Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Solana Torrance Project City of Torrance, California

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
°C	degrees Celsius
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AB	Assembly Bill
amsl	above mean sea level
AQMP	Air Quality Management Plan
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CALGreen	California's Green Building Standards
CalRecycle	California Department of Resources Recycling and Recovery
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
City	City of Torrance
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO_2	carbon dioxide
CPUC	California Public Utilities Commission
CY	cubic yard
DPM	diesel particulate matter
EO	Executive Order
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gas
GWP	global warming potential
H_2S	hydrogen sulfide
HAPs	hazardous air pollutants
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LEED	Leadership in Energy and Environmental Design
LOS	level of service
LST	localized significance thresholds
MMT	million metric ton
MT CO_2E	metric tons of CO_2 equivalent
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen

Acronym/Abbreviation	Definition
O_3	ozone
PFC	perfluorocarbon
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
ppb	parts per billion
ppm	parts per million
RCP	Regional Comprehensive Plan
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SB	Senate Bill
SBCCOG	South Bay Cities Council of Governments
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
SO_4	sulfates
SO_x	sulfur oxides
SRA	source-receptor area
TAC	toxic air contaminants
TIS	traffic impact study
VOC	volatile organic compound

EXECUTIVE SUMMARY

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Solana Torrance Project (project). This assessment utilizes the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

Project Overview

The project site is located at the southwest corner of the intersection of Hawthorne Boulevard and Via Valmonte in the City of Torrance (City) in Los Angeles County, California. The project site encompasses approximately 24.68 acres, which is currently vacant.

The project is a 248-unit multifamily residential development, which includes four- and five-story residential structures constructed over structured parking garages. The project's residential unit mix will include 135 one-bedroom units and 113 two-bedroom units (Withee Malcom 2017). A total of 4,000 square feet is allocated for a leasing office and community room. The 188,417 square-foot subterranean parking garage area will include 499 parking spaces; on-grade parking will provide an additional 47 parking spaces. The project's estimated development area is 6.06 acres, which is proposed to occur within a disturbed and terraced area along the northeastern portion of the project development footprint, east of a moderate to steep hillside. The project would preserve 18.62 acres of the 24.68-acre property as natural open space.

The project site is located within the South Coast Air Basin (SCAB) and is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Construction and operational criteria air pollutant and GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1.

Air Quality

The air quality impact analysis evaluated the potential for adverse impacts to air quality due to construction and operational emissions resulting from the project. Impacts were evaluated for their significance based on the SCAQMD mass daily criteria air pollutant thresholds of significance (SCAQMD 1993, as revised in March 2015). Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead. Pollutants that are evaluated include volatile organic compounds (VOCs) (also referred to

as reactive organic gases), oxides of nitrogen (NO_x), CO, sulfur oxides (SO_x), PM_{10}, and $PM_{2.5}$. VOCs and NO_x are important because they are precursors to O_3.

Air Quality Plan Consistency

Implementation of the project would not exceed the demographic growth forecasts in the Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (2016 RTP/SCS); therefore, the project would also be consistent with the SCAQMD 2016 Air Quality Management Plan (AQMP), which based future emission estimates on the SCAG 2016 RTP/SCS. In addition, the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations. Based on these considerations, impacts related to the project's potential to conflict with or obstruct implementation of the applicable air quality plan would be less than significant.

Construction Criteria Air Pollutant Emissions

Construction of the project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and VOC off-gassing) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Maximum daily construction emissions would not exceed the SCAQMD significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during construction in all construction years (2018–2020).

Operational Criteria Air Pollutant Emissions

Operational year 2020 was assumed consistent with the construction scenario. Operation of the project would generate operational criteria air pollutants from mobile sources (vehicles), area sources (consumer product use, architectural coatings, and landscape maintenance equipment), and energy (natural gas). Maximum operational emissions would not exceed the SCAQMD operational significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$.

Exposure of Sensitive Receptors

Construction activities would not generate emissions in excess of the SCAQMD site-specific localized significance thresholds (LSTs); therefore, site-specific construction impacts during construction of the project would be less than significant. In addition, diesel equipment would also be subject to the California Air Resources Board (CARB) air toxic control measures for in-use off-road diesel fleets, which would minimize diesel particulate matter (DPM) emissions. No residual toxic air contaminants (TAC) emissions and corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the project. Therefore, the exposure of project-related TAC emission impacts to sensitive receptors would be less than significant. The project

would not negatively affect the level of service (LOS) of intersections on the project site and would not significantly contribute to a CO hotspot. In addition, no sensitive receptor land uses are located near the only study area intersection that would operate at an unacceptable LOS. As such, potential project-generated impacts associated with CO hotspots would be less than significant.

Odors

Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application, which would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. Impacts associated with odors during construction would be less than significant. The project is a residential development that would not include land uses with sources that have the potential to generate substantial odors and impacts associated with odors during operation would be less than significant.

Cumulative Impacts

The potential for the project to result in a cumulatively considerable impact, per the SCAQMD guidance and thresholds, is based on the project's potential to exceed the project-specific daily thresholds. As discussed previously, maximum construction and operational emissions would not exceed the SCAQMD significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. Therefore, the project would not result in a cumulatively considerable increase in criteria air pollutants.

Greenhouse Gas Emissions

Global climate change is primarily considered a cumulative impact, but must also be evaluated on a project-level under CEQA. A project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG emissions. GHGs are gases that absorb infrared radiation in the atmosphere. Principal GHGs regulated under state and federal law and regulations include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). GHG emissions are measured in metric tons of CO_2 equivalent (MT CO_2E), which account for weighted global warming potential (GWP) factors for CH_4 and N_2O.

Project-Generated Construction and Operational Greenhouse Gas Emissions

The threshold applied to assess the potential for the project to generate GHG emissions either directly or indirectly that may have a significant impact on the environment was the recommended SCAQMD threshold of 4.8 MT CO_2E per service population per year. Pursuant to SCAQMD recommendation, construction emissions were amortized over a 30-year project

lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies (SCAQMD 2008).

Construction of the project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. Total project-generated GHG emissions during construction were estimated to be 1,198 MT CO_2E over the construction period. Estimated project-generated construction emissions amortized over 30 years would be approximately 39.93 MT CO_2E per year.

The project would generate operational GHG emissions from vehicular sources, area sources (natural gas combustion and landscape maintenance), electrical generation (including electrical generation associated with water supply and wastewater treatment), and solid waste. Estimated annual project-generated operational GHG emissions would be approximately 2,956 MT CO_2E per year. Estimated annual project-generated operational emissions in 2020 and amortized project construction emissions would be approximately 2,996 MT CO_2E per year.

Pursuant to the SCAG 2016 RTP/SCS population and household data, the average persons per household for the City in 2020 is estimated to be 2.61 (SCAG 2016). Based on the assumption of 2.61 persons per household, the proposed 248 residential units would generate 647 persons when the project is built out in 2020. Estimated annual GHG emissions of 2,996 MT CO_2E per year divided by a service population of 647 persons is 4.63 MT CO_2E per service population per year. As such, annual operational GHG emissions with amortized construction emissions would not exceed the SCAQMD threshold of 4.8 MT CO_2E per service population per year. Therefore, the project-generated GHG emissions would result in a less than significant impact.

Consistency with Applicable Greenhouse Gas Reduction Plans

The City has not adopted a comprehensive climate action plan and there is currently no local guidance that would be applicable to the project. At this time, no mandatory GHG plans, policies, or regulations or finalized agency guidelines would apply to implementation of the project. Nonetheless, development of the project site would support the overarching intent of the SCAG 2016 RTP/SCS by avoiding sprawling development and through incorporation of energy efficient features such as landscaping and irrigation. To the extent these regulations are applicable to the project, its inhabitants, or uses, the project would comply with all applicable regulations adopted in furtherance of the scoping plan to the extent required by law. As such, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs and no mitigation is required. This impact would be less than significant.

1 INTRODUCTION

1.1 Report Purpose and Scope

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Solana Torrance Project (project). This assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), and is based on the emissions-based significance thresholds recommended by the South Coast Air Quality Management District (SCAQMD) and other applicable thresholds of significance.

This introductory section provides a description of the project and the project location. Section 2, Air Quality, describes the air quality–related environmental setting, regulatory setting, existing air quality conditions, and thresholds of significance and analysis methodology and presents an air quality impact analysis per Appendix G of the CEQA Guidelines. Section 3, Greenhouse Gas Emissions, follows the same format as Section 2 and similarly describes the GHG emissions–related environmental setting, regulatory setting, existing climate changes conditions, and thresholds of significance and analysis methodology and presents a GHG emissions impact analysis per Appendix G of the CEQA Guidelines. Section 4, References Cited, includes a list of the references cited. Section 5, List of Preparers, includes a list of those who prepared this technical report.

The analysis in this technical report incorporates project data as provided on the site plans prepared by Withee Malcom Architects (March 21, 2017; Withee Malcom Architects 2017) and the traffic impact study (TIS) prepared by KHR Associates (April 14, 2017; KHR Associates 2017).

1.2 Regional and Local Setting

The approximately 24.68-acre (1,0745,148-square-foot) Solana Torrance property is located on privately owned land located west and north of Hawthorne Boulevard, south of Via Valmonte, and east of Palos Verdes Drive North within the City in southwestern Los Angeles County, approximately 18 miles southwest of downtown Los Angeles (Figure 1, Regional Map). The property is directly adjacent to and west of State Route 107/Hawthorne Boulevard and approximately 0.5 mile south of State Route 1 (Figure 2, Vicinity Map). More specifically, the property is located southeast of Palos Verdes Estates and north of Rolling Hills Estates. Ernie J. Howlett Park is located directly to the west.

The project is planned to occur within an approximate 6.06-acre area within an old mining pit and terraced area located southwest of the intersection of Via Valmonte and State Route 107/Hawthorne Boulevard in the northeastern portion of the property. Major circulation corridors surrounding the project in less than a 1-mile radius include Hawthorne Boulevard and Via

Valmonte adjacent to the project site. Adjacent land uses include residential to the north and west, residential and light commercial/office to the east, and vacant land/hillside to the south.

The General Plan (City of Torrance 2010) land use designation for the project development footprint is low density residential (R-LO), which is located within the Hillside Neighborhood District (City of Torrance 2010). The project is within an area zoned as light agricultural (A-1) within the City of Torrance Property Zoning Map (City of Torrance 2015).

The project site is located within the South Coast Air Basin (SCAB), which includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties.

1.3 Project Description

The project is a 248-unit multifamily residential development, which includes four- and five-story residential structures constructed over a parking garage. The project's residential unit mix will include 135 one-bedroom units and 113 two-bedroom units (Withee Malcom 2017). In addition to the 223,525 square feet of residential living space, the project will include 4,000 square feet for a leasing office and community room. The 188,417-square-foot subterranean parking garage area will include 499 parking spaces. On-grade parking will provide an additional 47 spaces, for a total of 546 parking spaces.

The project's estimated development area, which is proposed to occur within a disturbed and terraced area along the northeastern portion of the project development footprint, is 6.06 acres east of a moderate to steep hillside. The project would preserve 18.62 acres of the 24.68-acre property as natural open space. The project's density is approximately 10 dwelling units per acre, assuming the project site area of 24.68 acres. Table 1 provides a summary of the proposed residential units and parking spaces provided.

Table 1
Project Residential and Parking Land Use Breakdown

Residential Units and Amenities			
Plan Description	*Quantity (number of dwelling units)*	*Gross Unit Area (square feet)*	*Floor Area (square feet)*
1A. 1 bedroom + 1 bath	84	705	59,220
1C. 1 bedroom + 1 bath & mezzanine	47	745	35,015
1D. 1 bedroom + 1 bath	4	735	2,940
2A. 2 bedroom + 2 bath	96	1,115	107,040
2B. 2 bedroom + 2 bath & mezzanine	9	1,110	9,990
2C. 2 bedroom + 2 bath	4	1,130	4,520
2D. 2 bedroom + 2 bath	4	1,200	4,800

Table 1
Project Residential and Parking Land Use Breakdown

Residential Units and Amenities			
Plan Description	*Quantity (number of dwelling units)*	*Gross Unit Area (square feet)*	*Floor Area (square feet)*
Residential Units Subtotal	*248*	*901* (weighted average)	*223,525*
Circulation (enclosed corridors), lobby, stairs, elevator, storage, and mechanical space			*53,244*
Residential Area Subtotal			*276,769*
Leasing office and community room			*4,000*
Building Area Total[a]			**280,769**
Parking			
Parking Area	*Parking Provided (number of spaces)*		*Floor Area (square feet)*
Building A parking garage	127		52,634
Building B parking garage	93		33,950
Building C parking garage	49		18,925
Building D parking garage	230		82,908
Subtotal	*499*		*188,417*
On-grade parking	47		54,383[b]
Total	**546**		**295,718**

Source: Withee Malcom 2017
Notes:

[a] Building area total square footage does not include parking garage, which is presented separately in Table 1, or patio and balcony space, which is not included as habitable space in this analysis,

[b] On-grade parking square footage includes street area in addition to open parking. Assuming an average of 400 square feet per parking space, 47 spaces would total 18,800 square feet. As such, the estimate of 54,383 square feet conservatively includes additional space that is not intended for parking only.

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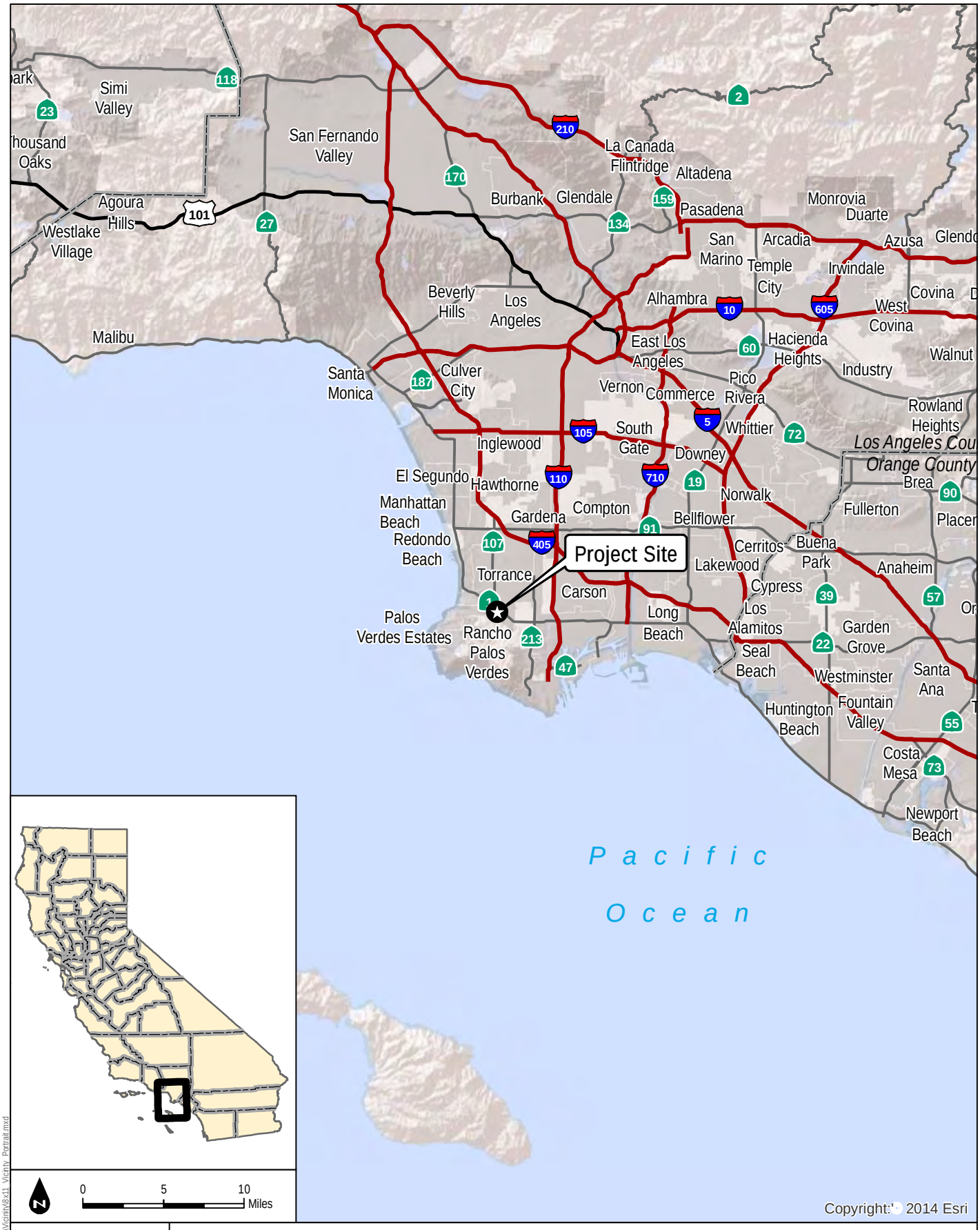

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FIGURE 1

Regional Map

Solana Torrance Project

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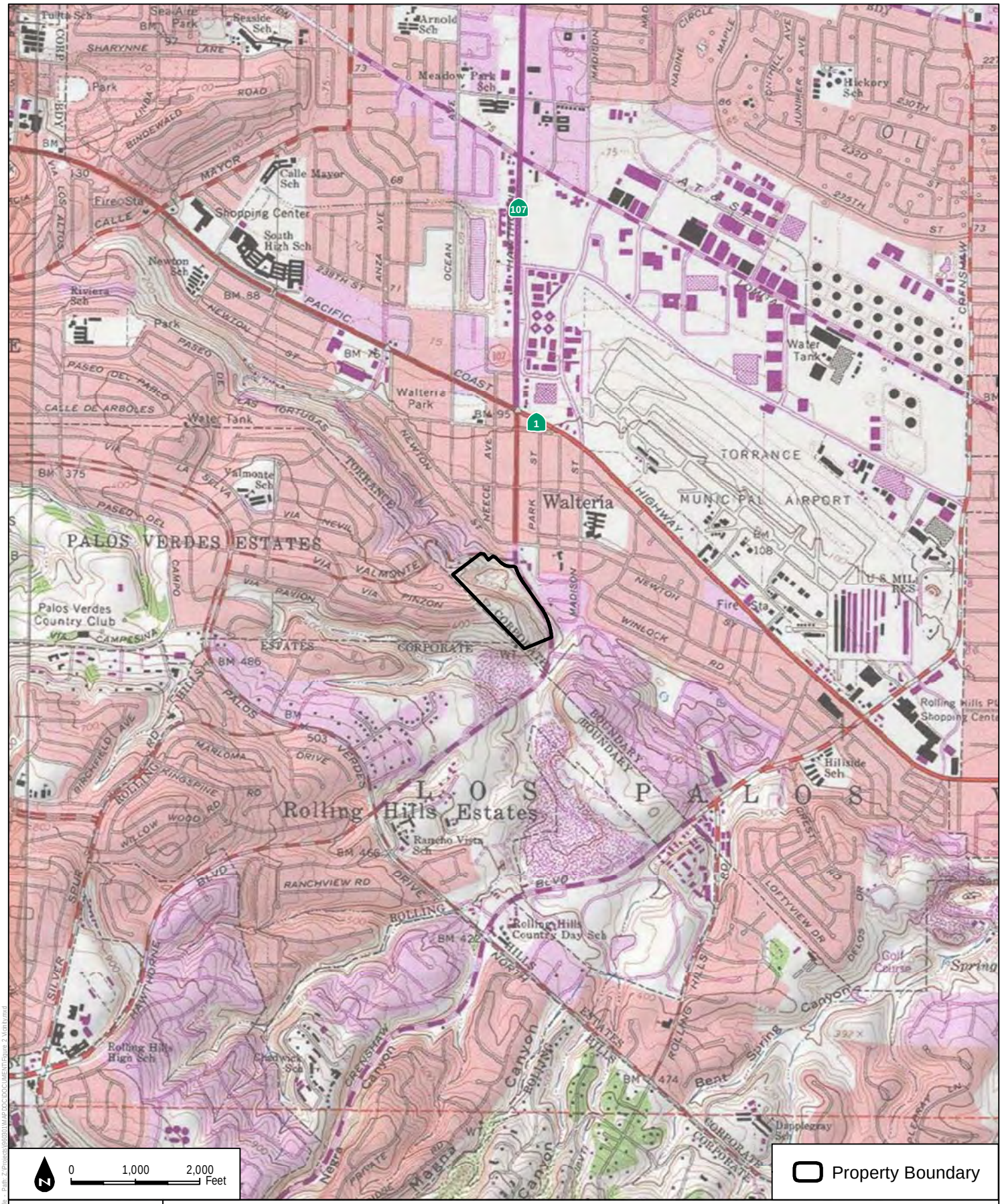

SOURCE: USGS 7.5-Minute Series Torrance Quadrangle

FIGURE 2

Vicinity Map

Solana Torrance Project

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2 AIR QUALITY

2.1 Environmental Setting

As stated previously, the project site is located within the SCAB. The SCAB is characterized as having a Mediterranean climate (typified as semiarid with mild winters, warm summers, and moderate rainfall). The SCAB is a 6,745-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east.

2.1.1 Meteorological and Topographical Conditions

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted. Meteorological and topographical conditions, however, are also important. Factors such as wind speed and direction, air temperature gradients and sunlight, and precipitation and humidity interact with physical landscape features to determine the movement and dispersal of air pollutants. The SCAB's air pollution problems are a consequence of the combination of emissions from the nation's second largest urban area, meteorological conditions adverse to the dispersion of those emissions, and mountainous terrain surrounding the SCAB that traps pollutants as they are pushed inland with the sea breeze (SCAQMD 2017). Meteorological and topographical factors that affect air quality in the SCAB are described below.[1]

Climate

The SCAB is characterized as having a Mediterranean climate (typified as semiarid with mild winters, warm summers, and moderate rainfall). The general region lies in the semi-permanent high-pressure zone of the eastern Pacific; as a result, the climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the SCAB is a function of the area's natural physical characteristics (e.g., weather and topography) and of manufactured influences (e.g., development patterns and lifestyle). Moderate temperatures, comfortable humidity, and limited precipitation characterize the climate in the SCAB. The average annual temperature varies little throughout the SCAB, averaging 75 degrees Fahrenheit (°F). However, with a less-pronounced oceanic influence, the eastern inland portions of the SCAB show greater variability in annual minimum and maximum temperatures. All portions of the SCAB have recorded temperatures over 100°F in recent years. Although the SCAB has a semiarid climate, the air near the surface is moist because of the

[1] The discussion of meteorological and topographical conditions of the SCAB is based on information provided in the *Final 2016 Air Quality Management Plan* (SCAQMD 2017).

presence of a shallow marine layer. Except for infrequent periods when dry air is brought into the SCAB by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. Annual average relative humidity is 70% at the coast and 57% in the eastern part of the SCAB. Precipitation in the SCAB is typically 9 to 14 inches annually and is rarely in the form of snow or hail because of typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the SCAB.

The average low in the City is reported at 44.2°F in January, and the average high is 78.6°F in August (City of Torrance 2009). In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from November to April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains. Rainfall averages around 13.58 inches per year in the City (City of Torrance 2009).

Sunlight

The presence and intensity of sunlight are necessary prerequisites for the formation of photochemical smog. Under the influence of the ultraviolet radiation of sunlight, certain "primary" pollutants (mainly reactive hydrocarbons and oxides of nitrogen (NO_x)[2]) react to form "secondary" pollutants (primarily oxidants). Since this process is time dependent, secondary pollutants can be formed many miles downwind of the emission sources. Southern California also has abundant sunshine, which drives the photochemical reactions that form pollutants such as ozone (O_3) and a substantial portion of fine particulate matter ($PM_{2.5}$, particles less than 2.5 microns in diameter). In the SCAB, high concentrations of O_3 are normally recorded during the late spring, summer, and early autumn months, when more intense sunlight drives enhanced photochemical reactions. Due to the prevailing daytime winds and time-delayed nature of photochemical smog, oxidant concentrations are highest in the inland areas of Southern California.

Temperature Inversions

Under ideal meteorological conditions and irrespective of topography, pollutants emitted into the air mix and disperse into the upper atmosphere. However, the Southern California region frequently experiences temperature inversions in which pollutants are trapped and accumulate close to the ground. The inversion, a layer of warm, dry air overlaying cool, moist marine air, is a normal condition in coastal Southern California. The cool, damp, and hazy sea air capped by

[2] NO_x is a general term pertaining to compounds of nitric oxide (NO), nitrogen dioxide (NO_2) and other oxides of nitrogen.

coastal clouds is heavier than the warm, clear air, which acts as a lid through which the cooler marine layer cannot rise. The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above mean sea level (amsl), the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet amsl, the terrain prevents the pollutants from entering the upper atmosphere, resulting in the pollutants settling in the foothill communities. Below 1,200 feet amsl, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the daylight hours.

Mixing heights for inversions are lower in the summer and inversions are more persistent, being partly responsible for the high levels of ozone (O_3) observed during summer months in the SCAB. Smog in Southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods, allowing them to form secondary pollutants by reacting in the presence of sunlight. The SCAB has a limited ability to disperse these pollutants due to typically low wind speeds and the surrounding mountain ranges.

As with other cities within the SCAB, the City is susceptible to air inversions, which trap a layer of stagnant air near the ground where pollutants are further concentrated. These inversions produce haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces, and other sources. Elevated particles less than 10 microns in diameter (PM_{10}) and $PM_{2.5}$ concentrations can occur in the SCAB throughout the year, but occur most frequently in fall and winter. Although there are some changes in emissions by day-of-week and season, the observed variations in pollutant concentrations are primarily the result of seasonal differences in weather conditions.

2.1.2 Pollutants and Effects

2.1.2.1 Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead. These pollutants, as well as toxic air contaminants (TACs), are discussed in the

following paragraphs.[3] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly NO_x and volatile organic compounds (VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric ozone) and at the Earth's surface in the troposphere (ozone).[4] The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

[3] The descriptions of each of the criteria air pollutants and associated health effects are based on the EPA's Criteria Air Pollutants (2016a) and the CARB Glossary of Air Pollutant Terms (2016a).

[4] The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections (EPA 2016b).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) consists of particulate matter that is 10 microns or less in diameter and is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical

reactions. Fine particulate matter ($PM_{2.5}$) consists of particulate matter that is 2.5 microns or less in diameter and is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in PM_{10} and $PM_{2.5}$ (EPA 2009).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as reactive organic gases). Combustion

engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of VOCs result from the formation of O_3 and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for VOCs as a group.

2.1.2.2 Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic noncancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the state of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$ (CARB 2016b). DPM is typically composed of carbon particles ("soot," also called black carbon, or BC) and numerous

organic compounds, including over 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2016b). The CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM; 17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2016b). Those most vulnerable to non-cancer health effects are children whose lungs are still developing and the elderly who often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

2.1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). The SCAQMD identifies sensitive

receptors as residences, schools, playgrounds, childcare centers, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes (SCAQMD 1993). Residential land uses are located to the north, east, and west of the project. The closest off-site sensitive receptors to the project site include residences located approximately 50 feet north of the project site boundary.

2.2 Regulatory Setting

2.2.1 Federal Regulations

2.2.1.1 Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutant (HAP) standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

2.2.1.2 Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants to protect public health and welfare. HAPs include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

2.2.2 State Regulations

2.2.2.1 Criteria Air Pollutants

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 2.

Table 2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1 hour	0.09 ppm (180 μg/m³)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m³)	0.070 ppm (137 μg/m³)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m³)	0.100 ppm (188 μg/m³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	0.053 ppm (100 μg/m³)	
CO	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m³)	0.075 ppm (196 μg/m³)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m³)
	24 hours	0.04 ppm (105 μg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 μg/m³	150 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m³	—	
$PM_{2.5}$[i]	24 hours	—	35 μg/m³	Same as Primary Standard

Table 2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
	Annual Arithmetic Mean	12 μg/m^3	12.0 μg/m^3	15.0 μg/m^3
Lead[j,k]	30-day Average	1.5 μg/m^3	—	—
	Calendar Quarter	—	1.5 μg/m^3 (for certain areas)[k]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 μg/m^3	
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m^3)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 μg/m^3)	—	—
Sulfates	24- hours	25 μg/m^3	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2016b.

Notes: μg/m^3 = micrograms per cubic meter; mg/m^3= milligrams per cubic meter; ppm = parts per million by volume; O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns.

a California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter (PM_{10}, $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

e National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

f On October 1, 2015, the national 8-hour O_3 primary and secondary standards were lowered from 0.075 to 0.070 ppm.

g To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

h On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the national 1-hour standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

i On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12.0 μg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-

hour PM_{10} standards (primary and secondary) of 150 μg/m^3 were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

j CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

k The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

2.2.2.2 Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. In 1987, the Legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) to address public concern over the release of TACs into the atmosphere. AB 2588 law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. There are several Airborne Toxic Control Measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

California Health and Safety Code Section 41700

This section of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment,

nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

2.2.3 Local Regulations

The following local/regional regulations pertaining to air quality would apply to the project.

2.2.3.1 South Coast Air Quality Management District

The SCAQMD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the SCAB, where the project is located. The SCAQMD operates monitoring stations in the SCAB, develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. The SCAQMD's Air Quality Management Plans (AQMPs) include control measures and strategies to be implemented to attain state and federal ambient air quality standards in the SCAB. The SCAQMD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

The most recent adopted AQMP is the 2016 AQMP (SCAQMD 2017), which was adopted by the SCAQMD governing board on March 3, 2017. The 2016 AQMP is a regional blueprint for achieving air quality standards and healthful air. The 2016 AQMP represents a new approach, focusing on available, proven, and cost effective alternatives to traditional strategies, while seeking to achieve multiple goals in partnership with other entities promoting reductions in GHGs and toxic risk, as well as efficiencies in energy use, transportation, and goods movement (SCAQMD 2017). Because mobile sources are the principal contributor to the SCAB's air quality challenges, the SCAQMD has been and will continue to be closely engaged with CARB and the EPA, who have primary responsibility for these sources. The 2016 AQMP recognizes the critical importance of working with other agencies to develop funding and other incentives that encourage the accelerated transition of vehicles, buildings, and industrial facilities to cleaner technologies in a manner that benefits not only air quality but also local businesses and the regional economy. These "win-win" scenarios are key to implementation of this 2016 AQMP with broad support from a wide range of stakeholders.

The previous AQMP was the 2012 AQMP, which was adopted in February 2013 (SCAQMD 2013). The 2012 AQMP proposed policies and measures to achieve federal and state standards for improved air quality in the SCAB and those portions of the Salton Sea Air Basin (formerly

named the Southeast Desert Air Basin) that are under SCAQMD jurisdiction. The 2012 AQMP is designed to meet applicable federal and state requirements for O_3 and particulate matter. The 2012 AQMP documents that attainment of the federal 24-hour $PM_{2.5}$ standard is impracticable by 2015 and the SCAB should be classified as a Serious nonattainment area along with the appropriate federal requirements. The 2012 AQMP includes the planning requirements to meet the 1-hour O_3 standard. The 2012 AQMP demonstrates attainment of the federal 24-hour $PM_{2.5}$ standard by 2014 in the SCAB through adoption of all feasible measures. Finally, the 2012 AQMP updates the EPA-approved 8-hour O_3 control plan with new measures designed to reduce reliance on the Clean Air Act Section 182(e)(5) long-term measures for NO_x and VOC reductions. The 2012 AQMP reduction and control measures, which are outlined to mitigate emissions, are based on existing and projected land use and development. The EPA, with a final ruling on April 14, 2016, approved the Clean Air Act planning requirements for the 24-hour $PM_{2.5}$ standard portion and on September 3, 2014, approved the 1-hour ozone Clean Air Act planning requirements.

Applicable Rules

Emissions that would result from mobile, area, and stationary sources during construction and operation of the project are subject to the rules and regulations of the SCAQMD. The SCAQMD rules applicable to the project may include the following:

- **Rule 401 – Visible Emissions:** This rule establishes the limit for visible emissions from stationary sources.
- **Rule 402 – Nuisance:** This rule prohibits the discharge of air pollutants from a facility that cause injury, detriment, nuisance, or annoyance to the public or damage to business or property.
- **Rule 403 – Fugitive Dust:** This rule requires fugitive dust sources to implement best available control measures for all sources and prohibits all forms of visible particulate matter from crossing any property line. SCAQMD Rule 403 is intended to reduce PM_{10} emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust.
- **Rule 431.2 – Sulfur Content of Liquid Fuels:** The purpose of this rule is to limit the sulfur content in diesel and other liquid fuels for the purpose of reducing the formation of SO_x and particulates during combustion and of enabling the use of add-on control devices for diesel-fueled internal combustion engines. The rule applies to all refiners, importers, and other fuel suppliers such as distributors, marketers, and retailers, as well as to users of diesel, low-sulfur

diesel, and other liquid fuels for stationary-source applications in the SCAQMD. The rule also affects diesel fuel supplied for mobile sources.

- **Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines:** This rule applies to stationary and portable engines rated at greater than 50 horsepower. The purpose of Rule 1110.2 is to reduce NO_x, VOCs, and CO emissions from engines. Emergency engines, including those powering standby generators, are generally exempt from the emissions and monitoring requirements of this rule because they have permit conditions that limit operation to 200 hours or less per year as determined by an elapsed operating time meter.
- **Rule 1113 – Architectural Coatings:** This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

2.2.3.2 Southern California Association of Governments

The SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the federally designated metropolitan planning organization for the Southern California region and is the largest metropolitan planning organization in the United States.

With respect to air quality planning and other regional issues, SCAG has prepared the 2008 Regional Comprehensive Plan: Helping Communities Achieve a Sustainable Future (2008 RCP) for the region (SCAG 2008). The 2008 RCP sets the policy context in which SCAG participates in and responds to the SCAQMD air quality plans and builds off the SCAMQD AQMP processes that are designed to meet health-based criteria pollutant standards in several ways (SCAG 2008). First, it complements AQMPs by providing guidance and incentives for public agencies to consider best practices that support the technology-based control measures in AQMPs. Second, the 2008 RCP emphasizes the need for local initiatives that can reduce the region's GHG emissions that contribute to climate change, an issue that is largely outside the focus of local attainment plans, which is assessed in Section 3. Third, the 2008 RCP emphasizes the need for better coordination of land use and transportation planning, which heavily influences the emissions inventory from the transportation sectors of the economy. This also minimizes land use conflicts, such as residential development near freeways, industrial areas, or other sources of air pollution.

On April 7, 2016, SCAG's Regional Council adopted the 2016–2040 RTP/SCS (2016 RTP/SCS). The 2016 RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The 2016 RTP/SCS charts

a course for closely integrating land use and transportation so that the region can grow smartly and sustainably. The 2016 RTP/SCS was prepared through a collaborative, continuous, and comprehensive process with input from local governments, county transportation commissions, tribal governments, nonprofit organizations, businesses, and local stakeholders within the Counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. In June 2016, SCAG received its conformity determination from the Federal Highway Administration and the Federal Transit Administration indicating that all air quality conformity requirements for the 2016 RTP/SCS and associated 2015 Federal Transportation Improvement Program Consistency Amendment through Amendment 15-12 have been met (SCAG 2016). As previously noted, the SCAQMD 2016 AQMP applies the updated SCAG growth forecasts assumed in the 2016 RTP/SCS.

2.2.3.3 City of Torrance

The City's General Plan (2010) includes various goals and policies designed to help improve air quality within the City. In regards to reducing mobile source emissions, the City has adopted a Trip Reduction Ordinance (Municipal Code Division 9 Chapter 10) to incentivize walking, cycling, use of public transit, and carpooling to work. Energy efficiency in buildings is addressed under energy conservation and sustainable building practices topics in the General Plan Update. Trip reduction strategies are addressed in the Land Use and Circulation Elements. The Land Use Element includes policies to encourage site design that is conducive to walking. To reduce vehicle traffic and congestion within Torrance, the Circulation Element includes policies to encourage the use of alternative forms of transportation and strategies to be implemented by employers, developers, and merchants within the City. Transportation Demand Management strategies include promoting the use of carpools, vanpools, work-related transit use, bicycling, and walking as a means to improve air quality and to minimize congestion on the local and regional network.

As discussed in the General Plan, policies pertaining to improving air quality are addressed in multiple chapters of the General Plan. Objective CR.13 and associated policies are presented below (City of Torrance 2010).

OBJECTIVE CR.13: To contribute to the improvement of local and regional ambient air quality to benefit the health of all.

- **Policy CR.13.1:** Continue to participate in the efforts of the CARB and the SCAQMD to meet State and federal air quality standards.
- **Policy CR.13.2:** Work with neighboring cities to implement local and regional projects that improve mobility on freeways and railways, reduce emissions, and improve air quality.

- **Policy CR.13.3:** Support regional air quality goals through conscientious land use and transportation planning and the implementation of resource conservation measures.
- **Policy CR.13.4:** Balance the achievement of clean air with other major goals of the City.
- **Policy CR.13.5:** Support air quality and energy and resource conservation by encouraging alternative modes of transportation such as walking, bicycling, transit, and carpooling.
- **Policy CR.13.6:** Promote citizen awareness and participation in programs to reduce air pollution and traffic congestion.
- **Policy CR.13.7:** Encourage the use of alternative fuel vehicles and re-refined oil.
- **Policy CR.13.8:** Promote energy-efficient building construction and operation practices that reduce emissions and improve air quality.

Many air quality strategies result in co-benefits with reducing GHG emissions and vice versa. See Section 3.2.3.4, City of Torrance, for a discussion of the City's GHG emission reduction policies.

2.3 Regional and Local Air Quality Conditions

2.3.1 South Coast Air Basin Attainment Designation

Pursuant to the 1990 federal Clean Air Act amendments, the EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as "attainment" for that pollutant. If an area exceeds the standard, the area is classified as "nonattainment" for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable." The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are re-designated as maintenance areas and must have approved Maintenance Plans to ensure continued attainment of the standards. The California Clean Air Act, like its federal counterpart, called for the designation of areas as "attainment" or "nonattainment," but based on CAAQS rather than the NAAQS. Table 3 depicts the current attainment status of the project site with respect to the NAAQS and CAAQS. The attainment classifications for the criteria pollutants are outlined in Table 3.

Table 3
South Coast Air Basin Attainment Classification

Pollutant	Designation/Classification	
	Federal Standards	*State Standards*
Ozone (O_3) – 1 hour	No Federal Standard	**Nonattainment**
Ozone (O_3) – 8 hour	**Extreme Nonattainment**	**Nonattainment**
Nitrogen Dioxide (NO_2)	Unclassifiable/Attainment	Attainment
Carbon Monoxide (CO)	Attainment/Maintenance	Attainment
Sulfur Dioxide (SO_2)	Not Designated [a]	Attainment
Coarse Particulate Matter (PM_{10})	Attainment/Maintenance	**Nonattainment**
Fine Particulate Matter ($PM_{2.5}$)	**Serious Nonattainment**	**Nonattainment**
Lead (Pb)	Nonattainment	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility-Reducing Particles	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	No designation

Sources: EPA 2016c (federal); CARB 2016d (state).
Notes: Attainment = meets the standards; Attainment/Maintenance = achieve the standards after a nonattainment designation; Nonattainment = does not meet the standards; Unclassified or Unclassifiable = insufficient data to classify; Unclassifiable/Attainment = meets the standard or is expected to be meet the standard despite a lack of monitoring data.
[a] Federal designations for SO_2 are on hold by EPA; EPA expects to make the designations by December 2017 (EPA 2016d).

In summary, the SCAB is designated as a nonattainment area for federal and state O_3 standards and federal and state $PM_{2.5}$ standards. The SCAB is designated as a nonattainment area for state PM_{10} standards; however, it is designated as an attainment area for federal PM_{10} standards. The SCAB is designated as an attainment area for federal and state CO standards, federal and state NO_2 standards, and federal and state SO_2 standards. While the SCAB has been designated as nonattainment for the federal rolling 3-month average lead standard, it is designated attainment for the state lead standard (EPA 2016c; CARB 2016c).

Despite the current non-attainment status, air quality within the SCAB has generally improved since the inception of air pollutant monitoring in 1976. This improvement is mainly due to lower-polluting on-road motor vehicles, more stringent regulation of industrial sources, and the implementation of emission reduction strategies by the SCAQMD. This trend toward cleaner air has occurred in spite of continued population growth. Despite this growth, air quality has improved significantly over the years, primarily due to the impacts of the region's air quality control program. PM_{10} levels have declined almost 50% since 1990, and $PM_{2.5}$ levels have also declined 50% since measurements began in 1999 (SCAQMD 2013). Similar improvements are observed with O_3, although the rate of O_3 decline has slowed in recent years.

2.3.2 Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across the state. The SCAQMD monitors local ambient air quality at the project site. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. The most recent background ambient air quality data from 2013 to 2015 are presented in Table 4. The Long Beach Webster Street monitoring station, located at 2425 Webster Street,[5] California 90810, is the nearest air quality monitoring station to the project site, located approximately 7.5 miles east from the project site. The data collected at this station are considered representative of the air quality experienced in the project vicinity. Air quality data for O_3, NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$ from the Long Beach Webster Street monitoring station are provided in Table 4. Because $PM_{2.5}$ and PM_{10} in 2013 are not monitored at the Webster Street monitoring station, $PM_{2.5}$ and 2013 PM_{10} measurements were taken from the Long Beach North Long Beach Boulevard monitoring station (3648 North Long Beach Boulevard, California, 90807, approximately 9.5 miles east–northeast from the project site). The number of days exceeding the ambient air quality standards is also shown in Table 4.

Table 4
Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2013	*2014*	*2015*	*2013*	*2014*	*2015*
Ozone (O_3)										
Long Beach Webster Street	ppm	Maximum 1-hour concentration	State	0.09	0.090	0.087	0.087	0	0	0
	ppm	Maximum 8-hour concentration	State	0.070	0.070	0.072	0.067	0	1	0
			Federal	0.070	0.069	0.063	0.066	0	0	0
Nitrogen Dioxide (NO_2)										
Long Beach Webster Street	ppm	Maximum 1-hour concentration	State	0.18	0.081	0.135	0.101	0	0	0
			Federal	0.100	0.0812	0.1359	0.1018	0	2	1
	ppm	Annual concentration	State	0.030	0.021	ND	0.020	–	–	–
			Federal	0.053	–	–	–	–	–	–
Carbon Monoxide (CO)										
Long Beach Webster Street	ppm	Maximum 1-hour concentration	State	20	–	–	–	–	–	–
			Federal	35	4.1	3.7	3.3	0	0	0
	ppm	Maximum 8-hour concentration	State	9.0	ND	ND	–	*0*	*0*	–
			Federal	9	2.6	2.6	2.2	0	0	0

[5] The address of 2425 Webster Street has been changed to 2425 Webster Avenue; however, the location is the same.

Table 4
Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2013	*2014*	*2015*	*2013*	*2014*	*2015*
Sulfur Dioxide (SO_2)										
Long Beach Webster Street	ppm	Maximum 1-hour concentration	Federal	0.075	0.0154	0.0147	0.0375	0	0	0
	ppm	Maximum 24-hour concentration	Federal	0.14	0.039	0.030	0.046	0	0	0
	ppm	Annual concentration	Federal	0.030	0.0104	0.0132[a]	0.0099[a]	0	0	0
Coarse Particulate Matter (PM_{10})[b]										
Long Beach North Long Beach Boulevard (2013); Webster Street (2014, 2015)	µg/m³	Maximum 24-hour concentration	State	50	ND	84.0	79.0	ND	19.3 (3)	37.6 (6)
			Federal	150	37	84	80	ND (0)	0.0 (0)	0.0 (0)
	µg/m³	Annual concentration	State	20	ND	29.5	31.3	–	–	–
Fine Particulate Matter ($PM_{2.5}$)[b]										
Long Beach North Long Beach Boulevard	µg/m³	Maximum 24-hour concentration	Federal	35	47.2	51.5	54.6	2.2 (2)	ND (2)	3.1 (3)
	µg/m³	Annual concentration	State	12	11.3	ND	ND	–	–	–
			Federal	12.0	11.3	11.5[a]	10.8	–	–	–

Sources: CARB 2016d; EPA 2016e.

Notes: — = not available; µg/m3 = micrograms per cubic meter; ND = insufficient data available to determine the value; ppm = parts per million
Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of federal and state standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour ozone, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
Long Beach Webster Street Monitoring Station is located at 2425 Webster Street, Long Beach, California 90810.
Long Beach North Long Beach Boulevard Monitoring Station is located at 3648 North Long Beach Boulevard, Long Beach, California 90807.

[a] Mean does not satisfy minimum data completeness criteria.

[b] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

2.4 Significance Criteria and Methodology

2.4.1 Thresholds of Significance

The significance criteria used to evaluate the project impacts to air quality is based on the recommendations provided in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this air quality analysis, a significant impact would occur if the project would (14 CCR 15000 et seq.):

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to determine whether the project would have a significant impact on air quality.

The SCAQMD has established Air Quality Significance Thresholds, as revised in March 2015, which set forth quantitative emission significance thresholds below which a project would not have a significant impact on ambient air quality under existing and cumulative conditions. The quantitative air quality analysis provided herein applies the SCAQMD thresholds identified in Table 5 to determine the potential for the project to result in a significant impact under CEQA.

Table 5
SCAQMD Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds		
Pollutant	*Construction (pounds per day)*	*Operation (pounds per day)*
VOCs	75	55
NO_x	100	55
CO	550	550

Table 5
SCAQMD Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds		
Pollutant	*Construction (pounds per day)*	*Operation (pounds per day)*
SO_x	150	150
PM_{10}	150	150
$PM_{2.5}$	55	55
Lead[a]	3	3
TACs and Odor Thresholds		
TACs[b]	Maximum incremental cancer risk ≥ 10 in 1 million Chronic and acute hazard index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality Standards for Criteria Pollutants[c]		
NO_2 1-hour average NO_2 annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.030 ppm (state) and 0.0534 ppm (federal)	
CO 1-hour average CO 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
PM_{10} 24-hour average PM_{10} annual average	10.4 μg/m³ (construction)[d] 2.5 μg/m³ (operation) 1.0 μg/m³	
$PM_{2.5}$ 24-hour average	10.4 μg/m³ (construction)[d] 2.5 μg/m³ (operation)	

Source: SCAQMD 2015.
Notes: SCAQMD = South Coast Air Quality Management District; VOC = volatile organic compounds; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TAC = toxic air contaminant; NO_2 = nitrogen dioxide; ppm = parts per million; μg/m³ = micrograms per cubic meter.
GHG emissions thresholds for industrial projects, as added in the March 2015 revision to the SCAQMD Air Quality Significance Thresholds, were not include included in Table 5 as they will be addressed within the GHG emissions analysis and not the air quality study.
[a] The phaseout of leaded gasoline started in 1976. Since gasoline no longer contains lead, the project is not anticipated to result in impacts related to lead; therefore, it is not discussed in this analysis.
[b] TACs include carcinogens and noncarcinogens.
[c] Ambient air quality standards for criteria pollutants are based on SCAQMD Rule 1303, Table A-2, unless otherwise stated.
[d] Ambient air quality threshold are based on SCAQMD Rule 403.

The evaluation of whether the project would conflict with or obstruct implementation of the applicable air quality plan (Impact AQ-1) is based on the SCAQMD CEQA Air Quality Handbook (SCAQMD 1993), Chapter 12, Sections 12.2 and 12.3. The first criterion assesses if the project would result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards of the interim emissions reductions specified in the AQMP, which is addressed in

detail under Impact AQ-2 in Section 2.5.2. The second criterion is if the project would exceed the assumptions in the AQMP or increments based on the year of project buildout and phase, as discussed further in Section 2.5.1.

To evaluate the potential for the project to violate any air quality standard or contribute substantially to an existing or projected air quality violation (Impact AQ-2), this analysis applies the SCAQMD's construction and operational criteria pollutants mass daily thresholds, as shown in Table 5. A project would result in a substantial contribution to an existing air quality violation of the NAAQS or CAAQS for O_3, which is a nonattainment pollutant, if the project's construction or operational emissions would exceed the SCAQMD VOC or NO_x thresholds shown in Table 5. These emissions-based thresholds for O_3 precursors are intended to serve as a surrogate for an "ozone significance threshold" (i.e., the potential for adverse O_3 impacts to occur). This approach is used because O_3 is not emitted directly (see the discussion of O_3 and its sources in Section 2.1.2 Pollutants and Effects), and the effects of an individual project's emissions of O_3 precursors (VOC and NO_x) on O_3 levels in ambient air cannot be determined through air quality models or other quantitative methods.

The assessment of the project's potential to expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3) includes a localized significance threshold (LST) analysis, as recommended by the SCAQMD, to evaluate the potential of localized air quality impacts to sensitive receptors in the immediate vicinity of the project. For project sites of 5 acres or less, the SCAQMD LST Methodology (2009) includes lookup tables that can be used to determine the maximum allowable daily emissions that would satisfy the localized significance criteria (i.e., the emissions would not cause an exceedance of the applicable concentration limits for NO_2, CO, PM_{10}, and $PM_{2.5}$) without performing project-specific dispersion modeling. Although the proposed development area of the site is greater than 5 acres (estimated to be 6.06 acres), the project would disturb less than 5 acres in 1 day, as discussed in detail in the following text, so it is appropriate to use the lookup tables for the LST evaluation.

The LST significance thresholds for NO_2 and CO represent the allowable increase in concentrations above background levels in the vicinity of a project that would not cause or contribute to an exceedance of the relevant ambient air quality standards, while the threshold for PM_{10} represents compliance with Rule 403 (Fugitive Dust). The LST significance threshold for $PM_{2.5}$ is intended to ensure that construction emissions do not contribute substantially to existing exceedances of the $PM_{2.5}$ ambient air quality standards. The allowable emission rates depend on the following parameters:

- Source-receptor area (SRA) in which the project is located

- Size of the project site
- Distance between the project site and the nearest sensitive receptor (e.g., residences, schools, hospitals)

The project site is located in SRA 3 (Southwest Coastal Los Angeles County). The SCAQMD provides guidance for applying California Emissions Estimator Model (CalEEMod) to the LSTs. LST pollutant screening level concentration data is currently published for 1-, 2-, and 5-acre sites for varying distances. The maximum number of acres disturbed on the peak day was estimated using the "Fact Sheet for Applying CalEEMod to Localized Significance Thresholds" (SCAQMD 2011), which provides estimated acres per 8-hour day for crawler tractors, graders, rubber tired dozers, and scrapers. Based on the SCAQMD guidance, and assuming an excavator can grade 0.5 acres per 8-hour day (similar to graders, dozers, and tractors), it was estimated that the maximum acres on the project site that would be disturbed by off-road equipment would be 1 acre per day (two excavators operating during the grading phase). Because the total disturbed acreage would be 6.06 acres over approximately 75 days, the estimate of 1 acre per day of disturbance is conservative. Because the SCAQMD does not provide lookup table values for sites less than 1 acre, the LST values for a 1 acre within SRA 3 were used.

The nearest sensitive-receptor land use (a residence) is located approximately 50 feet north of the project site, approximately 150 feet or more from actual building construction work. As such, the LST receptor distance was assumed to be 82 feet (25 meters), which is the shortest distance provided by the SCAQMD lookup tables. The LST values from the SCAQMD lookup tables for SRA 3 (Southwest Coastal Los Angeles County) for a 1-acre project site and a receptor distance of 25 meters are shown in Table 6.

Table 6
Localized Significance Thresholds for Source Receptor Area 3
(Southwest Coastal Los Angeles County)

Pollutant	Threshold (pounds per day)
NO_2	91
CO	562
PM_{10}	5
$PM_{2.5}$	3

Source: SCAQMD 2009.
Notes: NO_2 = nitrogen dioxide; CO = carbon monoxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
LST thresholds were determined based on the values for 1-acre site at a distance of 25 meters from the nearest sensitive receptor.

2.4.2 Approach and Methodology

2.4.2.1 Construction

Emissions from the construction phase of the project were estimated using CalEEMod Version 2016.3.1. Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based on information provided by the project applicant and CalEEMod default values when project specifics were not known.

For purposes of estimating project emissions, and based on information provided by the project applicant, it is assumed that construction of the project would commence in January 2018[6] and would last approximately 29 months, ending in June 2020. The analysis contained herein is based on the following assumptions (duration of phases is approximate):

- Grading: 3.5 months (January 2018–April 2018)
- Building Construction – Parking Garage: 7.5 months (May 2018–December 2018)
- Paving: 2 months (June 2018–August 2018)
- Building Construction – Residential (above podium): 18 months (December 2018–June 2020)
- Application of Architectural Coatings: 3 months (March 2020–June 2020)

Installation of utilities was assumed to occur during the grading phase. Both the parking garage and the residential development would be painted during the 3-month architectural coating phase. The residential building construction phase and the architectural coating phase end during the same month because the residential building construction phase duration includes finalization of the project construction and exterior improvements, as well as demobilization. For the analysis, it was generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week (22 days per month), during project construction.

Construction-worker estimates and vendor truck trips by construction phase were based on CalEEMod default values. Haul truck trips during the grading phase were based on project applicant-provided earthwork quantities. Grading is currently estimated to involve 91,387 cubic

[6] The analysis assumes a construction start date of January 2018, which represents the earliest date construction would initiate. Assuming the earliest start date for construction represents the worst-case scenario for criteria air pollutant and GHG emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

yards (CY) of cut and 21,633 CY of fill.[7] Of the 69,754 CY of excess cut soil, 18,232 CY would remain on site, resulting in 51,522 CY of soil for export. Based on the project applicant's construction team, a 20% shrink factor should be applied to the estimated 51,222 CY of excavated material to determine the volume that would be exported used haul trucks, which would result in export of 41,218 CY of material. Assuming a haul truck capacity of 16 CY per truck, earth-moving activities would result in approximately 2,576 round trips (5,152 one-way truck trips) during the grading phase. CalEEMod default trip length values were used for the distances for all construction-related trips.

The construction equipment mix and vehicle trips used for estimating the project-generated construction emissions are shown in Table 7.

Table 7
Construction Scenario Assumptions

Construction Phase	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Grading	8	0	5,152	Excavators	2	8
				Rubber tired loaders	1	8
Building construction – parking garage	102	40	0	Tractors/loaders/backhoes	2	8
Paving	8	2	0	Pavers	1	8
				Paving equipment	1	8
				Rollers	1	8
Building construction – residential (above podium)	182	30	0	Cranes	1	6
				Forklifts	2	8
				Welders	1	4
Architectural coating	58	2	0	—	—	—

Notes: See Appendix A for details.

2.4.2.2 Operation

Emissions from the operational phase of the project were estimated using CalEEMod Version 2016.3.1. Operational year 2020 was assumed consistent with the construction scenario.

[7] The grading quantities assessed herein represent the maximum estimated cut and fill, and maximum CY of export that would be required to prepare the site for the proposed development.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating, water heating, and stoves are calculated in the building energy use module of CalEEMod, as described in the following text. The project would not include woodstoves or fireplaces (wood or natural gas). As such, area source emissions associated with hearths were not included.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2016). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of residential and nonresidential buildings and on the default factor of pounds of VOC per building square foot per day. For parking lot land uses, CalEEMod estimates VOC emissions associated with use of parking surface degreasers based on a square footage of parking surface area and pounds of VOC per square foot per day.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers using during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of residential and nonresidential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings, and SCAQMD's Rule 1113 (Architectural Coatings) governs the VOC content for interior and exterior coatings. The model default reapplication rate of 10% of area per year is assumed. Consistent with CalEEMod defaults, it is assumed that the residential surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating. For nonresidential land uses (e.g., community and fitness rooms), it is assumed that the surface area for painting equals 2.0 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating. For the parking garage, the architectural coating area is assumed to be 6% of the total square footage, consistent with the supporting CalEEMod studies provided as an appendix to the CalEEMod User's Guide (CAPCOA 2016).

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers. The emissions associated from landscape equipment use are estimated based on CalEEMod default

values for emission factors (grams per residential dwelling unit per day and grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days. For Los Angeles County, the average annual "summer" days are estimated to 365 days; however, it is assumed that landscaping equipment would likely only operate during the week (not weekends), so operational days were assumed to be 250 days per year in CalEEMod (CAPCOA 2016). By design, the project would not include turf, and the proposed landscaped area would be minimal. Nonetheless, emissions associated with potential landscape maintenance equipment were included to conservatively capture potential project operational emission sources; however, it was assumed that all landscape equipment would be powered by electricity. Accordingly, landscape maintenance equipment emissions are only captured in the estimated project-generated GHG emissions analysis in Section 3.5, Impact Analysis, and not included in the criteria air pollutant assessment, which does not assess indirect electricity-use related emissions.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage (non-hearth). Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

CalEEMod default values for energy consumption for each land use were applied for the project analysis. The energy use from residential land uses is calculated in CalEEMod based on the Residential Appliance Saturation Study. For nonresidential buildings, CalEEMod energy intensity values (natural gas usage per square foot per year) assumptions were based on the California Commercial End-Use Survey database.

As explained in Section 3.2.2, State Regulations, Title 24 of the California Code of Regulations serves to enhance and regulate California's building standards. The most recent amendments to Title 24, Part 6, referred to as the 2016 standards, became effective on January 1, 2017. For the purposes of estimating project-generated energy emissions, a mitigation measure was applied to assume a 28% reduction from the 2013 standards (the basis for the default energy usage factors in CalEEMod) to reflect the benefits of compliance with the 2016 standards.

Mobile Sources

Mobile sources for the project would primarily be motor vehicles (automobiles and light-duty trucks) traveling to and from the project site. Motor vehicles may be fueled with gasoline,

diesel, or alternative fuels. Based on the TIS prepared for the project by KHR Associates, the proposed residential development is anticipated to generate 6.65 trips per dwelling unit (KHR Associates 2017).[8] Accordingly, the 248 dwelling units would generate approximately 1,453 trips per day. CalEEMod default data, including temperature, trip characteristics, variable start information, emissions factors, and trip distances, were conservatively used for the model inputs to estimate daily emissions from proposed vehicular sources. Project-related traffic was assumed to include a mixture of vehicles in accordance with the model outputs for traffic. Emission factors representing the vehicle mix and emissions for 2020 were used to estimate emissions associated with full buildout of the project.

The California Air Pollution Control Officers Association (CAPCOA) has developed methodologies for quantifying the GHG emission reductions associated with numerous mitigation measures (CAPCOA 2010). Several of the measures would also reduce air pollutant emissions, which are related to land use and transportation planning that would reduce vehicle trips and/or trip lengths, enhance walking and bicycles as alternative modes of transportation, enhance availability of transit, and incorporate other approaches. In regards to mobile source emission reduction features relating to land use, it was assumed that the project would involve an increase in typical density and an improvement to destination accessibility to job centers. The project's density of 10 dwelling units per acre is greater than the assumed blended average density of residential development of 7.6 dwelling units per acre (CAPCOA 2010), which results in a reduction in vehicle miles traveled. Job opportunities are located within 2 to 5 miles of the project site, and it was conservatively assumed that job centers are located within 5 miles of the project site, which is greater than the assumed average work trip length of 12 miles (CAPCOA 2010). The location of job opportunities near the project site would result in a reduction in home-to-work trip lengths for residents that work nearby. The reduction in overall commute vehicle miles traveled would result in an associated reduction in mobile source emissions.

In regards to neighborhood enhancements, it was assumed that the project would improve the pedestrian network on the project site and connecting off-site, which results in minor reductions to motor vehicle emissions. Pedestrian network improvements include providing access and links to pedestrian facilities contiguous with the project site and minimizing barriers to pedestrian access and interconnectivity, which would encourage pedestrian travel. Pedestrian network improvements would result in a minor vehicle miles traveled reduction and an associated reduction in mobile source emissions (CAPCOA 2010).

[8] The TIS used the trip rates provided in the *Institute of Transportation Engineers Trip Generation Manual, 9th Edition*, for the mid-rise apartment land use category.

2.5 Impact Analysis

2.5.1 Would the project conflict with or obstruct implementation of the applicable air quality plan?

As previously discussed, the project site is located within the SCAB under the jurisdiction of the SCAQMD, which is the local agency responsible for administration and enforcement of air quality regulations for the area. The SCAQMD has established criteria for determining consistency with the AQMP, currently the 2016 AQMP, in Chapter 12, Sections 12.2 and 12.3, in the SCAQMD CEQA Air Quality Handbook (SCAQMD 1993). The criteria are as follows (SCAQMD 1993):

- **Consistency Criterion No. 1:** The proposed project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards of the interim emissions reductions specified in the AQMP.
- **Consistency Criterion No. 2:** The proposed project will not exceed the assumptions in the AQMP or increments based on the year of project buildout and phase.

Consistency Criterion No. 1

Section 2.5.2 evaluates the project's potential impacts in regards to CEQA Guidelines Appendix G Threshold 2 (the project's potential to violate any air quality standard or contribute substantially to an existing or projected air quality violation impact analysis). As discussed in Section 2.5.2, the project would not result in a significant and unavoidable impact associated with the violation of an air quality standard. Because the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, the project would not conflict with Consistency Criterion No. 1 of the SCAQMD CEQA Air Quality Handbook.

Consistency Criterion No. 2

While striving to achieve the NAAQS for O_3 and $PM_{2.5}$ and the CAAQS for O_3, PM_{10}, and $PM_{2.5}$ through a variety of air quality control measures, the 2016 AQMP also accommodates planned growth in the SCAB. Projects are considered consistent with, and would not conflict with or obstruct implementation of, the AQMP if the growth in socioeconomic factors (e.g., population, employment) is consistent with the underlying regional plans used to develop the AQMP (per Consistency Criterion No. 2 of the SCAQMD CEQA Air Quality Handbook).

The SCAQMD primarily uses demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) developed by the SCAG for its RTP/SCS (SCAG 2016), which is based on general plans for cities and counties in the SCAB, for the development of the AQMP emissions inventory (SCAQMD 2017).[9] The SCAG 2016 RTP/SCS, and associated Regional Growth Forecast, are generally consistent with the local plans; therefore, the 2016 AQMP is generally consistent with local government plans. As discussed in Section 1.2, Regional and Local Setting, the General Plan (City of Torrance 2010) land use designation for the project development footprint is low density residential (R-LO). The project is within an area zoned as light agricultural (A-1) within the City of Torrance Property Zoning Map (City of Torrance 2015). The project would be consistent with the current General Plan land use designation. The project would not be consistent with the current zoning of the site; however, the project would preserve 18.62 acres of the 24.68-acre property as natural open space, which would not generate an increase in residential or employment population.

The SCAG 2016 RTP/SCS provides population and household estimates for the years 2012 and 2040. To provide an interim year comparison, this analysis interpolates the City's projected population and households in the project's operational year (2020) based on the average growth rate to compare with the estimated increase in population and households generated by the project. The SCAG 2016 RTP/SCS estimates that the City's population will increase approximately 9.08% between 2012 and 2040, or approximately 0.32% annually. Regarding households, SCAG 2016 RTP/SCS estimates that the City's total households will increase approximately 10.52% between 2012 and 2040, or approximately 0.38% annually.

The SCAG 2016 RTP/SCS forecasted values for 2012 and 2040 along with the interpolated 2020 values for the City's population and households is presented in Table 8.

[9] Information necessary to produce the emission inventory for the SCAB is obtained from the SCAQMD and other governmental agencies, including CARB, the California Department of Transportation (Caltrans), and SCAG. Each of these agencies is responsible for collecting data (e.g., industry growth factors, socio-economic projections, travel activity levels, emission factors, emission speciation profile, and emissions) and developing methodologies (e.g., model and demographic forecast improvements) required to generate a comprehensive emissions inventory. SCAG incorporates these data into their Travel Demand Model for estimating/projecting vehicle miles traveled (VMT) and driving speeds. SCAG's socio-economic and transportation activities projections in their 2016 RTP/SCS are integrated in the 2016 AQMP (SCAQMD 2017).

Table 8
SCAG 2016 RTP/SCS Regional Growth Forecast

Year	Population Estimate	Household Estimate
2012	146,500	56,100
2020	150,300[a]	57,786[b]
2040	159,800	62,200

Source: SCAG 2016.
Note:

[a] The population estimate for 2020 was interpolated based on the population forecast values for 2012 and 2040 provided in the SCAG 2016 RTP/SCS. For disclosure purposes, the SCAG 2012 RTP/SCS, which provided forecasted values for 2020, estimated that the City's population would be 150,800 persons in 2020. The difference between the City's 2020 population estimate provided in the SCAG 2012 RTP/SCS and the interpolated 2020 population estimated based on the SCAG 2016 RTP/SCS 2012 and 2040 population forecasts is not substantial (500 persons).

[b] The household estimate for 2020 was interpolated based on the household forecast values for 2012 and 2040 provided in the SCAG 2016 RTP/SCS. For disclosure purposes, the SCAG 2012 RTP/SCS estimated that the total households in the City would be 57,800 in 2020. The difference between the City's 2020 household estimate provided in the SCAG 2012 RTP/SCS and the interpolated 2020 household estimated based on the SCAG 2016 RTP/SCS 2012 and 2040 household forecasts is not substantial (14 units).

Pursuant to the household estimates provided in the SCAG 2016 RTP/SCS, the average household size in the City in the year 2020 is 2.61 persons per household (SCAG 2016).[10] Based on this assumption, the proposed 248 residential units would generate 647 persons when it is built out in 2020.[11] The addition of 647 persons to the 2012 population estimate of 146,500 persons would not exceed the SCAG 2016 RTP/SCS 2020 interpolated population estimate of 150,300 persons.

Based on these considerations, vehicle trip generation and planned development for the site are concluded to have been anticipated in the SCAG growth projections because the land use designation would remain the same (i.e., residential), despite the change in the zoning designation. Because the addition of project-generated residents to the City's estimated population would not exceed the SCAG 2016 RTP/SCS forecasted population, implementation of the project would not result in a conflict with, or obstruct implementation of, the applicable air quality plan (i.e., SCAQMD 2016 AQMP). Accordingly, the project would meet Consistency Criterion No. 2 of the SCAQMD CEQA Air Quality Handbook.

[10] Based on the SCAG 2016 RTP/SCS population and household estimates, the persons per household in 2012 would be 2.58 (146,500 persons ÷ 56,100 households), the persons per household in 2020 would be 2.61 (150,300 persons ÷ 57,786 households), and the persons per household in 2040 would be 2.61 (159,800 persons ÷ 62,000 households).

[11] Although the project will include employees for property management, they are anticipated to be minor and would be less than three persons. For employees living on site, they are assumed to be included in evaluation of the 300 residential units. As such, employees are not included in this analysis.

Therefore, implementation of the project would not result in a conflict with, or obstruct implementation of, the applicable air quality plan (i.e., the 2016 AQMP). Accordingly, the project would meet Consistency Criterion No. 2 of the SCAQMD CEQA Air Quality Handbook.

Summary

As described previously, the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, and would not conflict with Consistency Criterion No. 1. Implementation of the project would be not exceed the demographic growth forecasts in the SCAG 2016 RTP/SCS; therefore, the project would also be consistent with the SCAQMD 2016 AQMP, which based future emission estimates on the SCAG 2016 RTP/SCS. Thus, the project would not conflict with Consistency Criterion No. 2. Based on these considerations, impacts related to the project's potential to conflict with or obstruct implementation of the applicable air quality plan would be less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.2 Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Construction Emissions

Construction of the project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and VOC off-gassing) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and for dust, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated with a corresponding uncertainty in precise ambient air quality impacts.

As discussed in Section 2.4.2.1, Construction, criteria air pollutant emissions associated with temporary construction activity were quantified using CalEEMod. Construction emissions were calculated for the estimated worst-case day over the construction period associated with each phase and reported as the maximum daily emissions estimated during each year of construction

(2018 through 2020). Construction schedule assumptions, including phase type, duration, and sequencing, were based on information provided by the project applicant and is intended to represent a reasonable scenario based on the best information available. Default values provided in CalEEMod were used where detailed project information was not available.

Implementation of the project would generate air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, architectural coatings, and asphalt pavement application. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. The project would be required to comply with SCAQMD Rule 403 to control dust emissions generated during the grading activities. Standard construction practices that would be employed to reduce fugitive dust emissions include watering of the active sites three times per day depending on weather conditions. Internal combustion engines used by construction equipment, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce VOC emissions; however, the contractor is required to procure architectural coatings from a supplier in compliance with the requirements of SCAQMD's Rule 1113 (Architectural Coatings).

Table 9 presents the estimated maximum daily construction emissions generated during construction of the project. The values shown are the maximum summer or winter daily emissions results from CalEEMod. Details of the emission calculations are provided in Appendix A.

Table 9
Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	pounds per day					
2018	2.26	34.05	19.42	0.07	2.80	1.23
2019	2.03	12.39	14.71	0.04	2.73	1.06
2020	29.97	11.70	16.23	0.04	3.33	1.18
Maximum Daily Emissions	**29.97**	**34.05**	**19.42**	**0.07**	**3.33**	**1.23**
SCAQMD Threshold	*75*	*100*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD = South Coast Air Quality Management District.
See Appendix A for complete results.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect CalEEMod "mitigated" output, which accounts for compliance with SCAQMD Rule 403 (Fugitive Dust) and Rule 1113 (Architectural Coatings).

Maximum daily emissions of NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions would occur during the grading phase in 2018 as a result of off-road equipment operation and on-road vendor trucks and

haul trucks. The overlap of the building construction phase and the architectural coatings phases in 2020 would produce the maximum daily VOC emissions. As shown in Table 9, daily construction emissions would not exceed the SCAQMD significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during construction in all construction years. Construction-generated emissions would be temporary and would not represent a long-term source of criteria air pollutant emissions. As such, impacts would be less than significant.

Operational Emissions

The project involves development of 248 multifamily residential units, support facilities, and 546 parking spaces. Operation of the project would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources, including vehicle trips from future residents; area sources, including the use of consumer products, architectural coatings for repainting, and landscape maintenance equipment; and energy sources, including combustion of fuels used for space and water heating and cooking appliances. As discussed in Section 2.4.2.2, Operation, pollutant emissions associated with long-term operations were quantified using CalEEMod. Project-generated mobile source emissions were estimated in CalEEMod based on project-specific trip rates. CalEEMod default values were used to estimate emissions from the project area and energy sources.

Table 10 presents the maximum daily area, energy, and mobile source emissions associated with operation (year 2020) of the project. The values shown are the maximum summer or winter daily emissions results from CalEEMod. Details of the emission calculations are provided in Appendix A.

Table 10
Estimated Maximum Daily Operational Criteria Air Pollutant Emissions

Emission Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	pounds per day					
Area	6.49	0.19	15.63	0.00	0.08	0.08
Energy	0.09	0.75	0.33	0.00	0.06	0.06
Mobile	3.28	15.49	42.88	0.13	10.71	2.96
Total	**9.85**	**16.42**	**58.83**	**0.14**	**10.85**	**3.10**
SCAQMD Threshold	*75*	*100*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD = South Coast Air Quality Management District.
See Appendix A for complete results.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect CalEEMod "mitigated" output and operational year 2020.

As shown in Table 10, the combined daily area, energy, and mobile source emissions would not exceed the SCAQMD operational thresholds for VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$. Impacts associated with project-generated operational criteria air pollutant emissions would be less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.3 Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and the SCAQMD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality.

In considering cumulative impacts from the project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the SCAB is designated as nonattainment for the CAAQS and NAAQS. If a project's emissions would exceed the SCAQMD significance thresholds, it would be considered to have a cumulatively considerable contribution to nonattainment status in the SCAB. If a project does not exceed thresholds and is determined to have less-than-significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality. The basis for analyzing the project's cumulatively considerable contribution is if the project's contribution accounts for a significant proportion of the cumulative total emissions (i.e., it represents a "cumulatively considerable contribution" to the cumulative air quality impact) and consistency with the SCAQMD 2016 AQMP, which addresses the cumulative emissions in the SCAB.

As discussed in Section 2.3.1, South Coast Air Basin Attainment Designation, the SCAB has been designated as a federal nonattainment area for O_3 and $PM_{2.5}$ and a state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. The nonattainment status is the result of cumulative emissions from various sources of air pollutants and their precursors within the SCAB including motor vehicles,

off-road equipment, and commercial and industrial facilities. Construction and operation of the project would generate VOC and NO_x emissions (which are precursors to O_3) and emissions of PM_{10} and $PM_{2.5}$. However, as indicated in Tables 8 and 9, project-generated construction and operational emissions, respectively, would not exceed the SCAQMD emission-based significance thresholds for VOC, NOx, PM_{10}, or $PM_{2.5}$. As discussed in the analysis of the project's potential to conflict with or obstruct implementation of the applicable air quality plan (Section 2.5.1), the project would not conflict with the SCAQMD 2016 AQMP.

Cumulative localized impacts would potentially occur if a construction project were to occur concurrently with another off-site project. Construction schedules for potential future projects near the project site are currently unknown; therefore, potential construction impacts associated with two or more simultaneous projects would be considered speculative.[12] However, future projects would be subject to CEQA and would require air quality analysis and, where necessary, mitigation if the project would exceed SCAQMD thresholds. Criteria air pollutant emissions associated with construction activity of future projects would be reduced through implementation of control measures required by the SCAQMD. Cumulative PM_{10} and $PM_{2.5}$ emissions would be reduced because all future projects would be subject to SCAQMD Rule 403 (Fugitive Dust), which sets forth general and specific requirements for all construction sites in the SCAQMD.

Based on the previous considerations, the project would not result in a cumulatively considerable increase in emissions of nonattainment pollutants. Impacts would be less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

[12] The CEQA Guidelines state that if a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact (14 CCR 15145). This discussion is nonetheless provided in an effort to show good-faith analysis and comply with CEQA's information disclosure requirements.

2.5.4 Would the project expose sensitive receptors to substantial pollutant concentrations?

Localized Significance Thresholds Analysis

As discussed in Section 2.1.3, Sensitive Receptors, sensitive receptors are those individuals more susceptible to the effects of air pollution than the population at large. People most likely to be affected by air pollution include children, the elderly, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, childcare centers, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes (SCAQMD 1993). Residential land uses are located to the north, east, and west of the project. The closest off-site sensitive receptors to the project site include residences located approximately 50 feet north of the project site boundary.

An LST analysis has been prepared to determine potential impacts to nearby sensitive receptors during construction of the project. As indicated in the discussion of the thresholds of significance (Section 2.4), the SCAQMD also recommends the evaluation of localized NO_2, CO, PM_{10}, and $PM_{2.5}$ impacts as a result of construction activities to sensitive receptors in the immediate vicinity of the project site. The impacts were analyzed using methods consistent with those in the SCAQMD's *Final Localized Significance Threshold Methodology* (2009). According to the *Final Localized Significance Threshold Methodology*, "off-site mobile emissions from the project should not be included in the emissions compared to the LSTs" (SCAQMD 2009). Hauling of soils and construction materials associated with the project construction are not expected to cause substantial air quality impacts to sensitive receptors along off-site roadways. Emissions from the trucks would be relatively brief in nature and would cease once the trucks pass through the main streets.

Construction activities associated with the project would result in temporary sources of on-site fugitive dust and construction equipment emissions. Off-site emissions from vendor trucks, haul trucks, and worker vehicle trips are not included in the LST analysis. The maximum allowable daily emissions that would satisfy the SCAQMD localized significance criteria for SRA 3 are presented in Table 11 and compared to the maximum daily on-site construction emissions generated during the project.

Table 11
Localized Significance Thresholds Analysis for Project Construction

Maximum Onsite Emissions	NO_2	CO	PM_{10}	$PM_{2.5}$
	Pounds per Day			
Construction Emissions	11.52	8.29	0.54	0.45
SCAQMD LST	*91*	*562*	*5*	*3*
LST Exceeded?	**No**	**No**	**No**	**No**

Source: SCAQMD 2009.
Notes:
NO_2 = nitrogen dioxide; CO = carbon monoxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD = South Coast Air Quality Management District; LST = localized significance threshold.
See Appendix A for detailed results.
Localized significance thresholds are shown for 1-acre project sites corresponding to a distance to a sensitive receptor of 25 meters.
These estimates reflect control of fugitive dust required by Rule 403.
Greatest on-site NO_2 emissions is associated with the grading phase. Greatest on-site CO, PM_{10}, and $PM_{2.5}$ is associated with the overlap between the parking garage building construction phase and paving phase.

As shown in Table 11, construction activities would not generate emissions in excess of site-specific LSTs; therefore, site-specific construction impacts during construction of the project would be less than significant. In addition, diesel equipment would also be subject to the CARB air toxic control measures for in-use off-road diesel fleets, which would minimize DPM emissions.

Health Impacts of Toxic Air Contaminants

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as TACs or HAPs. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and aimed at TACs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal HAPs, and is adopting appropriate control measures for sources of these TACs. The following measures are required by state law to reduce diesel particulate emissions:

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-Use Off-road Diesel Vehicles (Title 13 California Code of Regulations, Chapter 9, Section 2449), the purpose of which is to reduce DPM and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles.
- All commercial diesel vehicles are subject to Title 13, Section 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to 5 minutes; electric auxiliary power units should be used whenever possible.

The greatest potential for TAC emissions during construction would be diesel particulate emissions from heavy equipment operations and heavy-duty trucks during construction of the project and the associated health impacts to sensitive receptors. The closest sensitive receptors are existing residences located approximately 50 feet from the project's northern boundary. As shown in Table 8, maximum daily particulate matter (PM_{10} or $PM_{2.5}$) emissions generated by construction equipment operation and from hauling of soil during grading (exhaust particulate matter, or DPM), combined with fugitive dust generated by equipment operation and vehicle travel, would be well below the SCAQMD significance thresholds. Moreover, total construction of the project would last approximately 29 months, after which project-related TAC emissions would cease.

There is an existing gasoline dispensing facility located approximately 250 feet from the northern project property line and approximately within 315 feet from the nearest residential building. The CARB Air Quality and Land Use Handbook: A Community Health Perspective (2005) recommends avoiding siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater), and a 50 foot separation is recommended for typical gas dispensing facilities. Based on aerial imagery (Google Earth 2016), the existing Chevron gasoline station has four pump islands (eight fuel pumps), which is not considered to be a large gasoline dispensing facility. As such, project sensitive receptors (i.e., future residents) would not be located within the recommended siting distance of 50 feet for a typical gas station.

No residual TAC emissions and corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the project. Thus, the project would not result in a long-term (i.e., 9-year, 30-year, or 70-year) source of TAC emissions. Therefore, the exposure of project-related TAC emission impacts to sensitive receptors would be less than significant.

Health Impacts of Carbon Monoxide

Mobile source impacts occur on two scales of motion. Regionally, project-related travel would add to regional trip generation and increase the vehicle miles traveled within the local airshed and the SCAB. Locally, project generated traffic would be added to the City's roadway system near the project site. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SCAB is steadily decreasing.

Projects contributing to adverse traffic impacts may result in the formation of CO hotspots. To verify that the project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO hotspots was conducted. The TIS (KHR Associates 2017) evaluated whether there would be a decrease in the level of service (LOS) (i.e., increased congestion) at the intersections affected by the project. The potential for CO hotspots was evaluated based on the results of the TIS. The California Department of Transportation Institute of Transportation Studies *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol; 1997) was followed. For projects located within an area designated as attainment or unclassified under the CAAQS or NAAQS, the CO Protocol identifies screening criteria for consideration. The first screening criteria focuses on projects that are likely to worsen air quality, which would occur if: a) the project significantly increases the percentage of vehicles operating in cold start mode (greater than 2%), b) the project significantly increases traffic volumes (greater than 5%), and/or c) the project worsens traffic flow. In addition to consideration of whether the project would worsen air quality, CO hotspots are typically evaluated when (1) the LOS of an intersection or roadway decreases to LOS E or worse; (2) signalization and/or channelization is added to an intersection; and (3) sensitive receptors such as residences, schools, and hospitals are located in the vicinity of the affected intersection or roadway segment.

The project's TIS evaluated 11 intersections. As determined by the TIS using the Intersection Capacity Utilization method, all intersections under the existing (2017) and existing plus ambient conditions (2019)[13] operate at acceptable LOS (LOS D or better) during the AM peak hour, and one intersection (Crenshaw Boulevard and Pacific Coast Highway) operates at LOS E in the PM peak hour. Using the Highway Capacity Manual method, the intersection of Crenshaw Boulevard and Pacific Coast Highway is estimated to operate at LOS F during the existing conditions (2017) and existing plus ambient conditions (2019) PM peak hours.

Under cumulative conditions (2019) using the Intersection Capacity Utilization method, the intersection of Crenshaw Boulevard and Pacific Coast Highway would operate at LOS E in the AM peak hour and LOS F in the PM peak hour; all other intersections would operate at an acceptable LOS in the AM and PM peak hours under the cumulative scenario. The change in intersection capacity utilization at the Crenshaw Boulevard and Pacific Coast Highway intersection from the Existing + Ambient scenario to the Ambient + Project scenario is estimated to be 0.002 in the AM peak hour and 0.001 in the PM peak hour, representing a nominal decrease in capacity utilization as a result of the project.

[13] The TIS (KHR Associates 2017) assumed 2019 as the buildout year; however, 2020 was assumed for operational emissions modeling because project construction would not be completed until 2020.

Based on the Highway Capacity Manual method, the intersection of Crenshaw Boulevard and Pacific Coast Highway would operate at LOS E in the AM peak hour and LOS F in the PM peak hour and the intersection of Crenshaw Boulevard and Rolling Hills Road would operate at LOS E in the AM peak hour. All other intersections would operate at an acceptable LOS in the AM and PM peak hours under the cumulative scenario. Under the Highway Capacity Manual method, the change in delay[14] at the Crenshaw Boulevard and Pacific Coast Highway intersection from the Existing + Ambient scenario to the Ambient + Project scenario is estimated to be 0.70 seconds in the AM peak hour and 1.00 second in the PM peak hour, representing a nominal increase in delay as a result of the project.

In the target year of 2019, with the addition of project traffic, the LOS at each of the study intersections during both the AM and PM peak hours of traffic increased slightly with no changes to the LOS designations. In addition, as explained in the TIS, capital improvements are slated for the intersections of Hawthorne Boulevard and Pacific Coast Highway and Vista Montana and Pacific Coast Highway that will reduce traffic congestion for each location. These improvements are planned to occur in 2018.

Based on the previous considerations, the project would not negatively affect the LOS of intersections in the project vicinity and would not significantly contribute to a CO hotspot. As such, potential project-generated impacts associated with CO hotspots would be less than significant.

Health Impacts of Other Criteria Air Pollutants

Construction and operation of the project would result in emissions that would not exceed the SCAQMD thresholds for any criteria air pollutants including VOC, NO_x, CO, SO_x, $PM_{10,}$ or $PM_{2.5}$. VOCs would be associated with motor vehicles, construction equipment, and architectural coatings; however, project-generated VOC emissions would not result in the exceedances of the SCAQMD thresholds as shown in Table 8. Generally, the VOCs in architectural coatings are of relatively low toxicity. Additionally, SCAQMD Rule 1113 restricts the VOC content of coatings for both construction and operational applications.

VOCs and NO_x are precursors to O_3, for which the SCAB is designated as nonattainment with respect to the NAAQS and CAAQS. The health effects associated with O_3 are generally associated with reduced lung function. The contribution of VOCs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the SCAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating

[14] Delay reflects the worst-case direction average intersection delay per vehicle (KHR Associates 2017).

excessive O_3 concentrations would also depend on the time of year that the VOC emissions would occur because exceedances of the O_3 AAQS tend to occur between April and October when solar radiation is highest. The holistic effect of a single project's emissions of O_3 precursors is speculative due to the lack of quantitative methods to assess this impact. Nonetheless, the VOC and NO_x emissions associated with project construction and operation could minimally contribute to regional O_3 concentrations and the associated health impacts. Because of to the minimal contribution during construction and operation, health impacts would be considered less than significant.

Construction and operation of the project would also not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or would obstruct the SCAB from coming into attainment for these pollutants. The project would also not result in substantial DPM emissions during construction and operation, and therefore, would not result in significant health effects related to DPM exposure. Additionally, the project would be required to comply with SCAQMD Rule 403, which limits the amount of fugitive dust generated during construction. Due to the minimal contribution of particulate matter during construction and operation, health impacts would be considered less than significant.

Construction and operation of the project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. Health impacts that result from NO_2 and NO_x include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, project construction would be relatively short term, and off-road construction equipment would be operating at various portions of the site and would not be concentrated in one portion of the site at any one time. In addition, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards. Construction and operation of the project would not require use of any stationary sources (e.g., diesel generators, boilers) that would create substantial, localized NO_x impacts. Therefore, potential health impacts associated with NO_2 and NO_x would be considered less than significant.

CO tends to be a localized impact associated with congested intersections. The associated potential for CO hotspots were discussed previously and are determined to be a less-than-significant impact. Thus, the project's CO emissions would not contribute to significant health effects associated with this pollutant. In summary, construction and operation of the project would not result in exceedances of the SCAQMD significance thresholds for criteria pollutants and potential health impacts associated with criteria air pollutants would be less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

2.5.5 Would the project create objectionable odors affecting a substantial number of people?

The occurrence and severity of potential odor impacts depends on numerous factors. The nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints.

Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the project. Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be less than significant.

Land uses and industrial operations associated with odor complaints include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding (SCAQMD 1993). The project entails operation of a residential development and would not result in the creation of a land use that is commonly associated with odors. Therefore, project operations would result in an odor impact that is less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

3 GREENHOUSE GAS EMISSIONS

3.1 Environmental Setting

3.1.1 Climate Change Overview

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017a).

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth, the Earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on the Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-twentieth century and is the most significant driver of observed climate change (IPCC 2013; EPA 2017a). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Section 3.3.2, Potential Effects of Climate Change.

3.1.2 Greenhouse Gases

A greenhouse gas (GHG) is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code section 38505(g) for purposes of administering many of the State's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). (See also CEQA Guidelines section 15364.5.)[15] Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as HFCs, PFCs, and SF_6, which are associated with certain industrial products and processes. The following paragraphs provide a summary of the most common GHGs and their sources.[16]

Carbon Dioxide. CO_2 is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 are from the combustion of fuels such as coal, oil, natural gas, and wood and changes in land use.

Methane. CH_4 is produced through both natural and human activities. CH_4 is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N_2O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N_2O. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N_2O as a propellant (such as in rockets, racecars, and aerosol sprays).

[15] Climate forcing substances include GHGs and other substances such as black carbon and aerosols. This discussion focuses on the seven GHGs identified in the California Health and Safety Code 38505 as impacts associated with other climate forcing substances are not evaluated herein.

[16] The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (1995), IPCC Fourth Assessment Report (2007), CARB's "Glossary of Terms Used in GHG Inventories" (2015a), and EPA's "Glossary of Climate Change Terms" (2016f).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are synthetic powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric ozone-depleting substances (e.g., CFCs, HCFCs, and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the ozone depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF_6 is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF_6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** NF_3 is used in the manufacture of a variety of electronics, including semiconductors and flat panel displays.

3.1.3 Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2016g). The Intergovernmental Panel on Climate Change (IPCC) developed the global warming potential (GWP) concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons of CO_2 equivalent (MT CO_2E).

The current version of CalEEMod (version 2016.3.1) assumes that the GWP for CH_4 is 25 (so emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and the GWP for N_2O is 298,

based on the IPCC Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the project.

3.2 Regulatory Setting

3.2.1 Federal Regulations

Massachusetts v. EPA. In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- The Administrator found that elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is the "endangerment finding."
- The Administrator further found the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions (EPA 2007):

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020, and directs National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy-

efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling discussed above, the Bush Administration issued Executive Order 13432 in 2007 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011, and in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Barack Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO_2 in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021, and NHTSA intends to set standards for model years 2022–2025 in a future rulemaking. On January 12, 2017, the EPA finalized its decision to maintain the current greenhouse (GHG) emissions standards for model years 2022–2025 cars and light trucks (EPA 2017b).

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

Executive Office Climate Action Plan. In June 2013, President Obama issued a national Climate Action Plan (Plan) that consisted of a wide variety of executive actions and had three pillars: (1) cut carbon in America, (2) prepare the U.S. for impacts of climate change, and (3) lead international efforts to combat global climate change and prepare for its impacts (EOP 2013). The Plan outlines 75 goals within the three main pillars. The Center for Climate and Energy Solutions' one-year review of progress in implementation of the Plan (C2ES 2014) found that the administration made at least some progress on most of the Plan's 75 goals, and many of the specific tasks outlined had been completed. Notable areas of progress included steps to limit carbon pollution from power plants; improve energy efficiency; reduce CH_4 and HFC emissions; help communities and industry become more resilient to climate change impacts; and end U.S. lending for coal-fired power plants overseas.

U.N. Framework Convention on Climate Change Pledge. On March 31, 2015, the State Department submitted the U.S. target to cut net GHG emissions to the United Nations Framework Convention on Climate Change. The submission, referred to as an Intended Nationally Determined Contribution, is a formal statement of the U.S. target, announced in China last year, to reduce our emissions by 26%–28% below 2005 levels by 2025, and to make best efforts to reduce by 28% (C2ES 2016). The target reflects a planning process that examined opportunities under existing regulatory authorities to reduce emissions in 2025 of all GHGs from all sources in every economic sector. Several U.S. laws, as well as existing and proposed regulations thereunder, are relevant to the implementation of the U.S. target, including the Clean Air Act (42 U.S.C. 7401 et seq.), the Energy Policy Act (42 U.S.C. 13201 et seq.), and the Energy Independence and Security Act (42 U.S.C. 17001 et seq.).

Clean Power Plan and New Source Performance Standards for Electric Generating Units. On October 23, 2015, EPA published a final rule (effective December 22, 2015) establishing the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO_2 emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel-fired electric utility steam-generating units, and (2) stationary combustion turbines. Concurrently, the EPA published a final rule (effective October 23, 2015) establishing Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (80 FR 64661–65120). The rule prescribes CO_2 emission standards for newly constructed, modified, and reconstructed affected fossil-fuel-fired electric utility generating units. The U.S. Supreme Court stayed implementation of the Clean Power Plan pending resolution of several lawsuits.

3.2.2 State Regulations

The statewide GHG emissions regulatory framework is summarized below by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, solid waste, water, and other state regulations and goals. The following text describes executive orders (EO), assembly bills (AB), senate bills (SB), and other regulations and plans that would directly or indirectly reduce GHG emissions.

State Climate Change Targets

The state has taken a number of actions to address climate change. These include executive orders, legislation, and CARB plans and requirements. These are summarized below.

EO S-3-05. EO S-3-05 (June 2005) established California's GHG emissions reduction targets and laid out responsibilities among the state agencies for implementing the EO and for reporting on progress toward the targets. This EO established the following targets:

- 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

EO S-3-05 also directed the California Environmental Protection Agency to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The Climate Action Team was formed, which subsequently issued reports from 2006 to 2010 (CAT 2016).

AB 32. In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32 (Núñez and Pavley). The bill is referred to as the California Global Warming Solutions Act of 2006 (September 27, 2006). AB 32 provided initial direction on creating a comprehensive multiyear program to limit California's GHG emissions at 1990 levels by 2020 and initiate the transformations required to achieve the state's long-range climate objectives.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the

Legislature to the Board as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and, requires CARB to identify specific information for GHG emissions reduction measures when updating the scoping plan.

CARB's 2007 Statewide Limit. In 2007, in accordance with California Health and Safety Code, Section 38550, CARB approved a statewide limit on the GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT CO_2E).

CARB's Climate Change Scoping Plan. One specific requirement of AB 32 is for CARB to prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (Health and Safety Code, Section 38561(a)), and to update the plan at least once every 5 years. In 2008, CARB approved the first scoping plan. The *Climate Change Scoping Plan: A Framework for Change* (*Scoping Plan*) included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state's long-range climate objectives. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
2. Achieving a statewide renewable energy mix of 33%
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS 17 Cal. Code Regs., Section 95480 et seq.)
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation

The Scoping Plan also identified local governments as essential partners in achieving California's goals to reduce GHG emissions because they have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG

emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Specifically, the Scoping Plan encouraged local governments to adopt a reduction goal for municipal operations and for community emissions to reduce GHGs by approximately 15% from then levels (2008) by 2020. Many local governments developed community-scale local GHG reduction plans based on this Scoping Plan recommendation.

In 2014, CARB approved the first update to the Scoping Plan. The *First Update to the Climate Change Scoping Plan: Building on the Framework* (*First Update)* defined the state's GHG emission reduction priorities for the next 5 years and laid the groundwork to start the transition to the post-2020 goals set forth in Executive Orders S-3-05 and B-16-2012. The *First Update* concluded that California is on track to meet the 2020 target but recommended a 2030 mid-term GHG reduction target be established to ensure a continuum of action to reduce emissions. The *First Update* recommended a mix of technologies in key economic sectors to reduce emissions through 2050 including: energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings and industrial machinery; decarbonizing electricity and fuel supplies; and, the rapid market penetration of efficient and clean energy technologies. As part of the *First Update*, CARB recalculated the state's 1990 emissions level, using more recent global warming potentials identified by the Intergovernmental Panel on Climate Change, from 427 MMT CO2e to 431 MMT CO_2E (CARB 2016a).

In 2015, as directed by EO B-30-15, CARB began working on an update to the Scoping Plan to incorporate the 2030 target of 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. The Governor called on California to pursue a new and ambitious set of strategies, in line with the five climate change pillars from his inaugural address, to reduce GHG emissions and prepare for the unavoidable impacts of climate change. In the summer of 2016, the Legislature affirmed the importance of addressing climate change through passage of Senate Bill 32 (SB 32) (Pavley, Chapter 249, Statutes of 2016).

In January 2017, CARB released the *2017 Climate Change Scoping Plan Update (2030 Scoping Plan)* for public review and comment (CARB 2017a). The 2030 Scoping Plan builds on the successful framework established in the initial Scoping Plan and First Update, while identifying new, technologically feasible and cost-effective strategies that will serve as the framework to achieve the 2030 GHG target and define the state's climate change priorities to 2030 and beyond. The strategies' "known commitments" include implementing renewable energy and energy efficiency (including the mandates of SB 350), increased stringency of the Low Carbon Fuel Standard, measures identified in the Mobile Source and Freight Strategies, measures identified in the proposed Short-Lived Climate Pollutant Plan, and increased stringency of SB 375 targets. To

fill the gap in additional reductions needed to achieve the 2030 target, it recommends continuing the Cap-and-Trade Program and a measure to reduce GHGs from refineries by 20%.

For local governments, the 2030 Scoping Plan replaced the initial Scoping Plan's 15% reduction goal with a recommendation to aim for a community-wide goal of no more than 6 MT CO_2E per capita by 2030 and no more than 2 MT CO_2E per capita by 2050, which are consistent with the state's long-term goals. These goals are also consistent with the Under 2 MOU (Under 2 2016) and the Paris Agreement (UNFCCC 2016), which are developed around the scientifically based levels necessary to limit global warming below two degrees Celsius. The 2030 Scoping Plan recognized the benefits of local government GHG planning (e.g., through climate action plans (CAPs)) and provide more information regarding tools CARB is working on to support those efforts. It also recognizes the CEQA streamlining provisions for project level review where there is a legally adequate CAP.[17] It is expected that CARB will consider the 2030 Scoping Plan for approval in the spring or summer 2017.

The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32, SB32 and the Executive Orders and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. A project is considered consistent with the statutes and Executive Orders if it meets the general policies in reducing GHG emissions in order to facilitate the achievement of the state's goals and does not impede attainment of those goals. As discussed in several cases, a given project need not be in perfect conformity with each and every planning policy or goals to be consistent. A project would be consistent, if it will further the objectives and not obstruct their attainment.

CARB's Regulations for the Mandatory Reporting of Greenhouse Gas Emissions. CARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (17 CCR 95100–95157) incorporated by reference certain requirements that EPA promulgated in its Final Rule on Mandatory Reporting of Greenhouse Gases (Title 40, Code of Federal Regulations (CFR), Part 98). Specifically, Section 95100(c) of the Mandatory Reporting Regulation incorporated those requirements that EPA promulgated in the Federal Register on October 30, 2009, July 12, 2010, September 22, 2010, October 28, 2010, November 30, 2010, December 17, 2010, and April 25, 2011. In general, entities subject to the Mandatory Reporting Regulation that emit over 10,000 MT CO_2E per year are required to report annual GHGs through the California Electronic GHG Reporting Tool. Certain sectors, such as refineries and cement plants, are required to report

[17] *Sierra Club v. County of Napa* (2004) 121 Cal.App.4th 1490; *San Francisco Tomorrow et al. v. City and County of San Francisco* (2015) 229 Cal.App.4th 498; *San Franciscans Upholding the Downtown Specific Plan v. City & County of San Francisco* (2002) 102 Cal.App.4th 656; *Sequoyah Hills Homeowners Assn. V. City of Oakland* (1993) 23 Cal.App.4th 704, 719.

regardless of emission levels. Entities that emit more than the 25,000 MT CO_2E per year threshold are required to have their GHG emission report verified by an CARB-accredited third-party verified.

EO B-18-12. EO B-18-12 (April 2012) directed state agencies, departments, and other entities under the governor's executive authority to take action to reduce entity-wide GHG emissions by at least 10% by 2015 and 20% by 2020, as measured against a 2010 baseline. EO B-18-12 also established goals for existing state buildings for reducing grid-based energy purchases and water use.

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. To facilitate achieving this goal, EO B-30-15 called for CARB to update the Scoping Plan to express the 2030 target in terms of MMT CO_2E. The EO also called for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets.

CARB's Short-Lived Climate Pollutant Reduction Strategy — SB 605 and SB 1383. SB 605 (September 2014) required CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state no later than January 1, 2016. As defined in the statute, short-lived climate pollutant means "an agent that has a relatively short lifetime in the atmosphere, from a few days to a few decades, and a warming influence on the climate that is more potent than that of carbon dioxide" (SB 605). SB 605, however, did not prescribe specific compounds as short-lived climate pollutants or add to the list of GHGs regulated under AB 32. In developing the strategy, CARB must complete an inventory of sources and emissions of short-lived climate pollutants in the state based on available data, identify research needs to address any data gaps, identify existing and potential new control measures to reduce emissions, and prioritize the development of new measures for short-lived climate pollutants that offer co-benefits by improving water quality or reducing other criteria air pollutants that impact community health and benefit disadvantaged communities. CARB released the *Proposed Short-Lived Climate Pollution Reduction Strategy* (SLCP Strategy) in April 2016 for public review and comment. The SLCP Strategy focused on methane, black carbon, and fluorinated gases, particularly HFCs, as important short-lived climate pollutants.

Governor Brown signed SB 1383 (Lara) in September 2016. This bill requires CARB to approve and implement a strategy to decrease emissions of short-lived climate pollutants to achieve a reduction in methane by 40%, hydrofluorocarbon by 40%, and anthropogenic black carbon by 50% below 2013 levels by 2030. In response to SB 1383, CARB revised the SLCP Strategy and

released the *Revised Proposed Short-Lived Climate Pollution Reduction Strategy* (Revised SLCP Strategy) for public comment from November 28, 2016 to January 17, 2017. CARB is scheduled to consider approving the SLCP Strategy at its public hearing in March 2017.

Building Energy

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code, Section 25402(b)(1)). The regulations receive input from members of industry, as well as the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (California Public Resources Code, Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code, Section 25402(d)) and cost effectiveness (California Public Resources Code, Sections 25402(b)(2) and (b)(3)). As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The current Title 24 standards are the 2016 Title 24 building energy efficiency standards, which became effective January 1, 2017. The updated standards will further reduce energy used and associated GHG emissions compared to previous standards, such as the 2013 Title 24 standards. In general, single-family homes built to the 2016 standards are anticipated to use about 28% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards, and nonresidential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015).

Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CALGreen, and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings and schools and hospitals. The CALGreen 2016

standards became effective January 1, 2017. The mandatory standards require the following (24 CCR Part 11):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance
- 65% of construction and demolition waste must be diverted from landfills
- Mandatory inspections of energy systems to ensure optimal working efficiency
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations
- Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements; stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 80% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs.

The California Public Utilities Commission, CEC, and CARB also have a shared, established goal of achieving zero net energy (ZNE) performance for new construction in California. The key policy timelines include: (1) all new residential construction in California will be ZNE by 2020, and (2) all new commercial construction in California will be ZNE by 2030.[18]

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. The CEC certifies an appliance based on a manufacturer's demonstration that the appliance meets the standards. New appliances regulated under Title 20 include: refrigerators, refrigerator-freezers and freezers; room air

[18] See, e.g., CPUC, California's Zero Net Energy Policies and Initiatives, Sept. 18, 2013, accessed at http://annualmeeting.naseo.org/Data/Sites/2/presentations/Fogel-Getting-to-ZNE-CA-Experience.pdf. It is expected that achievement of the zero net energy goal will occur via revisions to the Title 24 standards.

conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing each type of appliance covered under the regulations and appliances must meet the standards for energy performance, energy design, water performance and water design. Title 20 contains three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

Senate Bill 1. SB 1 (Murray) (August 2006) established a $3 billion rebate program to support the goal of the state to install rooftop solar energy systems with a generation capacity of 3,000 megawatts through 2016. SB 1 added sections to the Public Resources Code, including Chapter 8.8 (California Solar Initiative), that require building projects applying for ratepayer-funded incentives for photovoltaic systems to meet minimum energy efficiency levels and performance requirements. Section 25780 established that it is a goal of the state to establish a self-sufficient solar industry. The goals included establishing solar energy systems as a viable mainstream option for both homes and businesses within 10 years of adoption, and placing solar energy systems on 50% of new homes within 13 years of adoption. SB 1, also termed "Go Solar California," was previously titled "Million Solar Roofs."

California AB 1470 (Solar Water Heating). This bill established the Solar Water Heating and Efficiency Act of 2007. The bill makes findings and declarations of the Legislature relating to the promotion of solar water heating systems and other technologies that reduce natural gas demand. The bill defines several terms for purposes of the act. The bill requires the commission to evaluate the data available from a specified pilot program, and, if it makes a specified determination, to design and implement a program of incentives for the installation of 200,000 solar water heating systems in homes and businesses throughout the state by 2017.

Renewable Energy and Energy Procurement

SB 1078. SB 1078 (Sher) (September 2002) established the Renewable Portfolio Standard (RPS) program, which required an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010 (see SB 107, EO S-14-08, and S-21-09).

SB 1368. SB 1368 (September 2006), required the CEC to develop and adopt regulations for GHG emission performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the California Public Utilities Commission (CPUC).

AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general-purpose lighting, to reduce electricity consumption 50% for indoor residential lighting and 25% for indoor commercial lighting.

EO S-14-08. EO S-14-08 (November 2008) focused on the contribution of renewable energy sources to meet the electrical needs of California while reducing the GHG emissions from the electrical sector. This EO required that all retail suppliers of electricity in California serve 33% of their load with renewable energy by 2020. Furthermore, the EO directed state agencies to take appropriate actions to facilitate reaching this target. The CNRA, through collaboration with the CEC and California Department of Fish and Wildlife (formerly the California Department of Fish and Game), was directed to lead this effort.

EO S-21-09 and SBX1-2. EO S-21-09 (September 2009) directed CARB to adopt a regulation consistent with the goal of EO S-14-08 by July 31, 2010. CARB was further directed to work with the CPUC and CEC to ensure that the regulation builds upon the RPS program and was applicable to investor-owned utilities, publicly owned utilities, direct access providers, and community choice providers. Under this order, CARB was to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health and can be developed the most quickly in support of reliable, efficient, cost-effective electricity system operations. On September 23, 2010, CARB initially approved regulations to implement a Renewable Electricity Standard. However, this regulation was not finalized because of subsequent legislation (SB X1-2, Simitian, statutes of 2011) signed by Governor Brown in April 2011.

SB X1 2 expanded the Renewables Portfolio Standard by establishing a renewable energy target of 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation (30 megawatts or less), digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location.

SB X1-2 applies to all electricity retailers in the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must meet the renewable energy goals listed above.

SB 350. SB 350 (October 2015) further expanded the RPS by establishing a goal of 50% of the total electricity sold to retail customers in California per year by December 31, 2030. In addition, SB 350 included the goal to double the energy efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

Mobile Sources

AB 1493. AB 1493 (Pavley) (July 2002) was enacted in a response to the transportation sector accounting for more than half of California's CO_2 emissions. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards will result in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of about 30%.

Heavy Duty Diesel. CARB adopted the final Heavy Duty Truck and Bus Regulation, Title 13, Division 3, Chapter 1, Section 2025, on December 31, 2014 to reduce PM and NO_x emissions from heavy-duty diesel vehicles. The rule requires PM filters be applied to newer heavier trucks and buses by January 1, 2012, with older vehicles required to comply by January 1, 2015. The rule will require nearly all diesel trucks and buses to be compliant with the 2010 model year engine requirement by January 1, 2023. CARB also adopted an Airborne Toxic Control Measure to limit idling of diesel-fueled commercial vehicles on December 12, 2013. This rule requires diesel-fueled vehicles with gross vehicle weights greater than 10,000 pounds to idle no more than 5 minutes at any location (13 CCR 2485).

EO S-1-07. EO S-1-07 (January 2007, implementing regulation adopted in April 2009) sets a declining LCFS for GHG emissions measured in CO_2E grams per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020 (17 CCR 95480 et seq.). The carbon intensity measures the

amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered.

SB 375. SB 375 (Steinberg) (September 2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035 and to update those targets every 8 years. SB 375 requires the state's 18 regional metropolitan planning organizations (MPOs) to prepare a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plan (RTP) that will achieve the GHG reduction targets set by CARB. If a MPO is unable to devise an SCS to achieve the GHG reduction target, the MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to Government Code, Section 65080(b)(2)(K), a SCS does not: (i) regulate the use of land; (ii) supersede the land use authority of cities and counties; or (iii) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In September 2010, CARB adopted the first SB 375 targets for the regional metropolitan planning organizations. The targets for the Southern California Association of Governments (SCAG) are an 8% reduction in emissions per capita by 2020 and a 13% reduction by 2035. Achieving these goals through adoption of a SCS is the responsibility of the metropolitan planning organizations. SCAG adopted its first RTP/SCS in April 2012. The plan quantified a 9% reduction by 2020 and a 16% reduction by 2035 (SCAG 2013). In June 2012, CARB accepted SCAG's quantification of GHG reductions and its determination the SCS, if implemented, would achieve SCAG targets. On April 4, 2016, the SCAG Regional Council adopted the 2016 RTP/SCS, which builds upon the progress made in the 2012 RTP/SCS. The updated RTP/SCS quantified an 8% reduction by 2020 and an 18% reduction by 2030 (SCAG 2016). In June 2016, CARB accepted SCAG's quantification of GHG reductions and its determination the SCS, if implemented, would achieve SCAG targets

Advanced Clean Cars Program and Zero-Emissions Vehicle Program. The Advanced Clean Cars program (January 2012) is a new emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean

cars (CARB 2011). To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that in 2025 cars will emit 75% less smog-forming pollution than the average new car sold today. To reduce GHG emissions, CARB, in conjunction with the EPA and the NHTSA, adopted new GHG standards for model year 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% in 2025. The ZEV program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in the 2018 to 2025 model years.

EO B-16-12. EO B-16-12 (March 2012) required that state entities under the governor's direction and control support and facilitate the rapid commercialization of ZEVs. It ordered CARB, CEC, CPUC, and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to help achieve benchmark goals by 2015, 2020, and 2025. On a statewide basis, EO B-16-12 established a target reduction of GHG emissions from the transportation sector equaling 80% less than 1990 levels by 2050. This directive did not apply to vehicles that have special performance requirements necessary for the protection of the public safety and welfare.

AB 1236. AB 1236 (October 2015) (Chiu) required a city, county, or city and county to approve an application for the installation of electric vehicle charging stations, as defined, through the issuance of specified permits unless the city or county makes specified written findings based upon substantial evidence in the record that the proposed installation would have a specific, adverse impact upon the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The bill provided for appeal of that decision to the planning commission, as specified. The bill provided that the implementation of consistent statewide standards to achieve the timely and cost-effective installation of electric vehicle charging stations is a matter of statewide concern. The bill required electric vehicle charging stations to meet specified standards. The bill required a city, county, or city and county with a population of 200,000 or more residents to adopt an ordinance, by September 30, 2016, that created an expedited and streamlined permitting process for electric vehicle charging stations, as specified. The bill also required a city, county, or city and county with a population of less than 200,000 residents to adopt this ordinance by September 30, 2017.

Water

EO B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives have become permanent water-efficiency standards and requirements. The EO

includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources has modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development projects with smaller landscape areas.

Solid Waste

AB 939 and AB 341. In 1989, AB 939, known as the Integrated Waste Management Act (California Public Resources Code, Sections 40000 et seq.), was passed because of the increase in waste stream and the decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by the year 2000.

AB 341 (Chapter 476, Statutes of 2011 (Chesbro)) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by the year 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state's policy goal. CalRecycle conducted several general stakeholder workshops and several focused workshops and in August 2015 published a discussion document titled AB 341 Report to the Legislature, which identifies five priority strategies that CalRecycle believes would assist the state in reaching the 75% goal by 2020, legislative and regulatory recommendations and an evaluation of program effectiveness (CalRecycle 2012).

Other State Actions

Senate Bill 97. SB 97 (Dutton) (August 2007) directed the Governor's Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The CNRA adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4(a)). The Guidelines require a lead agency to consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)). The Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures. The adopted amendments do not establish a GHG emission threshold, instead allowing a Lead Agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The CNRA also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions (CNRA 2009a).

With respect to GHG emissions, the CEQA Guidelines state in Section 15064.4(a) that lead agencies should "make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions. The CEQA Guidelines note that an agency may identify emissions by either selecting a "model or methodology" to quantify the emissions or by relying on "qualitative analysis or other performance based standards" (14 CCR 15064.4(a)). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: (1) the extent a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

EO S-13-08. EO S-13-08 (November 2008) was intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. It directed state agencies to take specified actions to assess and plan for such impacts. It directed the CNRA, in cooperation with the California Department of Water Resources, CEC, California's coastal management agencies, and the Ocean Protection Council, to request that the National Academy of Sciences prepare a Sea Level Rise Assessment Report by December 1, 2010. The Ocean Protection Council, California Department of Water Resources, and CEC, in cooperation with other state agencies, were required to conduct a public workshop to gather information relevant to the Sea Level Rise Assessment Report. The Business, Transportation, and Housing Agency was ordered to assess within 90 days of issuance of the EO the vulnerability of the state's transportation systems to sea-level rise. The Governor's Office of Planning and Research and the CNRA are required to

provide land use planning guidance related to sea-level rise and other climate change impacts. The EO also required the other state agencies to develop adaptation strategies by June 9, 2009, to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. A discussion draft adaptation strategies report was released in August 2009, and the final *2009 California Climate Adaptation Strategy* report was issued in December 2009 (CNRA 2009b). An update to the 2009 report, *Safeguarding California: Reducing Climate Risk*, was issued in July 2014 (CNRA 2014). To assess the state's vulnerability, the report summarized key climate change impacts to the state for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and Water.

2015 State of the State Address. In January 2015, Governor Brown in his inaugural address and annual report to the Legislature established supplementary goals, which would further reduce GHG emissions over the next 15 years. These goals include an increase in California's renewable energy portfolio from 33% to 50%, a reduction in vehicle petroleum use for cars and trucks by up to 50%, measures to double the efficiency of existing buildings, and decreasing emissions associated with heating fuels.

2016 State of the State Address. In his January 2016 address, Governor Brown established a statewide goal to bring per capita GHG emission down to two tons per person, which reflects the goal of the Global Climate Leadership Memorandum of Understanding (Under 2 MOU) to limit global warming to less than two degrees Celsius by 2050. The Under 2 MOU agreement pursues emission reductions of 80% to 95% below 1990 levels by 2050 and/or reaching a per capita annual emissions goal of less than 2 metric tons by 2050. A total of 135 jurisdictions representing 32 countries and 6 continents, including California, have signed or endorsed the Under 2 MOU (Under 2 2016).

3.2.3 Local Regulations

3.2.3.1 South Coast Air Quality Management District

Air districts typically act in an advisory capacity to local governments in establishing the framework for environmental review of air pollution impacts under CEQA. This may include recommendations regarding significance thresholds, analytical tools to estimate emissions and assess impacts, and mitigations for potentially significant impacts. Although air districts will also address some of these issues on a project-specific basis as responsible agencies, they may provide general guidance to local governments on these issues (SCAQMD 2008). As discussed in Section 3.4.1.3, Proposed South Coast Air Quality Management District Thresholds, the SCAQMD has recommended numeric CEQA significance thresholds for GHG emissions for

lead agencies to use in assessing GHG impacts of residential and commercial development projects; however, these thresholds were not adopted. See Section 2.2.3.1, South Coast Air Quality Management District, for additional discussion on the SCAQMD.

3.2.3.2 Southern California Association of Governments

SB 375 requires metropolitan planning organizations to prepare an SCS in their RTP. The SCAG Regional Council adopted the 2012 RTP/SCS in April 2012 (SCAG 2012), and the 2016–2040 RTP/SCS (2016 RTP/SCS) was adopted in April 2016. Both the 2012 and 2016 RTP/SCSs establish a development pattern for the region that, when integrated with the transportation network and other policies and measures, would reduce GHG emissions from transportation (excluding goods movement). Specifically, the 2012 RTP/SCS links the goals of sustaining mobility with the goals of fostering economic development; enhancing the environment; reducing energy consumption; promoting transportation-friendly development patterns; and encouraging all residents affected by socioeconomic, geographic, and commercial limitations to be provided with fair access. The 2012 and 2016 RTP/SCSs do not require that local general plans, specific plans, or zoning be consistent with it but provide incentives for consistency for governments and developers. Because the current SCAQMD AQMP (2012 AQMP) is based on the SCAG 2012 RTP/SCS demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) developed by SCAG for their 2012–2035 RTP/SCS, the SCAG 2012 RTP/SCS is discussed in Section 3.4. See Section 2.2.3.2, Southern California Association of Governments, for an additional discussion of the SCAG.

3.2.3.3 South Bay Cities Council of Governments

The South Bay Cities Council of Governments (SBCCOG) is a joint powers authority of 16 cities and the County of Los Angeles that share the goal of maximizing the quality of life and productivity of the South Bay area. The SBCCOG has been working on climate action planning since 2008, employing a subregional approach to the management and coordination of climate action planning to assist its cities in complying with legislation such as AB 32 and SB 375. The SBCCOG completed the South Bay Sustainable Strategy to address land use and mobility in an area that is transit poor. While the SBCCOG does not intend to produce an SCS, it hopes to use its South Bay Sustainable Strategy as a guide to develop a scenario-planning model that will allow the SBCCOG to independently plan and evaluate its member cities' development scenarios. This approach will supplement the regional SCS with a concrete tool to demonstrate a strategy that best fits the conditions in the South Bay to SCAG, the Los Angeles County Metropolitan Transportation Authority, and the South Bay cities' planning staffs.

3.2.3.4 City of Torrance

The City's General Plan (2010) includes various goals and policies designed to reduce GHG emissions within the City. Policies addressing climate change are integrated throughout the City's General Plan. The primary avenues to address climate change in urban areas are by lowering transportation emissions and encouraging energy conservation and efficiency. In addition, cities should address the urban heat island effect resulting from land use patterns, and encourage recycling, which reduces the amount of trash sent to landfills, thereby lowering methane emissions. Recycling also reduces the amount of energy needed to produce products.

As discussed in the General Plan, climate change and GHG reduction policies are addressed in multiple chapters of the General Plan. Objective CR.14 and associated policies are presented below (City of Torrance 2010).

OBJECTIVE CR.14: To reduce the City's overall carbon footprint and counteract the effects of global warming through a reduction in the emissions of GHGs within Torrance.

- **Policy CR.14.1:** Support the CARB in its ongoing plans to implement AB 32, and fully follow any new AB 32-related regulations.
- **Policy CR.14.2:** Develop and implement GHG emissions reduction measures, including discrete, early-action GHG-reducing measures that are technologically feasible and cost-effective.
- **Policy CR.14.3:** Pursue actions recommended in the U.S. Mayors Climate Protection Agreement to meet AB 32 requirements.
- **Policy CR.14.4:** Act as a leader and example in sustainability and reduction in GHG emissions by conducting City business in the most GHG-sensitive way.

Many GHG emissions reduction strategies result in co-benefits with reducing criteria air pollutant emissions and vice versa. See Section 2.2.3.4, City of Torrance, for a discussion of the City's air quality policies.

3.3 Climate Change Conditions and Inventories

3.3.1 Sources of Greenhouse Gas Emissions

Per the EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2014* (2016e), total United States GHG emissions were approximately 6,870.5 MMT CO_2E in 2014. The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 80.9% of total GHG emissions (5,556.0 MMT CO_2E). The largest source of CO_2, and of overall GHG

emissions, was fossil-fuel combustion, which accounted for approximately 93.7% of CO_2 emissions in 2014 (5,208.2 MMT CO_2E). Total United States GHG emissions have increased by 7.4% from 1990 to 2014, and emissions increased from 2013 to 2014 by 1.0% (70.5 MMT CO_2E). Since 1990, United States GHG emissions have increased at an average annual rate of 0.3%; however, overall, net emissions in 2014 were 8.6% below 2005 levels (EPA 2016g).

According to California's 2000–2014 GHG emissions inventory (2016 edition), California emitted 441.5 MMT CO_2E in 2014, including emissions resulting from out-of-state electrical generation (CARB 2016e). The sources of GHG emissions in California include transportation, industry, electric power production from both in-state and out-of-state sources, residential and commercial activities, agriculture, high global-warming potential substances, and recycling and waste. The California GHG emission source categories and their relative contributions in 2014 are presented in Table 12.

Table 12
GHG Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2E)	Percent of Total[a]
Transportation	159.53	36%
Industrial uses	93.32	21%
Electricity generation[b]	88.24	20%
Residential and commercial uses	38.34	9%
Agriculture	36.11	8%
High global-warming potential substances	17.15	4%
Recycling and waste	8.85	2%
Totals	**441.54**	**100%**

Source: CARB 2016e.
Notes: Emissions reflect the 2014 California GHG inventory.
MMT CO_2E = million metric tons of carbon dioxide equivalent per year
[a] Percentage of total has been rounded, and total may not sum due to rounding.
[b] Includes emissions associated with imported electricity, which account for 36.51 MMT CO_2E annually.

During the 2000 to 2014 period, per capita GHG emissions in California have continued to drop from a peak in 2001 of 13.9 MT per person to 11.4 MT per person in 2014, representing an 18% decrease. In addition, total GHG emissions in 2014 were 2.8 MMT CO_2E less than 2013 emissions. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California is on track to meet the 2020 target of 431 MMT CO_2E (CARB 2016e).

3.3.2 Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014

Intergovernmental Panel on Climate Change Synthesis Report (IPCC 2014) indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014).

In California, climate change impacts have the potential to affect sea-level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2006). The primary effect of global climate change has been a 0.2°C rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights. Shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year. Sea levels have risen, and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1°F to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California, compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline of Sierra Nevada snowpack, which accounts for approximately half of the surface water storage in California, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability.

For the first time, however, several of the improved climate models shift toward drier conditions by the mid-to-late twenty-first century in central, and most notably, Southern California. By the late century, all projections show drying, and half of them suggest 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

A summary of current and future climate change impacts to resource areas in California, as discussed in the *Safeguarding California: Reducing Climate Risk* (CNRA 2014), is provided below.

Agriculture. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding to extreme drought, to destructive storm events; significant shifts in water availably and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production.

Biodiversity and Habitat. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shift and novel combinations of species; pathogens, parasites and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss has occurs).

Energy. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events and sea level rise.

Forestry. The most significant climate change related risk to forests is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large scale mortalities and combined with increasing temperatures have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts and vegetation conversions.

Ocean and Coastal Ecosystems and Resources. Sea level rise, changing ocean conditions and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities. Sea level rise in addition to more frequent and severe coastal storms and erosion are threatening vital infrastructure such as roads, bridges, power plants, ports and airports, gasoline pipes, and emergency facilities as well as negatively impacting the coastal recreational assets such as beaches and tidal wetlands.

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the twenty-first Century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies, and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity and duration of extreme heat and heat waves are likely to increase the risk of mortality due to heat related illness as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness such as asthma and allergies.

Transportation. While the transportation industry is a source of GHG emissions it is also vulnerable to climate change risks. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause the road surfaces to expand which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages, which could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of peoples and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety.

Water. Climate change could seriously impact the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the winter time. Increased risk of flooding has a variety of public health concerns including water quality, public safety, property damage, displacement and post-disaster mental health problems. Prolonged and intensified droughts can also negatively groundwater reserves and result in increased overdraft and subsidence. The higher risk of wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality.

3.4 Significance Criteria and Methodology

3.4.1 Thresholds of Significance

The significance criteria used to evaluate the project's GHG emissions impacts is based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this GHG emissions analysis, the project would have a significant environmental impact if it would (14 CCR 15000 et seq.):

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

Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. There are currently no established thresholds for assessing whether the GHG emissions of a project, such as the proposed project, would be considered a cumulatively considerable contribution to global climate change; however, all reasonable efforts should be made to minimize a project's contribution to global climate change. In addition, while GHG impacts are recognized exclusively as cumulative impacts (CAPCOA 2008), GHG emissions impacts must also be evaluated on a project-level under CEQA.

The CEQA Guidelines do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA (CNRA 2009a). The State of California has not adopted emission-based thresholds for GHG emissions under CEQA. The Governor's Office of Planning and Research's Technical Advisory titled "CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act Review" states that "public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact" (OPR 2008). Furthermore, the advisory document indicates that "in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact,' individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice." Section 15064.7(c) of

the CEQA Guidelines specifies that "when adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence."

To address Impact GHG-1, this analysis uses the SCAQMD recommended (not adopted) numeric CEQA significance thresholds for GHG emissions for lead agencies to use in assessing GHG impacts of residential and commercial development projects.

In October 2008, the SCAQMD proposed recommended numeric CEQA significance thresholds for GHG emissions for lead agencies to use in assessing GHG impacts of residential and commercial development projects as presented in its *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* (SCAQMD 2008). This guidance document, which builds on the previous guidance prepared by the CAPCOA, explored various approaches for establishing a significance threshold for GHG emissions. The draft interim CEQA thresholds guidance document was not adopted or approved by the Governing Board. However, in December 2008, the SCAQMD adopted an interim 10,000 MT CO_2E per-year screening level threshold for stationary source/industrial projects for which the SCAQMD is the lead agency (see SCAQMD Resolution No. 08-35, December 5, 2008).

The SCAQMD formed a GHG CEQA Significance Threshold Working Group to work with SCAQMD staff on developing GHG CEQA significance thresholds until statewide significance thresholds or guidelines are established. From December 2008 to September 2010, the SCAQMD hosted working group meetings and revised the draft threshold proposal several times, although it did not officially provide these proposals in a subsequent document. The SCAQMD has continued to consider adoption of significance thresholds for residential and general land use development projects. The most recent proposal, issued in September 2010, uses the following tiered approach to evaluate potential GHG impacts from various uses (SCAQMD 2010):

Tier 1 Determine if CEQA categorical exemptions are applicable. If not, move to Tier 2.

Tier 2 Consider whether or not the proposed project is consistent with a locally adopted GHG reduction plan that has gone through public hearing and CEQA review, that has an approved inventory, includes monitoring, etc. If not, move to Tier 3.

Tier 3 Consider whether the project generates GHG emissions in excess of screening thresholds for individual land uses. The 10,000 MT CO_2E per year threshold for industrial uses would be recommended for use by all lead agencies. Under option 1, separate screening thresholds are proposed for residential projects (3,500 MT CO_2E per year), commercial projects (1,400 MT CO_2E per year), and

mixed-use projects (3,000 MT CO_2E per year). Under option 2, a single numerical screening threshold of 3,000 MT CO_2E per year would be used for all non-industrial projects. If the project generates emissions in excess of the applicable screening threshold, move to Tier 4.

Tier 4 Consider whether the project generates GHG emissions in excess of applicable performance standards for the project service population (population plus employment). The efficiency targets were established based on the goal of AB 32 to reduce statewide GHG emissions to 1990 levels by 2020. The 2020 efficiency targets are 4.8 MT CO_2E per service population for project level analyses and 6.6 MT CO_2E per service population for plan level analyses. If the project generates emissions in excess of the applicable efficiency targets, move to Tier 5.

Tier 5 Consider the implementation of CEQA mitigation (including the purchase of GHG offsets) to reduce the project efficiency target to Tier 4 levels.

Because the project consists of a residential development, this analysis applies the recommended SCAQMD threshold of 4.8 MT CO_2E per service population per year. Per the SCAQMD guidance, construction emissions should be amortized over the operational life of the project, which is assumed to be 30 years (SCAQMD 2008). This impact analysis, therefore, adds amortized construction emissions to the estimated annual operational emissions and then compares operational emissions to the proposed SCAQMD threshold of 4.8 MT CO_2E per service population per year.

3.4.2 Approach and Methodology

3.4.2.1 Construction

CalEEMod Version 2016.3.1 was used to estimate potential project-generated GHG emissions during construction. Construction of the project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. All details for construction criteria air pollutants discussed in Section 2.4.2.1, are also applicable for the estimation of construction-related GHG emissions. As such, see Section 2.4.2.1 for a discussion of construction emissions calculation methodology and assumptions.

3.4.2.2 Operation

CalEEMod Version 2016.3.1 was used to estimate potential project-generated operational GHG emissions from vehicular sources, area sources (natural gas combustion and landscape maintenance), electrical generation (including electrical generation associated with water supply

and wastewater treatment), and solid waste. Emissions from each category—area sources, energy sources, mobile sources, solid waste, and water supply and wastewater treatment—are discussed in the following text with respect to the project. For additional details, see Section 2.4.2.3, Operation, for a discussion of operational emission calculation methodology and assumptions, specifically for area, energy (natural gas), and mobile sources. Operational year 2020 was assumed consistent with the construction schedule.

The project applicant is pursuing Leadership in Energy and Environmental Design (LEED) Gold certification for the project, which would, at a minimum, reduce the project's energy consumption and water usage, thereby reducing GHG emissions compared to a non-LEED-certified building. A building can earn credits toward LEED certification through performance in five key areas including sustainable sites, water savings, energy and atmosphere, materials and resources, and indoor environmental quality (LEED 2016).

Area Sources

CalEEMod was used to estimate GHG emissions from the project's area sources, which include operation of gasoline-powered landscape maintenance equipment, which produce minimal GHG emissions. It was assumed that 100% of the landscaping equipment would be electric powered. See Section 2.4.2.2, for a discussion of landscaping equipment emissions calculations. Consumer product use and architectural coatings result in VOC emissions, which are analyzed in air quality analysis only, and little to no GHG emissions.

Energy Sources

The estimation of operational energy emissions was based on CalEEMod land use defaults and units or total area (i.e., square footage) of the project's land uses. The energy use from residential land uses is calculated in CalEEMod based on the Residential Appliance Saturation Study. For nonresidential buildings, CalEEMod energy intensity value (electricity or natural gas usage per square foot per year) assumptions were based on the California Commercial End-Use Survey database. Emissions are calculated by multiplying the energy use by the utility carbon intensity (pounds of GHGs per kilowatt-hour for electricity or 1,000 British thermal units for natural gas) for CO_2 and other GHGs. Annual natural gas (non-hearth) and electricity emissions were estimated in CalEEMod using the emissions factors for Southern California Edison, which would be the energy source provider for the project.

As discussed in Section 3.2.2, the project would be required to comply with 2016 Title 24 California Building Energy Efficiency Standards (24 CCR Part 6) because the project would be constructed after January 1, 2017. For the purposes of estimating project-generated energy

emissions, a mitigation measure was applied to assume a 28% reduction from the 2013 standards (the basis for the default energy usage factors in CalEEMod) to reflect the benefits of compliance with the 2016 standards. Based on the project applicant's commitment to provide Energy Star™-rated appliances for each residential unit, it was assumed that the project would provide energy-efficient clothes washers, dishwashers, fans, and refrigerators. In addition, it was assumed that high-efficiency lighting would be incorporated in the parking garage and all common areas.

CalEEMod default energy intensity factors (CO_2, CH_4, and N_2O mass emissions per kilowatt hour) for Southern Californian Edison is based on the value for Southern Californian Edison's energy mix in 2012. As explained in Section 3.2.2, SB X1 2 established a target of 33% from renewable energy sources for all electricity providers in California by 2020 and SB 350 calls for further development of renewable energy, with a target of 50% by 2030. The CO_2 emissions intensity factors for utility energy use in CalEEMod were adjusted to account for implementation of 33% RPS in 2020, to reflect the increase in percentage of renewable energy in Southern Californian Edison's energy portfolio.

Mobile Sources

All details for criteria air pollutants discussed in Section 2.4.2.2 are also applicable for the estimation of operational mobile source GHG emissions. Project site location and neighborhood enhancements that would reduce vehicle miles traveled and associated GHG emissions include proximity to job centers, increase in average density, and improvements for the pedestrian network.

Regulatory measures related to mobile sources include AB 1493 (Pavley) and related federal standards. AB 1493 required that CARB establish GHG emission standards for automobiles, light-duty trucks, and other vehicles determined by CARB to be vehicles that are primarily used for noncommercial personal transportation in the state. In addition, the NHTSA and EPA have established corporate fuel economy standards and GHG emission standards, respectively, for automobiles and light-, medium-, and heavy-duty vehicles. Implementation of these standards and fleet turnover (replacement of older vehicles with newer ones) will gradually reduce emissions from the project's motor vehicles.. The effectiveness of fuel economy improvements was evaluated by using the CalEEMod emission factors for motor vehicles in 2020 to the extent it was captured in EMFAC 2014.

The Low Carbon Fuel Standard calls for a 10% reduction in the "carbon intensity" of motor vehicle fuels by 2020, which would further reduce GHG emissions. However, the carbon intensity reduction associated with the Low Carbon Fuel Standard was not assumed in EMFAC 2014 and thus, was not included in CalEEMod 2016 or the calculations below, which are therefore considered conservative.

Solid Waste

The project would generate solid waste, and therefore, result in CO_2E emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste. Project compliance with the 75% diversion rate by 2020, consistent with AB 341 (25% increase from the solid waste diversion requirements of AB 939, Integrated Waste Management Act), has been included in the GHG assessment.

Water and Wastewater

Supply, conveyance, treatment, and distribution of water for the project require the use of electricity, which would result in associated indirect GHG emissions. Similarly, wastewater generated by the project requires the use of electricity for conveyance and treatment, along with GHG emissions generated during wastewater treatment. Water consumption estimates for both indoor and outdoor water use and associated electricity consumption from water use and wastewater generation were estimated using CalEEMod default values.

In regards to indoor water use, the project would install low-flow bathroom and kitchen faucets, low-flow toilets, and low-flow showers. In regards to outdoor water, the project would install water-efficient devices and landscaping in accordance with applicable ordinances, including use of drought-tolerant species appropriate to the climate and region. The project has committed to not include turf, which would reduce water use associated with landscaping. It was assumed that the project would apply a water conservation strategy resulting in a 20% reduction in indoor water use per CALGreen and a minimum 20% reduction in outdoor water use.

3.5 Impact Analysis

3.5.1 Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction Emissions

Construction of the project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles. The SCAQMD *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* (2009) recommends that "construction emissions be amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies." Thus, the total construction GHG emissions were calculated, amortized over 30 years, and added to the total operational emissions for comparison with the GHG significance threshold of 4.8 MT CO_2E per service population per year. The

determination of significance, therefore, is addressed in the operational emissions discussion following the estimated construction emissions.

CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Section 2.4.2.1. Construction of the project is anticipated to commence in January 2018 and reach completion in June 2020, lasting a total of 29 months. On-site sources of GHG emissions include off-road equipment and off-site sources including vendor trucks and worker vehicles. Table 13 presents construction emissions for the project in 2018, 2019, and 2020 from on-site and off-site emission sources.

Table 13
Estimated Annual Construction GHG Emissions

Year	CO_2	CH_4	N_2O	CO_2E
	Metric Tons per Year			
2018	528.89	0.06	0.00	530.51
2019	446.91	0.04	0.00	448.03
2020	218.66	0.02	0.00	219.17
Total	**1,194.46**	**0.12**	**0.00**	**1,197.71**

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2E = carbon dioxide equivalent.
See Appendix A for complete results.

As shown in Table 13, the estimated total GHG emissions during construction of would be approximately 531 MT CO_2E in 2018, 448 MT CO_2E in 2019, and 219 MT CO_2E in 2020, for a total of 1,198 MT CO_2E over the construction period. Estimated project-generated construction emissions amortized over 30 years would be approximately 39.93 MT CO_2E per year. As with project-generated construction criteria air pollutant emissions, GHG emissions generated during construction of the project would be short-term in nature, lasting only for the duration of the construction period, and would not represent a long-term source of GHG emissions. Because there is no separate GHG threshold for construction, the evaluation of significance is discussed in the operational emissions analysis in the following text.

Operational Emissions

Operation of the project would generate GHG emissions through motor vehicle trips to and from the project site; landscape maintenance equipment operation; energy use (natural gas and generation of electricity consumed by the project); solid waste disposal; and generation of electricity associated with water supply, treatment, and distribution and wastewater treatment. CalEEMod was used to calculate the annual GHG emissions based on the operational assumptions described in Section 3.4.2.2, Operation.

The estimated operational (year 2020) project-generated GHG emissions from area sources, energy usage, motor vehicles, solid waste generation, and water usage and wastewater generation are shown in Table 14.

Table 14
Estimated Annual Operational GHG Emissions

Emission Source	CO_2	CH_4	N_2O	CO_2E
	metric tons per year			
Area	2.93	0.01	0.00	2.98
Energy	663.16	0.03	0.01	666.24
Mobile	2,181.27	0.12	0.00	2,184.35
Solid waste	6.96	0.41	0.00	17.23
Water supply and wastewater	81.49	0.02	0.01	85.22
Total	**2,935.81**	**0.59**	**0.02**	**2,956.02**
			Amortized Construction Emissions	*39.93*
			Operation + Amortized Construction Total	**2,995.95**

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2E = carbon dioxide equivalent
See Appendix A for detailed results.
These emissions reflect CalEEMod "mitigated" output and operational year 2020.

As shown in Table 14, estimated annual project-generated GHG emissions would be approximately 2,956 MT CO_2E per year as a result of project operations only. Estimated annual project-generated operational emissions in 2020 plus amortized project construction emissions would be approximately 2,996 MT CO_2E per year.

As discussed in Section 2.5.1, regarding the potential for the project to conflict with or obstruct implementation of the applicable air quality plan, pursuant to the SCAG 2016 RTP/SCS population and household data, the average persons per household for the City in 2020 is estimated to be 2.61 (SCAG 2016). Based on the assumption of 2.61 persons per household, the proposed 248 residential units would generate 647 persons at buildout in 2020. Although the project will include employees for property management, they are anticipated to be minor (i.e., less than three persons). For employees living on site, they are assumed to be included in evaluation of the 248 residential units. Accordingly, potential project employees are conservatively not included in the service population estimate.

Estimated annual GHG emissions of 2,996 MT CO_2E per year divided by a service population of 647 persons is 4.63 MT CO_2E per service population per year. As such, annual operational GHG emissions with amortized construction emissions would not exceed the SCAQMD threshold of 4.8 MT CO_2E per service population per year. Therefore, the project's GHG contribution would not be cumulatively considerable and is less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

3.5.2 Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The City has not adopted a comprehensive climate action plan and there is currently no local guidance that would be applicable to the project. At this time, no mandatory GHG plans, policies, or regulations or finalized agency guidelines would apply to implementation of the project.

As discussed in Section 3.2.2, the Scoping Plan, approved by CARB in 2008 and updated in 2014 and 2017, provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. The Scoping Plan is not directly applicable to specific projects, nor is it intended to be used for project-level evaluations.[19] Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., LCFS), among others.

The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32 and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. Table 15 highlights measures that have been, or will be, developed under the Scoping Plan and the project's consistency with Scoping Plan measures. To the extent that these regulations are applicable to the project, its inhabitants, or uses, the project would comply will all regulations adopted in furtherance of the Scoping Plan to the extent required by law.

[19] The Final Statement of Reasons for the amendments to the CEQA Guidelines reiterates the statement in the Initial Statement of Reasons that "[t]he Scoping Plan may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (CNRA 2009a).

Table 15
Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Project Consistency
Transportation Sector		
Advanced Clean Cars	T-1	The project's residents and employees would purchase vehicles in compliance with CARB vehicle standards that are in effect at the time of vehicle purchase.
Low Carbon Fuel Standard	T-2	Motor vehicles driven by the project's residents and employees would use compliant fuels.
Regional Transportation-Related GHG Targets	T-3	The project includes design features intended to enhance transit orientation and encourage non-vehicular mobility to supplement ongoing statewide efforts to increase fuel efficiency standards, promote electric and hybrid vehicles, and promote vehicular fuels from renewable resources. The project's pedestrian network, high-density development, and location near jobs and complementary land uses would influence alternative modes of travel and result in shorter trip lengths, which would reduce GHG emissions.
Vehicle Efficiency Measures 1. Tire Pressure 2. Fuel Efficiency Tire Program 3. Low-Friction Oil 4. Solar-Reflective Automotive Paint and Window Glazing	T-4	Motor vehicles driven by the project's residents and employees would maintain proper tire pressure when their vehicles are serviced. The project's residents and employees would replace tires in compliance with CARB vehicle standards that are in effect at the time of vehicle purchase. Motor vehicles driven by the project's residents and employees would use low-friction oils when their vehicles are serviced. The project's residents and employees would purchase vehicles in compliance with CARB vehicle standards that are in effect at the time of vehicle purchase.
Ship Electrification at Ports (Shore Power)	T-5	Not applicable.
Goods Movement Efficiency Measures 1. Port Drayage Trucks 2. Transport Refrigeration Units Cold Storage Prohibition 3. Cargo Handling Equipment, Anti-Idling, Hybrid, Electrification 4. Goods Movement Systemwide Efficiency Improvements 5. Commercial Harbor Craft Maintenance and Design Efficiency 6. Clean Ships 7. Vessel Speed Reduction	T-6	Not applicable.
Heavy-Duty Vehicle GHG Emission Reduction 1. Tractor-Trailer GHG Regulation 2. Heavy-Duty Greenhouse Gas Standards for New Vehicle and Engines (Phase I)	T-7	Not applicable.
Medium- and Heavy-Duty Vehicle Hybridization Voucher Incentive Project	T-8	Not applicable.

Table 15
Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Project Consistency
High-Speed Rail	T-9	Not applicable.
Electricity and Natural Gas Sector		
Energy Efficiency Measures (Electricity)	E-1	The project will comply with current Title 24, Part 6, of the California Code of Regulations energy efficiency standards for electrical appliances and other devices at the time of building construction. The project will use high-efficiency lighting in the parking garage and all common areas. The project will provide Energy Star™-rated appliances for each residential unit, including clothes washers, dishwashers, fans, and refrigerators. In addition, the project is pursing LEED Gold certification.
Energy Efficiency (Natural Gas)	CR-1	The project will comply with current Title 24, Part 6, of the California Code of Regulations energy efficiency standards for natural gas appliances and other devices at the time of building construction. The project will provide Energy Star™-rated appliances for each residential unit, including clothes washers, dishwashers, fans, and refrigerators. In addition, the project is pursing LEED Gold certification.
Solar Water Heating (California Solar Initiative Thermal Program)	CR-2	Determined by the project applicant to not be feasible. See discussion regarding Measure E-4.
Combined Heat and Power	E-2	Not applicable.
Renewable Portfolios Standard (33% by 2020)	E-3	The electricity used by the project will benefit from reduced GHG emissions resulting from increased use of renewable energy sources.
SB 1 Million Solar Roofs (California Solar Initiative, New Solar Home Partnership, Public Utility Programs) and Earlier Solar Programs	E-4	Based on information provided by the project applicant, on-site generation of renewable energy using solar panels is not feasible given the minimal rooftop space available to provide the electricity needed to make rooftop solar economically feasible and reliable for future residents. Roof space is limited because it would be used to house project systems, primarily the heating, ventilation, and air conditioning systems, that would serve the entire project, and because of the multistory nature of the project, the ratio of roof space to residential space is small.
Water Sector		
Water Use Efficiency	W-1	In regards to indoor water use, the project would install low-flow bathroom and kitchen faucets, toilets, and showers. In regards to outdoor water, the project would install water-efficient devices and landscaping in accordance with applicable ordinances, including use of drought-tolerant species appropriate to the climate and region. The project has committed to not include any turf, which would reduce water use associated with landscaping.
Water Recycling	W-2	Recycled water is not available to the site.
Water System Energy Efficiency	W-3	This is applicable for the transmission and treatment of water, but it is not applicable for the project.

Table 15
Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Project Consistency
Reuse Urban Runoff	W-4	Per the applicant, reuse of urban water on-site was determined to not be feasible.
Renewable Energy Production	W-5	Applicable for wastewater treatment systems. Not applicable for the project.
Green Buildings		
1. State Green Building Initiative: Leading the Way with State Buildings (Greening New and Existing State Buildings)	GB-1	The project would be required to be constructed in compliance with state or local green building standards in effect at the time of building construction.
2. Green Building Standards Code (Greening New Public Schools, Residential and Commercial Buildings)	GB-1	The project's buildings would meet green building standards that are in effect at the time of design and construction.
3. Beyond Code: Voluntary Programs at the Local Level (Greening New Public Schools, Residential and Commercial Buildings)	GB-1	The project would be required to be constructed in compliance with local green building standards in effect at the time of building construction.
4. Greening Existing Buildings (Greening Existing Homes and Commercial Buildings)	GB-1	This is applicable for existing buildings only. It is not applicable for the project except as future standards may become applicable to existing buildings.
Industry Sector		
Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	I-1	Not applicable.
Oil and Gas Extraction GHG Emission Reduction	I-2	Not applicable.
GHG Emissions Reduction from Natural Gas Transmission and Distribution	I-3	Not applicable.
Refinery Flare Recovery Process Improvements	I-4	Not applicable.
Work with the local air districts to evaluate amendments to their existing leak detection and repair rules for industrial facilities to include methane leaks	I-5	Not applicable.
Recycling and Waste Management Sector		
Landfill Methane Control Measure	RW-1	Not applicable.
Increasing the Efficiency of Landfill Methane Capture	RW-2	Not applicable.
Mandatory Commercial Recycling	RW-3	During both construction and operation of the project, the project would comply with all state regulations related to solid waste generation, storage, and disposal, including the California Integrated Waste Management Act, as amended. During construction, all wastes would be recycled to the maximum extent possible.

Table 15
Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Project Consistency
Increase Production and Markets for Compost and Other Organics	RW-3	Not applicable.
Anaerobic/Aerobic Digestion	RW-3	Not applicable.
Extended Producer Responsibility	RW-3	Not applicable (applicable to product designer and producers).
Environmentally Preferable Purchasing	RW-3	Not applicable (applicable to product designer and producers).
Forests Sector		
Sustainable Forest Target	F-1	Not applicable.
High GWP Gases Sector		
Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	H-1	The project's residents and employees would be prohibited from performing air conditioning repairs and would be required to use professional servicing.
SF_6 Limits in Non-Utility and Non-Semiconductor Applications	H-2	Not applicable.
Reduction of Perfluorocarbons in Semiconductor Manufacturing	H-3	Not applicable.
Limit High GWP Use in Consumer Products	H-4	The project's residents and employees would use consumer products that would comply with the regulations that are in effect at the time of manufacture.
Air Conditioning Refrigerant Leak Test During Vehicle Smog Check	H-5	Motor vehicles driven by the project's residents and employees would comply with the leak test requirements during smog checks.
Stationary Equipment Refrigerant Management Program – Refrigerant Tracking/Reporting/Repair Program	H-6	Not applicable.
Stationary Equipment Refrigerant Management Program – Specifications for Commercial and Industrial Refrigeration	H-6	Not applicable.
SF_6 Leak Reduction Gas Insulated Switchgear	H-6	Not applicable.
Agriculture Sector		
Methane Capture at Large Dairies	A-1	Not applicable.

Source: CARB 2010.
Notes: CARB = California Air Resources Board; CCR = California Code of Regulations; GHG = greenhouse gas; GWP = global warming potential; LEED = Leadership in Energy and Environmental Design; SB = Senate Bill; SF6 = sulfur hexafluoride

Based on the analysis in Table 15, the project would be consistent with the applicable strategies and measures in the Scoping Plan.

SCAG's 2016 RTP/SCS is a regional growth-management strategy that targets per capita GHG reduction from passenger vehicles and light-duty trucks in the Southern California region. The 2016 RTP/SCS incorporates local land use projections and circulation networks in city and county general plans. The 2016 RTP/SCS is not directly applicable to the project because the

underlying purpose of the 2016 RTP/SCS is to provide direction and guidance by making the best transportation and land use choices for future development. However, the development of the project site would support the overarching intent of the 2016 RTP/SCS by avoiding sprawling development and through incorporation of energy efficient features such as landscaping and irrigation.

The project would not impede the attainment of the GHG reduction goals for 2030 or 2050 identified in EO S-3-05 and SB 32. As discussed in Section 3.2.2, EO S-3-05 establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050. SB 32 establishes for a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40% below 1990 levels by December 31, 2030. While there are no established protocols or thresholds of significance for that future year analysis; CARB forecasts that compliance with the current Scoping Plan puts the state on a trajectory of meeting these long-term GHG goals, although the specific path to compliance is unknown (CARB 2014).

To begin, CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB 2014). With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the First Update to the Climate Change Scoping Plan states the following (CARB 2014):

> This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-3-05. This is confirmed in the *Second Update*, which states (CARB 2017):

> The Proposed Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasibility and

> cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Proposed Plan is developed to be consistent with requirements set forth in AB 32, SB 32, and AB 197.

The project would not interfere with implementation of any of the above-described GHG reduction goals for 2030 or 2050 because the project would not exceed the SCAQMD's recommended draft interim threshold of 4.8 MT CO_2E per service population per year (SCAQMD 2008). As discussed in Section 3.4.1, this efficiency threshold was established based on the goal of AB 32 to reduce statewide GHG emissions to 1990 levels by 2020. Because the project would not exceed the threshold, this analysis provides support for the conclusion that the project would not impede the state's trajectory toward the above-described statewide GHG reduction goals for 2030 or 2050.

In addition, as discussed previously, the project is consistent with the GHG emission reduction measures in the Scoping Plan and would not conflict with the state's trajectory toward future GHG reductions. In addition, since the specific path to compliance for the state in regards to the long-term goals will likely require development of technology or other changes that are not currently known or available, specific additional mitigation measures for the project would be speculative and cannot be identified at this time. The project's consistency would assist in meeting the City's contribution to GHG emission reduction targets in California. With respect to future GHG targets under SB 32 and EO S-3-05, CARB has also made clear its legal interpretation that it has the requisite authority to adopt whatever regulations are necessary, beyond the AB 32 horizon year of 2020, to meet SB 32's 40% reduction target by 2030 and EO S-3-05's 80% reduction target by 2050; this legal interpretation by an expert agency provides evidence that future regulations will be adopted to continue the state on its trajectory toward meeting these future GHG targets. Based on the above considerations, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and no mitigation is required. This impact would be less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Impacts would be less than significant without mitigation.

4 REFERENCES CITED

13 CCR 2025. Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants, from In-Use Heavy-Duty Diesel-Fueled Vehicles.

13 CCR 2449–2449.3 and Appendix A. General Requirements for In-Use Off-Road Diesel-Fueled Fleets.14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

17 CCR 93000. Substances Identified as Toxic Air Contaminants. In Subchapter 7, Toxic Air Contaminants.

24 CCR Part 6. California Energy Code. Sacramento, California: California Building Standards Commission. March 2010. ISBN 978-1-58001-976-7. Effective January 1, 2011. Accessed August 2016. http://www.documents.dgs.ca.gov/bsc/Title_24/documents/2010/Part%206/2010-CA-Energy.pdf.

California Public Resources Code Sections 40000–40511. Part 1. Integrated Waste Management.

CalRecycle (California Department of Resources Recycling and Recovery). 2012. *AB 341 Final Statement of Reasons: Mandatory Commercial Recycling Regulations*. Accessed August 2016. http://www.calrecycle.ca.gov/laws/rulemaking/archive/2012/MCR/RuleDocs/FSOR.pdf.

Caltrans (California Department of Transportation). 1997. *Transportation Project-Level Carbon Monoxide Protocol.*

CAPCOA (California Air Pollution Control Officers Association). 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. January 2008.

CAPCOA. 2010. *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures.* August 2010.

CAPCOA. 2016. *California Emissions Estimator Model (CalEEMod) User's Guide Version 2016.3*.1 Prepared by Trinity Consultants and the California Air Districts. September 2016. http://www.aqmd.gov/docs/default-source/caleemod/upgrades/2016.3/01_user-39-s-guide2016-3-1.pdf?sfvrsn=2.

CARB (California Air Resources Board). 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October 2000. Accessed August 2016. http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf.

CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005. Accessed August 2016. http://www.arb.ca.gov/ch/landuse.htm.

CARB. 2008. *Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act*. Sacramento, California. October 24, 2008.

CARB. 2014. *First Update to the Climate Change Scoping Plan Building on the Framework Pursuant to AB 32 – The California Global Warming Solutions Act of 2006*. May 2014. Accessed August 2014. http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

CARB. 2015. "Glossary of Terms Used in Greenhouse Gas Inventories." May 6, 2015. Accessed August 2016. http://www.arb.ca.gov/cc/inventory/faq/ghg_inventory_glossary.htm.

CARB. 2016a. "Glossary of Air Pollution Terms." CARB website. Accessed June 2016. http://www.arb.ca.gov/html/gloss.htm.

CARB. 2016b. "Ambient Air Quality Standards." May 4, 2016. Accessed August 2016. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

CARB. 2016c. "Area Designation Maps/State and National." Last updated May 5, 2016. http://www.arb.ca.gov/desig/adm/adm.htm.

CARB. 2016d. "iADAM: Air Quality Data Statistics." Accessed July 2016. http://www.arb.ca.gov/adam/topfour/topfour1.php.

CARB. 2016e. "California Greenhouse Gas Inventory – 2016 Edition." June 17, 2016. Accessed August 2016. http://www.arb.ca.gov/cc/inventory/data/data.htm.

CARB. 2017. The 2017 Climate Change Scoping Plan Update. January 20. Accessed January 2017. https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

CAT (California Climate Action Team). 2006. *Climate Action Team Report to the Governor Schwarzenegger and the Legislature*. Sacramento, California. March 2006. Accessed August 2016. http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF.

CAT. 2010. *Climate Action Team Biennial Report*. Sacramento, California. April 2010. Accessed August 2016. http://www.energy.ca.gov/2010publications/CAT-1000-2010-004/CAT-1000-2010-004.PDF.

CAT. 2016. Climate Action Team Reports. Accessed December 2016. http://climatechange.ca.gov/climate_action_team/reports/index.html.

CCCC (California Climate Change Center). 2006. *Our Changing Climate: Assessing the Risks to California*. CEC-500-2006-077. July 2006. Accessed August 2016. http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF.

CCCC. 2012. *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California*. July 2012. Accessed August 2016. http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf.

CEC (California Energy Commission). 2015. "2016 Building Efficiency Standards Frequently Asked Questions." Accessed August 2016. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf.

City of Torrance. 2009. *General Plan Update Draft Environmental Impact Report*. Accessed August 2016. http://www.torranceca.gov/pdf/gp_drafteir/Ch%2005-02%20AQ.pdf.

City of Torrance. 2010. *City of Torrance General Plan. Land Use Element and Community Resources Element*. Adopted April 6, 2010. Accessed July 2016. http://www.torranceca.gov/8691.htm.

City of Torrance. 2015. City of Torrance Property Zoning Map. Adopted July 2015. Accessed July 2016. http://www.torranceca.gov/PDF/Zoning2015.pdf.

CNRA (California Natural Resources Agency). 2009a. *Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97*. December 2009.

CNRA. 2009b. *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008.* Accessed August 2016. http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf.

EPA (U.S. Environmental Protection Agency). 2009. *Integrated Science Assessment for Particulate Matter*. U.S. EPA, EPA/600/R-08/139F, 2009.

EPA. 2010. *EPA and NHTSA Finalize Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks*. April 2010. Accessed August 2016. https://www3.epa.gov/otaq/climate/regulations/420f10014.pdf.

EPA. 2013. *Integrated Science Assessment of Ozone and Related Photochemical Oxidants*. U.S. EPA, EPA/600R-10/076F, 2013.

EPA. 2016a. "Criteria Air Pollutants." July 21, 2016. Accessed August 2016. https://www.epa.gov/criteria-air-pollutants.

EPA. 2016b. *Integrated Science Assessment for Oxides of Nitrogen-Health Criteria (2016 Final Report)*. U.S. EPA, EPA/600/R-15/068, 2016.

EPA. 2016c. "EPA Region 9 Air Quality Maps and Geographic Information." Last updated April 27, 2016. Accessed August 2016. http://www.epa.gov/region9/air/maps/.

EPA. 2016d. "Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard – Round 3." July 22, 2016. Accessed February 2017. https://www.epa.gov/sites/production/files/2016-07/documents/areadesign.pdf.

EPA. 2016e. "AirData: Access to Air Pollution Data." Last updated February 23, 2016. Accessed August 2016. http://www.epa.gov/airdata/ad_rep_mon.html.

EPA. 2016f. "Glossary of Climate Change Terms." August 9, 2016. Accessed August 2016. https://www3.epa.gov/climatechange/glossary.html.

EPA. 2016g. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2014* EPA 430-R-16-002. Washington, D.C.: EPA. April 15, 2016. Accessed August 2016. https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2016-Main-Text.pdf.

EPA. 2017a. "Climate Change." Last updated January 19, 2017. Accessed January 2017. https://www.epa.gov/climatechange.

EPA. 2017b. *Carbon Pollution Standards for Cars and Light Trucks to Remain Unchanged Through 2025*. January 13. Accessed February 2017. https://www.epa.gov/newsreleases/carbon-pollution-standards-cars-and-light-trucks-remain-unchanged-through-2025.

Google Earth. 2016. Aerial imagery. May 2016.

IPCC (Intergovernmental Panel on Climate Change). 1995. *IPCC Second Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the U.N. Framework Convention on Climate Change*.

IPCC. 2007. *IPCC Fourth Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the U.N. Framework Convention on Climate Change*.

IPCC. 2014. *Climate Change 2014 Synthesis Report: A Report of the Intergovernmental Panel on Climate Change.* Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Accessed August 2016. http://www.ipcc.ch/report/ar5/syr/.

KHR Associates. 2017. *Revised Solana Torrance Traffic Impact Study*. April 14, 2017.

LEED (Leadership in Energy and Environmental Design). 2016. "United States Green Building Council LEED." Accessed August 2016. http://www.usgbc.org/leed.

OPR (Governor's Office of Planning and Research). 2008. *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review.*

SCAG (Southern California Association of Governments). 2008. *2008 Regional Comprehensive Plan: Helping Communities Achieve a Sustainable Future.*

SCAG. 2012. *2012–2035 Regional Transportation Plan/Sustainable Communities Strategy*. Adopted April 2012. Accessed August 2016. http://rtpscs.scag.ca.gov/Pages/2012-2035-RTP-SCS.aspx.

SCAG. 2016. *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*. Adopted April 7, 2016. Accessed March 2017. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx.

SCAQMD (South Coast Air Quality Management District). 1993. *CEQA Air Quality Handbook*.

SCAQMD. 2008. *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold*. October 2008.

SCAQMD. 2009. *Final Localized Significance Threshold Methodology*. Revised July 2009.

SCAQMD. 2010. "Greenhouse Gases CEQA Significance Thresholds Working Group Meeting No. 15." September 28, 2010. Accessed August 2016. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf?sfvrsn=2.

SCAQMD. 2011. "Fact Sheet for Applying CalEEMod to Localized Significance Thresholds." Accessed August 2016. http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf?sfvrsn=2.

SCAQMD. 2013. *Final 2012 Air Quality Management Plan*. February 2013. Accessed August 2016. http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan.

SCAQMD. 2015. "SCAQMD Air Quality Significance Thresholds." Originally published in *CEQA Air Quality Handbook*, Table A9-11-A. Revised March 2015. http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2.

SCAQMD. 2017. *Final 2016 Air Quality Management Plan.* March 16, 2017. Accessed March 2017. http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

Withee Malcom Architects. 2017. *Solana Torrance Site Plans*. March 21.

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APPENDIX A

CalEEMod Output Files

CalEEMod Version: CalEEMod.2016.3.1 Date: 4/13/2017 2:39 PM

Solana Torrance Residential Development - Los Angeles-South Coast County, Winter

Solana Torrance Residential Development

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	499.00	Space	0.00	188,417.00	0
Parking Lot	47.00	Space	0.00	54,383.00	0
City Park	2.21	Acre	0.00	96,385.00	0
Health Club	4.00	1000sqft	0.00	4,000.00	0
User Defined Recreational	18.62	User Defined Unit	18.62	0.00	0
Apartments Mid Rise	248.00	Dwelling Unit	6.06	276,769.00	647

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	592.37	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Section 1.0 Project Characteristics. Operational year 2020. CO2 Intensity factor adjusted per 33% RPS by 2020.

Land Use - See 1.1 Land Usage. Apartments Mid Rise square footage includes residential floor area and building circulation. Health Club represents the leasing office and community room. Enclosed Parking with Elevator represents the numbers of parking spaces and total square footage of buildings A, B, C and D. Parking Lot represents the additional on-grade parking spaces and paved street/circulation area. City Park represents landscape area. User Defined Recreational represents preserved natural open space.

Construction Phase - See 3.0 Construction Detail.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions. Small portable air compressors (0.75 HP) used for architectural coating will be battery-operated.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Trips and VMT - See 3.0 Construction Detail. Default CalEEMod values for Grading, Paving, and Architectural Coating trips. Building Construction trips calculated using CalEEMod worker and vendor trip rates for proposed land uses.

On-road Fugitive Dust - Default CalEEMod values.

Demolition - No demolition would occur.

Grading - See 3.0 Construction Detail. 41,218 CY of export (91,387 CY cut - 21,633 CY fill = 69,754 CY - 18,232 CY remaining onsite = 51,522 CY * 20% shrink factor = 41,218 CY). 6.06 acres disturbed. Based on applicant-provided data.

Architectural Coating - Default CalEEMod values.

Vehicle Trips - Default CalEEMod rates and project-specific weekday trip rates (KHR Associates 2017) for Apartments Mid Rise are consistent. Health Club and City Park land uses will not generate trips as it represents onsite amenities.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Road Dust - Default CalEEMod values.

Woodstoves - No woodstoves. No fireplaces.

Consumer Products - Default CalEEMod values.

Area Coating - Default CalEEMod values.

Landscape Equipment - Default CalEEMod values.

Energy Use - Default CalEEMod values.

Water And Wastewater - 100% Aerobic. Default CalEEMod values for indoor and outdoor water use.

Solid Waste - Default CalEEMod values.

Construction Off-road Equipment Mitigation - Water Exposed Area, Frequency: 3 times per day.

Mobile Land Use Mitigation - Project Setting: Suburban Center. Increase Density: 10 dwelling units/acre. Improve Destination Accessibility: Distance to Job Center: 5 miles (job centers within 2-5 miles). Improve Pedestrian Network: Project Site and Connecting Off-Site.

Area Mitigation - Landscape Equipment: 100% electric.

Energy Mitigation - Project will meet 2016 Title 24 standards. 28% improvement above 2013 Title 24 standards. Install High Efficiency Lighting: 40% Lighting Energy Reduction. Energy Efficient Appliances: Apartments: Clothes Washer, Dishwasher, Fan, and Refrigerator.

Water Mitigation - Apply Water Conservation Strategy: 20% reduction in indoor, 20% reduction in outdoor.

Waste Mitigation - Percent Reduction in Waste Disposed: 75%. Waste diversion consistent with Assembly Bill 341.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	NumDays	370.00	164.00
tblConstructionPhase	NumDays	370.00	390.00
tblConstructionPhase	NumDays	35.00	75.00
tblConstructionPhase	NumDays	20.00	44.00
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	210.80	0.00
tblFireplaces	NumberNoFireplace	24.80	0.00
tblFireplaces	NumberWood	12.40	0.00
tblGrading	AcresOfGrading	0.00	6.06
tblGrading	MaterialExported	0.00	41,218.00
tblLandUse	BuildingSpaceSquareFeet	199,600.00	188,417.00
tblLandUse	BuildingSpaceSquareFeet	18,800.00	54,383.00
tblLandUse	GreenSpaceSquareFeet	96,267.60	96,385.00
tblLandUse	LandUseSquareFeet	199,600.00	188,417.00
tblLandUse	LandUseSquareFeet	18,800.00	54,383.00
tblLandUse	LandUseSquareFeet	96,267.60	96,385.00
tblLandUse	LandUseSquareFeet	248,000.00	276,769.00

tblLandUse	LotAcreage	4.49	0.00
tblLandUse	LotAcreage	0.42	0.00
tblLandUse	LotAcreage	2.21	0.00
tblLandUse	LotAcreage	0.09	0.00
tblLandUse	LotAcreage	0.00	18.62
tblLandUse	LotAcreage	6.53	6.06
tblLandUse	Population	709.00	647.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	592.37
tblProjectCharacteristics	OperationalYear	2018	2020
tblTripsAndVMT	VendorTripNumber	83.00	40.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	83.00	30.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	323.00	102.00
tblTripsAndVMT	WorkerTripNumber	323.00	182.00
tblTripsAndVMT	WorkerTripNumber	65.00	58.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	32.93	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
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tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
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tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
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tblWoodstoves	NumberCatalytic	12.40	0.00
tblWoodstoves	NumberNoncatalytic	12.40	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.2619	34.0499	19.0886	0.0723	2.2264	0.8985	2.8003	0.5948	0.8280	1.2315	0.0000	7,676.7216	7,676.7216	0.9531	0.0000	7,700.5483
2019	2.0284	12.3905	14.0802	0.0372	2.2264	0.5022	2.7285	0.5948	0.4668	1.0616	0.0000	3,727.2970	3,727.2970	0.3773	0.0000	3,736.7300
2020	29.9690	11.6975	15.4385	0.0434	2.8875	0.4422	3.3297	0.7704	0.4109	1.1813	0.0000	4,338.9387	4,338.9387	0.3881	0.0000	4,348.6401
Maximum	**29.9690**	**34.0499**	**19.0886**	**0.0723**	**2.8875**	**0.8985**	**3.3297**	**0.7704**	**0.8280**	**1.2315**	**0.0000**	**7,676.7216**	**7,676.7216**	**0.9531**	**0.0000**	**7,700.5483**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.2619	34.0499	19.0886	0.0723	2.2264	0.8985	2.8003	0.5948	0.8280	1.2315	0.0000	7,676.7216	7,676.7216	0.9531	0.0000	7,700.5483
2019	2.0284	12.3905	14.0802	0.0372	2.2264	0.5022	2.7285	0.5948	0.4668	1.0616	0.0000	3,727.2970	3,727.2970	0.3773	0.0000	3,736.7300
2020	29.9690	11.6975	15.4385	0.0434	2.8875	0.4422	3.3297	0.7704	0.4109	1.1813	0.0000	4,338.9387	4,338.9387	0.3881	0.0000	4,348.6401
Maximum	**29.9690**	**34.0499**	**19.0886**	**0.0723**	**2.8875**	**0.8985**	**3.3297**	**0.7704**	**0.8280**	**1.2315**	**0.0000**	**7,676.7216**	**7,676.7216**	**0.9531**	**0.0000**	**7,700.5483**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.7839	0.2380	20.5870	1.0800e-003		0.1131	0.1131		0.1131	0.1131	0.0000	36.9659	36.9659	0.0363	0.0000	37.8724
Energy	0.1054	0.9021	0.3932	5.7500e-003		0.0728	0.0728		0.0728	0.0728		1,149.8308	1,149.8308	0.0220	0.0211	1,156.6637
Mobile	3.3750	16.7660	45.3372	0.1477	11.9839	0.1555	12.1394	3.2074	0.1458	3.3532		15,010.4083	15,010.4083	0.8505		15,031.6718
Total	**10.2643**	**17.9060**	**66.3174**	**0.1545**	**11.9839**	**0.3414**	**12.3253**	**3.2074**	**0.3317**	**3.5392**	**0.0000**	**16,197.2050**	**16,197.2050**	**0.9088**	**0.0211**	**16,226.2078**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.4860	0.1876	15.6255	7.0000e-004		0.0840	0.0840		0.0840	0.0840	0.0000	25.8469	25.8469	0.0189	0.0000	26.3187
Energy	0.0874	0.7483	0.3260	4.7700e-003		0.0604	0.0604		0.0604	0.0604		953.8135	953.8135	0.0183	0.0175	959.4815
Mobile	3.1921	15.4866	40.9509	0.1311	10.5698	0.1385	10.7083	2.8289	0.1299	2.9588		13,325.6507	13,325.6507	0.7660		13,344.8009
Total	**9.7655**	**16.4225**	**56.9024**	**0.1366**	**10.5698**	**0.2829**	**10.8527**	**2.8289**	**0.2743**	**3.1032**	**0.0000**	**14,305.3110**	**14,305.3110**	**0.8032**	**0.0175**	**14,330.6010**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**4.86**	**8.29**	**14.20**	**11.61**	**11.80**	**17.14**	**11.95**	**11.80**	**17.32**	**12.32**	**0.00**	**11.68**	**11.68**	**11.63**	**17.03**	**11.68**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/16/2018	4/30/2018	5	75	
2	Building Construction - Parking Garage	Building Construction	5/1/2018	12/14/2018	5	164	
3	Paving	Paving	6/1/2018	8/1/2018	5	44	
4	Building Construction - Residential	Building Construction	12/16/2018	6/12/2020	5	390	
5	Architectural Coating	Architectural Coating	3/15/2020	6/15/2020	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.06

Acres of Paving: 0

Residential Indoor: 560,457; Residential Outdoor: 186,819; Non-Residential Indoor: 6,000; Non-Residential Outdoor: 2,000; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	0	8.00	187	0.41
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Loaders	1	8.00	203	0.36
Grading	Scrapers	0	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction - Parking Garage	Cranes	0	7.00	231	0.29
Building Construction - Parking Garage	Forklifts	0	8.00	89	0.20
Building Construction - Parking Garage	Generator Sets	0	8.00	84	0.74
Building Construction - Parking Garage	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction - Parking Garage	Welders	0	8.00	46	0.45
Paving	Pavers	1	8.00	130	0.42

Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38
Building Construction - Residential	Cranes	1	6.00	231	0.29
Building Construction - Residential	Forklifts	2	8.00	89	0.20
Building Construction - Residential	Generator Sets	0	8.00	84	0.74
Building Construction - Residential	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction - Residential	Welders	1	4.00	46	0.45
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	8.00	0.00	5,152.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Parking Garage	2	102.00	40.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Residential	4	182.00	30.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	0	58.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1478	0.0000	0.1478	0.0187	0.0000	0.0187			0.0000			0.0000
Off-Road	1.0081	11.5167	8.2868	0.0166		0.4809	0.4809		0.4424	0.4424		1,668.0326	1,668.0326	0.5193		1,681.0146
Total	**1.0081**	**11.5167**	**8.2868**	**0.0166**	**0.1478**	**0.4809**	**0.6287**	**0.0187**	**0.4424**	**0.4611**		**1,668.0326**	**1,668.0326**	**0.5193**		**1,681.0146**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6991	22.4963	4.9124	0.0548	1.2010	0.0861	1.2870	0.3292	0.0823	0.4115		5,914.2429	5,914.2429	0.4302		5,924.9988
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0369	0.3978	9.5000e-004	0.0894	8.0000e-004	0.0902	0.0237	7.4000e-004	0.0245		94.4461	94.4461	3.5500e-003		94.5349
Total	**0.7480**	**22.5333**	**5.3102**	**0.0557**	**1.2904**	**0.0869**	**1.3773**	**0.3529**	**0.0831**	**0.4360**		**6,008.6890**	**6,008.6890**	**0.4338**		**6,019.5337**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0577	0.0000	0.0577	7.2800e-003	0.0000	7.2800e-003			0.0000			0.0000
Off-Road	1.0081	11.5167	8.2868	0.0166		0.4809	0.4809		0.4424	0.4424	0.0000	1,668.0326	1,668.0326	0.5193		1,681.0146
Total	**1.0081**	**11.5167**	**8.2868**	**0.0166**	**0.0577**	**0.4809**	**0.5386**	**7.2800e-003**	**0.4424**	**0.4497**	**0.0000**	**1,668.0326**	**1,668.0326**	**0.5193**		**1,681.0146**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6991	22.4963	4.9124	0.0548	1.2010	0.0861	1.2870	0.3292	0.0823	0.4115		5,914.2429	5,914.2429	0.4302		5,924.9988
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0369	0.3978	9.5000e-004	0.0894	8.0000e-004	0.0902	0.0237	7.4000e-004	0.0245		94.4461	94.4461	3.5500e-003		94.5349
Total	**0.7480**	**22.5333**	**5.3102**	**0.0557**	**1.2904**	**0.0869**	**1.3773**	**0.3529**	**0.0831**	**0.4360**		**6,008.6890**	**6,008.6890**	**0.4338**		**6,019.5337**

3.3 Building Construction - Parking Garage - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5322	5.2595	4.6734	6.2100e-003		0.3726	0.3726		0.3428	0.3428		625.5519	625.5519	0.1947		630.4205
Total	**0.5322**	**5.2595**	**4.6734**	**6.2100e-003**		**0.3726**	**0.3726**		**0.3428**	**0.3428**		**625.5519**	**625.5519**	**0.1947**		**630.4205**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1918	4.9134	1.4734	0.0103	0.2561	0.0351	0.2912	0.0737	0.0336	0.1073		1,096.5994	1,096.5994	0.0791		1,098.5775
Worker	0.6237	0.4709	5.0722	0.0121	1.1401	0.0102	1.1503	0.3024	9.3700e-003	0.3117		1,204.1875	1,204.1875	0.0453		1,205.3204
Total	**0.8155**	**5.3844**	**6.5455**	**0.0224**	**1.3962**	**0.0453**	**1.4415**	**0.3761**	**0.0430**	**0.4190**		**2,300.7869**	**2,300.7869**	**0.1244**		**2,303.8979**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5322	5.2595	4.6734	6.2100e-003		0.3726	0.3726		0.3428	0.3428	0.0000	625.5519	625.5519	0.1947		630.4205
Total	**0.5322**	**5.2595**	**4.6734**	**6.2100e-003**		**0.3726**	**0.3726**		**0.3428**	**0.3428**	**0.0000**	**625.5519**	**625.5519**	**0.1947**		**630.4205**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1918	4.9134	1.4734	0.0103	0.2561	0.0351	0.2912	0.0737	0.0336	0.1073		1,096.5994	1,096.5994	0.0791		1,098.5775
Worker	0.6237	0.4709	5.0722	0.0121	1.1401	0.0102	1.1503	0.3024	9.3700e-003	0.3117		1,204.1875	1,204.1875	0.0453		1,205.3204
Total	**0.8155**	**5.3844**	**6.5455**	**0.0224**	**1.3962**	**0.0453**	**1.4415**	**0.3761**	**0.0430**	**0.4190**		**2,300.7869**	**2,300.7869**	**0.1244**		**2,303.8979**

3.4 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8219	8.7605	7.3982	0.0114		0.4781	0.4781		0.4398	0.4398		1,147.0444	1,147.0444	0.3571		1,155.9716
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8219**	**8.7605**	**7.3982**	**0.0114**		**0.4781**	**0.4781**		**0.4398**	**0.4398**		**1,147.0444**	**1,147.0444**	**0.3571**		**1,155.9716**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.5900e-003	0.2457	0.0737	5.1000e-004	0.0128	1.7500e-003	0.0146	3.6900e-003	1.6800e-003	5.3700e-003		54.8300	54.8300	3.9600e-003		54.9289
Worker	0.0489	0.0369	0.3978	9.5000e-004	0.0894	8.0000e-004	0.0902	0.0237	7.4000e-004	0.0245		94.4461	94.4461	3.5500e-003		94.5349
Total	**0.0585**	**0.2826**	**0.4715**	**1.4600e-003**	**0.1022**	**2.5500e-003**	**0.1048**	**0.0274**	**2.4200e-003**	**0.0298**		**149.2761**	**149.2761**	**7.5100e-003**		**149.4638**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8219	8.7605	7.3982	0.0114		0.4781	0.4781		0.4398	0.4398	0.0000	1,147.0444	1,147.0444	0.3571		1,155.9716
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8219**	**8.7605**	**7.3982**	**0.0114**		**0.4781**	**0.4781**		**0.4398**	**0.4398**	**0.0000**	**1,147.0444**	**1,147.0444**	**0.3571**		**1,155.9716**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.5900e-003	0.2457	0.0737	5.1000e-004	0.0128	1.7500e-003	0.0146	3.6900e-003	1.6800e-003	5.3700e-003		54.8300	54.8300	3.9600e-003		54.9289
Worker	0.0489	0.0369	0.3978	9.5000e-004	0.0894	8.0000e-004	0.0902	0.0237	7.4000e-004	0.0245		94.4461	94.4461	3.5500e-003		94.5349
Total	**0.0585**	**0.2826**	**0.4715**	**1.4600e-003**	**0.1022**	**2.5500e-003**	**0.1048**	**0.0274**	**2.4200e-003**	**0.0298**		**149.2761**	**149.2761**	**7.5100e-003**		**149.4638**

3.5 Building Construction - Residential - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0052	9.1056	5.2434	8.6500e-003		0.5295	0.5295		0.4917	0.4917		846.7625	846.7625	0.2512		853.0427
Total	**1.0052**	**9.1056**	**5.2434**	**8.6500e-003**		**0.5295**	**0.5295**		**0.4917**	**0.4917**		**846.7625**	**846.7625**	**0.2512**		**853.0427**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1438	3.6851	1.1050	7.7200e-003	0.1921	0.0263	0.2184	0.0553	0.0252	0.0805		822.4496	822.4496	0.0593		823.9331
Worker	1.1129	0.8403	9.0503	0.0216	2.0343	0.0181	2.0525	0.5395	0.0167	0.5562		2,148.6483	2,148.6483	0.0809		2,150.6698
Total	**1.2567**	**4.5254**	**10.1553**	**0.0293**	**2.2264**	**0.0445**	**2.2709**	**0.5948**	**0.0419**	**0.6367**		**2,971.0978**	**2,971.0978**	**0.1402**		**2,974.6029**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0052	9.1056	5.2434	8.6500e-003		0.5295	0.5295		0.4917	0.4917	0.0000	846.7625	846.7625	0.2512		853.0427
Total	**1.0052**	**9.1056**	**5.2434**	**8.6500e-003**		**0.5295**	**0.5295**		**0.4917**	**0.4917**	**0.0000**	**846.7625**	**846.7625**	**0.2512**		**853.0427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1438	3.6851	1.1050	7.7200e-003	0.1921	0.0263	0.2184	0.0553	0.0252	0.0805		822.4496	822.4496	0.0593		823.9331
Worker	1.1129	0.8403	9.0503	0.0216	2.0343	0.0181	2.0525	0.5395	0.0167	0.5562		2,148.6483	2,148.6483	0.0809		2,150.6698
Total	**1.2567**	**4.5254**	**10.1553**	**0.0293**	**2.2264**	**0.0445**	**2.2709**	**0.5948**	**0.0419**	**0.6367**		**2,971.0978**	**2,971.0978**	**0.1402**		**2,974.6029**

3.5 Building Construction - Residential - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8905	8.1740	5.0118	8.6600e-003		0.4621	0.4621		0.4291	0.4291		834.7876	834.7876	0.2486		841.0036
Total	**0.8905**	**8.1740**	**5.0118**	**8.6600e-003**		**0.4621**	**0.4621**		**0.4291**	**0.4291**		**834.7876**	**834.7876**	**0.2486**		**841.0036**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1300	3.4765	1.0154	7.6300e-003	0.1921	0.0225	0.2146	0.0553	0.0215	0.0768		813.8313	813.8313	0.0572		815.2606
Worker	1.0079	0.7400	8.0531	0.0209	2.0343	0.0175	2.0519	0.5395	0.0162	0.5557		2,078.6781	2,078.6781	0.0715		2,080.4658
Total	**1.1379**	**4.2165**	**9.0685**	**0.0285**	**2.2264**	**0.0400**	**2.2664**	**0.5948**	**0.0377**	**0.6325**		**2,892.5094**	**2,892.5094**	**0.1287**		**2,895.7264**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8905	8.1740	5.0118	8.6600e-003		0.4621	0.4621		0.4291	0.4291	0.0000	834.7876	834.7876	0.2486		841.0036
Total	**0.8905**	**8.1740**	**5.0118**	**8.6600e-003**		**0.4621**	**0.4621**		**0.4291**	**0.4291**	**0.0000**	**834.7876**	**834.7876**	**0.2486**		**841.0036**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1300	3.4765	1.0154	7.6300e-003	0.1921	0.0225	0.2146	0.0553	0.0215	0.0768		813.8313	813.8313	0.0572		815.2606
Worker	1.0079	0.7400	8.0531	0.0209	2.0343	0.0175	2.0519	0.5395	0.0162	0.5557		2,078.6781	2,078.6781	0.0715		2,080.4658
Total	**1.1379**	**4.2165**	**9.0685**	**0.0285**	**2.2264**	**0.0400**	**2.2664**	**0.5948**	**0.0377**	**0.6325**		**2,892.5094**	**2,892.5094**	**0.1287**		**2,895.7264**

3.5 Building Construction - Residential - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7991	7.4243	4.8306	8.6600e-003		0.4035	0.4035		0.3747	0.3747		818.8928	818.8928	0.2466		825.0585
Total	**0.7991**	**7.4243**	**4.8306**	**8.6600e-003**		**0.4035**	**0.4035**		**0.3747**	**0.3747**		**818.8928**	**818.8928**	**0.2466**		**825.0585**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1115	3.1905	0.9222	7.5700e-003	0.1921	0.0153	0.2073	0.0553	0.0146	0.0699		808.3472	808.3472	0.0541		809.6985
Worker	0.9301	0.6597	7.2984	0.0202	2.0343	0.0170	2.0513	0.5395	0.0157	0.5552		2,015.5051	2,015.5051	0.0635		2,017.0933
Total	**1.0416**	**3.8502**	**8.2206**	**0.0278**	**2.2264**	**0.0323**	**2.2587**	**0.5948**	**0.0303**	**0.6251**		**2,823.8523**	**2,823.8523**	**0.1176**		**2,826.7918**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7991	7.4243	4.8306	8.6600e-003		0.4035	0.4035		0.3747	0.3747	0.0000	818.8928	818.8928	0.2466		825.0585
Total	**0.7991**	**7.4243**	**4.8306**	**8.6600e-003**		**0.4035**	**0.4035**		**0.3747**	**0.3747**	**0.0000**	**818.8928**	**818.8928**	**0.2466**		**825.0585**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1115	3.1905	0.9222	7.5700e-003	0.1921	0.0153	0.2073	0.0553	0.0146	0.0699		808.3472	808.3472	0.0541		809.6985
Worker	0.9301	0.6597	7.2984	0.0202	2.0343	0.0170	2.0513	0.5395	0.0157	0.5552		2,015.5051	2,015.5051	0.0635		2,017.0933
Total	**1.0416**	**3.8502**	**8.2206**	**0.0278**	**2.2264**	**0.0323**	**2.2587**	**0.5948**	**0.0303**	**0.6251**		**2,823.8523**	**2,823.8523**	**0.1176**		**2,826.7918**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	27.8245					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**27.8245**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4400e-003	0.2127	0.0615	5.0000e-004	0.0128	1.0200e-003	0.0138	3.6900e-003	9.7000e-004	4.6600e-003		53.8898	53.8898	3.6000e-003		53.9799
Worker	0.2964	0.2102	2.3259	6.4500e-003	0.6483	5.4200e-003	0.6537	0.1719	4.9900e-003	0.1769		642.3038	642.3038	0.0202		642.8100
Total	**0.3038**	**0.4229**	**2.3873**	**6.9500e-003**	**0.6611**	**6.4400e-003**	**0.6675**	**0.1756**	**5.9600e-003**	**0.1816**		**696.1936**	**696.1936**	**0.0238**		**696.7899**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	27.8245					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**27.8245**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4400e-003	0.2127	0.0615	5.0000e-004	0.0128	1.0200e-003	0.0138	3.6900e-003	9.7000e-004	4.6600e-003		53.8898	53.8898	3.6000e-003		53.9799
Worker	0.2964	0.2102	2.3259	6.4500e-003	0.6483	5.4200e-003	0.6537	0.1719	4.9900e-003	0.1769		642.3038	642.3038	0.0202		642.8100
Total	**0.3038**	**0.4229**	**2.3873**	**6.9500e-003**	**0.6611**	**6.4400e-003**	**0.6675**	**0.1756**	**5.9600e-003**	**0.1816**		**696.1936**	**696.1936**	**0.0238**		**696.7899**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.1921	15.4866	40.9509	0.1311	10.5698	0.1385	10.7083	2.8289	0.1299	2.9588		13,325.6507	13,325.6507	0.7660		13,344.8009
Unmitigated	3.3750	16.7660	45.3372	0.1477	11.9839	0.1555	12.1394	3.2074	0.1458	3.3532		15,010.4083	15,010.4083	0.8505		15,031.6718

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Apartments Mid Rise	1,649.20	1,584.72	1453.28	5,508,449	4,858,452
Enclosed Parking with Elevator	0.00	0.00	0.00		
Health Club	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
Total	1,649.20	1,584.72	1,453.28	5,508,449	4,858,452

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Health Club	16.60	8.40	6.90	16.90	64.10	19.00	52	39	9
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
User Defined Recreational	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Parking Lot	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
City Park	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Health Club	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
User Defined Recreational	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Apartments Mid Rise	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0874	0.7483	0.3260	4.7700e-003		0.0604	0.0604		0.0604	0.0604		953.8135	953.8135	0.0183	0.0175	959.4815
NaturalGas Unmitigated	0.1054	0.9021	0.3932	5.7500e-003		0.0728	0.0728		0.0728	0.0728		1,149.8308	1,149.8308	0.0220	0.0211	1,156.6637

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	9543.75	0.1029	0.8795	0.3743	5.6100e-003		0.0711	0.0711		0.0711	0.0711		1,122.7945	1,122.7945	0.0215	0.0206	1,129.4667
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	229.808	2.4800e-003	0.0225	0.0189	1.4000e-004		1.7100e-003	1.7100e-003		1.7100e-003	1.7100e-003		27.0363	27.0363	5.2000e-004	5.0000e-004	27.1969
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.1054**	**0.9021**	**0.3932**	**5.7500e-003**		**0.0728**	**0.0728**		**0.0728**	**0.0728**		**1,149.8308**	**1,149.8308**	**0.0220**	**0.0211**	**1,156.6637**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	7.9209	0.0854	0.7300	0.3106	4.6600e-003		0.0590	0.0590		0.0590	0.0590		931.8709	931.8709	0.0179	0.0171	937.4085
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	0.186512	2.0100e-003	0.0183	0.0154	1.1000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003		21.9426	21.9426	4.2000e-004	4.0000e-004	22.0730
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0874**	**0.7483**	**0.3260**	**4.7700e-003**		**0.0604**	**0.0604**		**0.0604**	**0.0604**		**953.8135**	**953.8135**	**0.0183**	**0.0175**	**959.4815**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.4860	0.1876	15.6255	7.0000e-004		0.0840	0.0840		0.0840	0.0840	0.0000	25.8469	25.8469	0.0189	0.0000	26.3187
Unmitigated	6.7839	0.2380	20.5870	1.0800e-003		0.1131	0.1131		0.1131	0.1131	0.0000	36.9659	36.9659	0.0363	0.0000	37.8724

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5031					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	5.6502					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.6306	0.2380	20.5870	1.0800e-003		0.1131	0.1131		0.1131	0.1131		36.9659	36.9659	0.0363		37.8724
Total	**6.7839**	**0.2380**	**20.5870**	**1.0800e-003**		**0.1131**	**0.1131**		**0.1131**	**0.1131**	**0.0000**	**36.9659**	**36.9659**	**0.0363**	**0.0000**	**37.8724**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5031					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	5.6502					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3327	0.1876	15.6255	7.0000e-004		0.0840	0.0840		0.0840	0.0840		25.8469	25.8469	0.0189		26.3187
Total	**6.4860**	**0.1876**	**15.6255**	**7.0000e-004**		**0.0840**	**0.0840**		**0.0840**	**0.0840**	**0.0000**	**25.8469**	**25.8469**	**0.0189**	**0.0000**	**26.3187**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Version: CalEEMod.2016.3.1 Date: 4/13/2017 2:43 PM

Solana Torrance Residential Development - Los Angeles-South Coast County, Summer

Solana Torrance Residential Development

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	499.00	Space	0.00	188,417.00	0
Parking Lot	47.00	Space	0.00	54,383.00	0
City Park	2.21	Acre	0.00	96,385.00	0
Health Club	4.00	1000sqft	0.00	4,000.00	0
User Defined Recreational	18.62	User Defined Unit	18.62	0.00	0
Apartments Mid Rise	248.00	Dwelling Unit	6.06	276,769.00	647

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	592.37	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Section 1.0 Project Characteristics. Operational year 2020. CO2 Intensity factor adjusted per 33% RPS by 2020.

Land Use - See 1.1 Land Usage. Apartments Mid Rise square footage includes residential floor area and building circulation. Health Club represents the leasing office and community room. Enclosed Parking with Elevator represents the numbers of parking spaces and total square footage of buildings A, B, C and D. Parking Lot represents the additional on-grade parking spaces and paved street/circulation area. City Park represents landscape area. User Defined Recreational represents preserved natural open space.

Construction Phase - See 3.0 Construction Detail.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions. Small portable air compressors (0.75 HP) used for architectural coating will be battery-operated.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Trips and VMT - See 3.0 Construction Detail. Default CalEEMod values for Grading, Paving, and Architectural Coating trips. Building Construction trips calculated using CalEEMod worker and vendor trip rates for proposed land uses.

On-road Fugitive Dust - Default CalEEMod values.

Demolition - No demolition would occur.

Grading - See 3.0 Construction Detail. 41,218 CY of export (91,387 CY cut - 21,633 CY fill = 69,754 CY - 18,232 CY remaining onsite = 51,522 CY * 20% shrink factor = 41,218 CY). 6.06 acres disturbed. Based on applicant-provided data.

Architectural Coating - Default CalEEMod values.

Vehicle Trips - Default CalEEMod rates and project-specific weekday trip rates (KHR Associates 2017) for Apartments Mid Rise are consistent. Health Club and City Park land uses will not generate trips as it represents onsite amenities.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Road Dust - Default CalEEMod values.

Woodstoves - No woodstoves. No fireplaces.

Consumer Products - Default CalEEMod values.

Area Coating - Default CalEEMod values.

Landscape Equipment - Default CalEEMod values.

Energy Use - Default CalEEMod values.

Water And Wastewater - 100% Aerobic. Default CalEEMod values for indoor and outdoor water use.

Solid Waste - Default CalEEMod values.

Construction Off-road Equipment Mitigation - Water Exposed Area, Frequency: 3 times per day.

Mobile Land Use Mitigation - Project Setting: Suburban Center. Increase Density: 10 dwelling units/acre. Improve Destination Accessibility: Distance to Job Center: 5 miles (job centers within 2-5 miles). Improve Pedestrian Network: Project Site and Connecting Off-Site.

Area Mitigation - Landscape Equipment: 100% electric.

Energy Mitigation - Project will meet 2016 Title 24 standards. 28% improvement above 2013 Title 24 standards. Install High Efficiency Lighting: 40% Lighting Energy Reduction. Energy Efficient Appliances: Condo/Townhouse: Clothes Washer, Dishwasher, Fan, and Refrigerator.

Water Mitigation - Apply Water Conservation Strategy: 20% reduction in indoor, 20% reduction in outdoor.

Waste Mitigation - Percent Reduction in Waste Disposed: 75%. Waste diversion consistent with Assembly Bill 341.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	NumDays	370.00	164.00
tblConstructionPhase	NumDays	370.00	390.00
tblConstructionPhase	NumDays	35.00	75.00
tblConstructionPhase	NumDays	20.00	44.00
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	210.80	0.00
tblFireplaces	NumberNoFireplace	24.80	0.00
tblFireplaces	NumberWood	12.40	0.00
tblGrading	AcresOfGrading	0.00	6.06
tblGrading	MaterialExported	0.00	41,218.00
tblLandUse	BuildingSpaceSquareFeet	199,600.00	188,417.00
tblLandUse	BuildingSpaceSquareFeet	18,800.00	54,383.00
tblLandUse	GreenSpaceSquareFeet	96,267.60	96,385.00
tblLandUse	LandUseSquareFeet	199,600.00	188,417.00
tblLandUse	LandUseSquareFeet	18,800.00	54,383.00
tblLandUse	LandUseSquareFeet	96,267.60	96,385.00
tblLandUse	LandUseSquareFeet	248,000.00	276,769.00

tblLandUse	LotAcreage	4.49	0.00
tblLandUse	LotAcreage	0.42	0.00
tblLandUse	LotAcreage	2.21	0.00
tblLandUse	LotAcreage	0.09	0.00
tblLandUse	LotAcreage	0.00	18.62
tblLandUse	LotAcreage	6.53	6.06
tblLandUse	Population	709.00	647.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	592.37
tblProjectCharacteristics	OperationalYear	2018	2020
tblTripsAndVMT	VendorTripNumber	83.00	40.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	83.00	30.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	323.00	102.00
tblTripsAndVMT	WorkerTripNumber	323.00	182.00
tblTripsAndVMT	WorkerTripNumber	65.00	58.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	32.93	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	12.40	0.00
tblWoodstoves	NumberNoncatalytic	12.40	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.1550	33.7424	19.4199	0.0733	2.2264	0.8979	2.7999	0.5948	0.8274	1.2309	0.0000	7,783.2161	7,783.2161	0.9371	0.0000	7,806.6440
2019	1.9244	12.3141	14.7084	0.0387	2.2264	0.5018	2.7282	0.5948	0.4665	1.0613	0.0000	3,878.8057	3,878.8057	0.3781	0.0000	3,888.2574
2020	29.8419	11.6140	16.2307	0.0453	2.8875	0.4419	3.3294	0.7704	0.4107	1.1811	0.0000	4,528.0427	4,528.0427	0.3897	0.0000	4,537.7856
Maximum	**29.8419**	**33.7424**	**19.4199**	**0.0733**	**2.8875**	**0.8979**	**3.3294**	**0.7704**	**0.8274**	**1.2309**	**0.0000**	**7,783.2161**	**7,783.2161**	**0.9371**	**0.0000**	**7,806.6440**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.1550	33.7424	19.4199	0.0733	2.2264	0.8979	2.7999	0.5948	0.8274	1.2309	0.0000	7,783.2161	7,783.2161	0.9371	0.0000	7,806.6440
2019	1.9244	12.3141	14.7084	0.0387	2.2264	0.5018	2.7282	0.5948	0.4665	1.0613	0.0000	3,878.8057	3,878.8057	0.3781	0.0000	3,888.2574
2020	29.8419	11.6140	16.2307	0.0453	2.8875	0.4419	3.3294	0.7704	0.4107	1.1811	0.0000	4,528.0427	4,528.0427	0.3897	0.0000	4,537.7856
Maximum	**29.8419**	**33.7424**	**19.4199**	**0.0733**	**2.8875**	**0.8979**	**3.3294**	**0.7704**	**0.8274**	**1.2309**	**0.0000**	**7,783.2161**	**7,783.2161**	**0.9371**	**0.0000**	**7,806.6440**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.7839	0.2380	20.5870	1.0800e-003		0.1131	0.1131		0.1131	0.1131	0.0000	36.9659	36.9659	0.0363	0.0000	37.8724
Energy	0.1054	0.9021	0.3932	5.7500e-003		0.0728	0.0728		0.0728	0.0728		1,149.8308	1,149.8308	0.0220	0.0211	1,156.6637
Mobile	3.4679	16.3043	47.7119	0.1553	11.9839	0.1547	12.1387	3.2074	0.1451	3.3525		15,777.9655	15,777.9655	0.8552		15,799.3463
Total	**10.3572**	**17.4443**	**68.6921**	**0.1622**	**11.9839**	**0.3407**	**12.3246**	**3.2074**	**0.3310**	**3.5384**	**0.0000**	**16,964.7622**	**16,964.7622**	**0.9135**	**0.0211**	**16,993.8823**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.4860	0.1876	15.6255	7.0000e-004		0.0840	0.0840		0.0840	0.0840	0.0000	25.8469	25.8469	0.0189	0.0000	26.3187
Energy	0.0874	0.7483	0.3260	4.7700e-003		0.0604	0.0604		0.0604	0.0604		953.8135	953.8135	0.0183	0.0175	959.4815
Mobile	3.2804	15.0958	42.8825	0.1379	10.5698	0.1377	10.7076	2.8289	0.1291	2.9581		14,011.2096	14,011.2096	0.7683		14,030.4177
Total	**9.8539**	**16.0316**	**58.8340**	**0.1434**	**10.5698**	**0.2821**	**10.8520**	**2.8289**	**0.2735**	**3.1025**	**0.0000**	**14,990.8699**	**14,990.8699**	**0.8055**	**0.0175**	**15,016.2178**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**4.86**	**8.10**	**14.35**	**11.58**	**11.80**	**17.18**	**11.95**	**11.80**	**17.36**	**12.32**	**0.00**	**11.64**	**11.64**	**11.83**	**17.03**	**11.64**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/16/2018	4/30/2018	5	75	
2	Building Construction - Parking Garage	Building Construction	5/1/2018	12/14/2018	5	164	
3	Paving	Paving	6/1/2018	8/1/2018	5	44	
4	Building Construction - Residential	Building Construction	12/16/2018	6/12/2020	5	390	
5	Architectural Coating	Architectural Coating	3/15/2020	6/15/2020	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.06

Acres of Paving: 0

Residential Indoor: 560,457; Residential Outdoor: 186,819; Non-Residential Indoor: 6,000; Non-Residential Outdoor: 2,000; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	0	8.00	187	0.41
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Loaders	1	8.00	203	0.36
Grading	Scrapers	0	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction - Parking Garage	Cranes	0	7.00	231	0.29
Building Construction - Parking Garage	Forklifts	0	8.00	89	0.20
Building Construction - Parking Garage	Generator Sets	0	8.00	84	0.74
Building Construction - Parking Garage	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction - Parking Garage	Welders	0	8.00	46	0.45
Paving	Pavers	1	8.00	130	0.42

Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38
Building Construction - Residential	Cranes	1	6.00	231	0.29
Building Construction - Residential	Forklifts	2	8.00	89	0.20
Building Construction - Residential	Generator Sets	0	8.00	84	0.74
Building Construction - Residential	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction - Residential	Welders	1	4.00	46	0.45
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	8.00	0.00	5,152.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Parking Garage	2	102.00	40.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Residential	4	182.00	30.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	0	58.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1478	0.0000	0.1478	0.0187	0.0000	0.0187			0.0000			0.0000
Off-Road	1.0081	11.5167	8.2868	0.0166		0.4809	0.4809		0.4424	0.4424		1,668.0326	1,668.0326	0.5193		1,681.0146
Total	**1.0081**	**11.5167**	**8.2868**	**0.0166**	**0.1478**	**0.4809**	**0.6287**	**0.0187**	**0.4424**	**0.4611**		**1,668.0326**	**1,668.0326**	**0.5193**		**1,681.0146**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6818	22.1924	4.5919	0.0557	1.2010	0.0844	1.2854	0.3292	0.0808	0.4100		6,014.8883	6,014.8883	0.4141		6,025.2402
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0442	0.0334	0.4321	1.0100e-003	0.0894	8.0000e-004	0.0902	0.0237	7.4000e-004	0.0245		100.2952	100.2952	3.7600e-003		100.3892
Total	**0.7260**	**22.2257**	**5.0240**	**0.0567**	**1.2904**	**0.0852**	**1.3756**	**0.3529**	**0.0815**	**0.4344**		**6,115.1835**	**6,115.1835**	**0.4178**		**6,125.6294**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0577	0.0000	0.0577	7.2800e-003	0.0000	7.2800e-003			0.0000			0.0000
Off-Road	1.0081	11.5167	8.2868	0.0166		0.4809	0.4809		0.4424	0.4424	0.0000	1,668.0326	1,668.0326	0.5193		1,681.0146
Total	**1.0081**	**11.5167**	**8.2868**	**0.0166**	**0.0577**	**0.4809**	**0.5386**	**7.2800e-003**	**0.4424**	**0.4497**	**0.0000**	**1,668.0326**	**1,668.0326**	**0.5193**		**1,681.0146**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6818	22.1924	4.5919	0.0557	1.2010	0.0844	1.2854	0.3292	0.0808	0.4100		6,014.8883	6,014.8883	0.4141		6,025.2402
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0442	0.0334	0.4321	1.0100e-003	0.0894	8.0000e-004	0.0902	0.0237	7.4000e-004	0.0245		100.2952	100.2952	3.7600e-003		100.3892
Total	**0.7260**	**22.2257**	**5.0240**	**0.0567**	**1.2904**	**0.0852**	**1.3756**	**0.3529**	**0.0815**	**0.4344**		**6,115.1835**	**6,115.1835**	**0.4178**		**6,125.6294**

3.3 Building Construction - Parking Garage - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5322	5.2595	4.6734	6.2100e-003		0.3726	0.3726		0.3428	0.3428		625.5519	625.5519	0.1947		630.4205
Total	**0.5322**	**5.2595**	**4.6734**	**6.2100e-003**		**0.3726**	**0.3726**		**0.3428**	**0.3428**		**625.5519**	**625.5519**	**0.1947**		**630.4205**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1840	4.9024	1.3404	0.0106	0.2561	0.0346	0.2906	0.0737	0.0331	0.1068		1,126.7177	1,126.7177	0.0742		1,128.5724
Worker	0.5635	0.4253	5.5088	0.0129	1.1401	0.0102	1.1503	0.3024	9.3700e-003	0.3117		1,278.7636	1,278.7636	0.0480		1,279.9627
Total	**0.7476**	**5.3277**	**6.8492**	**0.0234**	**1.3962**	**0.0447**	**1.4409**	**0.3761**	**0.0424**	**0.4185**		**2,405.4813**	**2,405.4813**	**0.1222**		**2,408.5351**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5322	5.2595	4.6734	6.2100e-003		0.3726	0.3726		0.3428	0.3428	0.0000	625.5519	625.5519	0.1947		630.4205
Total	**0.5322**	**5.2595**	**4.6734**	**6.2100e-003**		**0.3726**	**0.3726**		**0.3428**	**0.3428**	**0.0000**	**625.5519**	**625.5519**	**0.1947**		**630.4205**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1840	4.9024	1.3404	0.0106	0.2561	0.0346	0.2906	0.0737	0.0331	0.1068		1,126.7177	1,126.7177	0.0742		1,128.5724
Worker	0.5635	0.4253	5.5088	0.0129	1.1401	0.0102	1.1503	0.3024	9.3700e-003	0.3117		1,278.7636	1,278.7636	0.0480		1,279.9627
Total	**0.7476**	**5.3277**	**6.8492**	**0.0234**	**1.3962**	**0.0447**	**1.4409**	**0.3761**	**0.0424**	**0.4185**		**2,405.4813**	**2,405.4813**	**0.1222**		**2,408.5351**

3.4 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8219	8.7605	7.3982	0.0114		0.4781	0.4781		0.4398	0.4398		1,147.0444	1,147.0444	0.3571		1,155.9716
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8219**	**8.7605**	**7.3982**	**0.0114**		**0.4781**	**0.4781**		**0.4398**	**0.4398**		**1,147.0444**	**1,147.0444**	**0.3571**		**1,155.9716**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2000e-003	0.2451	0.0670	5.3000e-004	0.0128	1.7300e-003	0.0145	3.6900e-003	1.6500e-003	5.3400e-003		56.3359	56.3359	3.7100e-003		56.4286
Worker	0.0442	0.0334	0.4321	1.0100e-003	0.0894	8.0000e-004	0.0902	0.0237	7.4000e-004	0.0245		100.2952	100.2952	3.7600e-003		100.3892
Total	**0.0534**	**0.2785**	**0.4991**	**1.5400e-003**	**0.1022**	**2.5300e-003**	**0.1048**	**0.0274**	**2.3900e-003**	**0.0298**		**156.6311**	**156.6311**	**7.4700e-003**		**156.8179**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8219	8.7605	7.3982	0.0114		0.4781	0.4781		0.4398	0.4398	0.0000	1,147.0444	1,147.0444	0.3571		1,155.9716
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8219**	**8.7605**	**7.3982**	**0.0114**		**0.4781**	**0.4781**		**0.4398**	**0.4398**	**0.0000**	**1,147.0444**	**1,147.0444**	**0.3571**		**1,155.9716**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.2000e-003	0.2451	0.0670	5.3000e-004	0.0128	1.7300e-003	0.0145	3.6900e-003	1.6500e-003	5.3400e-003		56.3359	56.3359	3.7100e-003		56.4286
Worker	0.0442	0.0334	0.4321	1.0100e-003	0.0894	8.0000e-004	0.0902	0.0237	7.4000e-004	0.0245		100.2952	100.2952	3.7600e-003		100.3892
Total	**0.0534**	**0.2785**	**0.4991**	**1.5400e-003**	**0.1022**	**2.5300e-003**	**0.1048**	**0.0274**	**2.3900e-003**	**0.0298**		**156.6311**	**156.6311**	**7.4700e-003**		**156.8179**

3.5 Building Construction - Residential - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0052	9.1056	5.2434	8.6500e-003		0.5295	0.5295		0.4917	0.4917		846.7625	846.7625	0.2512		853.0427
Total	**1.0052**	**9.1056**	**5.2434**	**8.6500e-003**		**0.5295**	**0.5295**		**0.4917**	**0.4917**		**846.7625**	**846.7625**	**0.2512**		**853.0427**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1380	3.6768	1.0053	7.9300e-003	0.1921	0.0259	0.2180	0.0553	0.0248	0.0801		845.0383	845.0383	0.0556		846.4293
Worker	1.0055	0.7588	9.8294	0.0229	2.0343	0.0181	2.0525	0.5395	0.0167	0.5562		2,281.7155	2,281.7155	0.0856		2,283.8550
Total	**1.1435**	**4.4356**	**10.8346**	**0.0309**	**2.2264**	**0.0441**	**2.2704**	**0.5948**	**0.0415**	**0.6363**		**3,126.7537**	**3,126.7537**	**0.1412**		**3,130.2843**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0052	9.1056	5.2434	8.6500e-003		0.5295	0.5295		0.4917	0.4917	0.0000	846.7625	846.7625	0.2512		853.0427
Total	**1.0052**	**9.1056**	**5.2434**	**8.6500e-003**		**0.5295**	**0.5295**		**0.4917**	**0.4917**	**0.0000**	**846.7625**	**846.7625**	**0.2512**		**853.0427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1380	3.6768	1.0053	7.9300e-003	0.1921	0.0259	0.2180	0.0553	0.0248	0.0801		845.0383	845.0383	0.0556		846.4293
Worker	1.0055	0.7588	9.8294	0.0229	2.0343	0.0181	2.0525	0.5395	0.0167	0.5562		2,281.7155	2,281.7155	0.0856		2,283.8550
Total	**1.1435**	**4.4356**	**10.8346**	**0.0309**	**2.2264**	**0.0441**	**2.2704**	**0.5948**	**0.0415**	**0.6363**		**3,126.7537**	**3,126.7537**	**0.1412**		**3,130.2843**

3.5 Building Construction - Residential - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8905	8.1740	5.0118	8.6600e-003		0.4621	0.4621		0.4291	0.4291		834.7876	834.7876	0.2486		841.0036
Total	**0.8905**	**8.1740**	**5.0118**	**8.6600e-003**		**0.4621**	**0.4621**		**0.4291**	**0.4291**		**834.7876**	**834.7876**	**0.2486**		**841.0036**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1247	3.4719	0.9212	7.8400e-003	0.1921	0.0221	0.2142	0.0553	0.0212	0.0765		836.4439	836.4439	0.0536		837.7839
Worker	0.9092	0.6682	8.7754	0.0222	2.0343	0.0175	2.0519	0.5395	0.0162	0.5557		2,207.5743	2,207.5743	0.0758		2,209.4699
Total	**1.0339**	**4.1401**	**9.6966**	**0.0300**	**2.2264**	**0.0397**	**2.2661**	**0.5948**	**0.0373**	**0.6322**		**3,044.0181**	**3,044.0181**	**0.1294**		**3,047.2538**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8905	8.1740	5.0118	8.6600e-003		0.4621	0.4621		0.4291	0.4291	0.0000	834.7876	834.7876	0.2486		841.0036
Total	**0.8905**	**8.1740**	**5.0118**	**8.6600e-003**		**0.4621**	**0.4621**		**0.4291**	**0.4291**	**0.0000**	**834.7876**	**834.7876**	**0.2486**		**841.0036**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1247	3.4719	0.9212	7.8400e-003	0.1921	0.0221	0.2142	0.0553	0.0212	0.0765		836.4439	836.4439	0.0536		837.7839
Worker	0.9092	0.6682	8.7754	0.0222	2.0343	0.0175	2.0519	0.5395	0.0162	0.5557		2,207.5743	2,207.5743	0.0758		2,209.4699
Total	**1.0339**	**4.1401**	**9.6966**	**0.0300**	**2.2264**	**0.0397**	**2.2661**	**0.5948**	**0.0373**	**0.6322**		**3,044.0181**	**3,044.0181**	**0.1294**		**3,047.2538**

3.5 Building Construction - Residential - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7991	7.4243	4.8306	8.6600e-003		0.4035	0.4035		0.3747	0.3747		818.8928	818.8928	0.2466		825.0585
Total	**0.7991**	**7.4243**	**4.8306**	**8.6600e-003**		**0.4035**	**0.4035**		**0.3747**	**0.3747**		**818.8928**	**818.8928**	**0.2466**		**825.0585**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1067	3.1912	0.8361	7.7800e-003	0.1921	0.0150	0.2071	0.0553	0.0144	0.0697		831.0741	831.0741	0.0507		832.3420
Worker	0.8376	0.5959	7.9688	0.0215	2.0343	0.0170	2.0513	0.5395	0.0157	0.5552		2,140.5254	2,140.5254	0.0675		2,142.2126
Total	**0.9443**	**3.7870**	**8.8049**	**0.0293**	**2.2264**	**0.0320**	**2.2584**	**0.5948**	**0.0300**	**0.6248**		**2,971.5995**	**2,971.5995**	**0.1182**		**2,974.5545**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7991	7.4243	4.8306	8.6600e-003		0.4035	0.4035		0.3747	0.3747	0.0000	818.8928	818.8928	0.2466		825.0585
Total	**0.7991**	**7.4243**	**4.8306**	**8.6600e-003**		**0.4035**	**0.4035**		**0.3747**	**0.3747**	**0.0000**	**818.8928**	**818.8928**	**0.2466**		**825.0585**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1067	3.1912	0.8361	7.7800e-003	0.1921	0.0150	0.2071	0.0553	0.0144	0.0697		831.0741	831.0741	0.0507		832.3420
Worker	0.8376	0.5959	7.9688	0.0215	2.0343	0.0170	2.0513	0.5395	0.0157	0.5552		2,140.5254	2,140.5254	0.0675		2,142.2126
Total	**0.9443**	**3.7870**	**8.8049**	**0.0293**	**2.2264**	**0.0320**	**2.2584**	**0.5948**	**0.0300**	**0.6248**		**2,971.5995**	**2,971.5995**	**0.1182**		**2,974.5545**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	27.8245					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**27.8245**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.1100e-003	0.2127	0.0557	5.2000e-004	0.0128	1.0000e-003	0.0138	3.6900e-003	9.6000e-004	4.6400e-003		55.4049	55.4049	3.3800e-003		55.4895
Worker	0.2669	0.1899	2.5395	6.8500e-003	0.6483	5.4200e-003	0.6537	0.1719	4.9900e-003	0.1769		682.1455	682.1455	0.0215		682.6831
Total	**0.2740**	**0.4026**	**2.5952**	**7.3700e-003**	**0.6611**	**6.4200e-003**	**0.6675**	**0.1756**	**5.9500e-003**	**0.1816**		**737.5504**	**737.5504**	**0.0249**		**738.1726**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	27.8245					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**27.8245**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.1100e-003	0.2127	0.0557	5.2000e-004	0.0128	1.0000e-003	0.0138	3.6900e-003	9.6000e-004	4.6400e-003		55.4049	55.4049	3.3800e-003		55.4895
Worker	0.2669	0.1899	2.5395	6.8500e-003	0.6483	5.4200e-003	0.6537	0.1719	4.9900e-003	0.1769		682.1455	682.1455	0.0215		682.6831
Total	**0.2740**	**0.4026**	**2.5952**	**7.3700e-003**	**0.6611**	**6.4200e-003**	**0.6675**	**0.1756**	**5.9500e-003**	**0.1816**		**737.5504**	**737.5504**	**0.0249**		**738.1726**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.2804	15.0958	42.8825	0.1379	10.5698	0.1377	10.7076	2.8289	0.1291	2.9581		14,011.2096	14,011.2096	0.7683		14,030.4177
Unmitigated	3.4679	16.3043	47.7119	0.1553	11.9839	0.1547	12.1387	3.2074	0.1451	3.3525		15,777.9655	15,777.9655	0.8552		15,799.3463

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Apartments Mid Rise	1,649.20	1,584.72	1453.28	5,508,449	4,858,452
Enclosed Parking with Elevator	0.00	0.00	0.00		
Health Club	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
Total	1,649.20	1,584.72	1,453.28	5,508,449	4,858,452

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Health Club	16.60	8.40	6.90	16.90	64.10	19.00	52	39	9
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
User Defined Recreational	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Parking Lot	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
City Park	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Health Club	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
User Defined Recreational	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Apartments Mid Rise	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0874	0.7483	0.3260	4.7700e-003		0.0604	0.0604		0.0604	0.0604		953.8135	953.8135	0.0183	0.0175	959.4815
NaturalGas Unmitigated	0.1054	0.9021	0.3932	5.7500e-003		0.0728	0.0728		0.0728	0.0728		1,149.8308	1,149.8308	0.0220	0.0211	1,156.6637

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	9543.75	0.1029	0.8795	0.3743	5.6100e-003		0.0711	0.0711		0.0711	0.0711		1,122.7945	1,122.7945	0.0215	0.0206	1,129.4667
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	229.808	2.4800e-003	0.0225	0.0189	1.4000e-004		1.7100e-003	1.7100e-003		1.7100e-003	1.7100e-003		27.0363	27.0363	5.2000e-004	5.0000e-004	27.1969
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.1054**	**0.9021**	**0.3932**	**5.7500e-003**		**0.0728**	**0.0728**		**0.0728**	**0.0728**		**1,149.8308**	**1,149.8308**	**0.0220**	**0.0211**	**1,156.6637**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	7.9209	0.0854	0.7300	0.3106	4.6600e-003		0.0590	0.0590		0.0590	0.0590		931.8709	931.8709	0.0179	0.0171	937.4085
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	0.186512	2.0100e-003	0.0183	0.0154	1.1000e-004		1.3900e-003	1.3900e-003		1.3900e-003	1.3900e-003		21.9426	21.9426	4.2000e-004	4.0000e-004	22.0730
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0874**	**0.7483**	**0.3260**	**4.7700e-003**		**0.0604**	**0.0604**		**0.0604**	**0.0604**		**953.8135**	**953.8135**	**0.0183**	**0.0175**	**959.4815**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.4860	0.1876	15.6255	7.0000e-004		0.0840	0.0840		0.0840	0.0840	0.0000	25.8469	25.8469	0.0189	0.0000	26.3187
Unmitigated	6.7839	0.2380	20.5870	1.0800e-003		0.1131	0.1131		0.1131	0.1131	0.0000	36.9659	36.9659	0.0363	0.0000	37.8724

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5031					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	5.6502					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.6306	0.2380	20.5870	1.0800e-003		0.1131	0.1131		0.1131	0.1131		36.9659	36.9659	0.0363		37.8724
Total	**6.7839**	**0.2380**	**20.5870**	**1.0800e-003**		**0.1131**	**0.1131**		**0.1131**	**0.1131**	**0.0000**	**36.9659**	**36.9659**	**0.0363**	**0.0000**	**37.8724**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.5031					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	5.6502					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3327	0.1876	15.6255	7.0000e-004		0.0840	0.0840		0.0840	0.0840		25.8469	25.8469	0.0189		26.3187
Total	**6.4860**	**0.1876**	**15.6255**	**7.0000e-004**		**0.0840**	**0.0840**		**0.0840**	**0.0840**	**0.0000**	**25.8469**	**25.8469**	**0.0189**	**0.0000**	**26.3187**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Version: CalEEMod.2016.3.1 Date: 4/13/2017 2:41 PM

Solana Torrance Residential Development - Los Angeles-South Coast County, Annual

Solana Torrance Residential Development

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	499.00	Space	0.00	188,417.00	0
Parking Lot	47.00	Space	0.00	54,383.00	0
City Park	2.21	Acre	0.00	96,385.00	0
Health Club	4.00	1000sqft	0.00	4,000.00	0
User Defined Recreational	18.62	User Defined Unit	18.62	0.00	0
Apartments Mid Rise	248.00	Dwelling Unit	6.06	276,769.00	647

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	592.37	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Section 1.0 Project Characteristics. Operational year 2020. CO2 Intensity factor adjusted per 33% RPS by 2020.

Land Use - See 1.1 Land Usage. Apartments Mid Rise square footage includes residential floor area and building circulation. Health Club represents the leasing office and community room. Enclosed Parking with Elevator represents the numbers of parking spaces and total square footage of buildings A, B, C and D. Parking Lot represents the additional on-grade parking spaces and paved street/circulation area. City Park represents landscape area. User Defined Recreational represents preserved natural open space.

Construction Phase - See 3.0 Construction Detail.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions. Small portable air compressors (0.75 HP) used for architectural coating will be battery-operated.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Off-road Equipment - See 3.0 Construction Detail. Based on applicant-provided construction equipment assumptions.

Trips and VMT - See 3.0 Construction Detail. Default CalEEMod values for Grading, Paving, and Architectural Coating trips. Building Construction trips calculated using CalEEMod worker and vendor trip rates for proposed land uses.

On-road Fugitive Dust - Default CalEEMod values.

Demolition - No demolition would occur.

Grading - See 3.0 Construction Detail. 41,218 CY of export (91,387 CY cut - 21,633 CY fill = 69,754 CY - 18,232 CY remaining onsite = 51,522 CY * 20% shrink factor = 41,218 CY). 6.06 acres disturbed. Based on applicant-provided data.

Architectural Coating - Default CalEEMod values.

Vehicle Trips - Default CalEEMod rates and project-specific weekday trip rates (KHR Associates 2017) for Apartments Mid Rise are consistent. Health Club and City Park land uses will not generate trips as it represents onsite amenities.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Vehicle Emission Factors - Default CalEEMod emission factors for 2020.

Road Dust - Default CalEEMod values.

Woodstoves - No woodstoves. No fireplaces.

Consumer Products - Default CalEEMod values.

Area Coating - Default CalEEMod values.

Landscape Equipment - Default CalEEMod values.

Energy Use - Default CalEEMod values.

Water And Wastewater - 100% Aerobic. Default CalEEMod values for indoor and outdoor water use.

Solid Waste - Default CalEEMod values.

Construction Off-road Equipment Mitigation - Water Exposed Area, Frequency: 3 times per day.

Mobile Land Use Mitigation - Project Setting: Suburban Center. Increase Density: 10 dwelling units/acre. Improve Destination Accessibility: Distance to Job Center: 5 miles (job centers within 2-5 miles). Improve Pedestrian Network: Project Site and Connecting Off-Site.

Area Mitigation - Landscape Equipment: 100% electric.

Energy Mitigation - Project will meet 2016 Title 24 standards. 28% improvement above 2013 Title 24 standards. Install High Efficiency Lighting: 40% Lighting Energy Reduction. Energy Efficient Appliances: Condo/Townhouse: Clothes Washer, Dishwasher, Fan, and Refrigerator.

Water Mitigation - Apply Water Conservation Strategy: 20% reduction in indoor, 20% reduction in outdoor.

Waste Mitigation - Percent Reduction in Waste Disposed: 75%. Waste diversion consistent with Assembly Bill 341.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	NumDays	370.00	164.00
tblConstructionPhase	NumDays	370.00	390.00
tblConstructionPhase	NumDays	35.00	75.00
tblConstructionPhase	NumDays	20.00	44.00
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	210.80	0.00
tblFireplaces	NumberNoFireplace	24.80	0.00
tblFireplaces	NumberWood	12.40	0.00
tblGrading	AcresOfGrading	0.00	6.06
tblGrading	MaterialExported	0.00	41,218.00
tblLandUse	BuildingSpaceSquareFeet	199,600.00	188,417.00
tblLandUse	BuildingSpaceSquareFeet	18,800.00	54,383.00
tblLandUse	GreenSpaceSquareFeet	96,267.60	96,385.00
tblLandUse	LandUseSquareFeet	199,600.00	188,417.00
tblLandUse	LandUseSquareFeet	18,800.00	54,383.00
tblLandUse	LandUseSquareFeet	96,267.60	96,385.00
tblLandUse	LandUseSquareFeet	248,000.00	276,769.00

tblLandUse	LotAcreage	4.49	0.00
tblLandUse	LotAcreage	0.42	0.00
tblLandUse	LotAcreage	2.21	0.00
tblLandUse	LotAcreage	0.09	0.00
tblLandUse	LotAcreage	0.00	18.62
tblLandUse	LotAcreage	6.53	6.06
tblLandUse	Population	709.00	647.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00

tblProjectCharacteristics	CO2IntensityFactor	702.44	592.37
tblProjectCharacteristics	OperationalYear	2018	2020
tblTripsAndVMT	VendorTripNumber	83.00	40.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	83.00	30.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	323.00	102.00
tblTripsAndVMT	WorkerTripNumber	323.00	182.00
tblTripsAndVMT	WorkerTripNumber	65.00	58.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	32.93	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	12.40	0.00
tblWoodstoves	NumberNoncatalytic	12.40	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2018	2.4499	1.6876	5.6000e-003	0.1796	0.0692	0.2489	0.0478	0.0639	0.1118	0.0000	528.8861	528.8861	0.0649	0.0000	530.5096
2019	0.2518	1.6283	1.8588	4.9100e-003	0.2849	0.0655	0.3504	0.0762	0.0609	0.1371	0.0000	446.9117	446.9117	0.0446	0.0000	448.0260
2020	1.0304	0.6841	0.8597	2.4100e-003	0.1502	0.0259	0.1761	0.0402	0.0241	0.0642	0.0000	218.6627	218.6627	0.0202	0.0000	219.1669
Maximum	**1.0304**	**2.4499**	**1.8588**	**5.6000e-003**	**0.2849**	**0.0692**	**0.3504**	**0.0762**	**0.0639**	**0.1371**	**0.0000**	**528.8861**	**528.8861**	**0.0649**	**0.0000**	**530.5096**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2018	2.4499	1.6876	5.6000e-003	0.1762	0.0692	0.2455	0.0474	0.0639	0.1114	0.0000	528.8860	528.8860	0.0649	0.0000	530.5094
2019	0.2518	1.6283	1.8588	4.9100e-003	0.2849	0.0655	0.3504	0.0762	0.0609	0.1371	0.0000	446.9116	446.9116	0.0446	0.0000	448.0259
2020	1.0304	0.6841	0.8597	2.4100e-003	0.1502	0.0259	0.1761	0.0402	0.0241	0.0642	0.0000	218.6626	218.6626	0.0202	0.0000	219.1669
Maximum	**1.0304**	**2.4499**	**1.8588**	**5.6000e-003**	**0.2849**	**0.0692**	**0.3504**	**0.0762**	**0.0639**	**0.1371**	**0.0000**	**528.8860**	**528.8860**	**0.0649**	**0.0000**	**530.5094**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.55**	**0.00**	**0.44**	**0.26**	**0.00**	**0.14**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-2-2018	4-1-2018	0.9718	0.9718
2	4-2-2018	7-1-2018	0.7400	0.7400
3	7-2-2018	10-1-2018	0.4997	0.4997
4	10-2-2018	1-1-2019	0.4129	0.4129
5	1-2-2019	4-1-2019	0.4634	0.4634
6	4-2-2019	7-1-2019	0.4627	0.4627
7	7-2-2019	10-1-2019	0.4679	0.4679
8	10-2-2019	1-1-2020	0.4733	0.4733
9	1-2-2020	4-1-2020	0.6097	0.6097
10	4-2-2020	7-1-2020	1.0965	1.0965
		Highest	1.0965	1.0965

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.2018	0.0298	2.5734	1.4000e-004		0.0141	0.0141		0.0141	0.0141	0.0000	4.1919	4.1919	4.1100e-003	0.0000	4.2947
Energy	0.0192	0.1646	0.0718	1.0500e-003		0.0133	0.0133		0.0133	0.0133	0.0000	835.6176	835.6176	0.0352	0.0100	839.4861
Mobile	0.5867	3.0391	8.1812	0.0266	2.0907	0.0276	2.1183	0.5605	0.0258	0.5863	0.0000	2,456.3803	2,456.3803	0.1369	0.0000	2,459.8019
Waste						0.0000	0.0000		0.0000	0.0000	27.8240	0.0000	27.8240	1.6444	0.0000	68.9327
Water						0.0000	0.0000		0.0000	0.0000	5.8005	96.0626	101.8631	0.0247	0.0136	106.5287
Total	**1.8078**	**3.2335**	**10.8263**	**0.0278**	**2.0907**	**0.0550**	**2.1457**	**0.5605**	**0.0533**	**0.6138**	**33.6245**	**3,392.2523**	**3,425.8767**	**1.8452**	**0.0236**	**3,479.0441**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1646	0.0235	1.9532	9.0000e-005		0.0105	0.0105		0.0105	0.0105	0.0000	2.9310	2.9310	2.1400e-003	0.0000	2.9845
Energy	0.0160	0.1366	0.0595	8.7000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	663.1606	663.1606	0.0278	8.0100e-003	666.2424
Mobile	0.5539	2.8069	7.3801	0.0237	1.8440	0.0245	1.8686	0.4943	0.0230	0.5173	0.0000	2,181.2673	2,181.2673	0.1231	0.0000	2,184.3458
Waste						0.0000	0.0000		0.0000	0.0000	6.9560	0.0000	6.9560	0.4111	0.0000	17.2332
Water						0.0000	0.0000		0.0000	0.0000	4.6404	76.8501	81.4905	0.0197	0.0109	85.2230
Total	**1.7344**	**2.9669**	**9.3928**	**0.0246**	**1.8440**	**0.0461**	**1.8901**	**0.4943**	**0.0445**	**0.5389**	**11.5964**	**2,924.2089**	**2,935.8053**	**0.5839**	**0.0189**	**2,956.0288**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**4.06**	**8.25**	**13.24**	**11.53**	**11.80**	**16.24**	**11.91**	**11.80**	**16.43**	**12.20**	**65.51**	**13.80**	**14.30**	**68.36**	**20.07**	**15.03**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/16/2018	4/30/2018	5	75	
2	Building Construction - Parking Garage	Building Construction	5/1/2018	12/14/2018	5	164	
3	Paving	Paving	6/1/2018	8/1/2018	5	44	
4	Building Construction - Residential	Building Construction	12/16/2018	6/12/2020	5	390	
5	Architectural Coating	Architectural Coating	3/15/2020	6/15/2020	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.06

Acres of Paving: 0

Residential Indoor: 560,457; Residential Outdoor: 186,819; Non-Residential Indoor: 6,000; Non-Residential Outdoor: 2,000; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	0	8.00	187	0.41
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Loaders	1	8.00	203	0.36
Grading	Scrapers	0	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction - Parking Garage	Cranes	0	7.00	231	0.29
Building Construction - Parking Garage	Forklifts	0	8.00	89	0.20
Building Construction - Parking Garage	Generator Sets	0	8.00	84	0.74
Building Construction - Parking Garage	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction - Parking Garage	Welders	0	8.00	46	0.45

Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38
Building Construction - Residential	Cranes	1	6.00	231	0.29
Building Construction - Residential	Forklifts	2	8.00	89	0.20
Building Construction - Residential	Generator Sets	0	8.00	84	0.74
Building Construction - Residential	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction - Residential	Welders	1	4.00	46	0.45
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	8.00	0.00	5,152.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Parking Garage	2	102.00	40.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Residential	4	182.00	30.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	0	58.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.5400e-003	0.0000	5.5400e-003	7.0000e-004	0.0000	7.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0378	0.4319	0.3108	6.2000e-004		0.0180	0.0180		0.0166	0.0166	0.0000	56.7455	56.7455	0.0177	0.0000	57.1872
Total	**0.0378**	**0.4319**	**0.3108**	**6.2000e-004**	**5.5400e-003**	**0.0180**	**0.0236**	**7.0000e-004**	**0.0166**	**0.0173**	**0.0000**	**56.7455**	**56.7455**	**0.0177**	**0.0000**	**57.1872**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0258	0.8603	0.1775	2.0700e-003	0.0443	3.1900e-003	0.0475	0.0122	3.0500e-003	0.0152	0.0000	203.1850	203.1850	0.0143	0.0000	203.5433
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6600e-003	1.4200e-003	0.0153	4.0000e-005	3.2900e-003	3.0000e-005	3.3200e-003	8.7000e-004	3.0000e-005	9.0000e-004	0.0000	3.2664	3.2664	1.2000e-004	0.0000	3.2695
Total	**0.0275**	**0.8617**	**0.1927**	**2.1100e-003**	**0.0476**	**3.2200e-003**	**0.0508**	**0.0130**	**3.0800e-003**	**0.0161**	**0.0000**	**206.4514**	**206.4514**	**0.0145**	**0.0000**	**206.8127**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1600e-003	0.0000	2.1600e-003	2.7000e-004	0.0000	2.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0378	0.4319	0.3108	6.2000e-004		0.0180	0.0180		0.0166	0.0166	0.0000	56.7455	56.7455	0.0177	0.0000	57.1871
Total	**0.0378**	**0.4319**	**0.3108**	**6.2000e-004**	**2.1600e-003**	**0.0180**	**0.0202**	**2.7000e-004**	**0.0166**	**0.0169**	**0.0000**	**56.7455**	**56.7455**	**0.0177**	**0.0000**	**57.1871**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0258	0.8603	0.1775	2.0700e-003	0.0443	3.1900e-003	0.0475	0.0122	3.0500e-003	0.0152	0.0000	203.1850	203.1850	0.0143	0.0000	203.5433
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6600e-003	1.4200e-003	0.0153	4.0000e-005	3.2900e-003	3.0000e-005	3.3200e-003	8.7000e-004	3.0000e-005	9.0000e-004	0.0000	3.2664	3.2664	1.2000e-004	0.0000	3.2695
Total	**0.0275**	**0.8617**	**0.1927**	**2.1100e-003**	**0.0476**	**3.2200e-003**	**0.0508**	**0.0130**	**3.0800e-003**	**0.0161**	**0.0000**	**206.4514**	**206.4514**	**0.0145**	**0.0000**	**206.8127**

3.3 Building Construction - Parking Garage - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0436	0.4313	0.3832	5.1000e-004		0.0306	0.0306		0.0281	0.0281	0.0000	46.5343	46.5343	0.0145	0.0000	46.8964
Total	**0.0436**	**0.4313**	**0.3832**	**5.1000e-004**		**0.0306**	**0.0306**		**0.0281**	**0.0281**	**0.0000**	**46.5343**	**46.5343**	**0.0145**	**0.0000**	**46.8964**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0154	0.4108	0.1155	8.6000e-004	0.0207	2.8500e-003	0.0235	5.9600e-003	2.7300e-003	8.6900e-003	0.0000	82.8746	82.8746	5.6800e-003	0.0000	83.0167
Worker	0.0464	0.0397	0.4264	1.0100e-003	0.0917	8.3000e-004	0.0925	0.0243	7.7000e-004	0.0251	0.0000	91.0668	91.0668	3.4200e-003	0.0000	91.1524
Total	**0.0617**	**0.4504**	**0.5419**	**1.8700e-003**	**0.1123**	**3.6800e-003**	**0.1160**	**0.0303**	**3.5000e-003**	**0.0338**	**0.0000**	**173.9414**	**173.9414**	**9.1000e-003**	**0.0000**	**174.1691**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0436	0.4313	0.3832	5.1000e-004		0.0306	0.0306		0.0281	0.0281	0.0000	46.5342	46.5342	0.0145	0.0000	46.8964
Total	**0.0436**	**0.4313**	**0.3832**	**5.1000e-004**		**0.0306**	**0.0306**		**0.0281**	**0.0281**	**0.0000**	**46.5342**	**46.5342**	**0.0145**	**0.0000**	**46.8964**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0154	0.4108	0.1155	8.6000e-004	0.0207	2.8500e-003	0.0235	5.9600e-003	2.7300e-003	8.6900e-003	0.0000	82.8746	82.8746	5.6800e-003	0.0000	83.0167
Worker	0.0464	0.0397	0.4264	1.0100e-003	0.0917	8.3000e-004	0.0925	0.0243	7.7000e-004	0.0251	0.0000	91.0668	91.0668	3.4200e-003	0.0000	91.1524
Total	**0.0617**	**0.4504**	**0.5419**	**1.8700e-003**	**0.1123**	**3.6800e-003**	**0.1160**	**0.0303**	**3.5000e-003**	**0.0338**	**0.0000**	**173.9414**	**173.9414**	**9.1000e-003**	**0.0000**	**174.1691**

3.4 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0181	0.1927	0.1628	2.5000e-004		0.0105	0.0105		9.6800e-003	9.6800e-003	0.0000	22.8928	22.8928	7.1300e-003	0.0000	23.0710
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0181**	**0.1927**	**0.1628**	**2.5000e-004**		**0.0105**	**0.0105**		**9.6800e-003**	**9.6800e-003**	**0.0000**	**22.8928**	**22.8928**	**7.1300e-003**	**0.0000**	**23.0710**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.1000e-004	5.5100e-003	1.5500e-003	1.0000e-005	2.8000e-004	4.0000e-005	3.2000e-004	8.0000e-005	4.0000e-005	1.2000e-004	0.0000	1.1117	1.1117	8.0000e-005	0.0000	1.1136
Worker	9.8000e-004	8.3000e-004	8.9700e-003	2.0000e-005	1.9300e-003	2.0000e-005	1.9500e-003	5.1000e-004	2.0000e-005	5.3000e-004	0.0000	1.9163	1.9163	7.0000e-005	0.0000	1.9181
Total	**1.1900e-003**	**6.3400e-003**	**0.0105**	**3.0000e-005**	**2.2100e-003**	**6.0000e-005**	**2.2700e-003**	**5.9000e-004**	**6.0000e-005**	**6.5000e-004**	**0.0000**	**3.0280**	**3.0280**	**1.5000e-004**	**0.0000**	**3.0317**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0181	0.1927	0.1628	2.5000e-004		0.0105	0.0105		9.6800e-003	9.6800e-003	0.0000	22.8928	22.8928	7.1300e-003	0.0000	23.0709
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0181**	**0.1927**	**0.1628**	**2.5000e-004**		**0.0105**	**0.0105**		**9.6800e-003**	**9.6800e-003**	**0.0000**	**22.8928**	**22.8928**	**7.1300e-003**	**0.0000**	**23.0709**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.1000e-004	5.5100e-003	1.5500e-003	1.0000e-005	2.8000e-004	4.0000e-005	3.2000e-004	8.0000e-005	4.0000e-005	1.2000e-004	0.0000	1.1117	1.1117	8.0000e-005	0.0000	1.1136
Worker	9.8000e-004	8.3000e-004	8.9700e-003	2.0000e-005	1.9300e-003	2.0000e-005	1.9500e-003	5.1000e-004	2.0000e-005	5.3000e-004	0.0000	1.9163	1.9163	7.0000e-005	0.0000	1.9181
Total	**1.1900e-003**	**6.3400e-003**	**0.0105**	**3.0000e-005**	**2.2100e-003**	**6.0000e-005**	**2.2700e-003**	**5.9000e-004**	**6.0000e-005**	**6.5000e-004**	**0.0000**	**3.0280**	**3.0280**	**1.5000e-004**	**0.0000**	**3.0317**

3.5 Building Construction - Residential - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.5300e-003	0.0501	0.0288	5.0000e-005		2.9100e-003	2.9100e-003		2.7000e-003	2.7000e-003	0.0000	4.2249	4.2249	1.2500e-003	0.0000	4.2563
Total	**5.5300e-003**	**0.0501**	**0.0288**	**5.0000e-005**		**2.9100e-003**	**2.9100e-003**		**2.7000e-003**	**2.7000e-003**	**0.0000**	**4.2249**	**4.2249**	**1.2500e-003**	**0.0000**	**4.2563**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.7000e-004	0.0207	5.8100e-003	4.0000e-005	1.0400e-003	1.4000e-004	1.1800e-003	3.0000e-004	1.4000e-004	4.4000e-004	0.0000	4.1690	4.1690	2.9000e-004	0.0000	4.1761
Worker	5.5500e-003	4.7400e-003	0.0510	1.2000e-004	0.0110	1.0000e-004	0.0111	2.9100e-003	9.0000e-005	3.0100e-003	0.0000	10.8988	10.8988	4.1000e-004	0.0000	10.9091
Total	**6.3200e-003**	**0.0254**	**0.0568**	**1.6000e-004**	**0.0120**	**2.4000e-004**	**0.0123**	**3.2100e-003**	**2.3000e-004**	**3.4500e-003**	**0.0000**	**15.0678**	**15.0678**	**7.0000e-004**	**0.0000**	**15.0852**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.5300e-003	0.0501	0.0288	5.0000e-005		2.9100e-003	2.9100e-003		2.7000e-003	2.7000e-003	0.0000	4.2249	4.2249	1.2500e-003	0.0000	4.2563
Total	**5.5300e-003**	**0.0501**	**0.0288**	**5.0000e-005**		**2.9100e-003**	**2.9100e-003**		**2.7000e-003**	**2.7000e-003**	**0.0000**	**4.2249**	**4.2249**	**1.2500e-003**	**0.0000**	**4.2563**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.7000e-004	0.0207	5.8100e-003	4.0000e-005	1.0400e-003	1.4000e-004	1.1800e-003	3.0000e-004	1.4000e-004	4.4000e-004	0.0000	4.1690	4.1690	2.9000e-004	0.0000	4.1761
Worker	5.5500e-003	4.7400e-003	0.0510	1.2000e-004	0.0110	1.0000e-004	0.0111	2.9100e-003	9.0000e-005	3.0100e-003	0.0000	10.8988	10.8988	4.1000e-004	0.0000	10.9091
Total	**6.3200e-003**	**0.0254**	**0.0568**	**1.6000e-004**	**0.0120**	**2.4000e-004**	**0.0123**	**3.2100e-003**	**2.3000e-004**	**3.4500e-003**	**0.0000**	**15.0678**	**15.0678**	**7.0000e-004**	**0.0000**	**15.0852**

3.5 Building Construction - Residential - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1162	1.0667	0.6540	1.1300e-003		0.0603	0.0603		0.0560	0.0560	0.0000	98.8285	98.8285	0.0294	0.0000	99.5644
Total	**0.1162**	**1.0667**	**0.6540**	**1.1300e-003**		**0.0603**	**0.0603**		**0.0560**	**0.0560**	**0.0000**	**98.8285**	**98.8285**	**0.0294**	**0.0000**	**99.5644**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0166	0.4624	0.1265	1.0100e-003	0.0247	2.9100e-003	0.0276	7.1200e-003	2.7800e-003	9.9000e-003	0.0000	97.9003	97.9003	6.5300e-003	0.0000	98.0636
Worker	0.1190	0.0992	1.0783	2.7700e-003	0.2603	2.2900e-003	0.2626	0.0691	2.1100e-003	0.0712	0.0000	250.1829	250.1829	8.6000e-003	0.0000	250.3980
Total	**0.1355**	**0.5616**	**1.2048**	**3.7800e-003**	**0.2849**	**5.2000e-003**	**0.2901**	**0.0763**	**4.8900e-003**	**0.0811**	**0.0000**	**348.0832**	**348.0832**	**0.0151**	**0.0000**	**348.4616**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1162	1.0667	0.6540	1.1300e-003		0.0603	0.0603		0.0560	0.0560	0.0000	98.8284	98.8284	0.0294	0.0000	99.5643
Total	**0.1162**	**1.0667**	**0.6540**	**1.1300e-003**		**0.0603**	**0.0603**		**0.0560**	**0.0560**	**0.0000**	**98.8284**	**98.8284**	**0.0294**	**0.0000**	**99.5643**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0166	0.4624	0.1265	1.0100e-003	0.0247	2.9100e-003	0.0276	7.1200e-003	2.7800e-003	9.9000e-003	0.0000	97.9003	97.9003	6.5300e-003	0.0000	98.0636
Worker	0.1190	0.0992	1.0783	2.7700e-003	0.2603	2.2900e-003	0.2626	0.0691	2.1100e-003	0.0712	0.0000	250.1829	250.1829	8.6000e-003	0.0000	250.3980
Total	**0.1355**	**0.5616**	**1.2048**	**3.7800e-003**	**0.2849**	**5.2000e-003**	**0.2901**	**0.0763**	**4.8900e-003**	**0.0811**	**0.0000**	**348.0832**	**348.0832**	**0.0151**	**0.0000**	**348.4616**

3.5 Building Construction - Residential - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0472	0.4380	0.2850	5.1000e-004		0.0238	0.0238		0.0221	0.0221	0.0000	43.8303	43.8303	0.0132	0.0000	44.1604
Total	**0.0472**	**0.4380**	**0.2850**	**5.1000e-004**		**0.0238**	**0.0238**		**0.0221**	**0.0221**	**0.0000**	**43.8303**	**43.8303**	**0.0132**	**0.0000**	**44.1604**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4200e-003	0.1918	0.0519	4.5000e-004	0.0112	8.9000e-004	0.0120	3.2200e-003	8.5000e-004	4.0700e-003	0.0000	43.9714	43.9714	2.7900e-003	0.0000	44.0413
Worker	0.0496	0.0400	0.4420	1.2100e-003	0.1177	1.0000e-003	0.1187	0.0313	9.2000e-004	0.0322	0.0000	109.6726	109.6726	3.4600e-003	0.0000	109.7590
Total	**0.0560**	**0.2318**	**0.4939**	**1.6600e-003**	**0.1288**	**1.8900e-003**	**0.1307**	**0.0345**	**1.7700e-003**	**0.0363**	**0.0000**	**153.6441**	**153.6441**	**6.2500e-003**	**0.0000**	**153.8003**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0472	0.4380	0.2850	5.1000e-004		0.0238	0.0238		0.0221	0.0221	0.0000	43.8303	43.8303	0.0132	0.0000	44.1603
Total	**0.0472**	**0.4380**	**0.2850**	**5.1000e-004**		**0.0238**	**0.0238**		**0.0221**	**0.0221**	**0.0000**	**43.8303**	**43.8303**	**0.0132**	**0.0000**	**44.1603**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4200e-003	0.1918	0.0519	4.5000e-004	0.0112	8.9000e-004	0.0120	3.2200e-003	8.5000e-004	4.0700e-003	0.0000	43.9714	43.9714	2.7900e-003	0.0000	44.0413
Worker	0.0496	0.0400	0.4420	1.2100e-003	0.1177	1.0000e-003	0.1187	0.0313	9.2000e-004	0.0322	0.0000	109.6726	109.6726	3.4600e-003	0.0000	109.7590
Total	**0.0560**	**0.2318**	**0.4939**	**1.6600e-003**	**0.1288**	**1.8900e-003**	**0.1307**	**0.0345**	**1.7700e-003**	**0.0363**	**0.0000**	**153.6441**	**153.6441**	**6.2500e-003**	**0.0000**	**153.8003**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9182					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.9182**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4000e-004	7.1500e-003	1.9400e-003	2.0000e-005	4.2000e-004	3.0000e-005	4.5000e-004	1.2000e-004	3.0000e-005	1.5000e-004	0.0000	1.6396	1.6396	1.0000e-004	0.0000	1.6422
Worker	8.8400e-003	7.1200e-003	0.0788	2.2000e-004	0.0210	1.8000e-004	0.0212	5.5700e-003	1.6000e-004	5.7400e-003	0.0000	19.5487	19.5487	6.2000e-004	0.0000	19.5641
Total	**9.0800e-003**	**0.0143**	**0.0807**	**2.4000e-004**	**0.0214**	**2.1000e-004**	**0.0216**	**5.6900e-003**	**1.9000e-004**	**5.8900e-003**	**0.0000**	**21.1883**	**21.1883**	**7.2000e-004**	**0.0000**	**21.2063**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9182					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.9182**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4000e-004	7.1500e-003	1.9400e-003	2.0000e-005	4.2000e-004	3.0000e-005	4.5000e-004	1.2000e-004	3.0000e-005	1.5000e-004	0.0000	1.6396	1.6396	1.0000e-004	0.0000	1.6422
Worker	8.8400e-003	7.1200e-003	0.0788	2.2000e-004	0.0210	1.8000e-004	0.0212	5.5700e-003	1.6000e-004	5.7400e-003	0.0000	19.5487	19.5487	6.2000e-004	0.0000	19.5641
Total	**9.0800e-003**	**0.0143**	**0.0807**	**2.4000e-004**	**0.0214**	**2.1000e-004**	**0.0216**	**5.6900e-003**	**1.9000e-004**	**5.8900e-003**	**0.0000**	**21.1883**	**21.1883**	**7.2000e-004**	**0.0000**	**21.2063**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5539	2.8069	7.3801	0.0237	1.8440	0.0245	1.8686	0.4943	0.0230	0.5173	0.0000	2,181.2673	2,181.2673	0.1231	0.0000	2,184.3458
Unmitigated	0.5867	3.0391	8.1812	0.0266	2.0907	0.0276	2.1183	0.5605	0.0258	0.5863	0.0000	2,456.3803	2,456.3803	0.1369	0.0000	2,459.8019

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Apartments Mid Rise	1,649.20	1,584.72	1453.28	5,508,449	4,858,452
Enclosed Parking with Elevator	0.00	0.00	0.00		
Health Club	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
Total	1,649.20	1,584.72	1,453.28	5,508,449	4,858,452

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Health Club	16.60	8.40	6.90	16.90	64.10	19.00	52	39	9
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
User Defined Recreational	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Parking Lot	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
City Park	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Health Club	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
User Defined Recreational	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907
Apartments Mid Rise	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	505.2461	505.2461	0.0247	5.1200e-003	507.3895
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	645.2502	645.2502	0.0316	6.5400e-003	647.9875
NaturalGas Mitigated	0.0160	0.1366	0.0595	8.7000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	157.9145	157.9145	3.0300e-003	2.9000e-003	158.8529
NaturalGas Unmitigated	0.0192	0.1646	0.0718	1.0500e-003		0.0133	0.0133		0.0133	0.0133	0.0000	190.3674	190.3674	3.6500e-003	3.4900e-003	191.4986

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	3.48347e+006	0.0188	0.1605	0.0683	1.0200e-003		0.0130	0.0130		0.0130	0.0130	0.0000	185.8912	185.8912	3.5600e-003	3.4100e-003	186.9959
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	83880	4.5000e-004	4.1100e-003	3.4500e-003	2.0000e-005		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	4.4762	4.4762	9.0000e-005	8.0000e-005	4.5028
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0192**	**0.1646**	**0.0718**	**1.0400e-003**		**0.0133**	**0.0133**		**0.0133**	**0.0133**	**0.0000**	**190.3674**	**190.3674**	**3.6500e-003**	**3.4900e-003**	**191.4986**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	2.89113e+006	0.0156	0.1332	0.0567	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.2817	154.2817	2.9600e-003	2.8300e-003	155.1985
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Health Club	68076.8	3.7000e-004	3.3400e-003	2.8000e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	3.6328	3.6328	7.0000e-005	7.0000e-005	3.6544
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0160**	**0.1366**	**0.0595**	**8.7000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**157.9145**	**157.9145**	**3.0300e-003**	**2.9000e-003**	**158.8529**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.04916e+006	281.9033	0.0138	2.8600e-003	283.0992
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	1.26993e+006	341.2234	0.0167	3.4600e-003	342.6709
Health Club	34480	9.2646	4.5000e-004	9.0000e-005	9.3039
Parking Lot	47857	12.8589	6.3000e-004	1.3000e-004	12.9135
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**645.2502**	**0.0316**	**6.5400e-003**	**647.9875**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	959113	257.7084	0.0126	2.6100e-003	258.8017
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	864909	232.3964	0.0114	2.3500e-003	233.3823
Health Club	27636.8	7.4259	3.6000e-004	8.0000e-005	7.4574
Parking Lot	28714.2	7.7154	3.8000e-004	8.0000e-005	7.7481
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**505.2461**	**0.0247**	**5.1200e-003**	**507.3895**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1646	0.0235	1.9532	9.0000e-005		0.0105	0.0105		0.0105	0.0105	0.0000	2.9310	2.9310	2.1400e-003	0.0000	2.9845
Unmitigated	1.2018	0.0298	2.5734	1.4000e-004		0.0141	0.0141		0.0141	0.0141	0.0000	4.1919	4.1919	4.1100e-003	0.0000	4.2947

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0918					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0312					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0788	0.0298	2.5734	1.4000e-004		0.0141	0.0141		0.0141	0.0141	0.0000	4.1919	4.1919	4.1100e-003	0.0000	4.2947
Total	**1.2018**	**0.0298**	**2.5734**	**1.4000e-004**		**0.0141**	**0.0141**		**0.0141**	**0.0141**	**0.0000**	**4.1919**	**4.1919**	**4.1100e-003**	**0.0000**	**4.2947**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0918					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0312					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0416	0.0235	1.9532	9.0000e-005		0.0105	0.0105		0.0105	0.0105	0.0000	2.9310	2.9310	2.1400e-003	0.0000	2.9845
Total	**1.1646**	**0.0235**	**1.9532**	**9.0000e-005**		**0.0105**	**0.0105**		**0.0105**	**0.0105**	**0.0000**	**2.9310**	**2.9310**	**2.1400e-003**	**0.0000**	**2.9845**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	81.4905	0.0197	0.0109	85.2230
Unmitigated	101.8631	0.0247	0.0136	106.5287

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	16.1582 / 10.1867	92.6583	0.0239	0.0133	97.2238
City Park	0 / 2.63317	7.8605	3.8000e-004	8.0000e-005	7.8939
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Health Club	0.236573 / 0.144996	1.3442	3.5000e-004	1.9000e-004	1.4110
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**101.8631**	**0.0247**	**0.0136**	**106.5287**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	12.9266 / 8.14935	74.1266	0.0192	0.0107	77.7791
City Park	0 / 2.10654	6.2884	3.1000e-004	6.0000e-005	6.3151
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Health Club	0.189258 / 0.115997	1.0754	2.8000e-004	1.6000e-004	1.1288
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**81.4904**	**0.0197**	**0.0109**	**85.2230**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.9560	0.4111	0.0000	17.2332
Unmitigated	27.8240	1.6444	0.0000	68.9327

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	114.08	23.1572	1.3686	0.0000	57.3710
City Park	0.19	0.0386	2.2800e-003	0.0000	0.0956
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Health Club	22.8	4.6282	0.2735	0.0000	11.4662
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**27.8240**	**1.6444**	**0.0000**	**68.9327**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	28.52	5.7893	0.3421	0.0000	14.3428
City Park	0.0475	9.6400e-003	5.7000e-004	0.0000	0.0239
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Health Club	5.7	1.1571	0.0684	0.0000	2.8665
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**6.9560**	**0.4111**	**0.0000**	**17.2332**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation