generally reduce GHG emissions. It cannot be definitively known or stated at this time what level of emissions reductions future development projects occurring under implementation of the proposed Project would achieve via the implementation of these mitigation measures.

While the implementation of Mitigation Measures AQ-1, AQ-2, would reduce GHG emissions, it cannot be definitively known or stated at this time if future emissions in the City would be reduced to levels that are below applicable thresholds. Therefore, this impact would be significant and unavoidable despite the implementation of policies in the applicable policies that have been incorporated with the intent of reducing GHG emissions and the incorporation of Mitigation Measures AQ-1 and AQ-2.

The Project would have a significant and unavoidable impact with respect to this threshold.

3.7.2 GHG IMPACT 2

The Project would have the potential to conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

The Project’s consistency with SB 32 (2017 Scoping Plan).

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 3-2 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 3-2: 2017 SCOPING PLAN CONSISTENCY SUMMARY⁶

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. The Project would use energy from Southern California Edison (SCE). SCE has committed to diversify the portfolio of energy sources by increasing energy from wind and solar sources. The Project would not interfere with or obstruct SCE energy source diversification efforts.

⁶ Source California Air Resources Board, California’s 2017 Climate Change Scoping Plan, November 2017 and CARB, Climate Change Scoping Plan, December 2008.

Action	Responsible Parties	Consistency
<p>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.</p>		<p>Consistent. The Project would be constructed in compliance with current California Building Code requirements. Specifically, new buildings must achieve compliance with 2019 Building and Energy Efficiency Standards and the 2019 California Green Building Standards requirements. The proposed Project includes energy efficient field lighting and fixtures that meet the current Title 24 Standards throughout the Project Site and would be a modern development with energy efficient boilers, heaters, and air conditioning systems.</p>
<p>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.</p>		
<p>Implement Mobile Source Strategy (Cleaner Technology and Fuels)</p>		
<p>At least 1.5 million zero emission and plug-in hybrid light-duty EVs by 2025.</p>	<p>CARB, California State Transportation Agency (CalSTA), Strategic Growth Council (SGC), California Department of Transportation (Caltrans), CEC, OPR, Local Agencies</p>	<p>Consistent. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB zero emission and plug-in hybrid light-duty EV 2025 targets. As this is a CARB enforced standard, vehicles that access the Project are required to comply with the standards and would therefore comply with the strategy.</p>
<p>At least 4.2 million zero emission and plug-in hybrid light-duty EVs by 2030.</p>		<p>Consistent. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB zero emission and plug-in hybrid light-duty EV 2030 targets. As this is a CARB enforced standard, vehicles that access the Project are required to comply with the standards and would therefore comply with the strategy.</p>
<p>Further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean cars regulations.</p>		<p>Consistent. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB efforts to further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean cars regulations. As this is a CARB enforced standard, vehicles that access the Project are required to comply with</p>

Action	Responsible Parties	Consistency
		the standards and would therefore comply with the strategy.
Medium- and Heavy-Duty GHG Phase 2.		Consistent. This is a CARB Mobile Source Strategy. The Project would not obstruct or interfere with CARB efforts to implement Medium- and Heavy-Duty GHG Phase 2. As this is a CARB enforced standard, vehicles that access the Project are required to comply with the standards and would therefore 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 measure is not within the purview of this Project.
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."		Consistent. This Project would not obstruct or interfere with 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. This measure is not within the purview of this Project.

Action	Responsible Parties	Consistency
<p>Harmonize project performance with emissions reductions and increase competitiveness of transit and active transportation modes (e.g., via guideline documents, funding programs, project selection, etc.).</p>	<p>CalSTA, SGC, OPR, CARB, Governor’s Office of Business and Economic Development (GO-Biz), California Infrastructure and Economic Development Bank (IBank), Department of Finance (DOF), California Transportation Commission (CTC), Caltrans</p>	<p>Consistent. Although this is directed towards CARB and Caltrans, the proposed Project would be designed to promote and support pedestrian activity on-site and in the Project Site area.</p>
<p>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).</p>	<p>CalSTA, Caltrans, CTC, OPR, SGC, CARB</p>	<p>Not applicable. This measure is not within the purview of this Project.</p>
<p>Implement California Sustainable Freight Action Plan</p>		
<p>Improve freight system efficiency.</p>	<p>CalSTA, CalEPA, CNRA, CARB, Caltrans, CEC, GO-Biz</p>	<p>Not applicable. This measure is not within the purview of this Project.</p>
<p>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.</p>	<p>CalSTA, CalEPA, CNRA, CARB, Caltrans, CEC, GO-Biz</p>	<p>Not applicable. This measure is not within the purview of this Project.</p>
<p>Adopt a Low Carbon Fuel Standard with a Carbon Intensity reduction of 18%.</p>	<p>CARB</p>	<p>Consistent. When adopted, this measure would apply to all fuel purchased and used by the Project in the state. The Project would not obstruct or interfere with agency efforts to adopt a Low Carbon Fuel Standard with a Carbon Intensity reduction of 18%.</p>

Action	Responsible Parties	Consistency
Implement the Short-Lived Climate Pollutant Strategy (SLPS) by 2030		
40% reduction in methane and hydrofluorocarbon emissions below 2013 levels.	CARB, CalRecycle, CDFA, California State Water Resource Control Board (SWRCB), Local Air Districts	Consistent. The Project would be required to comply with this measure and reduce any Project-source SLPS emissions accordingly. The Project would not obstruct or interfere agency efforts to reduce SLPS emissions.
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. However, the Project site is not an identified property that needs to be conserved.
Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity.		Consistent. The Project site includes developed, vacant or disturbed property and does not comprise an area that would effectively provide for carbon sequestration. The Project would not obstruct or interfere agency efforts to increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity.
Utilize wood and agricultural products to increase the amount of carbon stored in the natural and built environments.		Consistent. To the extent appropriate for the proposed residential buildings, wood products would be used in construction.

Action	Responsible Parties	Consistency
		Additionally, future development in accordance with the Project would include landscaping.
Establish scenario projections to serve as the foundation for the Implementation Plan.		Not applicable. This measure is not within the purview of this Project.
Implement Forest Carbon Plan	CNRA, California Department of Forestry and Fire Protection (CAL FIRE), 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. Since the Project would exceed the efficiency based GHG emissions target, the project has the potential to conflict with the 2017 Scoping Plan even with implementation of applicable mitigation measures as previously discussed.

The Project would have a significant and unavoidable impact with respect to this threshold.

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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 Buena Park General Plan & Zoning Code Update 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 at hqureshi@urbanxroads.com.

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EDUCATION

Master of Science in Environmental Studies
California State University, Fullerton • May 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Planned Communities and Urban Infill – Urban Land Institute • June 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August 2007
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APPENDIX 3.1:

HOUSING ELEMENT IMPLEMENTATION TABLE

ID	Address	APN	DU	Commercial SF
1	8641 LOS COYOTES DR	289-162-04	1	0
2	5891 STANTON AVE	066-184-26	1	0
3	7611 5TH ST	277-071-14	1	0
4	7601 5TH ST	277-071-15	1	0
5	7571 5TH ST	277-073-15	3	0
6	7561 5TH ST	277-073-16	3	0
7	7551 5TH ST	277-073-17	3	0
8	7541 5TH ST	277-073-18	2	0
9	7531 5TH ST	277-073-19	8	0
10	7651 E 5TH ST	277-071-13	10	0
11	6161 FULLERTON AVE	277-071-12	2	0
12	6152 KINGMAN AVE	277-071-19	2	0
13	6141 FULLERTON AVE	277-071-11	2	0
14	6122 WESTERN AVE	277-073-25	5	0
15	7611 ARTESIA BLVD	277-101-20	1	0
16	5951 FULLERTON AVE	277-101-17	2	0
17	5941 FULLERTON AVE	277-101-16	2	0
18	5941 WESTERN AVE	066-111-14	1	0
19	5952 BURNHAM AVE	066-111-18	3	0
20	5921 BURNHAM AVE	066-112-10	1	0
21	5911 WESTERN AVE	066-111-11	1	0
22	5901 BURNHAM AVE	066-112-33	5	0
23	5891 WESTERN AVE	066-111-32	1	0
24	5893 BURNHAM AVE	066-112-37	5	0
25	5883 BURNHAM AVE	066-112-38	5	0
26	5872 KINGMAN AVE	277-101-30	2	0
27	5861 FULLERTON AVE	277-101-10	2	0
28	5862 KINGMAN AVE	277-101-31	2	0
29	5831 BURNHAM AVE	066-112-31	1	0
30	5801 WESTERN AVE	066-111-04	1	0
31	5781 FULLERTON AVE	277-101-03	4	0
32	5741 BURNHAM AVE	066-112-01	10	0
33	5711 WESTERN AVE	066-122-05	6	0
34	5691 WESTERN AVE	066-122-04	6	0
35	6151 INDIANA AVE	066-260-09	7	0
36	8222 4TH ST	066-260-32	1	0
37	8201 4TH ST	066-230-31	8	0
38	8207 4TH ST	066-230-64	2	0
39	8091 E 4TH ST	066-230-29	9	0
40	6102 STANTON AVE	066-230-78	9	0
41	8022 ARTESIA BLVD	066-230-67	3	0
42	8012 ARTESIA BLVD	066-230-77	3	0
43	8002 ARTESIA BLVD	066-230-76	3	0
44	5961 KINGMAN AVE	277-102-16	1	0
44	7539 ARTESIA BLVD	277-102-17	10	0
44	7521 ARTESIA BLVD	277-102-18	11	0
45	8231 9TH ST	070-034-16	3	0
46	6321 INDIANA AVE	070-012-22	7	0
47	8141 7TH ST	070-012-28	3	0
48	6311 INDIANA AVE	070-012-21	7	0
49	8201 7TH ST	070-012-06	4	0
50	6292 LOS ROBLES AVE	070-012-16	4	0
51	8191 7TH ST	070-012-25	4	0
52	8185 7TH ST	070-012-24	4	0
53	8171 7TH ST	070-012-08	4	0
54	8161 7TH ST	070-012-10	4	0
55	6281 INDIANA AVE	070-012-30	4	0
56	8151 7TH ST	070-012-11	6	0

57	6282 LOS ROBLES AVE	070-012-37	5	0
58	6302 LOS ROBLES AVE	070-012-32	5	0
59	6531 INDIANA AVE	070-034-17	1	0
60	8203 9TH ST	070-034-18	5	0
61	8201 9TH ST	070-034-19	5	0
62	8191 9TH ST	070-034-14	5	0
63	8232 WHITAKER ST	070-034-01	3	0
64	8182 WHITAKER ST	070-034-05	1	0
65	8172 WHITAKER ST	070-034-06	1	0
66	8162 WHITAKER ST	070-034-07	1	0
67	8152 WHITAKER ST	070-034-08	1	0
68	8171 WHITAKER ST	070-024-10	1	0
69	8151 WHITAKER ST	070-024-12	1	0
70	8131 WHITAKER ST	070-024-15	3	0
71	8121 WHITAKER ST	070-024-14	8	0
72	6461 LOS ROBLES AVE	070-023-14	2	0
73	8027 WHITAKER ST	070-023-09	1	0
74	6441 INDIANA AVE	070-024-16	1	0
75	6431 INDIANA AVE	070-024-18	1	0
76	8212 8TH ST	070-024-17	2	0
77	8192 8TH ST	070-024-19	4	0
78	8182 8TH ST	070-024-20	4	0
79	8162 8TH ST	070-024-22	6	0
80	8142 8TH ST	070-024-03	1	0
81	8132 8TH ST	070-024-02	1	0
82	8042 8TH ST	070-023-03	1	0
83	8021 8TH ST	070-021-25	1	0
84	6391 INDIANA AVE	070-022-17	2	0
85	6382 LOS ROBLES AVE	070-022-14	1	0
86	8111 8TH ST	070-021-08	3	0
87	8051 8TH ST	070-021-12	4	0
88	8031 8TH ST	070-021-13	2	0
89	6371 LOS ROBLES AVE	070-021-07	1	0
90	6372 LOS ROBLES AVE	070-022-02	2	0
91	6361 LOS ROBLES AVE	070-021-06	2	0
92	362 LOS ROBLES AVE	070-022-16	2	0
93	8202 7TH ST	070-022-07	9	0
94	8154 E 7TH ST	070-022-04	2	0
95	8142 7TH ST	070-022-03	1	0
96	6342 LOS ROBLES AVE	070-022-15	1	0
97	7241 9TH ST	276-221-39	3	0
98	6511 WESTERN AVE	276-221-25	3	0
98	6551 WESTERN AVE	276-221-26	7	0
98	7451 9TH ST	276-221-27	1	0
99	7261 9TH ST	276-221-41	4	0
100	7251 9TH ST	276-221-40	4	0
101	7091 9TH ST	276-231-39	1	0
102	6498 GRAMERCY ST	276-221-38	2	0
103	7412 8TH ST	276-221-08	1	0
104	7392 8TH ST	276-221-06	1	0
105	7411 8TH ST	276-202-11	5	0
106	7441 8TH ST	276-202-14	4	0
107	7431 8TH ST	276-202-13	3	0
108	8273 CALIFORNIA ST	070-033-10	1	0
109	6632 INDIANA ST	070-033-09	1	0
110	6591 INDIANA AVE	070-035-04	4	0
111	6581 INDIANA AVE	070-035-03	4	0
112	8211 CALIFORNIA ST	070-035-06	4	0
113	6571 INDIANA AVE	070-035-02	4	0

114	8172 CALIFORNIA ST	070-046-02	4	0
115	8142 CALIFORNIA ST	070-046-03	6	0
116	6561 INDIANA AVE	070-035-01	4	0
117	8202 9TH ST	070-035-05	4	0
118	8192 9TH ST	070-035-07	4	0
119	8182 9TH ST	070-035-08	5	0
120	5682 WESTERN AVE	066-123-01	3	0
121	5702 WESTERN AVE	066-123-02	4	0
122	5712 WESTERN AVE	066-123-03	4	0
123	7501 FRANKLIN ST	066-123-04	9	0
124	7682 CRAIG AVE	066-132-09	1	0
124	7692 CRAIG AVE	066-132-15	1	0
124	7712 CRAIG AVE	066-132-16	1	0
124	7722 CRAIG AVE	066-132-17	1	0
125	7501 5TH ST	277-073-20	2	0
126	8032 8TH ST	070-023-02	1	0
127	8052 8TH ST	070-023-04	1	0
128	9051 HOLDER ST	134-031-02	2	0
129	8694 WESTERN AVE	135-132-11	12	0
130	8732 WESTERN AVE	135-133-05	9	0
131	8752 VALLEY VIEW ST	260-011-03	2	0
132	8752 VALLEY VIEW ST	260-011-04	3	0
134	7611 8TH ST	276-213-17	1	0
135	7861 MELROSE ST	276-322-16	1	0
136	BEACH BLVD/MELROSE ST	276-361-03	250	0
137	6161 KENTUCKY DR	260-021-01	4	0
138	8881 HOFFMAN ST	260-021-04	1	0
139	8901 HOFFMAN ST	260-021-05	4	0
140	6221 LINCOLN AVE	260-022-07	7	0
141	8761 HOFFMAN ST	260-031-02	5	0
142	8833 HOFFMAN ST	260-031-07	10	0
143	8742 HOFFMAN ST	260-032-01	7	0
144	8738 HOFFMAN ST	260-071-05	9	0
145	8246 VALLEY VIEW ST	069-283-25	66	0
146	7962 PINCHOT CT	276-312-22	2	0
147	7682 9TH ST	276-282-13	16	0
147	7692 9TH ST	276-282-14	2	0
148	7341 9TH ST	276-221-32	6	0
149	8601 WESTERN AVE	135-152-44	53	0
150	7871 COMMONWEALTH AVE	066-253-07	7	3,408
151	6212 DARLINGTON AVE	066-253-20	4	2,025
152	6211 DARLINGTON AVE	066-252-12	3	2,025
153	6202 DARLINGTON AVE	066-253-21	3	2,025
154	6201 DARLINGTON AVE	066-252-13	3	2,025
155	7811 COMMONWEALTH AVE	066-252-22	17	7,446
156	6550 KNOTT AVE	276-231-44	12	16,858
157	6186 BEACH BLVD	066-251-11	5	0
157	7791 COMMONWEALTH AVE	066-251-31	43	0
158	6181 HOMEWOOD AVE	066-251-18	9	0
159	6100 BEACH BLVD	066-251-28	2	0
159	6172 BEACH BLVD	066-251-29	2	0
160	6171 HOMEWOOD AVE	066-251-27	4	0
161	6100 BEACH BLVD	066-251-24	2	0
161	6100 BEACH BLVD	066-251-25	2	0
162	6161 HOMEWOOD AVE	066-251-26	4	0
163	6156 BEACH BLVD	066-251-08	2	0
164	6152 BEACH BLVD	066-251-07	2	0
165	6151 HOMEWOOD	066-251-20	2	0
166	6146 BEACH BLVD	066-251-06	2	0

167	6141 HOMEWOOD AVE	066-251-21	4	0
168	6136 BEACH BLVD	066-251-04	2	0
169	6132 BEACH BLVD	066-251-03	2	0
170	6131 HOMEWOOD AVE	066-251-22	4	0
171	6121 HOMEWOOD AVE	066-251-23	4	0
172	6122 BEACH BLVD	066-251-30	7	0
173	6111 HOMEWOOD AVE	066-241-12	4	0
174	6101 HOMEWOOD AVE	066-241-13	4	0
175	6102 BEACH BLVD	066-241-10	4	0
176	6091 HOMEWOOD AVE	066-241-14	3	0
177	BEACH BLVD/4TH ST	066-241-08	2	0
177	6086 BEACH BLVD	066-241-09	5	0
178	6081 HOMEWOOD AVE	066-241-15	4	0
179	6071 HOMEWOOD AVE	066-241-16	10	0
180	6061 HOMEWOOD AVE	066-241-25	5	0
181	6051 HOMEWOOD AVE	066-241-26	5	0
182	6042 BEACH BLVD	066-241-21	5	0
183	6032 BEACH BLVD	066-241-20	2	0
184	6026 BEACH BLVD	066-241-23	2	0
185	HOMEWOOD AVE/ARTESIA BLVD	066-241-18	11	0
185	7780 ARTESIA BLVD	066-241-19	10	0
186	7781 ARTESIA BLVD	066-181-09	3	0
187	7771 ARTESIA BLVD	066-181-08	4	0
188	5951 HOMEWOOD AVE	066-181-10	4	0
189	5921 HOMEWOOD AVE	066-181-13	4	0
190	5911 HOMEWOOD AVE	066-181-14	4	0
191	5901 HOMEWOOD AVE	066-181-15	4	0
192	588 HOMEWOOD AVE	066-181-21	17	0
193	5801 HOMEWOOD AVE	066-171-08	4	0
194	5791 HOMEWOOD AVE	066-171-09	4	0
195	5781 HOMEWOOD AVE	066-171-10	4	0
196	5771 HOMEWOOD AVE	066-171-11	5	0
197	BEACH BLVD/CRAIG AVE	066-132-21	15	0
198	5681 BEACH BLVD	066-132-22	18	0
199	5621 BEACH BLVD	066-133-15	19	0
200	5731 BEACH BLVD	066-134-08	17	0
201	7791 FRANKLIN ST	066-163-14	3	0
202	7781 FRANKLIN ST	066-163-15	3	0
203	7771 FRANKLIN ST	066-163-16	3	0
204	7761 FRANKLIN ST	066-163-17	4	0
205	5730 BEACH BLVD	066-163-18	9	0
206	5891 HOMEWOOD AVE	066-181-16	4	0
207	5972 BEACH BLVD	066-181-20	12	0
208	6056 BEACH BLVD	066-241-06	17	0
209	5900 DALE ST	066-391-17	12	10,535
210	5870 DALE ST	066-391-19	7	6,690
211	5940 DALE ST	066-391-24	14	12,062
212	5970 DALE ST	066-391-25	13	11,137
213	8350 LOS COYOTES DR	066-530-03	43	40,511
214	7642 5TH ST	277-072-01	3	0
215	7622 5TH ST	277-072-02	3	0
216	7602 5TH ST	277-072-03	3	0
217	7582 5TH ST	277-072-04	5	0
218	7581 COMMONWEALTH AVE	277-072-05	5	0
219	7601 COMMONWEALTH AVE	277-072-06	4	0
220	7621 COMMONWEALTH AVE	277-072-07	4	0
221	7631 COMMONWEALTH AVE	277-072-08	11	0
221	FULLERTON AVE/5TH ST	277-082-06	8	0
222	7571 COMMONWEALTH AVE	277-074-01	6	0

223	7551 COMMONWEALTH AVE	277-074-03	6	0
224	7542 5TH ST	277-074-04	6	0
225	7501 COMMONWEALTH AVE	277-074-05	22	0
226	6025 BEACH BLVD	277-081-03	5	0
227	6031 BEACH BLVD	277-081-04	5	0
228	6035 BEACH BLVD	277-081-05	5	0
229	6071 BEACH BLVD	277-081-07	15	0
230	6001 BEACH BLVD	277-081-34	9	0
230	7701 ARTESIA BLVD	277-081-35	7	0
231	5741 BEACH BLVD	277-091-01	3	0
232	5751 BEACH BLVD	277-091-02	3	0
233	5761 BEACH BLVD	277-091-03	4	0
234	5797 BEACH BLVD	277-091-06	5	0
235	5811 BEACH BLVD	277-091-07	4	0
236	5831 BEACH BLVD	277-091-09	7	0
237	5841 BEACH BLVD	277-091-10	4	0
238	5861 BEACH BLVD	277-091-11	5	0
239	5871 BEACH BLVD	277-091-12	4	0
240	5881 BEACH BLVD	277-091-13	4	0
241	5891 BEACH BLVD	277-091-14	5	0
242	5931 BEACH BLVD	277-091-15	19	0
243	5941 BEACH BLVD	277-091-16	7	0
244	7712 FRANKLIN ST	277-091-36	7	0
245	6472 STANTON AVE	070-023-10	5	6,214
245	6462 STANTON AVE	070-023-11	5	6,435
246	8192 ORANGETHORPE AVE	070-072-31	4	2,174
247	8202 ORANGETHORPE AVE	070-072-32	3	2,084
248	8212 ORANGETHORPE AVE	070-072-33	3	2,083
249	8222 ORANGETHORPE AVE	070-072-34	3	2,083
250	8232 ORANGETHORPE AVE	070-072-35	7	3,070
251	7141 THOMAS ST	070-080-25	9	0
252	8295 PAGE ST	070-080-45	3	0
253	8301 PAGE ST	070-080-46	5	0
254	8400 KASS DR	070-080-47	12	0
255	8410 KASS DR	070-080-32	12	0
256	7072 THOMAS ST	070-080-15	11	0
257	7082 THOMAS ST	070-080-14	11	0
258	7102 THOMAS ST	070-080-13	24	0
259	7142 THOMAS ST	070-080-12	19	0
260	8440 KASS DR	070-080-59	54	0
260	8420 KASS DR	070-080-60	32	0
261	8460 KASS DR	070-080-58	69	0
262	8401 PAGE ST	070-080-56	82	0
263	THOMAS ST/PAGE ST	070-080-64	3	0
263	THOMAS ST/PAGE ST	070-080-65	7	0
264	8511 LA PALMA AVE	070-302-22	13	13,800
265	7930 DALE ST	070-302-23	47	50,181
266	7151 STANTON AVE	070-721-10	7	-7,314
267	7161 STANTON AVE	070-721-11	9	-8,738
268	7402 ORANGETHORPE AVE	136-172-14	25	438,333
269	7412 ORANGETHORPE AVE	136-172-15	25	0
270	7051 VALLEY VIEW ST	263-081-08	74	78,320
270	ORANGETHORPE AVE/VALLEY VIEW ST	263-081-10	6	6,299
271	6600 ORANGETHORPE AVE	263-541-01	197	0
272	7017 KNOTT AVE	263-541-06	134	140,821
273	6805 KNOTT AVE	276-142-03	45	0
274	7651 9TH ST	276-213-27	5	2,831
275	7661 9TH ST	276-213-28	4	2,253
276	7671 9TH ST	276-213-29	4	2,255

277	6555 BEACH BLVD	276-213-32	11	5,227
277	6555 BEACH BLVD	276-213-39	26	11,631
278	8201 ORANGETHORPE AVE	276-331-05	97	0
279	8251 ORANGETHORPE AVE	276-331-09	65	0
280	8101 ORANGETHORPE AVE	276-341-38	9	3,949
281	8031 ORANGETHORPE AVE	276-352-07	42	18,419
282	6940 STANTON AVE	276-352-08	8	3,907
283	8001 ORANGETHORPE AVE	276-352-11	11	4,998
284	BRENNER AVE/ORANGETHORPE AVE	276-362-09	3	1,445
285	7921 ORANGETHORPE AVE	276-362-12	24	10,589
285	7911 ORANGETHORPE AVE	276-362-17	5	2,481
286	7979 ORANGETHORPE AVE	276-362-13	10	4,571
287	6911 STANTON AVE	276-362-14	14	6,447
288	7681 ORANGETHORPE AVE	276-371-24	5	0
288	BEACH BLVD/MELROSE ST	276-371-26	13	0
288	7681 ORANGETHORPE AVE	276-371-28	24	0
288	7691 ORANGETHORPE AVE	276-371-29	212	0
288	BEACH BLVD/MELROSE ST	276-371-35	4	0
288	BEACH BLVD/MELROSE ST	276-371-36	4	0
289	7039 ORANGETHORPE AVE	276-381-09	98	0
290	6801 WESTERN AVE	276-382-08	75	0
291	6841 WESTERN AVE	276-382-09	44	0
292	6841 WESTERN AVE	276-382-10	114	120,039
292	6925 WESTERN AVE	276-382-12	7	8,103
293	WESTERN AVE/ORANGETHORPE AVE	276-382-13	14	15,239
293	7479 ORANGETHORPE AVE	276-382-14	15	15,925
293	7479 ORANGETHORPE AVE	276-382-15	56	59,671
294	7379 ORANGETHORPE AVE	276-382-18	23	24,171
294	6870 ORAN CIR	276-382-19	43	45,716
294	7321 ORANGETHORPE AVE	276-382-20	25	26,453
294	6860 ORAN CIR	276-382-21	87	91,928
294	ORAN CIR/ORANGETHORPE AVE	276-382-22	1	1,628
294	6863 ORAN CIR	276-382-23	13	13,777
294	6899 ORAN CIR	276-382-24	27	28,363
294	6951 ORAN CIR	276-382-25	22	23,189
294	7237 ORANGETHORPE CIR	276-382-26	26	28,246
294	7225 ORANGETHORPE AVE	276-382-27	133	58,504
294	7294 MELROSE ST	276-382-28	139	182,331
295	6281 BEACH BLVD	277-013-52	148	0
295	6281 BEACH BLVD	277-013-58	148	0
296	6332 BEACH BLVD	277-041-01	2	0
297	6342 BEACH BLVD	277-041-02	2	0
298	6344 BEACH BLVD	277-041-15	2	0
299	6346 BEACH BLVD	277-041-16	2	0
300	6348 BEACH BLVD	277-041-14	2	0
301	6392 BEACH BLVD	277-041-18	21	0
302	7772 7TH ST	277-041-13	4	0
303	6341 HOMEWOOD AVE	277-041-12	9	0
304	6361 HOMEWOOD AVE	277-041-11	4	0
305	6371 HOMEWOOD AVE	277-041-10	4	0
306	6381 HOMEWOOD AVE	277-041-09	4	0
307	6391 HOMEWOOD AVE	277-041-08	4	0
308	6412 AUTO CENTER DR	277-041-07	5	0
309	STANTON AVE/WHITAKER ST	277-052-17	3	1,815
310	7957 WHITAKER ST	277-052-18	5	2,697
311	7931 WHITAKER ST	277-052-21	11	5,922
312	6448 AUTO CENTER DR	277-052-25	26	13,936
313	7951 WHITAKER ST	277-052-26	14	7,318
314	7891 WHITAKER ST	277-052-27	37	18,295

315	6532 AUTO CENTER DR	277-061-04	45	22,591
316	8951 KNOTT AVE	069-130-63	164	172,717
316	8991 LINCOLN AVE	069-130-64	15	16,188
317	8633 KNOTT AVE	069-491-21	3	0
317	8651 KNOTT AVE	069-491-24	16	0
318	9021 KNOTT AVE	134-062-18	44	19,602
318	LINCOLN GLEN DR/LINCOLN AVE	134-062-24	5	2,483
318	9011 KNOTT AVE	134-062-27	32	14,375
319	10010 VALLEY VIEW ST	134-311-32	14	14,797
319	BALL RD/VALLEY VIEW ST	134-311-36	6	6,552
319	6020 BALL RD	134-311-38	48	50,956
319	6080 BALL RD BUENA PARK	134-311-43	86	90,389
319	6010 BALL RD	134-311-44	75	78,712
320	8750 KNOTT AVE	135-181-07	17	18,222
321	8858 KNOTT AVE	135-182-08	43	45,624
321	8888 KNOTT AVE	135-182-09	119	125,453
321	8998 KNOTT AVE	135-182-13	228	239,301
322	7101 LINCOLN AVE	135-192-50	54	42,189
323	6201 LINCOLN AVE	260-022-05	20	21,640
323	6201 LINCOLN AVE	260-022-06	10	11,086
324	6955 LA PALMA AVE	263-421-04	23	25,029
324	6931 LA PALMA AVE	263-421-05	51	53,880
324	6901 LA PALMA AVE	263-421-06	22	23,364
324	6865 LA PALMA AVE	263-421-07	26	27,518
324	7905 KNOTT AVE	263-421-08	59	62,143
325	7651 KNOTT AVE	263-431-23	7	7,841
326	7091 THOMAS ST	070-080-08	23	0
327	8112 CRESCENT AVE	070-141-01	11	0
327	8530 STANTON AVE	070-141-02	7	0
328	8700 STANTON AVE	070-141-07	27	34,813
329	8030 DALE ST	070-501-01	107	121,361
330	8226 ON THE MALL	070-511-01	1,174	-817,077
331	8361 LA PALMA AVE	070-101-03	23	-21,867
331	8381 LA PALMA AVE	070-101-05	22	-20,633
331	8231 LA PALMA AVE	070-111-03	31	-28,689
331	8191 LA PALMA	070-111-07	251	-229,654
331	8161 LA PALMA AVE	070-111-08	43	-40,171
332	8374 ON THE MALL	070-511-05	35	-32,699
332	8460 LA PALMA AVE	070-511-07	16	-14,855
332	8450 ON THE MALL	070-511-08	539	-493,028
332	8376 LA PALMA AVE	070-511-14	303	-277,054
332	8201 ON THE MALL	070-511-15	381	-348,418
332	8290 ON THE MALL	070-511-16	174	-159,179
332	LA PALMA AVE/DALE ST	070-511-18	294	-269,542
333	6701 STANTON AVE	276-312-23	3	0
334	5650 KNOTT AVE	066-020-23	24	19,524
334	5648 KNOTT AVE	066-020-25	9	7,292
334	7101 CATE DR	066-020-27	670	526,902
335	8475 ARTESIA BLVD	066-391-12	97	76,448
336	7540 ORANGETHORPE AVE	136-181-21	15	-13,591
336	7540 ORANGETHORPE AVE	136-181-23	26	-23,000
336	7530 ORANGETHORPE AVE	136-181-24	45	-39,727
337	6441 LINCOLN AVE	260-042-39	13	0
338	7600 CRESCENT AVE	135-131-19	13	0
339	7082 CRESCENT AVE	135-161-41	29	0
340	8071 WHITAKER AVE	070-023-05	23	0
341	7212 MELROSE AVE	276-382-02	53	0
Total			10,322	438,333

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APPENDIX 3.2:
CALEEMOD EMISSIONS MODEL OUTPUTS

14635-Buena Park General Plan & Zoning Code Update Detailed Report

Table of Contents

- 1. Basic Project Information
 - 1.1. Basic Project Information
 - 1.2. Land Use Types
 - 1.3. User-Selected Emission Reduction Measures by Emissions Sector
- 2. Emissions Summary
 - 2.4. Operations Emissions Compared Against Thresholds
 - 2.5. Operations Emissions by Sector, Unmitigated
- 4. Operations Emissions Details
 - 4.1. Mobile Emissions by Land Use
 - 4.1.1. Unmitigated
 - 4.2. Energy
 - 4.2.1. Electricity Emissions By Land Use - Unmitigated
 - 4.2.3. Natural Gas Emissions By Land Use - Unmitigated
 - 4.3. Area Emissions by Source

4.3.2. Unmitigated

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	14635-Buena Park General Plan & Zoning Code Update
Lead Agency	—
Land Use Scale	Plan/community
Analysis Level for Defaults	County
Windspeed (m/s)	1.80
Precipitation (days)	18.8
Location	Buena Park, CA, USA
County	Orange
City	Buena Park
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5711
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	10,322	Dwelling Unit	3,351	20,127,900	120,900,110	—	30,760	—
General Office Building	87.7	1000sqft	2.01	87,667	0.00	—	—	—

Regional Shopping Center	351	1000sqft	8.05	350,667	0.00	—	—	—
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1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	447	877	443	3,417	9.37	23.6	354	378	23.5	62.5	86.0	5,462	1,174,549	1,180,011	599	32.1	322	1,204,877
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	391	824	454	2,626	9.03	23.3	354	377	23.2	62.5	85.7	5,462	1,142,054	1,147,516	600	33.3	135	1,172,568
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	405	846	309	2,943	7.86	11.8	337	348	11.6	59.4	71.1	5,462	932,845	938,307	596	32.1	209	962,965
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	74.0	154	56.5	537	1.43	2.15	61.4	63.6	2.12	10.8	13.0	904	154,443	155,347	98.6	5.31	34.6	159,430

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

14635-Buena Park General Plan & Zoning Code Update Detailed Report, 10/19/2022

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	360	333	183	2,700	7.71	2.71	354	357	2.53	62.5	65.0	—	785,324	785,324	27.9	28.4	191	794,665
Area	75.1	538	160	673	1.01	12.7	—	12.7	12.8	—	12.8	0.00	197,249	197,249	3.75	0.52	—	197,497
Energy	11.8	5.91	101	43.5	0.64	8.17	—	8.17	8.17	—	8.17	—	182,628	182,628	18.2	1.08	—	183,405
Water	—	—	—	—	—	—	—	—	—	—	—	822	9,347	10,169	85.5	2.15	—	12,945
Waste	—	—	—	—	—	—	—	—	—	—	—	4,640	0.00	4,640	464	0.00	—	16,234
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	130	130
Total	447	877	443	3,417	9.37	23.6	354	378	23.5	62.5	86.0	5,462	1,174,549	1,180,011	599	32.1	322	1,204,877
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	361	334	199	2,517	7.41	2.71	354	357	2.53	62.5	65.0	—	754,473	754,473	28.9	29.7	4.96	764,046
Area	18.0	484	154	65.6	0.98	12.5	—	12.5	12.5	—	12.5	0.00	195,605	195,605	3.68	0.37	—	195,807
Energy	11.8	5.91	101	43.5	0.64	8.17	—	8.17	8.17	—	8.17	—	182,628	182,628	18.2	1.08	—	183,405
Water	—	—	—	—	—	—	—	—	—	—	—	822	9,347	10,169	85.5	2.15	—	12,945
Waste	—	—	—	—	—	—	—	—	—	—	—	4,640	0.00	4,640	464	0.00	—	16,234
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	130	130
Total	391	824	454	2,626	9.03	23.3	354	377	23.2	62.5	85.7	5,462	1,142,054	1,147,516	600	33.3	135	1,172,568
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	353	327	194	2,479	7.13	2.59	337	339	2.42	59.4	61.9	—	726,345	726,345	27.9	28.7	78.6	735,681
Area	40.3	513	14.4	421	0.09	1.01	—	1.01	1.06	—	1.06	0.00	14,524	14,524	0.30	0.13	—	14,569
Energy	11.8	5.91	101	43.5	0.64	8.17	—	8.17	8.17	—	8.17	—	182,628	182,628	18.2	1.08	—	183,405
Water	—	—	—	—	—	—	—	—	—	—	—	822	9,347	10,169	85.5	2.15	—	12,945
Waste	—	—	—	—	—	—	—	—	—	—	—	4,640	0.00	4,640	464	0.00	—	16,234

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	130	130
Total	405	846	309	2,943	7.86	11.8	337	348	11.6	59.4	71.1	5,462	932,845	938,307	596	32.1	209	962,965
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	64.5	59.7	35.4	452	1.30	0.47	61.4	61.9	0.44	10.8	11.3	—	120,255	120,255	4.63	4.75	13.0	121,800
Area	7.36	93.6	2.62	76.8	0.02	0.18	—	0.18	0.19	—	0.19	0.00	2,405	2,405	0.05	0.02	—	2,412
Energy	2.16	1.08	18.4	7.94	0.12	1.49	—	1.49	1.49	—	1.49	—	30,236	30,236	3.02	0.18	—	30,365
Water	—	—	—	—	—	—	—	—	—	—	—	136	1,548	1,684	14.1	0.36	—	2,143
Waste	—	—	—	—	—	—	—	—	—	—	—	768	0.00	768	76.8	0.00	—	2,688
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.6	21.6
Total	74.0	154	56.5	537	1.43	2.15	61.4	63.6	2.12	10.8	13.0	904	154,443	155,347	98.6	5.31	34.6	159,430

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	50,851	50,851	6.43	0.78	—	51,245

General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	1,116	1,116	0.14	0.02	—	1,125
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	2,461	2,461	0.31	0.04	—	2,480
Total	—	—	—	—	—	—	—	—	—	—	—	—	54,428	54,428	6.89	0.83	—	54,849
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	50,851	50,851	6.43	0.78	—	51,245
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	1,116	1,116	0.14	0.02	—	1,125
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	2,461	2,461	0.31	0.04	—	2,480
Total	—	—	—	—	—	—	—	—	—	—	—	—	54,428	54,428	6.89	0.83	—	54,849
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	8,419	8,419	1.07	0.13	—	8,484
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	185	185	0.02	< 0.005	—	186
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	407	407	0.05	0.01	—	411
Total	—	—	—	—	—	—	—	—	—	—	—	—	9,011	9,011	1.14	0.14	—	9,081

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	11.7	5.85	99.9	42.5	0.64	8.08	—	8.08	8.08	—	8.08	—	126,815	126,815	11.2	0.24	—	127,167
General Office Building	0.07	0.03	0.60	0.50	< 0.005	0.05	—	0.05	0.05	—	0.05	—	712	712	0.06	< 0.005	—	714
Regional Shopping Center	0.06	0.03	0.56	0.47	< 0.005	0.04	—	0.04	0.04	—	0.04	—	673	673	0.06	< 0.005	—	675
Total	11.8	5.91	101	43.5	0.64	8.17	—	8.17	8.17	—	8.17	—	128,200	128,200	11.3	0.24	—	128,556
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	11.7	5.85	99.9	42.5	0.64	8.08	—	8.08	8.08	—	8.08	—	126,815	126,815	11.2	0.24	—	127,167
General Office Building	0.07	0.03	0.60	0.50	< 0.005	0.05	—	0.05	0.05	—	0.05	—	712	712	0.06	< 0.005	—	714
Regional Shopping Center	0.06	0.03	0.56	0.47	< 0.005	0.04	—	0.04	0.04	—	0.04	—	673	673	0.06	< 0.005	—	675
Total	11.8	5.91	101	43.5	0.64	8.17	—	8.17	8.17	—	8.17	—	128,200	128,200	11.3	0.24	—	128,556
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	2.13	1.07	18.2	7.76	0.12	1.47	—	1.47	1.47	—	1.47	—	20,996	20,996	1.86	0.04	—	21,054
General Office Building	0.01	0.01	0.11	0.09	< 0.005	0.01	—	0.01	0.01	—	0.01	—	118	118	0.01	< 0.005	—	118

Regional Shopping Center	0.01	0.01	0.10	0.09	< 0.005	0.01	—	0.01	0.01	—	0.01	—	111	111	0.01	< 0.005	—	112
Total	2.16	1.08	18.4	7.94	0.12	1.49	—	1.49	1.49	—	1.49	—	21,225	21,225	1.88	0.04	—	21,284

4.3. Area Emissions by Source

4.3.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	18.0	9.02	154	65.6	0.98	12.5	—	12.5	12.5	—	12.5	0.00	195,605	195,605	3.68	0.37	—	195,807
Consumer Products	—	440	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	35.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	57.1	54.0	5.57	608	0.03	0.22	—	0.22	0.30	—	0.30	—	1,644	1,644	0.07	0.15	—	1,691
Total	75.1	538	160	673	1.01	12.7	—	12.7	12.8	—	12.8	0.00	197,249	197,249	3.75	0.52	—	197,497
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	18.0	9.02	154	65.6	0.98	12.5	—	12.5	12.5	—	12.5	0.00	195,605	195,605	3.68	0.37	—	195,807
Consumer Products	—	440	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	35.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	18.0	484	154	65.6	0.98	12.5	—	12.5	12.5	—	12.5	0.00	195,605	195,605	3.68	0.37	—	195,807
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.23	0.11	1.93	0.82	0.01	0.16	—	0.16	0.16	—	0.16	0.00	2,218	2,218	0.04	< 0.005	—	2,220
Consumer Products	—	80.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	6.40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	7.14	6.75	0.70	76.0	< 0.005	0.03	—	0.03	0.04	—	0.04	—	186	186	0.01	0.02	—	192
Total	7.36	93.6	2.62	76.8	0.02	0.18	—	0.18	0.19	—	0.19	0.00	2,405	2,405	0.05	0.02	—	2,412

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	742	9,145	9,888	77.3	1.95	—	12,400
General Office Building	—	—	—	—	—	—	—	—	—	—	—	29.9	75.8	106	3.07	0.07	—	204

Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	49.8	126	176	5.12	0.12	—	341
Total	—	—	—	—	—	—	—	—	—	—	—	822	9,347	10,169	85.5	2.15	—	12,945
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	742	9,145	9,888	77.3	1.95	—	12,400
General Office Building	—	—	—	—	—	—	—	—	—	—	—	29.9	75.8	106	3.07	0.07	—	204
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	49.8	126	176	5.12	0.12	—	341
Total	—	—	—	—	—	—	—	—	—	—	—	822	9,347	10,169	85.5	2.15	—	12,945
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	123	1,514	1,637	12.8	0.32	—	2,053
General Office Building	—	—	—	—	—	—	—	—	—	—	—	4.94	12.5	17.5	0.51	0.01	—	33.8
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	8.24	20.9	29.2	0.85	0.02	—	56.4
Total	—	—	—	—	—	—	—	—	—	—	—	136	1,548	1,684	14.1	0.36	—	2,143

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	4,398	0.00	4,398	440	0.00	—	15,386
General Office Building	—	—	—	—	—	—	—	—	—	—	—	43.9	0.00	43.9	4.39	0.00	—	154
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	198	0.00	198	19.8	0.00	—	694
Total	—	—	—	—	—	—	—	—	—	—	—	4,640	0.00	4,640	464	0.00	—	16,234
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	4,398	0.00	4,398	440	0.00	—	15,386
General Office Building	—	—	—	—	—	—	—	—	—	—	—	43.9	0.00	43.9	4.39	0.00	—	154
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	198	0.00	198	19.8	0.00	—	694
Total	—	—	—	—	—	—	—	—	—	—	—	4,640	0.00	4,640	464	0.00	—	16,234
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	728	0.00	728	72.8	0.00	—	2,547
General Office Building	—	—	—	—	—	—	—	—	—	—	—	7.27	0.00	7.27	0.73	0.00	—	25.5

Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	32.9	0.00	32.9	3.28	0.00	—	115
Total	—	—	—	—	—	—	—	—	—	—	—	768	0.00	768	76.8	0.00	—	2,688

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	129	129
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.33	1.33
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	130	130
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	129	129
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13

Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.33	1.33
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	130	130
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.3	21.3
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22	0.22
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.6	21.6

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Subtotal	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Annual	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Avoided	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Subtotal	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sequestered	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Subtotal	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Removed	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Subtotal	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	171,227	162,666	162,666	62,497,963	1,283,409	1,220,117	1,220,117	445,342,783

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
-------------	----------------------

Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	9290
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	1032

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
40758997.5	13,586,333	657,501	219,167	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	71,171,688	261	0.0330	0.0040	395,697,443
General Office Building	1,562,251	261	0.0330	0.0040	2,222,049
Regional Shopping Center	3,444,029	261	0.0330	0.0040	2,099,424

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	387,339,759	1,915,112,778
General Office Building	15,581,384	0.00
Regional Shopping Center	25,974,789	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	2,738	0.00
General Office Building	81.5	0.00
Regional Shopping Center	368	0.00

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	User Defined	750	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	User Defined	750	< 0.005	4.00	4.00	18.0
Regional Shopping Center	Other commercial A/C and heat pumps	User Defined	750	< 0.005	4.00	4.00	18.0

Regional Shopping Center	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
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5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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5.17. User Defined

Equipment Type	Fuel Type
—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	9.66	annual days of extreme heat
Extreme Precipitation	4.40	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack	N/A	N/A	N/A	N/A
Air Quality	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack	N/A	N/A	N/A	N/A

Air Quality	1	1	1	2
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The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	48.5
AQ-PM	80.9
AQ-DPM	91.5
Drinking Water	48.6
Lead Risk Housing	79.3
Pesticides	0.00
Toxic Releases	85.9
Traffic	87.4
Effect Indicators	—
CleanUp Sites	82.1
Groundwater	64.5
Haz Waste Facilities/Generators	64.6
Impaired Water Bodies	58.7
Solid Waste	75.7

Sensitive Population	—
Asthma	58.2
Cardio-vascular	47.8
Low Birth Weights	31.1
Socioeconomic Factor Indicators	—
Education	81.9
Housing	90.9
Linguistic	88.3
Poverty	77.2
Unemployment	81.7

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	41.46028487
Employed	19.02989863
Median HI	38.2137816
Education	—
Bachelor's or higher	45.52803798
High school enrollment	100
Preschool enrollment	21.73745669
Transportation	—
Auto Access	58.83485179
Active commuting	47.79930707
Social	—
2-parent households	65.35352239

Voting	1.93763634
Neighborhood	—
Alcohol availability	26.08751444
Park access	12.22892339
Retail density	87.29629154
Supermarket access	10.21429488
Tree canopy	19.47901963
Housing	—
Homeownership	7.943025792
Housing habitability	24.16271012
Low-inc homeowner severe housing cost burden	91.91582189
Low-inc renter severe housing cost burden	57.48748877
Uncrowded housing	9.277556782
Health Outcomes	—
Insured adults	26.25433081
Arthritis	91.8
Asthma ER Admissions	33.8
High Blood Pressure	83.5
Cancer (excluding skin)	89.7
Asthma	51.9
Coronary Heart Disease	87.2
Chronic Obstructive Pulmonary Disease	71.2
Diagnosed Diabetes	60.0
Life Expectancy at Birth	61.7
Cognitively Disabled	41.3
Physically Disabled	30.9
Heart Attack ER Admissions	45.5

Mental Health Not Good	39.8
Chronic Kidney Disease	73.0
Obesity	61.1
Pedestrian Injuries	39.8
Physical Health Not Good	46.9
Stroke	80.6
Health Risk Behaviors	—
Binge Drinking	40.3
Current Smoker	40.7
No Leisure Time for Physical Activity	33.6
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	6.4
Elderly	94.7
English Speaking	9.4
Foreign-born	75.6
Outdoor Workers	33.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	18.2
Traffic Density	88.4
Traffic Access	63.7
Other Indices	—
Hardship	72.4
Other Decision Support	—
2016 Voting	21.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	92.0
Healthy Places Index Score for Project Location (b)	26.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Operations: Hearths	Per SCAQMD Rule 445 no wood burning devices Wood fireplaces added to gas fireplaces
Operations: Refrigerants	Beginning 1 January 2025, all new air conditioning equipment may not use refrigerants with a GWP of 750 or greater.
Operations: Architectural Coatings	SCAQMD Rule 1113

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