Draft

GENERAL PLAN UPDATE

Greenhouse Gas Technical Report

Prepared for
City of Rancho Palos Verdes

July 17, 2017

ESA

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GREENHOUSE GAS TECHNICAL REPORT

Introduction

This technical report addresses the potential greenhouse gas (GHG) emissions associated with implementing projects in the City of Rancho Palos Verdes (City), California envisioned in the General Plan Update with a planned build-out year of 2040 .[1] This analysis describes the existing GHG environment, global climate change, and regulations associated with global climate change. Additionally, this technical report provides a programmatic analysis of the potential GHG impacts associated with the implementing projects that could result from the General Plan Update. Where applicable, measures to mitigate or minimize GHG impacts associated with the implementing project are included.

Information used to prepare this analysis was obtained from the City's Emissions Reduction Action Plan prepared for the South Bay Cities Council of Governments (SBCCOG) in December 2015[2], the City's Communities Greenhouse Gas Emissions Inventory prepared by SBCCOG in March 2011[3], the Southern California Association of Governments (SCAG) Local Profiles Report 2015 Profile of the City of Rancho Palos Verdes[4], the City's General Plan[5], and other sources identified herein.

This technical report is being prepared to support the environmental review process for the project under the California Environmental Quality Act (CEQA). The City is the proponent and the lead agency for the project.

Project Understanding

The City is located on the Palos Verdes Peninsula at the southwest tip of Los Angeles County. The City encompasses 13.5 square miles of land and 7.5 miles of coastline, bounded by the City of Palos Verdes Estates and the Pacific Ocean to the west, cities of Rolling Hills and Rolling Hills Estates to the north, the City of Los Angeles to the east, and the Pacific Ocean to the south. The proposed project is a comprehensive update of the City's 1975 General Plan, with a planned build

1 City of Rancho Palos Verdes. *Draft General Plan*. (2015).

2 Atkins. *City of Rancho Palos Verdes Emissions Reduction Action Plan*. (2015).

3 South Bay Cities Council of Governments. *City of Rancho Palos Verdes Communities Greenhouse Gas Emissions Inventory*. (2011).

4 Southern California Association of Governments. *Local Profiles Report 2015 Profile of the City of Rancho Palos Verdes* (2015)

5 City of Rancho Palos Verdes. *Draft General Plan*. (2015).

out year of 2040. Since its adoption in 1975, the City's General Plan had never been comprehensively updated.

While the proposed General Plan Update does include changes to the existing General Plan's goals and policies, text, and graphics, these changes do not result in significant changes to the City's overall vision of its development pattern, including no changes to the existing development envelopes or intensification of existing land uses that would necessitate additional infrastructure facilities.

As of 2013, the City is nearly built out and there remain limited opportunities for new residential and non-residential development of undeveloped land within the City. Much of the new development activity in the City is expected to be limited to the redevelopment of existing developed areas (infill), but would not result in more intensive zoning (i.e., single-family to multifamily). The amended Land Use Element designates approximately 399.48 acres for new residential development primarily as infill lots, with approximately 756 proposed dwelling units by 2030, primarily single-family residences, and less multi-family (City, 2015).

Construction and utilization of the proposed dwelling units would generate GHGs, which would add to the existing GHG emissions in the City. However, as the proposed residential developments are primarily infill lots, the proposed project net emissions would be emissions from the proposed project minus existing emissions from the current development.

Environmental Setting

Climate Change Overview

Global climate change refers to changes in average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation and storms. Historical records indicate that global climate changes have occurred in the past due to natural phenomena; however current data increasingly indicate that the current global conditions differ from past climate changes in rate and magnitude. Global climate change attributable to anthropogenic (human) GHG emissions is currently one of the most important and widely debated scientific, economic and political issues in the United States and the world. The extent to which increased concentrations of GHGs have caused or will cause climate change and the appropriate actions to limit and/or respond to climate change are the subject of significant and rapidly evolving regulatory efforts at the federal and state levels of government.

GHGs are those compounds in the Earth's atmosphere which play a critical role in determining temperature near the Earth's surface. More specifically, these gases allow high-frequency shortwave solar radiation to enter the Earth's atmosphere, but retain some of the low frequency infrared energy which is radiated back from the Earth towards space, resulting in a warming of the atmosphere. Not all GHGs possess the same ability to induce climate change; as a result, GHG contributions are commonly quantified in the units of equivalent mass of carbon dioxide (CO_2e).

Mass emissions are calculated by converting pollutant specific emissions to CO_2e emissions by applying the proper global warming potential (GWP) value.[6] These GWP ratios are provided by the Intergovernmental Panel on Climate Change (IPCC). Historically, GHG emission inventories were calculated using the GWPs from the IPCC's Second Assessment Report (SAR). The IPCC updated the GWP values based on the latest science in its Fourth Assessment Report (AR4). The updated GWPs in the IPCC AR4 have begun to be used in recent GHG emissions inventories. By applying the GWP ratios, Project-related CO_2e emissions can be tabulated in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline. The CO_2e values are calculated for construction years as well as existing and Project build-out conditions in order to generate a net change in GHG emissions for construction and operation. Compounds that are regulated as GHGs are discussed below.[7] [8]

Carbon Dioxide (CO_2): CO_2 is the most abundant GHG in the atmosphere and is primarily generated from fossil fuel combustion from stationary and mobile sources. CO_2 is the reference gas (GWP of 1) for determining the GWPs of other GHGs.

Methane (CH_4): CH_4 is emitted from biogenic sources (i.e., resulting from the activity of living organisms), incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. The GWP of CH_4 is 21 in the IPCC SAR and 25 in the IPCC AR4.

Nitrous Oxide (N_2O): N_2O produced by human-related sources including agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N_2O is 310 in the IPCC SAR and 298 in the IPCC AR4.

Hydrofluorocarbons (HFCs): HFCs are fluorinated compounds consisting of hydrogen, carbon, and fluorine. They are typically used as refrigerants in both stationary refrigeration and mobile air conditioning systems. The GWPs of HFCs ranges from 140 for HFC-152a to 11,700 for HFC-23 in the IPCC SAR and 124 for HFC-152a to 14,800 for HFC-23 in the IPCC AR4.

Perfluorocarbons (PFCs): PFCs are fluorinated compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. The GWPs of PFCs range from 6,500 to 9,200 in the IPCC SAR and 7,390 to 17,700 in the IPCC AR4.

Sulfur Hexafluoride (SF_6): SF_6 is a fluorinated compound consisting of sulfur and fluoride. It is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical

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6 GWPs and associated CO_2e values were developed by the Intergovernmental Panel on Climate Change (IPCC), and published in its Second Assessment Report (SAR) in, 1996. Historically, GHG emission inventories have been calculated using the GWPs from the IPCC's SAR. The IPCC updated the GWP values based on the science in its Fourth Assessment Report (AR4). The California Air Resources Board (CARB) has begun reporting GHG emission inventories for California using the GWP values from the IPCC AR4.

7 Intergovernmental Panel on Climate Change, Second Assessment Report, Working Group I: The Science of Climate Change, (1995).

8 Intergovernmental Panel on Climate Change, Fourth Assessment Report, Working Group I Report: The Physical Science Basis, (2007).

insulator in high voltage equipment that transmits and distributes electricity. SF_6 has a GWP of 23,900 in the IPCC SAR and 22,800 in the IPCC AR4.

Greenhouse Gas Emissions Inventory

Worldwide man-made emissions of GHGs were approximately 49,000 million metric tons (MMT) CO_2e in 2010 including ongoing emissions from industrial and agricultural sources and emissions from land use changes (e.g., deforestation).[9] Emissions of CO_2 from fossil fuel use and industrial processes account for 65 percent of the total while CO_2 emissions from all sources accounts for 76 percent of the total GHG emissions. Methane emissions account for 16 percent and N_2O emissions for 6.2 percent. In 2013, the United States was the world's second largest emitter of carbon dioxide at 5,300 MMT (China was the largest emitter of carbon dioxide at 10,300 MMT).[10]

The California Air Resources Board (CARB) compiles GHG inventories for the State of California. Based on the 2015 GHG inventory data (i.e., the latest year for which data are available from CARB), prepared by CARB in 2017, California emitted 440.4 $MMTCO_2e$ including emissions resulting from imported electrical power.[11] Between 1990 and 2015, the population of California grew by approximately 9.3 million (from 29.8 to 39.1 million).[12] This represents an increase of approximately 31 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from $773 billion in 1990 to $2.49 trillion in 2015 representing an increase of approximately 222 percent (just over three times the 1990 gross state product).[13] Despite the population and economic growth, California's net GHG emissions only grew by approximately 2.2 percent. According to CARB, the declining trend coupled with the state's GHG reduction programs (such as the Renewables Portfolio Standard, LCFS, vehicle efficiency standards, and declining caps under the Cap and Trade Program) demonstrate that California is on track to meet the 2020 GHG reduction target codified in California Health and Safety Code (HSC), Division 25.5, also known as The Global Warming Solutions Act of 2006 (AB 32).[14] **Table 1**, *State of California Greenhouse Gas Emissions*, identifies and quantifies statewide anthropogenic GHG emissions and sinks (e.g., areas of carbon

9 Intergovernmental Panel on Climate Change, Fifth Assessment Report Synthesis Report, (2014).

10 PBL Netherlands Environmental Assessment Agency and the European Commission Joint Research Center, Trends in Global CO_2 Emissions 2014 Report, (2014).

11 California Air Resources Board, California Greenhouse Gas 2000-2015 Inventory by Scoping Plan Category – Summary. Available: https://www.arb.ca.gov/cc/inventory/data/data.htm. Accessed June 2017.

12 U.S. Census Bureau, Data Finders, http://www.census.gov/. 2009; California Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State. State of California Department of Finance, American Community Survey, 2014. Available: http://www.dof.ca.gov/Reports/Demographic_Reports/American_Community_Survey/documents/Web_ACS2015_Pop-Race.xlsx. Accessed June 2017.

13 California Department of Finance, Gross State Product. Available at: http://www.dof.ca.gov/Forecasting/Economics/Indicators/Gross_State_Product/. Accessed June 2017. Amounts are based on current dollars as of the date of the report (June 2017).

14 California Air Resources Board, Frequently Asked Questions for the 2016 Edition California Greenhouse Gas Emission Inventory, (2016). Available: https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_faq_20160617.pdf. Accessed May 2017.

sequestration due to forest growth) in 1990 and 2015. As shown in the table, the transportation sector is the largest contributor to statewide GHG emissions at 37 percent in 2015.

TABLE 1
STATE OF CALIFORNIA GREENHOUSE GAS EMISSIONS [A]

Category	Total 1990 Emissions using IPCC SAR ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2014 Emissions using IPCC AR4 ($MMTCO_2e$)	Percent of Total 2014 Emissions
Transportation	150.7	35%	164.6	37%
Electric Power	110.6	26%	83.7	19%
Commercial	14.4	3%	12.8	3%
Residential	29.7	7%	23.2	5%
Industrial	103.0	24%	91.7	21%
Recycling and Waste [b]	—	—	8.7	2%
High GWP/Non-Specified [c]	1.3	<1%	19.1	4%
Agriculture/Forestry	23.6	6%	34.7	8%
Forestry Sinks	-6.7	-2%	— [d]	— [d]
Net Total (IPCC SAR)	**426.6**	**100%**	—	—
Net Total (IPCC AR4) [e]	**431**	**100%**	**440.4**	**100%**

[a] Totals may not add up exactly due to rounding.
[b] Included in other categories for the 1990 emissions inventory.
[c] High GWP gases are not specifically called out in the 1990 emissions inventory.
[d] Revised methodology under development (not reported for 2014).
[e] CARB revised the State's 1990 level GHG emissions using GWPs from the IPCC AR4.

Sources: California Air Resources Board, Staff Report – California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit, (2015). Available: https://www.arb.ca.gov/cc/inventory/1990level/1990level.htm. Accessed October 2016; California Air Resources Board, California Greenhouse Gas Emission Inventory – 2016 Edition, Scoping Plan Categorization, (2016). Available: http://www.arb.ca.gov/cc/inventory/data/data.htm. Accessed May 2017.

The South Bay Cities Council of Governments (SBCCOG) received funding from SCE's 2013-2014 Local Government Partnership Strategic Plan Pilots program to assist local governments within the South Bay sub-region perform inventories of local GHG emissions and develop GHG reduction programs and policies. As a member of the SBCCOG, the City collaborated with the SBCCOG on the development of the Emission Reduction Action Plan (ERAP). The City has conducted two inventories of community-wide greenhouse gas emissions, one for the baseline year of 2005 (future emissions reductions will be measured against this year) and another for 2007.[15] Additionally, the SBCCOG calculated inventories for 2010 and 2012.[16] **Table 2**, *Summary of GHG Emissions by Sector for 2005 to 2012*, is a summary of the City's emissions from each sector for the years 2005 and 2012 and the percent change from 2005 to 2012. As

[15] South Bay Cities Council of Governments. *City of Rancho Palos Verdes Communities Greenhouse Gas Emissions Inventory*. (2011).
[16] Atkins. *City of Rancho Palos Verdes Emissions Reduction Action Plan*. (2015).
[16] South Bay Cities Council of Governments. *City of Rancho Palos Verdes Communities Greenhouse Gas Emissions Inventory*. (2011).

shown in Table 2, the City's community and municipal GHG emissions decreased 8 percent from 2005 to 2012, falling from 289,289 $MTCO_2e$ in 2005 to 266,176 $MTCO_2e$ in 2012.

TABLE 2
SUMMARY OF GHG EMISSIONS BY SECTOR FOR 2005 TO 2012 ($MTCO_2e$)

Sector	2005	2012	Percent Change (2005 to 2012)
On-road Transportation	150,564	136,175	-9.6%
Residential Energy	88,941	86,129	-3.2%
Commercial/Industrial Energy	20,377	25,304	24.2%
Water	18,156	11,653	8%
Solid Waste	8,674	4,158	-52.1
Off-road Sources	157	340	116.7%
Wastewater	156	117	-25%
Municipal Emissions	2,264	2,291	1.2%
Total	**289,289**	**266,176**	**-8%**

Sources: Atkins. *City of Rancho Palos Verdes Emissions Reduction Action Plan*. (2015), ESA, 2017

The City's Community emissions were categorized in seven sectors: Commercial/Industrial Energy, Residential Energy, On-road Transportation, Solid Waste, Water, Wastewater, and Off-road Sources. The Municipal emissions were added as one sector.

- **Commercial/Industrial Energy** includes emissions from electricity and natural gas consumption in nonresidential buildings and facilities (including outdoor lighting) in the City.
- **Residential Energy** includes emissions from electricity and natural gas consumption in residential buildings in the City.
- **On-road Transportation** includes emissions from vehicles traveling (wholly or partially) within the City.
- **Solid Waste** includes emissions from waste that is generated in the community and sent to landfills.
- **Water** includes emissions from the electricity used to source, treat, and deliver imported water in the community that is not accounted for in the community utility data.
- **Wastewater** includes emissions from treating wastewater generated in the community.
- **Off-road Sources** include emissions from operating equipment for construction, commercial, light industrial and agricultural activities; lawn and garden equipment; and recreational vehicles such as all-terrain vehicles.

As shown in Table 2, the transportation sector was the largest contributor to emissions in both 2005 (53 percent) and 2012 (52 percent) by producing 150,564 $MTCO_2e$ and 136,175 $MTCO_2e$, respectively. This change represents almost a 10 percent decrease in emissions over the seven-year time period. Residential energy is the second-largest contributor to emissions, representing 31 percent in 2005 and 33 percent in 2012. Residential energy emissions decreased by about 3

percent from 2005 to 2012, from 88,941 $MTCO_2e$ to 86,129 $MTCO_2e$. Commercial energy consumption represented 7 percent of emissions in 2005 and 10 percent in 2012, and its total emissions increased by about 24 percent, from 20,377 $MTCO_2e$ to 25,304 $MTCO_2e$ over the time period. Water comprised 6 percent of the total, 18,156 $MTCO_2e$, in 2005, but was reduced to 4 percent of the total, 11,653 $MTCO_2e$, in 2012. Solid waste, wastewater, and off-road sources made up the remaining emissions in each year. Solid waste and wastewater emissions declined from 2005 to 2012; however, off-road sources increased 117 percent, from 157 to 340 $MTCO_2e$, in the same period. Off-road Sources comprise a very small percentage of overall emissions, but are variable primarily due to construction-related emissions, which are based on the level of development estimated in the City each year. Municipal emissions increased slightly from 2,264 $MTCO_2e$ to 2,291 $MTCO_2e$, a 1.2 percent increase.

The Business-as-Usual (BAU) forecasts estimate future emissions using current (2012) consumption patterns and emission factors with the anticipated growth in the City. Anticipated growth is estimated using data from regional planning scenarios developed by SCAG, the City, and other relevant sources. The most relevant growth factors are used to project emissions by sector. Compound annual growth rates were developed using the growth projections from 2012 to 2020 and from 2021 to 2035. The City's community and municipal BAU emissions in 2020 are estimated to be 262,363 $MTCO_2e$, or approximately a 9.5 percent decrease from the baseline (2005) emissions of 289,289 $MTCO_2e$. By 2035, emissions are estimated to decrease by approximately 9.4 percent from the baseline level to 262,083 $MTCO_2e$.[17] The City's greenhouse gas inventory is summarized in **Table 3**, *Citywide Greenhouse Gas Inventory ($MTCO_2e$)*, below.

TABLE 3
CITYWIDE GREENHOUSE GAS INVENTORY ($MTCO_2e$)

Category	2005 Baseline	BAU 2020	2035	Adjusted BAU 2020	Adjusted 2035
Municipal Emissions	2,291	2,291	2,291	2,177	2,177
Community Emissions	287,025	260,072	259,792	229,481	190,653
Total Citywide Emissions	*289,289*	*262,363*	*262,083*	*231,658*	*192,830*
Reduction from 2005 Baseline	__	-9.5%	-9.4%	-20%	-33%

[a] Adjusted BAU accounts for State GHG emission reduction measures.

Source: Atkins. *City of Rancho Palos Verdes Emissions Reduction Action Plan*. (2015)

Numerous State measures (see Regulatory Setting Section below), have been approved and/or adopted that will reduce GHG emissions in the City, once implemented. These measures do not require additional City action, but are accounted for in the City's emissions forecasts to provide a more accurate picture of future emissions and the level of action needed to reduce emissions to levels consistent with State recommendations. This forecast is called the Adjusted BAU forecast.

[17] Atkins. *City of Rancho Palos Verdes Emissions Reduction Action Plan*. (2015)

Under the Adjusted BAU scenario, City emissions were estimated to be 231,658 $MTCO_2e$ in 2020 and 192,830 $MTCO_2e$ in 2035. These emissions levels are 20 percent lower in 2020 than 2005 levels and 33 percent lower than 2005 levels by 2035.[18] In 2020, the City is expected to meet the State-aligned reduction target through existing efforts and legislation. In 2035, the City would need to reduce 44,270 $MTCO_2e$ emissions below the 2035 Adjusted BAU scenario to meet the State-aligned target.

Therefore, the City has started implementing new reduction measures and/or augmenting existing efforts as outlined in the City's Emissions Reduction Action Plan (ERAP) to meet the State-aligned target.[19] Ongoing implementation of reduction measures provides additional reductions that will further help mitigate climate change and provide additional coverage if State measures do not achieve their anticipated reductions. The ERAP measures primarily focus on ways to reduce energy as energy usage accounted for 42 percent of all City GHG emissions in 2012. Additionally, residents emit more GHGs from natural gas consumption than electricity consumption and residential and commercial/industrial energy use is increasing, with the exception of Residential natural gas use. Therefore, as outlined in the ERAP, the City plans on focusing on increasing energy efficiency and reducing GHG emissions from energy to meet attainment goals.

The City is implementing energy efficiency (EE) strategies, as outlined in the ERAP, to increase EE in both existing and new residential and commercial development, increase EE through water efficiency, and decrease energy demand through reducing the urban heat island effect. The City, through its partnership with the SBCCOG, will obtain and distribute educational content, energy audit services, and assistance identifying potential funding sources to help implement strategies. These City actions, combined with state measures, will lead to a 24 percent reduction from 2005 levels by 2020 and 54 percent reduction from 2005 levels by 2035.[20]

Effects of Greenhouse Gas Emissions

The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model all climate parameters, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the IPCC, in its Fifth Assessment Report, Summary for Policy Makers, stated that, "it is extremely likely [95–100 percent] that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings

18 Atkins. *City of Rancho Palos Verdes Emissions Reduction Action Plan*. (2015)
19 Atkins. *City of Rancho Palos Verdes Emissions Reduction Action Plan*. (2015)
20 Atkins. *City of Rancho Palos Verdes Emissions Reduction Action Plan*. (2015)

together."[21] A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity.[22]

According to CARB, the potential impacts in California due to global climate change may include: loss in snow pack; sea level rise; more extreme heat days per year; more high ozone days; more large forest fires; more drought years; increased erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems; and increased pest infestation.[23] Below is a summary of some of the potential effects, reported by an array of studies that could be experienced in California as a result of global warming and climate change.

Air Quality

Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore, its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the State.[24]

In 2009, the California Natural Resources Agency (CNRA) published the California Climate Adaptation Strategy as a response to the Governor's Executive Order S-13-2008.[25] The CNRA report lists specific recommendations for state and local agencies to best adapt to the anticipated risks posed by a changing climate. In accordance with the California Climate Adaptation Strategy, the California Energy Commission (CEC) was directed to develop a website on climate change scenarios and impacts that would be beneficial for local decision makers.[26] The website, known as Cal-Adapt, became operational in 2011.[27] The information provided from the Cal-Adapt website represents a projection of potential future climate scenarios. The data are comprised of the average values from a variety of scenarios and models and are meant to illustrate how the climate may change based on a variety of different potential social and

21 Intergovernmental Panel on Climate Change, Fifth Assessment Report, Summary for Policy Makers, (2013).

22 Anderegg, William R. L., J.W. Prall, J. Harold, S.H., Schneider, Expert Credibility in Climate Change, Proceedings of the National Academy of Sciences of the United States of America. 2010;107:12107-12109.

23 California Environmental Protection Agency, Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature, (2006).

24 California Energy Commission, Scenarios of Climate Change in California: An Overview, February 2006. http://www.energy.ca.gov/2005publications/CEC-500-2005-186/CEC-500-2005-186-SF.PDF. Accessed April 2016.

25 California Natural Resources Agency, Climate Action Team, 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008, (2009).

26 California Natural Resources Agency, Climate Action Team, 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008, (2009).

27 The Cal-Adapt website address is: http://cal-adapt.org.

economic factors. According to the Cal-Adapt website, the City of Rancho Palos Verdes could result in an average increase in temperature of approximately 5 to 9 percent (about 3.1 to 5.5°F) by 2070-2090, compared to the baseline 1961-1990 period.[28]

Water Supply

Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. Studies have found that, "Considerable uncertainty about precise impacts of climate change on California hydrology and water resources will remain until we have more precise and consistent information about how precipitation patterns, timing, and intensity will change," and that some studies identify little change in total annual precipitation in projections for California while others show significantly more precipitation.[29] Warmer, wetter winters would increase the amount of runoff available for groundwater recharge; however, this additional runoff would occur at a time when some basins are either being recharged at their maximum capacity or are already full.[30] Conversely, reductions in spring runoff and higher evapotranspiration because of higher temperatures could reduce the amount of water available for recharge.[31]

The California Department of Water Resources report on climate change and effects on the State Water Project (SWP), the Central Valley Project, and the Sacramento-San Joaquin Delta, concludes that "climate change will likely have a significant effect on California's future water resources…[and] future water demand."[32] It also reports that "much uncertainty about future water demand [remains], especially [for] those aspects of future demand that will be directly affected by climate change and warming. While climate change is expected to continue through at least the end of this century, the magnitude and, in some cases, the nature of future changes is uncertain." It also reports that the relationship between climate change and its potential effect on water demand is not well understood, but "[i]t is unlikely that this level of uncertainty will diminish significantly in the foreseeable future." Still, changes in water supply are expected to occur, and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows. [33] In its *Fifth Assessment Report*, the IPCC states "Changes in the global water cycle in response to the warming over the 21st century will not be uniform. The contrast in precipitation between wet and dry regions and between wet and dry seasons will increase, although there may be regional exceptions."[34]

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28 California Energy Commission, 2017. Cal-Adapt Website Local Climate Snapshots, http://cal-adapt.org/tools/factsheet/. Accessed July 2017.

29 Pacific Institute for Studies in Development, Environment and Security, Climate Change and California Water Resources: A Survey and Summary of the Literature, July 2003. http://www.pacinst.org/reports/climate_change_and_california_water_resources.pdf. Accessed April 2016.

30 Ibid.

31 Ibid.

32 California Department of Water Resources Climate Change Report, Progress on Incorporating Climate Change into Planning and Management of California's Water Resources, July 2006. http://baydeltaoffice.water.ca.gov/climatechange/DWRClimateChangeJuly06_update8-2-07.pdf. Accessed April 2016.

33 California Department of Water Resources Climate Change Report, Progress on Incorporating Climate Change into Planning and Management of California's Water Resources, July 2006. Available: http://www.water.ca.gov/climatechange/docs/DWRClimateChangeJuly06.pdf. Accessed March 2017.

34 Intergovernmental Panel on Climate Change, Fifth Assessment Report, Summary for Policy Makers, (2013).

Hydrology and Sea Level Rise

As discussed above, climate changes could potentially affect: the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture

California has a $30 billion agricultural industry that produces half the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thus affect their quality.[35]

Ecosystems and Wildlife

Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists expect that the average global surface temperature could rise by 2-11.5°F (1.1-6.4°C) by 2100, with significant regional variation.[36] Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Sea level could rise as much as two feet along most of the U.S. coast. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes such as carbon cycling and storage.[37]

Regulatory Setting

Federal

The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address GHGs. The federal government administers a wide array of public-private partnerships to reduce the GHG intensity generated in the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO_2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions. The USEPA

35 California Climate Change Center, Our Changing Climate: Assessing the Risks to California, (2006).

36 National Research Council, Advancing the Science of Climate Change, (2010).

37 Parmesan, C and Galbraith, H, 2004. Observed Ecological Impacts of Climate Change in North America. Arlington, VA: Pew. Cent. Glob. Clim. Change. Available: https://www.c2es.org/docUploads/final_ObsImpact.pdf. Accessed March 2017.

implements numerous voluntary programs that contribute to the reduction of GHG emissions. These programs (e.g., the Energy Star labeling system for energy-efficient products) play a significant role in encouraging voluntary reductions from large corporations, consumers, industrial and commercial buildings, and many major industrial sectors.

In *Massachusetts v. Environmental Protection Agency* (Docket No. 05–1120), the United States Supreme Court held in April of 2007 that the USEPA has statutory authority under Section 202 of the Clean Air Act (CAA) to regulate GHGs. The Court did not hold that the USEPA was required to regulate GHG emissions; however, it indicated that the agency must decide whether GHGs cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare.

On May 19, 2009, the President announced a national policy for fuel efficiency and emissions standards in the United States auto industry.[38] The adopted federal standard applies to passenger cars and light-duty trucks for model years 2012 through 2016. The rule surpasses the prior Corporate Average Fuel Economy standards and requires an average fuel economy standard of 35.5 miles per gallon (mpg) and 250 grams of CO_2 per mile by model year 2016, based on USEPA calculation methods. These standards were formally adopted on April 1, 2010. In August 2012, standards were adopted for model year 2017 through 2025 passenger cars and light-duty trucks. By 2025, vehicles are required to achieve 54.5 mpg (if GHG reductions are achieved exclusively through fuel economy improvements) and 163 grams of CO_2 per mile. According to the USEPA, a model year 2025 vehicle would emit one-half of the GHG emissions from a model year 2010 vehicle.[39]

On December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act. The USEPA adopted a Final Endangerment Finding for the six defined GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) on December 7, 2009.[40] The Endangerment Finding is required before USEPA can regulate GHG emissions under Section 202(a)(1) of the Clean Air Act consistently with the United States Supreme Court decision. The USEPA also adopted a Cause or Contribute Finding in which the USEPA Administrator found that GHG emissions from new motor vehicle and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare.[41] These findings do

[38] On March 15, 2017, the Trump Administration announced its intention to direct the USEPA to reconsider the model year 2017-2025 cars and light truck emissions standards, but did not rescind California's waiver. Therefore, the standards remain in effect. See: The White House, Remarks by President Trump at American Center for Mobility | Detroit, MI, March 15, 2017. Available at: https://www.whitehouse.gov/the-press-office/2017/03/15/remarks-president-trump-american-center-mobility-detroit-mi. Accessed May 2017.

[39] United States Environmental Protection Agency, EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks, (2012). Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EZ7C.PDF?Dockey=P100EZ7C.PDF. Accessed May 2017.

[40] United States Environmental Protection Agency, Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Section 202(a) of the Clean Air Act. Available at: https://www.epa.gov/climate-change/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a. Accessed May 2017.

[41] Ibid.

not themselves impose any requirements on industry or other entities; however, these actions were a prerequisite for implementing GHG emissions standards for vehicles.[42]

State

California has promulgated a series of executive orders, laws, and regulations aimed at reducing both the level of GHGs in the atmosphere and emissions of GHGs from commercial and private activities within the State.

California Air Resources Board

CARB, a part of the California Environmental Protection Agency (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets state ambient air quality standards (California Ambient Air Quality Standards [CAAQS]), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

In 2004, CARB adopted an Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants (Title 13 California Code of Regulations [CCR], Section 2485). The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure generally does not allow diesel-fueled commercial vehicles to idle for more than five (5) minutes at any given location with certain exemptions for equipment in which idling is a necessary function such as concrete trucks. While this measure primarily targets diesel particulate matter emissions, it has co-benefits of minimizing GHG emissions from unnecessary truck idling.

In 2008, CARB approved the Truck and Bus regulation to reduce particulate matter and nitrogen oxide emissions from existing diesel vehicles operating in California (13 CCR, Section 2025, subsection (h)). CARB has also promulgated emission standards for off-road diesel construction equipment of greater than 25 horsepower such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. The regulation, adopted by the CARB on July 26, 2007, aims to reduce emissions by installation of diesel soot filters and encouraging the retirement, replacement, or repower of older, dirtier engines with newer emission controlled models. While these regulations primarily target reductions in criteria air pollutant emission, they have co-benefits of minimizing GHG emissions due to improved engine efficiencies.

[42] Ibid.

California Greenhouse Gas Reduction Targets

The Governor announced on June 1, 2005, through Executive Order S-3-05,[43] the following GHG emission reduction targets:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

In accordance with Executive Order S-3-05, the Secretary of CalEPA is required to coordinate efforts of various agencies, which comprise the California Action Team (CAT), in order to collectively and efficiently reduce GHGs. These agencies include CARB, the Business, Transportation and Housing Agency, the Department of Food and Agriculture, the Resources Agency, the California Energy Commission, and the Public Utilities Commission. The CAT provides periodic reports to the Governor and Legislature on the state of GHG reduction in the state as well as strategies for mitigating and adapting to climate change. The first CAT Report to the Governor and the Legislature in 2006 contained recommendations and strategies to help meet the targets in Executive Order S-3-05. The 2010 CAT Report, finalized in December 2010, expands on the policies in the 2006 assessment.[44] The new information detailed in the CAT Report includes development of revised climate and sea-level projections using new information and tools that became available and an evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts.

On April 29, 2015, Governor Brown issued Executive Order B-30-15. Therein, Governor directed the following:

- Established a new interim statewide reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030.
- Ordered all state agencies with jurisdiction over sources of GHG emissions to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 reduction targets.
- Directed CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.

In response to the 2030 GHG reduction target, CARB released the 2017 Climate Change Scoping Plan Update in January 2017.[45] The Scoping Plan Update outlines the strategies the State will implement to achieve the 2030 GHG reduction target, which build on the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, improved vehicle, truck and freight movement emissions standards, increasing renewable energy, and strategies to reduce methane emissions from agricultural and other wastes by using it to meet our energy needs. The Scoping Plan Update

43 California Office of the Governor, Executive Order S-3-05. Available: https://www.gov.ca.gov/news.php?id=1861. Accessed March 2017.

44 California Environmental Protection Agency, Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature, (2010). Available: http://www.energy.ca.gov/2010publications/CAT-1000-2010-005/CAT-1000-2010-005.PDF. Accessed March 2017.

45 California Air Resources Board, The 2017 Climate Change Scoping Plan Update, (January 2017). Available: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed March 2017.

also comprehensively addresses GHG emissions from natural and working lands of California, including the agriculture and forestry sectors. The Scoping Plan Update considers the following scenarios:

- Proposed Scenario: Continuing the Cap-and-Trade Program combined with an additional 20 percent reduction of greenhouse gases in the refinery sector.
- Alternative 1: Direct regulations on a wide variety of sectors, such as specific required reductions for all large GHG sources, more renewables, etc.
- Alternative 2: A carbon tax to put a price on carbon, instead of the Cap-and-Trade Program.
- Alternative 3: All Cap-and-Trade. This would remove the refinery measure and keep the LCFS at 10 percent.
- Alternative 4: Cap-and-Tax. This would place a declining cap on industry, and natural gas and fuel suppliers, while also requiring them to pay a tax on each ton of GHG emitted.

CARB is scheduled to consider the proposed scenario and alternatives and potential adoption of the 2017 Climate Change Scoping Plan Update in 2017, although a specific date has not yet been announced.

California Health and Safety Code, Division 25.5 – California Global Warming Solutions Act of 2006

In 2006, the California State Legislature adopted Assembly Bill (AB) 32 (codified in the California Health and Safety Code [HSC], Division 25.5 – California Global Warming Solutions Act of 2006), which focuses on reducing GHG emissions in California to 1990 levels by 2020. HSC Division 25.5 defines regulated GHGs as CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 and represents the first enforceable statewide program to limit emissions of these GHGs from all major industries, with penalties for noncompliance. The law further requires that reduction measures be technologically feasible and cost effective. Under HSC Division 25.5, CARB has the primary responsibility for reducing GHG emissions. CARB is required to adopt rules and regulations directing state actions that would achieve GHG emissions reductions equivalent to 1990 statewide levels by 2020. In 2016, the California State Legislature adopted Senate Bill (SB) 32 and its companion bill AB 197, and both were signed by Governor Brown. SB 32 and AB 197 amends HSC Division 25.5 and establishes a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and includes provisions to ensure the benefits of state climate policies reach into disadvantaged communities.

A specific requirement of AB 32 was to prepare a Climate Change Scoping Plan for achieving the maximum technologically feasible and cost-effective GHG emission reduction by 2020 (Health and Safety Code section 38561 (h)). CARB developed an AB 32 Scoping Plan that contains strategies to achieve the 2020 emissions cap.[46] The initial scoping plan was approved in 2008, and contained a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to

46 California Air Resources Board, Initial AB 32 Climate Change Scoping Plan Document. Available at https://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm. Accessed September 2016.

meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the State's long-range climate objectives.[47] The First Update to the Scoping Plan (First Update) was approved by CARB in May 2014 and built upon the initial Scoping Plan with new strategies and recommendations.[48]

As required by HSC Division 25.5, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was originally set at 427 $MMTCO_2e$ using the GWP values from the IPCC SAR. CARB also projected the state's 2020 GHG emissions under business-as-usual (BAU) conditions – that is, emissions that would occur without any plans, policies, or regulations to reduce GHG emissions. CARB originally used an average of the state's GHG emissions from 2002 through 2004 and projected the 2020 levels at approximately 596 $MMTCO_2e$ (using GWP values from the IPCC SAR). Therefore, under the original projections, the state must reduce its projected 2020 emissions by 28.4 percent in order to meet the 1990 target of 427 $MMTCO_2e$. However, in 2014, CARB revised the target using the GWP values from the IPCC AR4 and determined that the 1990 GHG emissions inventory and 2020 GHG emissions limit is 431 $MMTCO_2e$. CARB also updated the State's projected 2020 emissions to account for the effect of the 2007–2009 economic recession, new estimates for future fuel and energy demand, and the reductions required by regulation that were recently adopted for motor vehicles and renewable energy. CARB's projected statewide 2020 emissions estimate using the GWP values from the IPCC AR4 is 509.4 $MMTCO_2e$. Therefore, the emission reductions necessary to achieve the 2020 emissions target of 431 $MMTCO_2e$ would be 78.4 $MMTCO_2e$, or a reduction of GHG emissions by approximately 15.4 percent. In the 2017 Climate Change Scoping Plan Update, CARB provides the estimated projected statewide 2030 emissions and the level of reductions necessary to achieve the 2030 target of 40 percent below 1990 levels. CARB's projected statewide 2030 emissions takes into account 2020 GHG reduction policies and programs. A summary of the GHG emissions reductions required under HSC Division 25.5 is provided in **Table 4**, *Estimated Greenhouse Gas Emissions Reductions Required by HSC Division 25.5*.

In its Climate Change Scoping Plan, CARB has acknowledged that land use-driven emissions are highly complex: "While it is possible to illustrate the [GHG] inventory many different ways, no chart or graph can fully display how diverse economic sectors fit together. California's economy is a web of activity where seemingly independent sectors and subsectors operate interdependently and often synergistically."[49] GHG emissions and reductions in the land use sector are complicated to assess given that emissions are influenced by reduction measures separate from the land use sector, such as the LCFS, vehicle emissions standards, and entities regulated under the Cap-and-Trade program including refineries and utility providers. These measures will impact other sectors of the economy and will also impact existing development in addition to new land use development. In its report, *California Environmental Quality Act Guidelines Update Proposed*

47 Ibid.

48 California Air Resources Board, First Update to the AB 32 Scoping Plan. Available at https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed September 2016.

49 California Air Resources Board, Climate Change Scoping Plan, December 2008. Available: https://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed May 2017.

Thresholds of Significance, the Bay Area Air Quality Management District (BAAQMD) evaluated the reduction in land use emissions needed in order to be consistent with AB 32.[50] CARB included the following sectors for land use emissions: Transportation (on-road passenger vehicles; on-road heavy-duty), electric power (electricity; cogeneration), commercial and residential (residential fuel use; commercial fuel use) and recycling and waste (domestic wastewater treatment). Table 2 of the BAAQMD document present the results of this analysis, which shows that a 26.2 percent reduction from statewide land-use driven GHG emissions would be necessary to meet the AB 32 goal of returning to the 1990 emission levels by 2020, which is lower than the statewide reduction of 28.5 percent required based on the original 2008 Climate Change Scoping Plan projections.

TABLE 4
ESTIMATED GREENHOUSE GAS EMISSIONS REDUCTIONS REQUIRED BY HSC DIVISION 25.5

Emissions Scenario	GHG Emissions ($MMTCO_2e$)
2008 Scoping Plan (IPCC SAR)	
2020 BAU Forecast (CARB 2008 Scoping Plan Estimate)	596
2020 Emissions Target Set by AB 32 (i.e., 1990 level)	427
Reduction below Business-As-Usual necessary to achieve 1990 levels by 2020	169 (28.4%) [a]
2011 Scoping Plan (GHG Estimates Updated in 2014 to Reflect IPCC AR4 GWPs)	
2020 BAU Forecast (CARB 2011 Scoping Plan Estimate)	509.4
2020 Emissions Target Set by AB 32 (i.e., 1990 level)	431
Reduction below Business-As-Usual necessary to achieve 1990 levels by 2020	78.4 (15.4%) [b]
2017 Scoping Plan Update	
2030 BAU Forecast ("Reference Scenario" which includes 2020 GHG reduction policies and programs)	392
2030 Emissions Target Set by HSC Division 25.5 (i.e., 40% below 1990 Level)	260
Reduction below Business-As-Usual Necessary to Achieve 40% below 1990 Level by 2030	132 (33.7%) [c]

$MMTCO_2e$ = million metric tons of carbon dioxide equivalents
[a] 596 – 427 = 169 / 596 = 28.4%
[b] 509.4 – 431 = 78.4 / 509.4 = 15.4%
[c] 392 – 260 = 132 / 392 = 33.7%

SOURCE: California Air Resources Board, Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document (FED), Attachment D, August 19, 2011; California Air Resources Board, 2020 Business-as-Usual (BAU) Emissions Projection, 2014 Edition. Available: http://www.arb.ca.gov/cc/inventory/data/bau.htm. Accessed May 2017; California Air Resources Board, The 2017 Climate Change Scoping Plan Update, (January 2017). Available: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed May 2017.

50 Bay Area Air Quality Management District, California Environmental Quality Act Guidelines Update Proposed Thresholds of Significance, (2010). May. Available: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/proposed_thresholds_report_-may_3_2010_final.pdf?la=en. Accessed: May 2017.

In 2016, the California State Legislature adopted Senate Bill (SB) 32 and its companion bill AB 197; both were signed by Governor Brown. SB 32 and AB 197 amends HSC Division 25.5 and establishes a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and includes provisions to ensure that the benefits of state climate policies reach into disadvantaged communities. CARB is in the process of preparing the second update to the Scoping Plan to reflect the 2030 target established in Executive Order B-30-15 and SB 32. The 2017 Scoping Plan Update discusses a Proposed Scenario and four alternatives. CARB states that the Proposed Scenario "is the clear choice to achieve the State's climate and clean air goals."[51] Under the Proposed Scenario, the majority of the reductions would result from continuation of the Cap-and-Trade regulation. Additional reductions are achieved from requiring 20 percent reduction of GHG emissions from the refinery sector, electricity sector standards (i.e., utility providers to supply 50 percent renewable electricity by 2030), doubling the energy efficiency savings at end uses, additional reductions from the Low Carbon Fuel Standard (LCFS), implementing the short-lived GHG strategy (e.g., hydrofluorocarbons), and implementing the mobile source strategy and sustainable freight action plan. The alternatives are designed to consider various combinations of these programs as well as consideration of a carbon tax in the event the Cap-and-Trade regulation is not continued.

Continuation of the Cap-and-Trade regulation (or carbon tax) is expected to cover approximately 34 to 76 percent of the 2030 reduction obligation.[52] Under the Proposed Scenario, the short-lived GHG strategy is expected to cover approximately 13 to 26 percent. The Renewables Portfolio Standard with 50 percent renewable electricity by 2030 is expected to cover approximately 10 to 11 percent. The mobile source strategy and sustainable freight action plan includes maintaining the existing vehicle GHG emissions standards, increasing the number of zero emission vehicles and improving the freight system efficiency, and is expected to cover approximately 9 to 11 percent. The doubling of the energy efficiency savings, including demand-response flexibility for 10 percent of residential and commercial electric space heating, water heating, air conditioning and refrigeration, requires the CEC in collaboration with the California Public Utilities Commission (CPUC) to establish the framework for the energy savings target setting. The CEC has proposed a schedule for establishing this framework and target setting by November 2017, which will outline the necessary actions that will need to occur in future years.[53] The CEC states that workforce education and training institutions will be required to engage the building industry, map industry priorities for efficiency to major occupations that will provide services, identify workforce competency gaps, and quantify the work needed to build a workforce to implement high-quality efficiency projects at scale.[54] Under the Proposed Scenario, CARB expects that the doubling of the energy efficiency savings by 2030 would cover approximately 7 to 8 percent of

[51] California Air Resources Board, The 2017 Climate Change Scoping Plan Update, (January 2017). Available: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed May 2017.

[52] California Air Resources Board, The 2017 Climate Change Scoping Plan Update, (January 2017). Available: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed May 2017.

[53] California Energy Commission, 2016 Existing Buildings Energy Efficiency Plan Update, December 2016. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/16-EBP-01/TN214801_20161214T155117_Existing_Building_Energy_Efficency_Plan_Update_Deceber_2016_Thi.pdf. Accessed May 2017.

[54] Ibid.

the 2030 reduction obligation. The other strategies would be expected to cover the remaining percentage of the 2030 reduction obligation.

Transportation Sector

In response to the transportation sector accounting for a large percentage of California's CO_2 emissions, AB 1493 (HSC Section 42823 and 43018.5), enacted on July 22, 2002, required CARB to set GHG emission standards for passenger vehicles, light duty trucks, and other vehicles whose primary use is non-commercial personal transportation manufactured in and after 2009. In setting these standards, CARB must consider cost effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. The federal CAA ordinarily preempts state regulation of motor vehicle emission standards; however, California is allowed to set its own standards with a federal CAA waiver from the USEPA. In June 2009, the USEPA granted California the waiver.

However, as discussed previously, the USEPA and USDOT adopted federal standards for model year 2012 through 2016 light-duty vehicles. Also as noted above, the USEPA and USDOT have adopted GHG emission standards for model year 2017 through 2025 vehicles. These standards are slightly different from the State's model year 2017 through 2025 standards, but the State of California has agreed not to contest these standards, in part due to the fact that while the national standard would achieve slightly less reductions in California, it would achieve greater reductions nationally and is stringent enough to meet state GHG emission reduction goals. In 2012, CARB adopted regulations that allow manufacturers to comply with the 2017 through 2025 national standards to meet state law.

In January 2007, Governor Brown enacted Executive Order S-01-07, which mandates the following: (1) establish a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and (2) adopt a Low Carbon Fuel Standard (LCFS) for transportation fuels in California. CARB identified the LCFS as one (1) of the nine (9) discrete early actions in the Climate Change Scoping Plan. The LCFS regulations were approved by CARB in 2009 and established a reduction in the carbon intensity of transportation fuels by 10 percent by 2020 with implementation beginning on January 1, 2011. In September 2015, CARB approved the re-adoption of the LCFS, which became effective on January 1, 2016, to address procedural deficiencies in the way the original regulation was adopted. In April 2017, the LCFS was brought before the Court of Appeal challenging the analysis of potential nitrogen dioxide impacts from biodiesel fuels. The Court directed CARB to conduct an analysis of nitrogen dioxide impacts from biodiesel fuels and froze the carbon intensity targets for diesel and biodiesel fuel provisions at 2017 levels until CARB has completed this analysis, which CARB has indicated is expected to occur in 2018.[55]

[55] Biodiesel Magazine, Court rules against CARB on LCFS, preserves 2017 status quo, April 17, 2017.

Land Use Transportation Planning

SB 375 (Chapter 728, Statutes of 2008), which establishes mechanisms for the development of regional targets for reducing passenger vehicle greenhouse gas emissions, was adopted by the State on September 30, 2008. Under SB 375, CARB is required, in consultation with the state's Metropolitan Planning Organizations, to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035. In February 2011, CARB adopted the final GHG emissions reduction targets for the State's Metropolitan Planning Organizations, including the Southern California Association of Governments (SCAG), which is the Metropolitan Planning Organization for the region in which the City of Los Angeles is located.[56] Of note, the reduction targets explicitly exclude emission reductions expected from the AB 1493 and the low carbon fuel standard regulations.

Under SB 375, the reduction target must be incorporated within that region's Regional Transportation Plan (RTP), which is used for long-term transportation planning, in a Sustainable Communities Strategy (SCS). Certain transportation planning and programming activities would then need to be consistent with the SCS; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., general plan) are not required to be consistent with either the RTP or SCS.

Cap-and-Trade Program

The Climate Change Scoping Plan identifies a Cap-and-Trade Program as one of the strategies California will employ to reduce GHG emissions. CARB asserts that this program would help put California on the path to meet its goal of reducing GHG emissions to 1990 levels by the year 2020, and ultimately achieving an 80 percent reduction from 1990 levels by 2050. Under Cap-and-Trade, an overall limit on GHG emissions from capped sectors is established and facilities subject to the cap would be able to trade permits to emit GHGs.

CARB designed and adopted a California Cap-and-Trade Program pursuant to its authority under AB 32.[57] The development of this Program included a multi-year stakeholder process and consideration of potential impacts on disproportionately impacted communities. The Cap-and-Trade Program is designed to reduce GHG emissions from major sources (deemed "covered entities") by setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve AB 32's emission-reduction mandate of returning to 1990 levels of emissions by 2020. The statewide cap for GHG emissions from the capped sectors (e.g., electricity generation, petroleum refining, and cement production) commenced in 2013 and would decline over time, achieving GHG emission reductions throughout the Program's duration.[58]

Under the Cap-and-Trade Program, CARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities.

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56 California Air Resources Board, Sustainable Communities. Available: https://www.arb.ca.gov/cc/sb375/sb375.htm. Accessed September 2016.

57 17 CCR §§ 95800 to 96023.

58 See generally 17 CCR §§ 95811, 95812.

Covered entities that emit more than 25,000 $MTCO_2e$ per year must comply with the Cap-and-Trade Program.[59] Triggering of the 25,000 $MTCO_2e$ per year "inclusion threshold" is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of Greenhouse Gas Emissions.[60]

Each covered entity with a compliance obligation is required to surrender "compliance instruments" for each $MTCO_2e$ of GHG they emit.[61] Covered entities are allocated free allowances in whole or part (if eligible), buy allowances at auction, purchase allowances from others, or purchase offset credits. A "compliance period" is the time frame during which the compliance obligation is calculated. The years 2013 and 2014 were the first compliance period, the years 2015–2017 are the second compliance period, and the years 2018–2020 are the third compliance period. At the end of each compliance period, each facility will be required to surrender compliance instruments to CARB equivalent to their total GHG emissions throughout the compliance period. There are also requirements to surrender compliance instruments covering 30 percent of the prior year's compliance obligation by November of each year. For example, in November 2014, a covered entity was required to submit compliance instruments to cover 30 percent of its 2013 GHG emissions.

The Cap-and-Trade Regulation provides a firm cap, ensuring that the 2020 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade Program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. As summarized by CARB in its First Update to the Climate Change Scoping Plan:

> *The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances.* ***But as the cap declines, aggregate emissions must be reduced.***[62]

In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program. However, as climate change is a global phenomenon and the effects of GHG emissions are considered cumulative in nature, a focus on aggregate GHG emissions reductions is warranted.

59 17 CCR § 95812.

60 17 CCR §§ 95100-95158.

61 Compliance instruments are permits to emit, the majority of which will be "allowances," but entities also are allowed to use CARB-approved offset credits to meet up to 8% of their compliance obligations.

62 CARB, First Update to the Climate Change Scoping Plan: Building on the Framework, at 86 (May 2014) (emphasis added).

Further, the reductions in GHG emissions that would be achieved by the Cap-and-Trade Program inherently are variable and, therefore, impossible to quantify with precision:

> *The Cap-and-Trade Regulation is different from most of the other measures in the Scoping Plan. The [R]egulation sets a hard cap, instead of an emission limit, so the emission reductions from the program vary as our estimates of "business as usual" emissions in the future are updated. In addition, the Cap-and-Trade Program works in concert with many of the direct regulatory measures—providing an additional economic incentive to reduce emissions. Actions taken to comply with direct regulations reduce an entity's compliance obligation under the Cap-and-Trade Regulation. So, for example, increased deployment of renewable electricity sources reduces a utility's compliance obligation under the Cap-and-Trade Regulation.*[63]

If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions reductions. In other words, the Cap-and-Trade Program functions similarly to an insurance policy for meeting California 2020's GHG emissions reduction mandate:

> *The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the "capped sectors." Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap.*[64]
>
> *[T]he Cap-and-Trade Regulation provides assurance that California's 2020 limit will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions.*[65]

In summary, the Cap-and-Trade Program will achieve aggregate, rather than site-specific or project-level, GHG emissions reductions. Also, due to the regulatory architecture adopted by CARB under AB 32, the reductions attributed to the Cap-and-Trade Program can change over time, depending on the State's emissions forecasts and the effectiveness of direct regulatory measures.

63 Ibid.

64 CARB, First Update to the Climate Change Scoping Plan: Building on the Framework, at 88 (May 2014)

65 Id. at 86-87.

The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported.[66] Accordingly, GHG emissions associated with CEQA projects' electricity usage are covered by the Cap-and-Trade Program.

The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the Program's first compliance period.[67] While the Cap-and-Trade Program technically covered fuel suppliers as early as 2012, they did not have a compliance obligation (i.e., they were not fully regulated) until 2015:

> *Suppliers of natural gas, suppliers of RBOB [Reformulated Gasoline Blendstock for Oxygenate Blending] and distillate fuel oils, suppliers of liquefied petroleum gas, and suppliers of liquefied natural gas specified in sections 95811(c), (d), (e), (f), and (g) that meet or exceed the annual threshold in section 95812(d)* ***will have a compliance obligation beginning with the second compliance period****.*[68]

The Cap-and-Trade Program covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported. The point of regulation for transportation fuels is when they are "supplied" (i.e., delivered into commerce). However, transportation fuels that are "supplied" in California, but can be demonstrated to have a final destination outside California, do not generate a compliance obligation. The underlying concept here is that CARB is seeking to capture tailpipe GHG emissions from the combustion of transportation fuels supplied to California end-users. Accordingly, as with stationary source GHG emissions and GHG emissions attributable to electricity use, virtually all, if not all, of GHG emissions from CEQA projects associated with vehicle combustion of transportation fuels are covered by the Cap-and-Trade Program.

Title 24, Building Standards Code and CALGreen Code

The California Energy Commission first adopted the Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, increased energy efficiency, and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically to allow for the consideration and inclusion of new energy efficiency technologies and methods.

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards (CALGreen) Code. The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable

66 17 CCR § 95811(b).
67 17 CCR §§ 95811, 95812(d).
68 Id. at § 95851(b)(emphasis added).

construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5) Environmental air quality."[69] The CALGreen Code is not intended to substitute for or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission. When the CALGreen Code went into effect in 2009, compliance through 2010 was voluntary. As of January 1, 2011, the CALGreen Code is mandatory for all new buildings constructed in the state. The CALGreen Code establishes mandatory measures for new residential and non-residential buildings. Such mandatory measures include energy efficiency, water conservation, material conservation, planning and design and overall environmental quality.[70] The CALGreen Code was most recently updated in 2016 to include new mandatory measures for residential as well as nonresidential uses; the new measures took effect on January 1, 2017.[71]

Regional

South Coast Air Quality Management District

The Project is located in the South Coast Air Basin (Air Basin), which consists of Orange County, Los Angeles County (excluding the Antelope Valley portion), and the western, non-desert portions of San Bernardino and Riverside Counties, in addition to the San Gorgonio Pass area in Riverside County. The South Coast Air Quality Management District (SCAQMD) is responsible for air quality planning in the Air Basin and developing rules and regulations to bring the area into attainment of the ambient air quality standards. This is accomplished though air quality monitoring, evaluation, education, implementation of control measures to reduce emissions from stationary sources, permitting and inspection of pollution sources, enforcement of air quality regulations, and by supporting and implementing measures to reduce emissions from motor vehicles.

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990.[72] The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- Phase out the use and corresponding emissions of chlorofluorocarbons, methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- Phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons by the year 2000;

69 California Building Standards Commission, 2010 California Green Building Standards Code, (2010).

70 California Building Standards Commission, 2010 California Green Building Standards Code, (2010).

71 California Building Standards Commission, CALGreen (Part 11 of Title 24). Available at: http://www.bsc.ca.gov/Home/CALGreen.aspx. Accessed May 2017.

72 South Coast Air Quality Management District, SCAQMD's Historical Activity on Climate Change. Available at: http://www.aqmd.gov/home/about/initiatives/climate-change. Accessed May 2017.

- Develop recycling regulations for hydrochlorofluorocarbons (e.g., SCAQMD Rules 1411 and 1415);
- Develop an emissions inventory and control strategy for methyl bromide; and
- Support the adoption of a California GHG emission reduction goal.

The SCAQMD has yet to adopt a GHG significance threshold for land use development projects (e.g., residential/commercial projects), but did form a GHG Significance Threshold Working Group to further evaluate potential GHG significance thresholds.[73] In October 2008, SCAQMD released a draft guidance document regarding interim CEQA GHG significance thresholds.[74] Within its October 2008 document, the SCAQMD proposed interim CEQA GHG indicators of significance using a tiered approach. Under Tier 1, projects that are exempt from CEQA would be less than significant. Under Tier 2, projects that are consistent with an adopted GHG reduction plan would be less than significant. Under Tier 3, all non-industrial land use projects, including mixed-use projects that emit 3,000 $MTCO_2e$ per year or less would be less than significant.[75] Tier 4 utilizes performance standards, including requiring projects to demonstrate they meet a percent emission reduction target below business as usual to determine significance for commercial/residential projects that emit greater than 3,000 $MTCO_2e$ per year.[76] In November 2009, the Working Group proposed an additional Tier 4 standard that utilizes performance standards, including requiring projects to demonstrate they meet a service population metric to determine significance for commercial/residential projects that emit greater than 3,000 $MTCO_2e$ per year.[77,78] The Working Group proposed a project-level service population target of 4.6 $MTCO_2e$ per service population based on calculations performed by the Bay Area Air Quality Management District.[79] On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold of 10,000 $MTCO_2e$ for stationary source/industrial projects where the SCAQMD is lead agency.[80]

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73 South Coast Air Quality Management District, Greenhouse Gases CEQA Significance Thresholds, (2008). Available at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds. Accessed May 2017.

74 South Coast Air Quality Management District, Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold, October 2008. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-6/ghg-meeting-6-guidance-document-discussion.pdf?sfvrsn=2. Accessed May 2017.

75 Ibid.

76 Ibid.

77 South Coast Air Quality Management District, Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group #14, November 19, 2009. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-14/ghg-meeting-14-main-presentation.pdf?sfvrsn=2. Accessed May 2017.

78 The SCAQMD defines service population as including population and employment.

79 Bay Area Air Quality Management District, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/revised-draft-ceqa-thresholds-justification-report-oct-2009.pdf?la=en. Accessed May 2017.

80 South Coast Air Quality Management District, Greenhouse Gases CEQA Significance Thresholds, (2008). Available at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds. Accessed May 2017.

In the September 2010 presentation by the Working Group, the Tier 4 performance standard of a percent emission reduction target below business as usual referred to an approach used by the San Joaquin Valley Air Pollution Control District that uses a comparison of a development's GHG emissions compared to a BAU scenario.[81,82] The Working Group did not recommend a specific numeric reduction target in the September 2010 presentation.[83] In addition, in September 2010, the Working Group re-calculated the per service population target as 4.8 $MTCO_2e$ per service population by dividing the 2020 statewide GHG reduction target for the land use sector by the sum of the total statewide population and land use sector employment, as explained in the September 28, 2010 minutes to the Stakeholder Working Group #15 meeting (the prior 4.6 $MTCO_2e$ per service population target was calculated by the Bay Area Air Quality Management District by dividing the 2020 statewide GHG reduction target for the land use sector by the sum of the total statewide population and total statewide employment).[84] The aforementioned Working Group has been inactive since 2011 and the SCAQMD has not formally adopted any GHG significance threshold for land use development projects.

Southern California Association of Governments

In February 2011, CARB adopted the GHG emissions reduction targets under SB 375 for the SCAG region. The target is a per capita reduction of 8 percent for 2020 and 13 percent for 2035 compared to the 2005 baseline. On April 7, 2016, SCAG adopted the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which is an update to the previous 2012 RTP/SCS.[85] Using growth forecasts and economic trends, the 2016 RTP/SCS provides a vision for transportation throughout the region for the next 25 years. It considers the role of transportation in the broader context of economic, environmental, and quality-of-life goals for the future, identifying regional transportation strategies to address mobility needs. The 2016 RTP/SCS describes how the region will achieve and exceed the GHG emission-reduction targets set by CARB by demonstrating an 8 percent reduction by 2020, 18 percent reduction by 2035, and 21 percent reduction by 2040 compared to the 2005 level on a per capita basis.[86] Compliance with and implementation of 2016 RTP/SCS policies and strategies would have co-benefits of

81 South Coast Air Quality Management District, Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group Meeting #15, September 28, 2010. Available at: 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. Accessed May 2017.

82 San Joaquin Valley Air Pollution Control District, Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA, December 17, 2009. Available at: http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf. Accessed May 2017.

83 South Coast Air Quality Management District, Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group Meeting #15, September 28, 2010. Available at: 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. Accessed May 2017.

84 South Coast Air Quality Management District, Minutes for the GHG CEQA Significance Threshold Stakeholder Working Group #15. Available at: 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. Accessed May 2017.

85 Southern California Association of Governments, 2016 RTP/SCS. Available: http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS. Accessed September 2016.

86 Ibid.

reducing per capita criteria air pollutant emissions associated with reduced per capita vehicle miles traveled (VMT).

SCAG's 2016 RTP/SCS provides specific strategies for successful implementation. These strategies include supporting projects that encourage a diverse job opportunities for a variety of skills and education, recreation and cultures and a full-range of shopping, entertainment and services all within a relatively short distance; encouraging employment development around current and planned transit stations and neighborhood commercial centers; encouraging the implementation of a "Complete Streets" policy that meets the needs of all users of the streets, roads and highways including bicyclists, children, persons with disabilities, motorists, electric vehicles, movers of commercial goods, pedestrians, users of public transportation, and seniors; and supporting alternative fueled vehicles. In addition, the 2016 RTP/SCS includes new strategies to promote active transportation, supports local planning and projects that serve short trips, expand understanding and consideration of public health in the development of local plans and projects, and supports improvements in sidewalk quality, local bike networks, and neighborhood mobility areas. It also proposes increasing access to the California Coast Trail, light rail and bus stations, and promoting corridors that support biking and walking, such as through a regional greenway network and local bike networks. The 2016 RTP/SCS proposes to better align active transportation investments with land use and transportation strategies, increase competitiveness of local agencies for federal and state funding, and to expand the potential for all people to use active transportation. CARB has accepted the SCAG GHG quantification determination in the 2016 RTP/SCS.[87]

Local

City of Rancho Palos Verdes General Plan 1975

The 1975 City of Rancho Palos Verdes General Plan (adopted June 26, 1975) does not address GHG emissions and climate change. However, some of the goals, objectives, and policies contained in the Natural Environment Element of the City's General Plan would also result in the reduction of GHG emissions. These goals, objectives, and polices in are provided below:

> **Overall Policy 2:** Develop a specific set of planning and design criteria for natural environment considerations with new development, and in upgrading existing areas for use by architects, planners, engineers, and others in a handbook/checklist form.
>
> **Overall Policy 3:** Develop and integrate a specific review process covering the natural environment aspects of any proposed development with the normal review processes associated with proposed development.
>
> **Overall Policy 4:** Consider more in detail natural environment factors in subsequent specific area studies as an integral part of these studies.

87 California Air Resources Board, Southern California Association of Governments' (SCAG) 2016 Sustainable Communities Strategy (SCS) ARB Acceptance of GHG Quantification Determination, June 2016. Available: https://www.arb.ca.gov/cc/sb375/scag_executive_order_g_16_066.pdf. Accessed September 2016.

City of Ranch Palos Verdes Emissions Reduction Action Plan

The ERAP presents the City's community and municipal inventories, forecasts, and recommended reduction targets for emissions to mitigate the City's impacts on climate change. The City's emission reduction targets are 15 percent below 2005 levels by 2020 and 49 percent below 2005 levels by 2035. To meet these targets, the ERAP recommends the following Community and Municipal Energy Efficiency Strategies applicable to the General Plan Update:

Community GHG Reduction Strategies

Goal 1: Increase Energy Efficiency in Existing Residential Units

Goal 2: Increase Energy Efficiency in New Residential Development

Goal 3: Increase Energy Efficiency in Existing Commercial Units

Goal 4: Increase Energy Efficiency in New Commercial Units

Goal 5: Increase Energy Efficiency through Water Efficiency (WE)

Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect

Municipal GHG Reduction Strategies

Goal 1: Participate in Education, Outreach, and Planning for Energy Efficiency

Goal 2: Increase Energy Efficiency in Municipal Buildings

Goal 3: Increase the Energy Efficiency in City Infrastructure

Impact Assessment

Methodology

The evaluation of potential impacts to GHG emissions that may result from the construction and long-term operations of implementing projects from the General Plan Update are conducted as follows.

The Climate Action Registry General Reporting Protocol provides procedures and guidelines for calculating and reporting GHG emissions from general and industry-specific activities. Although no numerical thresholds of significance have been adopted, and no specific protocols are available for land use projects, the General Reporting Protocol provides a framework for calculating and reporting GHG emissions from the General Plan Update. The GHG emissions provided in this section is consistent with the General Reporting Protocol framework. For the purposes of this technical report, total GHG emissions from the General Plan Update were quantified to provide information to decision makers and the public regarding the level of the General Plan Update's annual GHG emissions at buildout.

The General Reporting Protocol recommends separating GHG emissions into three categories that reflect different aspects of ownership or control over emissions. They include the following:

- Scope 1: Direct, on-site combustion of fossil fuels (e.g., natural gas, propane, gasoline, and diesel).
- Scope 2: Indirect, off-site emissions associated with purchased electricity or purchased steam.
- Scope 3: Indirect emissions associated with other emissions sources, such as third-party vehicles and embodied energy.[88]

For purposes of this analysis, it is considered reasonable and consistent with criteria pollutant calculations to consider those GHG emissions resulting from the buildout of the General Plan Update the incremental increases in the use of on-road mobile vehicles, electricity, and natural gas compared to existing conditions without buildout of the General Plan Update. This includes implementing project construction activities such as demolition, hauling, and construction worker trips. This analysis also considers indirect GHG emissions from water conveyance, wastewater generation, and solid waste handling. Since potential impacts resulting from GHG emissions are long-term rather than acute, GHG emissions are calculated on an annual basis.

The General Reporting Protocol provides a range of basic calculation methods. However, they are typically designed for existing buildings or facilities and are not directly applicable to planning and development situations where the buildings or facilities do not yet exist. As a result, this section relies on calculation guidance from state and regional agencies with scientific expertise in quantifying GHG emissions, such as CARB and the SCAQMD. GHG emissions are estimated using the California Emissions Estimator Model (CalEEMod) Version 2013.6.1, which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying air quality and GHG impacts from land use projects throughout California.[89]

Existing Baseline Emissions

Under CEQA, the baseline environmental year is established as the time the Notice of Preparation for the General Plan Update was filed, which is 2015. Existing Emissions were modeled in

88 Embodied energy includes energy required for water pumping and treatment for end-uses. Third-party vehicles include vehicles used by hotel guests and other visitors of the Project Site.

89 See: http://www.aqmd.gov/caleemod/.

CalEEMod and are presented in **Table 5**, 2015 *Existing GHG Emissions*. As shown in the table existing emissions for the City in 2015 were 261,126 $MTCO_2e$.

TABLE 5
2015 EXISTING GHG EMISSIONS

Emission Source	CO_2e (MT/yr)
Existing	
Mobile Sources	137,547
Energy Consumption	100,364
Water Consumption	12,800
Solid Waste	8,623
Area Source	1,792
TOTAL EXISTING EMISSIONS	**261,126**

CO_2e= carbon dioxide equivalent; MT/yr = metric tons per year; see Appendix A for CalEEMod model outputs.

Source: ESA, 2017

Construction (Short-Term) Emissions

The General Plan Update provides the framework for growth in the City to ensure that development will enrich the quality of life for existing and future residents. The Land Use and Circulation policies in the General Plan Update identified a need for more dwelling units and additional or linking of hike and bike trails, and planned roadway and intersection improvements within the City. Primary construction under the General Plan Update would occur with the addition of 668 single family residences and 88 multi-family residences; a total increase of 756 dwelling units by 2040. The construction schedule and sequencing of implementing projects to meet the identified housing and hike and bike trails needs is unknown at this time. However, for analysis purposes, two different scenarios were modeled to determine a worst-case construction scenario. The scenarios identified housing construction for analysis as they would generate larger GHG emissions than modification or additions to the hike and bike trails. Scenario 1, assumes that the 756 dwelling units would be constructed evenly over the 20-year period covered by the General Plan Update. Therefore, approximately 38 dwelling units would be constructed per year over the 20 years, equating to approximately 5 percent of the housing requirement being constructed per year. Scenario 2 assumes that one acre parcels are constructed, concurrently, with the maximum number of dwelling units per acre for both single family and multi-family development. The single family development parcel will have six dwelling units constructed per acre and the multi-family development parcel will have 22 dwelling units constructed per acre, which would maximize grading and construction on the acres.

Construction emissions were forecasted by assuming a conservative estimate of construction activities (i.e., assuming all construction occurs at the earliest feasible date) and applying the mobile source emissions factors associated with that construction year. The output values used CalEEMod default construction equipment based on the acreage and number of dwelling units to be developed. These values were then applied to the same construction phasing assumptions used in the criteria pollutant analysis (General Plan Update Air Quality Technical Report) to generate GHG emissions values for each scenario. The SCAQMD guidance, *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold*, recognizes that construction-related GHG emissions from projects "occur over a relatively short-term period of time" and that "they contribute a relatively small portion of the overall lifetime project GHG emissions."[90] The guidance recommends that construction project GHG emissions should 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."[91] In accordance with SCAQMD guidance, GHG emissions from construction have been amortized over the 30-year lifetime of the General Plan Update.

Operational (Long-Term) Emissions

Operational emissions were estimated using CalEEMod (Version 2016.3.1) software for the 2040 buildout year with and without the General Plan Update to determine the net incremental change in GHG emissions. Mobile source emissions are based on the vehicle emission factors from CARB's on-road vehicle emissions factor (EMFAC2014) model, which are part of the CalEEMod model, and "represents [C]ARB's current understanding of motor vehicle travel activities and their associated emission levels.[92] CalEEMod was also used to estimate GHG emissions from electricity, natural gas, solid waste, water and wastewater, fireplaces, and landscaping equipment.

For mobile sources, CalEEMod was used to generate the GHG emissions from the existing and General Plan Update uses based on the vehicle emission factors from EMFAC2014 and vehicle miles traveled anticipated in the ERAP. The estimated VMT takes into account trip distance reductions from characteristics including residential density, neighborhood walkability, and proximity to existing public transit and job centers. The estimated VMT reductions are calculated using the equations and methodologies prescribed in the California Air Pollution Control Officer's Association (CAPCOA) guidance document, *Quantifying Greenhouse Gas Mitigation Measures*, which provides emission reduction calculation formulas for transportation characteristics and measures.[93]

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90 South Coast Air Quality Management District, Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold, (2008) 3-8.

91 Ibid.

92 California Air Resources Board, Mobile Source Emissions Inventory. Available at: http://www.arb.ca.gov/msei/categories.htm#emfac2014. Accessed May 2017.

93 California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010).

With regard to energy demand, the consumption of fossil fuels to generate electricity and to provide heating and hot water generates GHG emissions. Energy demand rates were estimated in CalEEMod based on number of dwelling units and square footage of non-residential land uses as applicable. Energy demand (off-site electricity generation and on-site natural gas consumption) for the General Plan Update was calculated based on the ERAP data.

Solid waste disposal GHG emissions are calculated using CalEEMod software. The emissions are based on the waste disposal rate for the land uses as provided in the ERAP modeling data, the waste diversion rate, and the GHG emission factors for solid waste decomposition. The GHG emission factors, particularly for CH_4, depend on characteristics of the landfill, such as the presence of a landfill gas capture system and subsequent flaring or energy recovery. The default values, as provided in CalEEMod, for landfill gas capture (e.g., no capture, flaring, energy recovery) are statewide averages and are used in this assessment.

GHG emissions from water and wastewater result from the required energy to supply and distribute water and treat wastewater. Wastewater also results in emissions of GHGs from wastewater treatment systems. Emissions are calculated using CalEEMod and are based on the default water rates provided in the ERAP modeling data, the electrical intensity factors for water supply, treatment, and distribution and for wastewater treatment, GHG emission factors for the electricity utility provider, and the emission factors for the wastewater treatment process.

Other sources of GHG emissions from operation of the General Plan Update include equipment used to maintain landscaping, such as lawnmowers and trimmers. The CalEEMod software uses landscaping equipment GHG emission factors from the CARB OFFROAD model and the CARB *Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment (6/13/2003)*.[94]

Comparison to General Plan Update without GHG Reduction Characteristics, Features, and Measures

As discussed previously, state, regional, and local GHG reduction plans and policies, such as CARB's Climate Change Scoping Plan, SB 375 and City of Rancho Palos Verdes Emissions Reduction Action Plan would be applicable to the General Plan Update. These plans and policies are intended to reduce GHG emissions in accordance with the goals of HSC Division 25.5. In order to evaluate the efficacy of the GHG reduction characteristics, features, and measures that would be implemented as part of the General Plan Update, this analysis compares the General Plan Update's GHG emissions to the emissions that would be generated by the General Plan Update without implementation of GHG reduction characteristics, features, and measures. This approach mirrors the concepts used in CARB's Climate Change Scoping Plan, which demonstrates GHG reductions compared to a BAU scenario. This comparison is provided only to evaluate the General Plan Update's efficiency with respect to GHG emissions but is not a threshold of significance.

94 California Air Resources Board, OFFROAD Modeling Change Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment, (6/13/2003), http://www.arb.ca.gov/msei/2001_residential_lawn_and_garden_changes_in_eqpt_pop_and_act.pdf. Accessed March 2017.

The GHG emissions that would be generated by the General Plan Update without implementation of GHG reduction characteristics, features, and measures is quantified based on specific and defined circumstances in the context of relevant state activities and mandates. Because this comparison is intended to mirror the concepts used in CARB's Climate Change Scoping Plan, the GHG emissions for the General Plan Update without implementation of GHG reduction characteristics, features, and measures is evaluated based on the specific and defined circumstances that CARB relied on when it projected the State's GHG emissions in the absence of GHG reduction measures in the Climate Change Scoping Plan. The specific and defined circumstances used by CARB include regulatory conditions that existed during the 2009 to 2011 time period, which include the vehicle fleet that existed during the 2009 to 2011 period and the 2008 Title 24 Building Energy Efficiency Standards.[95] Although baseline emissions are estimated assuming conditions during the 2009 to 2011 time period, the current version of CalEEMod (Version 2016.3.1), which utilizes EMFAC2014 emissions factors, has been used to calculate emissions. Furthermore, the specific General Plan Update policies are not included as they encompass GHG reduction strategies and features that would be consistent with state, regional, and local GHG reduction plans and policies or would go above and beyond regulatory requirements. The emissions are estimated using the CalEEMod software, and the model inputs are adjusted to account for the specific and defined circumstances as described above. The analysis assumes the General Plan Update without implementation of GHG reduction characteristics, features, and measures would incorporate the same land uses and building square footage as the General Plan Update.

Thresholds of Significance

Appendix G of the State CEQA Guidelines

In accordance with Appendix G of the CEQA Guidelines, the General Plan Update could have a significant impact if it would:

Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

Amendments to Section 15064.4 of the CEQA Guidelines were adopted to assist lead agencies in determining the significance of the impacts of GHG emissions. Consistent with existing CEQA practice, Section 15064.4 gives lead agencies the discretion to determine whether to assess those emissions quantitatively or qualitatively. If a qualitative analysis is used, in addition to quantification, this section recommends certain qualitative factors that may be used in the determination of significance (i.e., extent to which the project may increase or reduce GHG emissions compared to the existing environment; whether the project exceeds an applicable significance threshold; and extent to which the project complies with regulations or requirements adopted to implement a reduction or mitigation of GHGs). The amendments do not establish a

[95] Baseline conditions mimic the 2012 emissions rates provided in the ERAP, with the exception of the EMFAC2014 emission rates.

threshold of significance; rather, lead agencies are granted discretion to establish significance thresholds for their respective jurisdictions, including looking to thresholds developed by other public agencies, or suggested by other experts, such as CAPCOA, so long as any threshold chosen is supported by substantial evidence (see Section 15064.7(c)). The California Natural Resources Agency has also clarified that the CEQA Guidelines amendments focus on the effects of GHG emissions as cumulative impacts, and that they should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see Section 15064(h)(3)).[96]

Although GHG emissions can be quantified as discussed under Methodology above, CARB, SCAQMD, and the City of Rancho Palos Verdes have not adopted project-level significance thresholds for GHG emissions that would be applicable to the General Plan Update. The Governor's Office of Planning and Research (OPR) released a technical advisory on CEQA and climate change that provided some guidance on assessing the significance of GHG emissions, and states that "lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice," and that while "climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment."[97] Furthermore, the technical advisory states that "CEQA authorizes reliance on previously approved plans and mitigation programs that have adequately analyzed and mitigated GHG emissions to a less than significant level as a means to avoid or substantially reduce the cumulative impact of a project."[98]

Per CEQA Guidelines Section 15064(h)(3), a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area of the project.[99] To qualify, such a plan or program must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency.[100] Examples of such programs include a "water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plan, [and] plans or regulations for the reduction of greenhouse gas emissions."[101] Thus, CEQA Guidelines Section 15064(h)(3) allows a lead agency to make a finding of non-significance for GHG emissions if a project complies with a program and/or other regulatory schemes to reduce GHG emissions.[102]

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96 See generally California Natural Resources Agency, Final Statement of Reasons for Regulatory Action (December 2009), pp. 11-13, 14, 16; see also Letter from Cynthia Bryant, Director of the Office of Planning and Research to Mike Chrisman, Secretary for Natural Resources, April 13, 2009. Available at https://www.opr.ca.gov/docs/Transmittal_Letter.pdf. Accessed May 2017.

97 Governor's Office of Planning and Research, Technical Advisory – CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review, (2008).

98 Ibid.

99 14 CCR § 15064(h)(3).

100 Ibid.

101 Ibid.

102 See, for example, San Joaquin Valley Air Pollution Control District (SJVAPCD), CEQA Determinations of Significance for Projects Subject to ARB's GHG Cap-and-Trade Regulation, APR-2025 (June 25, 2014), in which

In the absence of any adopted, quantitative threshold, the General Plan Update would not have a significant effect on the environment if the General Plan Update is found to be consistent with the applicable regulatory plans and policies to reduce GHG emissions, including the emissions reduction measures discussed within CARB's Climate Change Scoping Plan, SCAG's 2016 RTP/SCS, the City of Rancho Palos Verdes Emissions Reduction Action Plan, and Green Building Code.

General Plan Update Goals, Policies and Implementation Actions and Characteristics

General Plan Update Goals, Policies and Implementation Actions

A number of goals, policies, and implementation actions in the proposed City of Rancho Palos Verdes General Plan Update address sustainability and the reduction of the carbon footprint of the City. Specifically, the City will continue active participation in cooperative regional efforts to reduce pollutant emissions as well as focus more attention on improvements at the local level. Implementation of these goals, policies, and programs would reduce impacts related to global warming associated with the General Plan Update. These include:

Conservation and Open Space Element

- To conserve, protect, and enhance the City's natural resources; beauty; and open space for the benefit and enjoyment of its residents and the residents of the entire region. Future development shall recognize the sensitivity of the natural environment and be accomplished in such a manner as to maximize the protection of it.

Climate Change Policies for Public Facilities and Developments

1. Continue to work with SBCCOG to develop an Emission Reduction Action Plan (ERAP) and a Climate Action Plan that would include strategies that consider the unique characteristics and conditions of the City.
2. Promote new energy efficient buildings and retrofit existing public facilities to be as energy efficient as feasible.
3. Continue to manage the City transportation fleet's fueling standards to achieve the greatest number of hybrid and alternative fuel vehicles.
4. Support development of publicly accessible alternative fuel infrastructure.
5. Encourage utility companies to provide informational literature about energy conservation for the public at City facilities.

the SJVAPCD "determined that GHG emissions increases that are covered under ABR's Cap-and-Trade regulation cannot constitute significant increases under CEQA…" Furthermore, the SCAQMD has taken this position in CEQA documents it has produced as a lead agency. The SCAQMD has prepared three Negative Declarations and one Draft Environmental Impact Report that demonstrate the SCAQMD has applied its 10,000 $MTCO_2e$/yr significance threshold in such a way that GHG emissions covered by the Cap-and-Trade Program do not constitute emissions that must be measured against the threshold. See SCAQMD, Final Negative Declaration for Ultramar Inc. Wilmington Refinery Cogeneration Project, SHC No. 2012041014 (October 2014); SCAQMD Final Negative Declaration for Phillips 99 Los Angeles Refinery Carson Plant—Crude Oil Storage Capacity Project, SCH No. 2013091029 (December 2014); SCAQMD Final Mitigated Negative Declaration for Toxic Air Contaminant Reduction for Compliance with SCAQMD Rules 1420.1 and 1402 at the Exide Technologies Facility in Vernon, CA, SCH No. 2014101040 (December 2014); and SCAQMD Final Environmental Impact Report for the Breitburn Santa Fe Springs Blocks 400/700 Upgrade Project, SCH No. 2014121014 (August 2015).

6. Improve pedestrian, bicycle, and public transportation routes and amenities to serve the travel needs of residents and visitors. Where feasible, connect major destinations such as parks, open spaces, civic facilities, retail, and recreation areas with pedestrian, bicycle, and public transportation infrastructure; promote shared roadways; and require new development and redevelopment projects to provide pedestrian, bicycle, and public transportation amenities and streetscape improvements.
7. Continue to support the preservation of open spaces throughout the City.

Climate Change Policies for Private Developments

8. Continue to review development proposals for potential regional and local air quality impacts per the California Environmental Quality Act (CEQA), and if potential impacts are identified, require mitigation to reduce the impact to a level that is less than significant, where technically and economically feasible.
9. Continue to enforce State Title 24 building construction requirements and apply standards that promote energy conservation.
10. Continue to promote and encourage participation in the City's Voluntary Green Building Construction Program and award participating developers with a faster entitlement process and up to 50% rebate on permitting fees.
11. Continue to implement the required components of the Congestion Management Plan (CMP) and continue to work with Los Angeles County on annual updates to the CMP.
12. Provide information to educate residents and businesses on topics such as waste reduction, recycling, sustainable buildings and landscaping, and renewable energy generation. Use a range of tools, including fact sheets, websites, newsletters, advertising, and workshops, to reach potential audiences.
13. Continue to provide subsidies in application fees for solar panels, skylights, high-efficiency pool/spa pumps, tankless water heaters, and Energy Star units to promote efficient use of energy and conservation.

Conservation Policies Specific to the Natural Communities Conservation Plan

19. Collect baseline data for air and water quality to develop standards for evaluation of the impacts of current or proposed development in and adjacent to Rancho Palos Verdes.

Land Use Element

- Carefully control and direct future growth towards making a positive contribution to all elements of the community. Growth in Rancho Palos Verdes should be a cautious, evolutionary process that considers the capacity limitations for the City, and the environmental factors and quality of life on the Peninsula.

Residential Land Use Policies

2. Retain the present predominance of single family residences found throughout the City. Allow for the maintenance and replacement of existing non-conforming multi-family residential uses.
3. Require all new housing developed to include suitable and adequate landscaping, open space, and other design amenities to meet the City's standards.
5. Maintain and update the development codes with quality standards, being flexible to new technology and techniques of building.
8. Encourage energy and water conservation in housing design.

Institutional (Public, Educational, and Religious) Land Use Policies

25. Encourage implementation of plans for pedestrian and bicycling networks linking residential areas with schools for the safety of children.

Circulation Element

- Provide and maintain a safe, efficient, and comprehensive system of roads and trails, and coordinate them with other jurisdictions and agencies.
- Facilitate mobility of residents through an adequate public transportation system with consideration of the City's demographics.
- Where appropriate, use complete street concepts to integrate the needs of all users of the roadway system consistent with the California Complete Streets Act of 2008 (AB 1358).

Transportation Systems Policies

1. Balance traffic impacts to residential neighborhoods with efficient traffic flow and public safety by implementing appropriate traffic-calming measures.
2. Require any new developments or redevelopment to provide streets wide enough to support the City's future traffic needs and to address potential impacts to nearby intersections resulting from such developments.
3. Encourage synchronization and coordination of traffic signals along arterials.
4. Ensure that future residential developments provide direct access to roadways other than arterials.
5. Work with other Peninsula cities and/or regional agencies to improve public transportation on the Peninsula and to provide access to other destinations in the region.
6. Implement the Trails Network Plan to meet the recreational needs of the community while maintaining the unique character of the Peninsula.
7. Coordinate and cooperate with neighboring jurisdictions to develop trail networks.
9. Require that all new developments, where appropriate, establish paths and trails.
23. Design and construct new trails in accordance with the Trails Network Plan and other national, state, and local standards, where appropriate.
24. When constructing paths and trails, require the use of construction techniques that minimize the impact on the environment.
26. Include the bikeways in the Conceptual Bikeways Plan or alternate approaches to provide access, prior to approval of proposals for land development through a subdivision of land application and/or conditional use permit application.
27. Require consideration of the inclusion of bikeways in the Conceptual Bikeways Plan or alternate approaches to provide access during project design for all City Department of Public Works or Department of Recreation and Parks projects.

Infrastructure System Policies

29. Allow new development only where adequate infrastructure systems can reasonably be provided.

Resource System Policies

32. Encourage the use of alternative water and energy generation sources.

33. Promote, practice, and encourage workable energy and water conservation techniques.
34. Review any proposed development, major new resource uses, or significant changes to resource systems for impacts to the surrounding neighborhood and community.
35. Encourage the use of recycled/reclaimed water in the irrigation of large open space areas, including golf courses, open space areas owned by homeowners' associations, and City parks and ballfields.
36. Encourage Cal Water to complete a conservation plan that provides for the availability of a recycled water system in the City.

Disposal/Recovery System Policies

40. Encourage waste reduction and recycling programs.
41. Require all new developments to provide sanitary sewers connected to the County Sanitation District's system.

Flood Control/Storm Drain System Policies

43. Encourage the retention of all remaining natural watercourses in their natural state.
44. Require developers to install and develop a mechanism for ongoing maintenance of necessary flood control devices in order to mitigate downstream flood hazards induced by proposed upstream developments.

Housing and Social Services Element

- Accommodate the housing needs of all income groups as quantified by Regional Housing Needs Assessment by facilitating the construction of the maximum feasible number of housing units for all income groups.

Fiscal Element

Fiscal Policies

13. Actively pursue energy-efficient methods and equipment in existing and future City buildings and spaces, as well as public infrastructure, to help reduce operating costs.

General Plan Update Characteristics

Land Use Characteristics

The General Plan Update would represent an infill development, since it would be undertaken on vacant land located throughout the City, and would be located near existing off-site commercial, residential, retail, and recreational destinations and in close proximity to existing public transit stops and hike, bike and equestrian trails, which would result in reduced vehicle trips, VMT, and associated transportation-related GHG emissions compared to a project without these characteristics.

As discussed above, CAPCOA has provided guidance for mitigating or reducing emissions from land use development projects within its guidance document titled *Quantifying Greenhouse Gas Mitigation Measures.* The land use characteristics listed below are consistent with the CAPCOA guidance document, and would reduce vehicle trips within the City and vehicle trip distances and would achieve a reduction in associated transportation-related air pollutant and GHG emissions.

Increased Density: Increased density, measured in terms of persons, jobs, and/or dwelling units per unit area, reduces emissions associated with transportation as it reduces the distance people travel for work or services and provides a foundation for the implementation of other strategies such as enhanced transit services. This measure corresponds to CAPCOA guidance measure LUT-1.[103] According to CAPCOA, the reduction in VMT from increased density applies to urban and suburban settings for residential, retail, office, industrial, and mixed-use projects. Implementing projects under the General Plan Update would provide single family and multi-family housing on vacant lots throughout the City, in close proximity to existing retail, commercial and recreational sites within the City. The General Plan Update would be expected to increase housing in the City by 756 dwelling units, based on the Regional Housing Needs Assessment, most of which will be developed with the maximum density per acre allowable by zoning. Therefore, this applies to the General Plan Update.

Location Efficiency: Location efficiency describes the reduction in VMT expected based on the type of urban landscape such as an urban area, compact infill, or suburban center. In general, compared to the statewide average, projects could realize VMT reductions up to 65 percent in an urban area, up to 30 percent in a compact infill area, or up to 10 percent in a suburban center for land use/location strategies.[104] This measure corresponds to CAPCOA guidance measure LUT-2.[105] According to CAPCOA, the reduction in VMT from this measure applies to urban and suburban settings for residential, retail, office, industrial, and mixed-use projects. Implementing projects, primarily residential, under the General Plan Update would be located in a suburban setting and therefore, this measure applies to the General Plan Update. According to the CAPCOA guidance, factors that contribute to VMT reductions under this measure include the geographic location of the City within the region. The City represents a suburban location relative to the City of Los Angeles. The City is served by existing public bus transportation and hike, bike and equestrian trails located throughout the City. The City is a suburban area with many existing off-site commercial, recreational, and residential buildings. The location efficiency of the City would result in reduced vehicle trips and VMT compared to the statewide and South Coast Air Basin average and would result in corresponding reductions in transportation-related emissions.

Integrate Affordable and Below Market Rate Housing: Below Market Housing provides greater opportunity for low income families to live closer to jobs centers and achieve

103 California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010) 155-158.

104 CalEEMod, by default, assumes that trip distances in the South Coast Air Basin are slightly longer than the statewide average. This is due to the fact that commute patterns in the South Coast Air Basin involve a substantial portion of the population commuting relatively far distances, which is documented in the Southern California Association of Governments 2016 RTP/SCS. The 2016 RTP/SCS shows that, even under future Plan conditions, upwards of 50 percent of all work trips are 10 miles or longer (SCAG, Performance Measures Appendix, p. 13, 2016). The 2016 RTP/SCS does not specify the current percentage of work trips greater than 10 miles in the region, but it can be assumed that the percentage is currently greater than 50 percent since the goal of the 2016 RTP/SCS is to reduce overall VMT in the region. It is thus reasonable to assume that the trip distances in South Coast Air Basin are analogous to the statewide average given that the default model trip distances in the South Coast Air Basin are slightly longer but still generally similar to the statewide average. Therefore, projects could achieve similar levels of VMT reduction (65 percent in an urban area, 30 percent in a compact infill area, or 10 percent for a suburban center) compared to the South Coast Air Basin average.

105 California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010) 159-161.

jobs/housing match near transit. Residential development projects of five or more dwelling units will provide a deed-restricted low-income housing component onsite. This measure corresponds to CAPCOA guidance measure LUT-6. [106] According to CAPCOA, the reduction in VMT from this measure applies to urban and suburban settings for residential and mixed-use projects. The City is a suburban area and will provide below market housing in residential developments of five or more dwellings. Therefore, this measure applies to the General Plan Update.

Orient Project Toward Non-Auto Corridor: Development designed around an existing or planned transit, bicycle, or pedestrian corridor encourages alternative mode use. This measure corresponds to CAPCOA guidance measure LUT-7. [107] According to CAPCOA, the reduction in VMT from this measure applies to urban and suburban settings for residential, retail, office, industrial, and mixed-use projects. The City is a suburban area and has an extensive hike, bike, and equestrian trail network. Additionally, the General Plan Update requires that all new developments, where appropriate, establish paths and trails. Therefore, this measure applies to the General Plan Update.

Locate Project near Bike Path/Bike Lane: Development designed around an existing or planned bicycle facility encourages alternative mode use. This measure corresponds to CAPCOA guidance measure LUT-8. [108] According to CAPCOA, the reduction in VMT from this measure applies to urban and suburban settings for residential, retail, office, industrial, and mixed-use projects. The City is a suburban area and has an extensive bike trail network that connects residential with commercial, retail and recreational uses. Additionally, the General Plan Update requires that all new developments, where appropriate, establish paths and trails. Therefore, this measure applies to the General Plan Update.

Incorporate Bike Lane Street Design (on-site): Projects which incorporate bicycle lanes, routes, and shared-use paths into street systems, new subdivisions and large developments encourage travel by bike, reducing VMT. This measure corresponds to CAPCOA guidance measure SDT-5. [109] According to CAPCOA, the reduction in VMT from this measure applies to urban and suburban settings for residential, retail, office, industrial, and mixed-use projects. The City is a suburban area and has an extensive bike trail network that connects residential with commercial, retail and recreational uses. Additionally, the General Plan Update requires that all new developments, where appropriate, establish paths and trails. Therefore, this measure applies to the General Plan Update.

Provide Bike Parking with Multi-Unit Residential Projects: Long-term bicycle parking will be provided at apartment complexes or condominiums without garages. This measure

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106 California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010) 176-178.

107 California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010) 179-180.

108 California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010) 181.

109 California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010) 200-201.

corresponds to CAPCOA guidance measure SDT-7. [110] According to CAPCOA, the reduction in VMT from this measure applies to urban and suburban settings for large residential, retail, office, mixed use, and industrial projects. The City is a suburban area and implementing residential projects will provide long-term bicycle parking at multi-family developments without garages. Additionally, the General Plan Update requires that all new developments, where appropriate, establish paths and trails. Therefore, this measure applies to the General Plan Update.

Dedicate Land for Bike Trails: Larger projects may be required to provide for, contribute to, or dedicate land for the provision of off-site bicycle trails linking the project to designated bicycle commuting routes in accordance with an adopted citywide or countywide bikeway plan. This measure corresponds to CAPCOA guidance measure SDT-9. [111] According to CAPCOA, the reduction in VMT from this measure applies to urban and suburban settings for residential projects. The City is a suburban area and implementing residential projects will dedicate land or build off-site bicycle trails linking their projects to the City's Trails Network Plan. Additionally, the General Plan Update requires that all new developments, where appropriate, establish paths and trails. Therefore, this measure applies to the General Plan Update.

Impact Analysis

Threshold GHG-1: A significant impact would occur if the General Plan Update would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment by conflicting with applicable regulatory plans and policies to reduce GHG emissions as discussed within CARB's Climate Change Scoping Plan, SCAG's 2016 RTP/SCS, the City of Rancho Palos Verdes Emissions Reduction Action Plan, and Green Building Code.

Impact Statement GHG-1: The General Plan Update would generate GHG emissions, directly and indirectly, due to construction and operational activities; however, annual GHG emissions as a result of buildout of the General Plan Update would not have a significant effect on the environment because it would be consistent with applicable regulatory plans and policies to reduce GHG emissions; including the emission reduction measures discussed within CARB's Climate Change Scoping Plan, SCAG's 2016 RTP/SCS, the City of Rancho Palos Verdes Emissions Reduction Action Plan, and Green Building Code.

Construction (Short-Term) GHG Emissions

GHG emissions would result from construction activities of implementing projects allowed under the land use and circulation policies in the proposed General Plan Update (i.e. construction of the proposed 756 dwelling units, planned roadway and intersection improvements and hike and bike paths). The primary source of GHG emissions generated by construction activities is from use of diesel-powered construction equipment and other combustion sources (i.e., generators, worker vehicles, materials delivery, and other sources). In general, site preparation including demolition,

[110] California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010) 204.

[111] California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010) 206.

grading, and excavation represent the construction activities that would result in the highest levels of GHG emissions. GHGs would not only be emitted by on-site construction equipment but also from off-site haul trucks and construction workers traveling to and from the site.

For analysis purposes, construction of the dwelling units would have greater GHG emissions than construction of the planned roadway and intersection improvements or the hike and bike trails because of the duration and equipment involved. Therefore, two worst-case construction scenarios were developed for quantifying impacts to GHGs from construction of the dwelling units. Scenario 1 assumes a maximum development of 5 percent per year. Scenario 2 assumes concurrent construction of the maximum density development allowed for both a single family and multi-family development constructed on one acre each.

The emissions of GHGs associated with each construction scenario were calculated using CalEEMod. Results of the GHG emissions calculations are presented on **Table 6**, *Estimated Unmitigated Construction Greenhouse Gas Emissions*. It should be noted that the GHG emissions shown in Table 6 are based on construction equipment operating continuously throughout the work day. In reality, construction equipment tends to operate periodically or cyclically throughout the work day. Therefore, the GHG emissions shown reflect a conservative estimate. A complete listing of the equipment by phase, emission factors, and calculation parameters used in this analysis is included within the emissions calculation worksheets that are provided in Appendix A.

Although GHGs are generated during construction and are accordingly considered one-time emissions, it is important to include them when assessing all of the long-term GHG emissions associated with the General Plan Update. The draft SCAQMD indicators of significance recommend that construction-related GHG emissions be amortized over a project's 30-year lifetime in order to include these emissions as part of a project's annualized lifetime total emissions, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies. In accordance with this methodology, the estimated General Plan Update construction GHG emissions have been amortized over a 30-year period and are included in the annualized operational GHG emissions.

TABLE 6
ESTIMATED UNMITIGATED CONSTRUCTION GREENHOUSE GAS EMISSIONS

Emission Source	CO_2e (Metric Tons) [a, b]
Scenario 1 (5% Construction per year)	
5% (33 SF and 4 MF du)/year	428
Total Construction Emissions (20 years)	8,561
Amortized Construction Emissions (30 years)	**285**
Scenario 2 (SF and MF max development/acre)	
Total Single Family DU Project Construction Emissions	11,608
Total Multi-Family DU Project Construction Emissions	441
Total Construction Emissions	12,049
Amortized Construction Emissions (30-years)	**401**

SF – single family, MF – multi-family, du – dwelling units

[a] Totals may not add up exactly due to rounding in the modeling calculations.

[b] The emissions were estimated assuming construction begins at the earliest possible date (2018). This provides for a conservative emissions estimate as emission factors decline in future years. Project construction may commence at a later date, which would generally result in similar or reduced emissions, primarily due to vehicles meeting more stringent emissions standards.

SOURCE: ESA, 2017

Due to the potential persistence of GHGs in the environment, impacts are based on annual emissions and, in accordance with SCAQMD methodology, construction-period impacts are not assessed independent of operational-period impacts, which are discussed in the next section. Since Scenario 2 has the largest amortized construction emissions, Scenario 2 will be the scenario used in calculation of the operational emissions below.

Operational (Long-Term) GHG Emissions

As outlined in the General Plan Update, the amended Land Use Element designates approximately 399.48 acres for new residential development primarily as infill lots, with approximately 756 proposed dwelling units by 2040; primarily single-family residences, 688 dwelling units, and less multi-family residences, 88 dwelling units.

GHG emissions associated with and without buildout of the General Plan Update, including both direct and indirect sources, were estimated using the CalEEMod model. Buildout of housing under the General Plan Update is designed to include green building techniques and other sustainability features. Buildout must comply with the portions of City's Green Building Code applicable to residential developments. Additionally, physical and operational building characteristics for which sufficient data is available to quantify the reductions from building energy and resource consumption have been included in the quantitative analysis, and include, the following measures: installation of energy efficient appliances; low-water fixtures; and building energy usage consistent with the 2016 California Title 24 Building Energy Efficiency Standards. Direct GHG emissions would be generated from both area sources and mobile sources. Mobile sources of emissions would consist of motor vehicles trips generated by residents. Indirect source emissions associated with land use developments include energy consumption (e.g., electricity and natural gas), water and wastewater usage, and solid waste disposal. GHG emissions from electricity consumed onsite by future development projects in the City associated with the proposed General Plan Update would be generated offsite by fuel combustion at the electricity provider. GHG emissions from water and wastewater transport are also indirect emissions resulting from the energy required to transport water from its source, and the energy required to treat wastewater and transport it to its treated discharge point.

For the purpose of conducting an accurate comparison between the GHG emissions generated by the General Plan Update at buildout and the GHG emissions generated by existing developments in the City, the GHG emissions for the existing developments were estimated for the proposed General Plan Update's buildout year, 2040. Given that mobile source emissions in California are expected to continually improve over time due to vehicle fleet turnover and the implementation of more advanced vehicle technologies, including lower emission fuels, the future emissions in the City generated by the existing land uses would be lower than the current emissions generated under existing baseline conditions. This approach of using a future baseline for the existing land

uses is reasonable for this analysis because under a scenario where new developments included in the proposed General Plan Update would not occur, the GHG emissions associated with the existing developments in the City are still expected to come down in the future due to efficiency improvements in mobile sources. Additionally, the future baseline GHG emissions for the existing developments would be lower than those currently being generated in the City. Therefore, the use of a future baseline for existing uses allows for a more conservative analysis by preventing the potential understating of GHG emissions in the event the General Plan Update results in a net increase in emissions or, in the event the General Plan Update results in a net decrease in emissions, the potential overstating of the General Plan Update's GHG emissions in the City.

Maximum annual net GHG emissions resulting from motor vehicles, energy (i.e., electricity, natural gas), water conveyance and wastewater treatment, and solid waste were calculated for the General Plan Update buildout year (2040) as shown in **Table 7**, *Greenhouse Gas Emissions*. As evidenced in Table 7, 2040 emissions with or without implementation of the proposed General Plan Update would result in an overall net decrease in GHG emissions in the City from the baseline existing emissions of 25 and 28 percent, respectively. City-wide emissions with the General Plan Update would be approximately 5 percent higher than emissions would be without buildout under the General Plan Update.

As shown in Table 7, 2040 emissions with buildout of the General Plan Update would be 25 percent lower than existing baseline emissions and 28 percent lower than 2040 emissions without implementation of the General Plan Update. The reduction in emissions is due to the following primary factors; reduction in vehicle trips and VMT associated with the General Plan Update policies, more efficient and less emitting vehicles, lower carbon intensity electricity, and increased energy efficiency in existing and new buildings as encouraged by the City's ERAP.

TABLE 7
GREENHOUSE GAS EMISSIONS
METRIC TONS CO_2E PER YEAR [a]

	Existing City Emissions 2015	Without General Plan Update [b] 2040	With General Plan Update [b] 2040
Emissions			
On Road Mobile Sources	137,547	83,130	88,738
Area	1,792	1,791	1,804
Energy	100,364	84,044	86,829
Water Conveyance and Wastewater Treatment	12,800	9,378	9,957
Solid Waste	8,623	8,620	9,101
Scenario 2 Construction (Amortized) – largest of both scenarios	—	—	402
Proposed Subtotal	**261,126**	**186,963**	**196,831**

Percent Change (from 2040 Emissions Forecast without General Plan Update)	**—**	**5%**
Percent Change from 2015 Baseline Emissions	**-28%**	**-25%**

NOTES:

a Totals may not add up exactly due to rounding in the modeling calculations.

b The operational emissions were estimated in CalEEMod and EMFAC2014 using model runs set for year 2020, assuming construction begins at the earliest possible date (2018). This provides for a conservative emissions estimate as emission factors, particularly for fleet-wide motor vehicles, decline in future years.

SOURCE: ESA, 2017.

The ERAP presents the City's community and municipal inventories, forecasts, and recommended reduction targets for emissions to mitigate the City's impacts on climate change. The City's ERAP emission reduction targets are 15 percent below 2005 levels by 2020 and 49 percent below 2005 levels by 2035. To meet these targets, the ERAP recommends Community and Municipal Energy Efficiency Strategies including increased energy efficiency in existing and new residential and commercial uses as well as municipal buildings and City infrastructure, water efficiency, reduction of the urban heat island effect, and participation in education, outreach, and planning for energy efficiency. Implementation of ERAP strategies allows for the ongoing reduction of GHG emissions within the City. With continued improvements in vehicle and energy efficiencies and implementation of ERAP efficiency strategies, the emissions would continue to decrease. Impacts are less than significant.

Consistency with Applicable GHG Reduction Plans and Policies

CARB's Climate Change Scoping Plan

In support of HSC Division 25.5, the State has promulgated specific laws aimed at GHG reductions applicable to the General Plan Update. The primary focus of many of the statewide and regional mandates, plans, policies and regulations is to address worldwide climate change. Due to the complex physical, chemical and atmospheric mechanisms involved in global climate change, there is no basis for concluding that the General Plan Update's small increase in annual GHG emissions would cause a measurable change in global GHG emissions necessary to influence global climate change. The GHG emissions of the General Plan Update alone would not likely cause a direct physical change in the environment. According to CAPCOA, "GHG impacts are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective."[112] It is global GHG emissions in their aggregate that contribute to climate change, not any single source of GHG emissions alone.

Table 8, *Consistency with Applicable Greenhouse Gas Reduction Strategies*, contains a list of GHG-reducing strategies potentially applicable to the General Plan Update. The analysis describes the consistency of the General Plan Update with these strategies that support the State's

[112] California Air Pollution Control Officers Association, CEQA & Climate change: Evaluating and Addressing Greenhous Gas Emissions from Projects Subject to the California Environmental Quality Act, (2008).

strategies in the Climate Change Scoping Plan to reduce GHG emissions. The Climate Change Scoping Plan relies on a broad array of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based mechanisms such as the Cap-and-Trade program. As shown below, the General Plan Update would incorporate policies to reduce energy use, conserve water, reduce waste generation, and reduce vehicle travel consistent with statewide strategies and regulations. As a result, the General Plan Update would not conflict with applicable Climate Change Scoping Plan strategies and regulations to reduce GHG emissions.

TABLE 8
CONSISTENCY WITH APPLICABLE GREENHOUSE GAS REDUCTION STRATEGIES

Sector / Source	Category / Description	Consistency Analysis
Energy		
California Renewables Portfolio Standard	Increases the proportion of electricity from renewable sources to 33 percent renewable power by 2020.	**Consistent.** The General Plan Update would use electricity provided by SCE, which is committed to achieving 35 percent renewables by 2020.
California Renewables Portfolio Standard and SB 350	Increases the proportion of electricity from renewable sources to 33 percent renewable power by 2020. SB 350 requires 50 percent by 2030. It also requires the State Energy Resources Conservation and Development Commission to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.	**Consistent.** The General Plan Update would use electricity provided by SCE, which is required to meet the 2030 performance standard. The General Plan Update would also meet or exceed the applicable requirements of the State of California Green Building Standards Code and the City of Rancho Palos Verdes Green Building Code. The General Plan Update would incorporate energy efficiency measures as outlined in the General Plan Update policies and the ERAP.
CCR, Title 24	Energy Efficiency Standards for Residential and Nonresidential Buildings	**Consistent.** The General Plan Update would meet or exceed the applicable requirements of the State of California Green Building Standards Code and the City of Rancho Palos Verdes Green Building Code. The General Plan Update would also incorporate energy efficiency measures as outlined in the General Plan Update policies.
Assembly Bill 1109	The Lighting Efficiency And Toxics Reduction Act (AB1109) prohibits manufacturing specified general purpose lights that contain levels of hazardous substances prohibited by the European Union. AB 1109 also requires a reduction in average statewide electrical energy consumption by not less than 50% from the 2007 levels for indoor residential lighting and not less than 25% from the 2007 levels for indoor commercial and outdoor lighting by 2018	**Consistent.** As discussed above, the General Plan Update would meet or exceed the applicable requirements of the State of California Green Building Standards Code and the City of Rancho Palos Verdes Green Building Code and would also incorporate energy efficiency measures as outlined in the General Plan Update policies.
SB 1368	Establishes an emissions performance standard for power plants within the State of California.	**Consistent.** The General Plan Update would be consistent with this regulation and would not conflict with implementation of the emissions standards for power plants.
California Green Building Standards Code Requirements	All bathroom exhaust fans shall be ENERGY STAR compliant.	**Consistent.** The General Plan Update would utilize energy efficiency appliances and equipment and would meet or exceed the energy standards in ASHRAE 90.1-2010, Appendix G and the Title 24 Building Energy Efficiency Standards.

Sector / Source	Category / Description	Consistency Analysis
	HVAC Systems will be designed to meet ASHRAE standards.	**Consistent.** The General Plan Update would utilize energy efficiency appliances and equipment and would meet or exceed the energy standards in ASHRAE 90.1-2010, Appendix G and the Title 24 Building Energy Efficiency Standards.
	Energy commissioning shall be performed for buildings larger than 10,000 square feet.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements.
	Air filtration systems are required to meet a minimum of MERV 8 or higher.	**Consistent.** The General Plan Update would meet or exceed this requirement as part of its compliance with the City's requirements, and the CALGreen Code.
	Refrigerants used in newly installed HVAC systems shall not contain any CFCs.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Parking spaces shall be designed for carpool or alternative fueled vehicles. Up to eight percent of total parking spaces will be designed for such vehicles.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Long-term and short-term bike parking shall be provided for up to five percent of vehicle trips.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Stormwater Pollution Prevention Plan (SWPPP) required.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Indoor water usage must be reduced by 20% compared to current California Building Code Standards for maximum flow.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code
	All irrigation controllers must be installed with weather sensing or soil moisture sensors.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Wastewater usage shall be reduced by 20 percent compared to current California Building Standards.	**Consistent.** The General Plan Update would meet or exceed this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Requires a minimum of 50 percent recycle or reuse of nonhazardous construction and demolition debris.	**Consistent.** The General Plan Update would meet or exceed this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Requires documentation of types of waste recycled, diverted or reused.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Requires use of low VOC coatings consistent with AQMD Rule 1168.	**Consistent.** The General Plan Update would be consistent with this regulation and would meet or exceed the low VOC coating requirements.
	100 percent of vegetation, rocks, soils from land clearing shall be recycled or stockpiled on-site.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
Mobile Sources		

Sector / Source	Category / Description	Consistency Analysis
AB 1493 (Pavley Regulations)	Reduces greenhouse gas emissions in new passenger vehicles from model year 2012 through 2016 (Phase I) and model year 2017-2025 (Phase II). Also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020.	**Consistent.** The General Plan Update would be consistent with this regulation and would not conflict with implementation of the vehicle emissions standards.
Low Carbon Fuel Standard (Executive Order S-01-07)	Establishes protocols for measuring life-cycle carbon intensity of transportation fuels and helps to establish use of alternative fuels.	**Consistent.** The General Plan Update would be consistent with this regulation and would not conflict with implementation of the transportation fuel standards.
Advanced Clean Cars Program	In 2012, CARB adopted the Advanced Clean Cars (ACC) program to reduce criteria pollutants and GHG emissions for model year vehicles 2015 through 2025. ACC includes the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years.	**Consistent.** The General Plan Update would be consistent with this regulation and would not conflict with implementation of the Advanced Clean Cars Program.
SB 375	SB 375 establishes mechanisms for the development of regional targets for reducing passenger vehicle greenhouse gas emissions. Under SB 375, CARB is required, in consultation with the state's Metropolitan Planning Organizations, to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035.	**Consistent.** The General Plan Update would be consistent with SCAG RTP/SCS goals and objectives under SB 375 to implement "smart growth." The General Plan Update incorporates policies to help the City meet housing demands and build and implement the Trails Network Plan to reduce reducing reliance on automobiles and minimizing associated air pollutant emissions. The General Plan Update would meet the applicable requirements of CALGreen and the City of Rancho Palos Verdes Green Building Code. The General Plan Update would also reduce VMT as a result of its nearby access to public transportation within a quarter-mile of the Project Site, and its proximity to other destinations including off-site residential, retail, and recreational.
Water		
CCR, Title 24	Title 24 includes water efficiency requirements for new residential and non-residential uses.	**Consistent.** See discussion under California Green Building Standards Code Requirements above.
Senate Bill X7-7	The Water Conservation Act of 2009 sets an overall goal of reducing per capita urban water use by 20% by December 31, 2020. Each urban retail water supplier shall develop water use targets to meet this goal.	**Consistent.** See discussion under California Green Building Standards Code Requirements above.
Solid Waste		
California Integrated Waste Management Act (IWMA) of 1989 and Assembly Bill (AB) 341	The IWMA mandated that state agencies develop and implement an integrated waste management plan which outlines the steps to be taken to divert at least 50 percent of their solid waste from disposal facilities. AB 341 directs CalRecycle to develop and adopt regulations for mandatory commercial recycling and sets a statewide goal for 75 percent disposal reduction by the year 2020.	**Consistent.** The General Plan Update would be served by a solid waste collection and recycling service that may include mixed waste processing, and that yields waste diversion results comparable to source separation and consistent with Citywide recycling targets.

Sector / Source	Category / Description	Consistency Analysis
Other Sources		
Climate Action Team	Reduce diesel-fueled commercial motor vehicle idling.	**Consistent.** The General Plan Update would be consistent with the CARB Air Toxics Control Measure to limit heavy duty diesel motor vehicle idling to no more than 5 minutes at any given time.
	Achieve California's 50 percent waste diversion mandate (Integrated Waste Management Act of 1989) to reduce GHG emissions associated with virgin material extraction.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Plant five million trees in urban areas by 2020 to effect climate change emission reductions.	**Consistent.** The General Plan Update would require appropriate landscaping on the residential developments including vegetation and trees.
	Implement efficient water management practices and incentives, as saving water saves energy and GHG emissions.	**Consistent.** The General Plan Update would meet this requirement as part of its compliance with the City's requirements and the CALGreen Code.
	Reduce GHG emissions from electricity by reducing energy demand. The California Energy Commission updates appliance energy efficiency standards that apply to electrical devices or equipment sold in California. Recent policies have established specific goals for updating the standards; new standards are currently in development.	**Consistent.** The General Plan Update would utilize energy efficiency appliances and equipment and would meet or exceed the energy standards in ASHRAE 90.1-2010, Appendix G and the Title 24 Building Energy Efficiency Standards.
	Apply strategies that integrate transportation and land-use decisions, including but not limited to promoting jobs/housing proximity, high-density residential/ commercial development along transit corridors, and implementing intelligent transportation systems.	**Consistent.** The General Plan Update would incorporate physical and operational characteristics that would reduce vehicle trips and VMT and encourage alternative modes of transportation for residents.
	Reduce energy use in private buildings.	**Consistent.** The General Plan Update would utilize energy efficiency appliances and equipment and would meet or exceed the energy standards in ASHRAE 90.1-2010, Appendix G and the Title 24 Building Energy Efficiency Standards.

SOURCE: ESA, 2017.

Furthermore, in addition to the General Plan Update's consistency with applicable GHG reduction strategies, the General Plan Update would not conflict with the future anticipated statewide GHG reductions goals. CARB has outlined a number of potential strategies for achieving the 2030 reduction target of 40 percent below 1990 levels. These potential strategies include renewable resources for half of the State's electricity by 2030, increasing the fuel economy of vehicles and the number of zero-emission or hybrid vehicles, reducing the rate of growth in VMT, supporting high speed rail and other alternative transportation options, and use of high efficiency appliances, water heaters, and HVAC systems.[113] The General Plan Update would benefit from statewide and utility-provider efforts towards increasing the portion of

[113] Energy + Environmental Economics, Summary of the California State Agencies' PATHWAYS Project: Long-term Greenhouse Gas Reduction Scenarios, April 6, 2015. Available: https://www.arb.ca.gov/html/fact_sheets/e3_2030scenarios.pdf. Accessed November 2016.

electricity provided from renewable resources. The General Plan Update would also benefit from statewide efforts towards increasing the fuel economy standards of vehicles. The General Plan Update would support alternative transportation and reducing VMT growth by locating residential developments at infill location within the City in close proximity to existing public transit and hike, bike and equestrian trails. The General Plan Update would utilize energy efficiency appliances and equipment. While CARB is in the process of developing a framework for the 2030 reduction target in the Scoping Plan, the General Plan Update would support or not impede implementation of these potential reduction strategies identified by CARB.

SCAG's 2016 RTP/SCS

Transportation-related GHG emissions are the largest sector of emissions from buildout of the General Plan Update. This finding is consistent with the findings in many regional plans, such as the SCAG 2016 RTP/SCS, which recognizes that the transportation sector is the largest contributor to the State's GHG emissions. The purpose of the SCAG 2016 RTP/SCS is to achieve the regional per capita GHG reduction targets for the passenger vehicle and light-duty truck sector established by CARB pursuant to SB 375. SCAG's Program EIR for the 2016 RTP/SCS, released in December 2015, states that "[e]ach [Metropolitan Planning Organization] is required to prepare an SCS in conjunction to [sic] with the RTP in order to meet these GHG emissions reduction targets by aligning transportation, land use, and housing strategies with respect to [Senate Bill] 375."[114] SCAG's 2016 RTP/SCS plans for regional population growth using smart land use strategies. As part of the 2016 RTP/SCS, "transportation network improvements would be included, and more compact, infill, walkable and mixed-use development strategies to accommodate new region's growth would be encouraged to accommodate increases in population, households, employment, and travel demand."[115] Moreover, the 2016 RTP/SCS states that while "[p]opulation and job growth would induce land use change (development projects) and increase VMT, and would result in direct and indirect GHG emissions," the 2016 RTP/SCS would "supports sustainable growth through a more compact, infill, and walkable development pattern."[116]

Consistent with SCAG's 2016 RTP/SCS alignment of transportation, land use, and housing strategies, the General Plan Update would accommodate increases in population, households, employment, and travel demand by implementing smart land use strategies. As discussed previously, the implementing project sites are infill locations within the City that are close to jobs, off-site housing, shopping and recreational uses and in close proximity to existing public transit stops, which would result in reduced VMT, as compared to a project of similar size and land uses at a location without close and walkable access to off-site destinations and public transit stops.

114 Southern California Association of Governments, Program Environmental Impact Report – 2016 Regional Transportation Plan/Sustainable Communities Strategy, (2015) 3.8-37.

115 Southern California Association of Governments, Program Environmental Impact Report – 2016 Regional Transportation Plan/Sustainable Communities Strategy, (2015) 3.8-35.

116 Southern California Association of Governments, Program Environmental Impact Report – 2016 Regional Transportation Plan/Sustainable Communities Strategy, (2015) 3.8-36.

The General Plan Update would be consistent with and support the goals and benefits of the SCAG 2016 RTP/SCS, which seeks improved access and mobility by placing "destinations closer together, thereby decreasing the time and cost of traveling between them."[117] According to SCAG, incorporating "smart land use strategies encourages walking, biking, and transit use, and therefore reduces vehicular demand" and associated pollutants.[118] Additionally, the SCAG 2016 RTP/SCS seeks better "placemaking," defined as "the process of developing options for locations where [people] can live and work that include a pleasant and convenient walking environment that reduces their reliance on their car."[119] The General Plan Update is locating residential developments in vacant areas across the City close to public transit and hike, bike and equestrian trails. It also has many policies to increase walkability and biking and reduce VMTs. The General Plan Update would therefore be consistent with the SCAG 2016 RTP/SCS goals and benefits intended to improve mobility and access to diverse destinations, provide better "placemaking," provide more transportation choices, and reduce vehicular demand and associated emissions. As such, the General Plan Update would be consistent with regional plans to reduce VMT and associated GHG emissions.

City of Rancho Palos Verdes Emissions Reduction Action Plan

The City of Rancho Palos Verdes is committed to reducing GHGs and has adopted an Emission Reduction Action Plan. As stated in the ERAP, and reiterated in the General Plan Update, the City is committed to providing a more livable, equitable, and economically vibrant community through the implementation of energy efficiency measures and subsequent reduction of emissions. The ERAP included reductions that are required by the LCFS, AB 1493 and Advanced Clean Cars, CBC Title 24, Renewable Portfolio Standard and SB X7-7.

The significance of the General Plan Update GHG emissions is also evaluated based on whether they would be generated in connection with a design that is consistent with relevant plans, policies or regulations designed to encourage development that results in the efficient use of public and private resources. The General Plan Update would comply with the City of Rancho Palos Verdes Emissions Reduction Action Plan and Green Building Code to reduce GHG emissions by implementing energy efficient building designs, reducing indoor and outdoor water demand, and installing energy-efficient appliances and equipment. These measures are consistent with the City's GHG reduction, sustainability, and smart-growth goals of improving energy and water efficiency in buildings, decreasing per-capita water use, using energy efficient appliances and equipment, and creating a more livable city.

Table 9, *Consistency with City of Rancho Palos Verdes Emissions Reduction Action Plan*, contains a list of GHG-reducing strategies applicable to the General Plan Update. The General Plan Upgrade analysis describes the consistency of the General Plan Update with these GHG

[117] Southern California Association of Governments, 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy, (2016), page 16. Available at: http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS.pdf. Accessed May 2017.

[118] Southern California Association of Governments, 2012RTP/SCS, (2012) 39.

[119] Southern California Association of Governments, 2012RTP/SCS, (2012) 112.

emissions reduction goals and actions. As discussed in Table 9, the General Plan Update is consistent with the applicable goals and actions.

TABLE 9
CONSISTENCY WITH CITY OF RANCHO PALOS VERDES EMISSIONS REDUCTION ACTION PLAN

Action		Description	Consistency Analysis
Goal 1: Increase Energy Efficiency in Existing Residential Units			
1.1	EE Training and Education	The City embarked on an effort to educate residents on how to improve energy efficiency in their homes from changes to behavior to physical modification or improvements to their homes. Educate community members about behavioral and technological changes that can increase energy efficiently	**Consistent.** The General Plan Update provides policies to educate the residents on energy efficiency.
1.2	Increase Participation in Existing EE Programs	The City embarked on an effort to increase resident's participation in existing energy efficiency programs that are low-cost or even provide a financial benefit to the resident, such as rebate programs, demand response programs and technical and financial assistance programs.	**Consistent.** The General Plan Update provides policies to encourage the residents to participate in energy efficiency programs.
1.3	Establish or Promote Home Energy Evaluations	The City promotes home energy audits to identify cost-effective opportunities for energy savings and for residents to take practical actions to achieve energy efficiency.	**Consistent.** The General Plan Update provides policies to encourage the residents to participate in energy efficiency home audits.
1.4	Promote or Incentivize Residential Home Energy Renovations	Approximately 88 percent of residential buildings in the City were built before the adoption of Title 24 and are not energy efficient. The City has embarked on an effort to promote home energy renovations, through city-supervised funding, permit process improvements and city ordinance.	**Consistent.** The General Plan Update includes policies to encourage the residents to participate in energy efficiency programs, including home energy renovations.
Goal 2: Increase Energy Efficiency in New Residential Development			
2.1	Encourage EE Standards Exceeding Title 24	The City encourages implementing energy efficiency building measures beyond those required in current Title 24 Standards through the 2 Tier system which contain measures that are more stringent. Tier 1 reduces energy usage by 15% and Tier 2 reduces energy usage by 30% beyond Title 24.	**Consistent.** The General Plan Update include policies to encourage developers to go beyond Title 24 standards to increase energy efficiency, including waived or reduced permit fees..
Goal 3: Increase Energy Efficiency in Existing Commercial Units			
3.1	EE Training and Education	The City embarked on an effort to educate commercial business owners on how to improve energy efficiency in their shops	**Consistent.** The General Plan Update provides policies to educate businesses in the City on energy efficiency.
3.2	Increase Participation in Existing EE Programs	The City embarked on an effort to increase businesses' participation in existing energy efficiency programs that are low-cost or even provide a financial benefit to the resident, such as rebate programs and demand response programs.	**Consistent.** The General Plan Update provides policies to encourage businesses' to participate in energy efficiency programs.

Action		Description	Consistency Analysis
3.3	Incentivize Non-Residential Energy Audits	The City promotes commercial energy audits to identify cost-effective opportunities for energy savings and for business owners to take practical actions to achieve energy efficiency.	**Consistent.** The General Plan Update provides policies to encourage business owners to participate in energy efficiency commercial audits.
3.4	Promote Commercial Energy Retrofits	Most commercial buildings in the City were built before the adoption of Title 24 and the facilities and equipment are not energy efficient. The City has embarked on an effort to promote non-residential energy retrofits, through city-supervised funding, permit process improvements and city ordinance.	**Consistent.** The General Plan Update includes policies to encourage the business owners to participate in energy efficiency programs, including non-residential energy retrofits..
Goal 4: Increase Energy Efficiency in New Commercial Development			
4.1	Encourage EE Standards Exceeding Title 24	The City encourages implementing energy efficiency building measures beyond those required in current Title 24 Standards through Tier 1 reduction by 15% ,Tier 2 reduction by 30%, LEED, Build It Green/Green Point Rating System, or Energy Star Certified Buildings.	**Consistent.** The General Plan Update include policies to encourage developers to go beyond Title 24 standards to increase energy efficiency, including waived or reduced permit fees.
Goal 5: Increase Energy Efficiency through Water Efficiency (WE)			
5.1	Promote WE through SBX7-7	The Water Conservation Act of 2009 requires all water suppliers to increase water use efficiency. The legislation set an overall goal of reducing per capita urban water consumption by 20 percent form a baseline level by 2020. The goal can be met by a variety of actions, including targeted public outreach and promoting water efficiency measures such as low-irrigation landscaping.	**Consistent.** The General Plan Update include policies to encourage residents and businesses to reduce water usage and to promote low-irrigation landscaping.
5.2	Promote WE Standards Exceeding SB X7-7	The City studying ways to exceed water efficiency standards, including the use of recycled/gray water and promote the harvesting of rain water.	**Consistent.** The General Plan Update includes policies to encourage residents and businesses to reduce water usage, including promoting the use of rainwater harvesting and using grew water for non-municipal uses.
Goal 6: Decrease Energy Demand Through Reducing Urban Heat Island Effect			
6.1	Promote Tree Planting for Shading and EE	Trees and plant naturally help cool an environment by providing shade and evapotranspiration, making vegetation a simple and effective way to reduce urban heat islands.	**Consistent.** The General Plan Update includes policies to encourage residents and businesses encourage tree planting at plan check and developing a city tree planting program

SOURCE: ATKINS, 2015; ESA, 2017.

The analysis above describes the consistency of the General Plan Update with the applicable City of Rancho Palos Verdes GHG emissions reduction plans, policies, and regulations, including the City of Rancho Palos Verdes Emissions Reduction Action Plan. As discussed in Table 9, the General Plan Update would implement policies and incorporate water conservation, energy conservation, tree-planting, and other features consistent with these plans. Therefore, the General

Plan Update would be consistent with the City's applicable plans, policies or regulations for GHG emissions.

Green Building Code

The General Plan Update would comply with the Rancho Palos Verdes Green Building Code to reduce GHG emissions by increasing energy-efficiency beyond requirements, reducing indoor and outdoor water demand, installing energy-efficient appliances and equipment, and complying with 2016 California Title 24 Building Energy Efficiency Standards, as amended by the City. The General Plan Update would also meet the mandatory measures of the CALGreen Code as amended by the City by incorporating strategies such as low-flow toilets, low-flow faucets, low-flow showers, and other energy and resource conservation measures. The heating, ventilation, and air conditioning (HVAC) system would be sized and designed in compliance with the CALGreen Code to maximize energy efficiency caused by heat loss and heat gain. Therefore, the General Plan Update would be consistent with the City's Green Building Code.

Consistency with Executive Orders S-3-05 and B-30-15

At the state level, Executive Orders S-3-05 and B-30-15 are orders from the State's Executive Branch for the purpose of reducing GHG emissions. Executive Order S-3-05's goal to reduce GHG emissions to 1990 levels by 2020 was codified by the Legislature as the 2006 Global Warming Solutions Act (HSC Division 25.5). As analyzed above, the General Plan Update would be consistent with HSC Division 25.5. Therefore, the General Plan Update does not conflict with this component of the Executive Orders.

The Executive Orders also establish the goals to reduce GHG emissions to 40 below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. The 2050goals have not yet been codified by the Legislature. Studies have shown that, in order to meet the 2030 and 2050 targets, aggressive technologies in the transportation and energy sectors, including electrification and the decarbonization of fuel, will be required. In its *Climate Change Scoping Plan*, CARB acknowledged that the "measures needed to meet the 2050 goal are too far in the future to define in detail."[120] In the First Update, however, CARB generally described the type of activities required to achieve the 2050 target: "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 rapid market penetration of efficiency and clean energy technologies that requires significant efforts to deploy and scale markets for the cleanest technologies immediately."[121] Due to the technological shifts required and the unknown parameters of the regulatory framework in 2050, as well as uncertainties regarding the scenario(s) that CARB will ultimately adopt for achieving the 2050 reduction goal, quantitatively analyzing the Project's impacts further relative to the 2050 goal currently is speculative for purposes of CEQA.

Due to the uncertainty regarding specific state and local actions that will be implemented to achieve the 2050 GHG emission reduction targets, calculating General Plan Update emissions levels for 2050 would be highly speculative. Nonetheless, statewide efforts are underway to

[120] CARB, Climate Change Scoping Plan, p. 117, December 2008.
[121] CARB, First Update, p. 32, May 2014.

facilitate the State's achievement of this goal and it is reasonable to expect the General Plan Update's emissions level to decline as the regulatory initiatives identified by CARB in the First Update are implemented, and other technological innovations occur. Stated differently, the General Plan Update's emissions total at build-out (presented in Table 7) represents the maximum emissions inventory for the General Plan Update as California's emissions sources are being regulated (and foreseeably expected to continue to be regulated in the future) in furtherance of the State's environmental policy objectives. As such, given the reasonably anticipated decline in General Plan Update emissions once fully constructed and operational, the General Plan Update would be consistent with the Executive Orders' goals.

The Climate Change Scoping Plan recognizes that HSC Division 25.5 establishes an emissions reduction trajectory that will allow California to achieve the more stringent 2050 target: "These [greenhouse gas emission reduction] measures also put the state on a path to meet the long-term 2050 goal of reducing California's greenhouse gas emissions to 80 percent below 1990 levels. This trajectory is consistent with the reductions that are needed globally to stabilize the climate."[122] Also, CARB's First Update provides that it "lays the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050," and many of the emission reduction strategies recommended by CARB would serve to reduce the General Plan Update's post-2020 emissions level to the extent applicable by law:[123, 124]

- **Energy Sector:** Continued improvements in California's appliance and building energy efficiency programs and initiatives, such as the State's zero net energy building goals, would serve to reduce the Project's emissions level.[125] Additionally, further additions to California's renewable resource portfolio would favorably influence the General Plan Update's emissions level.[126]
- **Transportation Sector:** Anticipated deployment of improved vehicle efficiency, zero emission technologies, lower carbon fuels, and improvement of existing transportation systems all will serve to reduce the General Plan Update's emissions level.[127]
- **Water Sector:** The General Plan Update's emissions level will be reduced as a result of further enhancements to water conservation technologies.[128]
- **Waste Management Sector:** Plans to further improve recycling, reuse and reduction of solid waste will beneficially reduce the General Plan Update's emissions level.[129]

122 CARB, Climate Change Proposed Scoping Plan, p. 15, October 2008

123 CARB, First Update, p. 4, May 2014. See also id. at pp. 32–33 [recent studies show that achieving the 2050 goal will require that the "electricity sector will have to be essentially zero carbon; and that electricity or hydrogen will have to power much of the transportation sector, including almost all passenger vehicles."]

124 Ibid., at Table 6: Summary of Recommended Actions by Sector, pp. 94-99, May 2014.

125 Ibid., at pp. 37-39, 85, May 2014.

126 Ibid., at pp. 40-41, May 2014.

127 Ibid., at pp. 55-56, May 2014.

128 CARB, First Update, p. 65, May 2014.

129 Ibid., at p. 69, May 2014.

While the 2020 cap would remain in effect post-2020,[130] the Cap-and-Trade Program is not currently scheduled to extend beyond 2020 in terms of additional GHG emissions reductions. However, CARB has expressed its intention to extend the Cap-and-Trade Program beyond 2020 in conjunction with setting a mid-term target. The "recommended action" in the First Update to the Climate Change Scoping Plan for the Cap-and-Trade Program is: "Develop a plan for a post-2020 Cap-and-Trade Program, including cost containment, to provide market certainty and address a mid-term emissions target."[131]

In addition to CARB's First Update, in January 2015 during his inaugural address, Governor Jerry Brown expressed a commitment to achieve "three ambitious goals" that he would like to see accomplished by 2030 to reduce the State's GHG emissions: (1) increasing the State's Renewables Portfolio Standard from 33 percent in 2020 to 50 percent in 2030; (2) cutting the petroleum use in cars and trucks in half; and (3) doubling the efficiency of existing buildings and making heating fuels cleaner.[132] These expressions of Executive Branch policy may be manifested in adopted legislative or regulatory action through the state agencies and departments responsible for achieving the State's environmental policy objectives, particularly those relating to global climate change. As discussed previously, the Governor has already signed into law SB 350 (Chapter 547, Statues of 2015), which increased the Renewables Portfolio Standard to 50 percent by 2030 and included interim targets of 40 percent by 2024 and 45 percent by 2027.

Further, recent studies show that the State's existing and proposed regulatory framework can allow the State to reduce its GHG emissions level to 40 percent below 1990 levels by 2030, and to 80 percent below 1990 levels by 2050. According to the 2017 Scoping Plan Update (previously scheduled for consideration for adoption by CARB in late June 2017, but postponed to an undetermined future date), reductions needed to achieve the 2030 target are expected to be achieved by targeting specific emission sectors, including those sectors that are not directly controlled or influenced by the General Plan Update, but nonetheless contribute to General Plan Update -related GHG emissions. For instance, the General Plan Update itself is not subject to the Cap-and-Trade regulation; however, General Plan Update -related emissions would decline pursuant to the regulation as utility providers and transportation fuel producers are subject to renewable energy standards, Cap-and-Trade, and the LCFS. The 2017 Scoping Plan Update also calls for the doubling of the energy efficiency savings, including demand-response flexibility for 10 percent of residential and commercial electric space heating, water heating, air conditioning and refrigeration. The strategy is in the process of being designed specifically to accommodate existing residential and commercial uses under the CEC's Existing Building Energy Efficiency Action Plan.[133] This strategy requires the CEC in collaboration with the CPUC to establish the

130 California Health & Safety Code § 38551(a) ("The statewide greenhouse gas emissions limit shall remain in effect unless otherwise amended or repealed.").

131 CARB, First Update, p. 98 (May 2014).

132 Los Angeles Times, Transcript: Governor Jerry Brown's January 5, 2015, Inaugural Address, http://www.latimes.com/local/political/la-me-pc-brown-speech-text-20150105-story.html. Accessed March 2, 2015.

133 California Energy Commission, 2016 Existing Buildings Energy Efficiency Plan Update, December 2016. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/16-EBP-01/TN214801_20161214T155117_Existing_Building_Energy_Efficency_Plan_Update_Deceber_2016_Thi.pdf. Accessed May 2017.

framework for the energy savings target setting. The CEC has proposed a schedule for establishing this framework and target setting by November 2017, which will outline the necessary actions that will need to occur in future years, including workforce education and training institutions engaging with the building industry, mapping industry priorities for efficiency to major occupations that will provide services, identifying workforce competency gaps, and quantifying the work needed to build a workforce to implement high-quality efficiency projects at scale.[134] Even though these studies did not provide an exact regulatory and technological roadmap to achieve the 2030 and 2050 goals, they demonstrated that various combinations of policies could allow the statewide emissions level to remain very low through 2050, suggesting that the combination of new technologies and other regulations not analyzed in the study could allow the State to meet the 2030 and 2050 targets.[135]

For the reasons described above, the General Plan Update's post-2020 emissions trajectory is expected to follow a declining trend, consistent with the establishment of the 2030 and 2050 targets. Therefore, as the General Plan Update would be consistent with State applicable plans, policies and regulations adopted for the purpose of reducing GHG emissions, impacts regarding State greenhouse gas reduction plans would be less than significant.

Conclusion

In summary, the GHG emissions analysis provided above and the General Plan Update's consistency with applicable regulatory plans and policies to reduce GHG emissions demonstrates that the General Plan Update would substantially comply with or exceed the GHG reduction actions and strategies outlined in CARB's Climate Change Scoping Plan, SCAG's 2016 RTP/SCS, and the City of Rancho Palos Verdes Emissions Reduction Action Plan, and Green Building Code.

The General Plan Update would be consistent with the applicable strategies outlined in CARB's Climate Change Scoping Plan, in particular with strategies to improve energy and water efficiency, reduction of solid waste, and mobile source efficiency by locating implementing projects at infill locations within the City with close proximity to public transit and off-site commercial, retail, and restaurant land uses. SCAG's 2016 RTP/SCS is designed to demonstrate reductions in VMT within the region in accordance with per capita VMT reductions established by CARB. As discussed above, the General Plan Update would incorporate characteristics that would achieve reductions in VMT based on substantial evidence according to VMT reduction guidelines from CAPCOA's guidance document, *Quantifying Greenhouse Gas Mitigation*

134 Ibid.

135 Energy and Environmental Economics (E3), "Summary of the California State Agencies' PATHWAYS Project: Long-term Greenhouse Gas Reduction Scenarios" (April 2015); Greenblatt, Jeffrey, Energy Policy, "Modeling California Impacts on Greenhouse Gas Emissions" (Vol. 78, pp. 158-172). The California Air Resources Board, California Energy Commission, California Public Utilities Commission, and the California Independent System Operator engaged E3 to evaluate the feasibility and cost of a range of potential 2030 targets along the way to the state's goal of reducing GHG emissions to 80% below 1990 levels by 2050. With input from the agencies, E3 developed scenarios that explore the potential pace at which emission reductions can be achieved as well as the mix of technologies and practices deployed. E3 conducted the analysis using its California PATHWAYS model. Enhanced specifically for this study, the model encompasses the entire California economy with detailed representations of the buildings, industry, transportation, and electricity sectors.

Measures, which provides emission reduction calculation formulas for transportation characteristics and measures.[136] As such, the General Plan Update would be consistent with regional plans to reduce VMT and associated GHG emissions. The General Plan Update would also be consistent with the City's ERAP, and Green Building Ordinance by complying with and incorporating energy efficient designs, water conservation measures, and waste reduction measures. The General Plan Update's consistency with these applicable regulatory plans and policies to reduce GHG emissions would minimize the General Plan Update's small incremental increase in the City's overall GHG emissions and render GHG impacts less than significant.

Cumulative Impacts

Annual worldwide man-made GHG emissions were approximately 49,000 $MMTCO_2e$ including ongoing emissions from industrial and agricultural sources and emissions from land use changes (e.g., deforestation).[137] Emissions of CO_2 from fossil fuel use and industrial processes account for 65 percent of the total while CO_2 emissions from all sources account for 76 percent of the total. CH_4 emissions account for 16 percent and N_2O emissions for 6.2 percent. In 2015, the United States was the world's second largest emitter of carbon dioxide at 5,200 MMT (China was the largest emitter of carbon dioxide at 10,700 MMT).[138]

As previously discussed, CARB compiles GHG inventories for the State of California. In 2015, California emitted 440.4 $MMTCO_2e$ including emissions resulting from imported electrical power. Between 1990 and 2015, the population of California grew by approximately 31 percent. The California economy grew by approximately 222 percent. Despite the population and economic growth, California's net GHG emissions only grew by approximately 2.2 percent.

A cumulatively considerable impact would occur where the impact of the General Plan Update in addition to the related projects would be significant. However, in the case of global climate change, a cumulative impacts analysis differs from other environmental issues areas, such as aesthetics or noise. The proximity of the implementing projects under the General Plan Update to other related projects or other GHG emission generating activities is not directly relevant to the determination of a cumulative impact because climate change is a global condition. According to CAPCOA, "GHG impacts are exclusively cumulative impacts; there are non-cumulative GHG emission impacts from a climate change perspective."[139] Moreover, although the State requires MPOs and other planning agencies to consider how region-wide planning decisions can impact global climate change, there is currently no established non-speculative method to assess the cumulative impact of proposed independent private-party development projects.

136 California Air Pollution Control Officers Association, Quantifying Greenhouse Gas Mitigation Measures, (2010).

137 Intergovernmental Panel on Climate Change, Fifth Assessment Report Synthesis Report, (2014). Available: http://ipcc.ch/report/ar5/syr/. Accessed March 2017.

138 PBL Netherlands Environmental Assessment Agency and the European Commission Joint Research Center, Trends in Global CO_2 Emissions 2016 Report, (2016). Available: http://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2016-trends-in-global-co2-emisions-2016-report-2315.pdf. Accessed March 2017.

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

Although HSC Division 25.5 sets a statewide target for 2020 GHG emissions, the implementing tools of the law (e.g., CARB's *Climate Change Scoping Plan*) are clear that the reductions are not expected to occur uniformly from all sources or sectors. CARB has set targets specific to the transportation sector (land use-related transportation emissions), for example, and under SB 375, SCAG must incorporate these GHG-reduction goals into the RTP and demonstrate that its SCS or Alternative Planning Strategy is consistent with the Regional Housing Needs Assessment. One of the goals of this process is to ensure that the efforts of State, regional and local planning agencies accommodate the contemporaneous increase in population and employment with a decrease in overall GHG emissions. For example, adopting zoning designations that reduce density in areas which are expected to experience growth in population and housing needs, is seen as inconsistent with anti-sprawl goals of sustainable planning. Although development under a reduced density scenario results in lower GHG emissions from the use of that land compared to what is currently or hypothetically allowed (by creating fewer units and fewer attributable vehicle trips), total regional GHG emissions will likely fail to decrease at the desired rate or, worse, increase if regional housing and employment needs of an area are met with a larger number of less-intensive development projects. Therefore, it is not simply a cumulative increase in regional development or the resultant GHG emissions that threatens GHG reduction goals.

With implementation of good planning policies, the land use sector can accommodate growth and still be consistent with statewide plans to reduce GHG emissions. To that end, various agencies are required to develop programs to guide future building and transportation development towards minimized resource consumption and lowered resultant pollution. As discussed above, the City has adopted a Green Building Code that includes mandatory measures.

As discussed above, the General Plan Update would be consistent with applicable GHG emissions reduction plans and policies discussed within CARB's Climate Change Scoping Plan, SCAG's 2016 RTP/SCS, and the City of Rancho Palos Verdes Emissions Reduction Action Plan, and Green Building Code. These applicable GHG reduction plans and policies include providing residential uses within a relatively short distance of existing transit stops and building and maintain the hike, bike, and equestrial pathways. As a result, the General Plan Update would be consistent with the State's goals and result in a GHG emissions profile that is consistent with State GHG reduction plans. In accordance with CEQA requirements, related projects would be required to demonstrate consistency with applicable GHG emissions reduction plans and policies and provide appropriate mitigation in accordance with CEQA requirements to mitigate significant impacts.

Furthermore, the overwhelming majority of the General Plan Update -related GHG emissions are from source sectors that include electricity generated in-state or imported and the combustion of transportation fuels. These sectors are already covered entities under the Cap-and-Trade Program and as such would be reduced sector-wide in accordance with the goals of HSC Division 25.5, in addition to the previously discussed GHG emissions reductions from the implementing projects-specific energy efficiency design features, and VMT-reducing characteristics. Given the General Plan Update's consistency with State, SCAG, and City of Ranchos Palos Verdes GHG emission reduction goals and objectives, the General Plan Update would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of

GHGs. In the absence of adopted numerical significance thresholds, and given this consistency, it is concluded that the General Plan Update's impacts are not cumulatively considerable.

Mitigation Measures

As noted above, for Impact GHG-1, the General Plan Update is consistent with the City's applicable goals and actions for GHG emissions, the General Plan Update would result in less than significant GHG emissions and impacts would be less than significant. No mitigation is required. The General Plan Update would be consistent with State applicable plans, policies and regulations adopted for the purpose of reducing GHG emissions, and impacts regarding State greenhouse gas reduction plans would be less than significant. No mitigation is required.

Level of Significance After Mitigation

The General Plan Update does not require any mitigation measures as specified above. Impacts would be less than significant.

Appendix A

Construction Assumptions
Proposed Project Assumptions
GHG CalEEMod Summaries

Appendix A

Construction Assumptions
Proposed Project Assumptions
GHG CalEEMod Summaries

RPV

Project Consturction Assumptions

CalEEMod Inputs (Non-Default information only)

Project Location	
County	Los Angeles
Air District	South Coast
Climate Zone	8
Construction Year	2018
Utility Provider	Southern California Edison

	Base	2015[1]	2020[1]	2030
CO intensity	702.43634	531.7443	411.6277	351.2182
% renewable	0%	24.30%	41.40%	50.00%

[1] http://www.cpuc.ca.gov/renewables/

Land Use	Dus	Acers	CalEEMod Land Use Type
Total Growth			
Residential	668	386	Single Family
Multi-Family Residential	88	4	Apartments Mid Rise
Annual Growth - 5%			
Residential	33	19	Single Family
Multi-Family Residential	4	0.2	Apartments Mid Rise
1 Acre development			
Residential	6	1	Single Family
Multi-Family Residential	22	1.0	Apartments Mid Rise

Construction Schedule

Phases (if applicable)	Number of Workers (Max.)	Start (month/date/year)	Finish (month/date/year)	Duration (Work Days)
Demolition	N/A	N/A	N/A	N/A
Site Preparation		1/1/2018	1/12/2018	10
Grading		1/13/2018	2/23/2018	30
Building Construction		2/24/2018	12/28/2018	220
Architectural Coatings		11/1/2018	12/26/2018	40
Paving		2/24/2018	3/23/2018	20

RPV
Operational Assumptions

CalEEMod Inputs (Non-Default information only)

			Base	2015[1]	2020[1]	2030
Project Location		CO intensity	702.43634	531.74431	411.6277	351.2182
County	Los Angeles	% renewable	0%	24.30%	41.40%	50.00%
Air District	South Coast					
Climate Zone	8					
Operational Year	2015 Existing					
	2040 Buildout					
Utility Provider	Southern California Edison					

[1] http://www.cpuc.ca.gov/renewables/

Land Use	SF/ DU	KSF	Student/ bed	Acers	CalEEMod Land Use Type
Existing					
Residential	13,534			5,110	Single Family
Commercial[2]	13,123,000	13,123		1,028	General Office
Baseline					
Residential	14,290			5,509	Single Family
Commercial[2]	13,123,000	13,123		1,028	General Office
New					
Residential	756			399	Single Family
Residential 1-acre	28			1	Single Family

[2] 2015 data approximated from the *City of Rancho Palos Verdes Emissions Reduction Plan* . Dated December 2015 and prepared by Atkins (ERP). The ERP has non-residental land use data for 2012 and 2035. The 2015 data was approximated by adding the approximate growth assumed between 2012 and 2015. The RPE only segregates some emissions by residential vs non-residential, therefore all emissions are calculated based on those two categories for this analysis.

Service Population	Unknown	employees	
Service Population (# Employees)	35,351	Residents - Existing	(Based on Land use Element, 2.65 persons/du and 3.8% vacancy rate)
	1,927	Residents - New	
	37,278	Total	
	1,927	Net Service Population	

RPV
Operational Assumptions

Trip Generation:

Single Family Housing[3]	WD_TR	ST_TR	WU_TR	HW_TL	HS_TL	HO_TL
Existing	4.22	4.22	4.22	13.45345	13.45345	13.45345
Existing 2040	3.94	3.94	3.94	13.438163	13.438163	13.438163
Project 2040	3.94	3.94	3.94	13.438166	13.438166	13.438166
Project 2040 1-acre	3.94	3.94	3.94	13.438166	13.438166	13.438166
Baseline 2040	3.99	3.99	3.99	13.45345		

[3] Trip lengths and vehicle miles traveled are based on the commnity inventory for the 2015 ERP. As the only growth anticipated from the 2035 values in the ERP are related to the residential, the existing 2035 values were used for the analysis at 2040. The ERP has total VMT but is not broken out by landuse type, therefore inputs in CalEEMod are consolidated into the Single Family Residential category.

Area Source

wood stoves Defaults for existing. 0 for new as not allowed. Non cat/cat = 676.7

fireplaces	**default Existing**
	SF
wood	676.7
gas[4]	0
none	1353.4

fireplaces	**default**	**Project**
	SF	SF
wood	37.8	0
gas[4]	642.6	0.00
none	75.6	139.86

fireplaces	**default**	**1-Acre Development (LST)**
	SF	SF
wood	1.4	0
gas[4]	23.8	0.00
none	2.8	5.18

[4] Natural Gas is not included here as it is included in the Energy use section where specific source of natural gas use was not broken out in the 2015 ERP.

RPV
Operational Assumptions

Energy Use

	T24E	NT24E	LightingElect	T24NG	NT24NG
Single Family Residential					
Existing	9,806.22	0.00	0.00	65,417.94	0.00
Existing 2040	9,434.85	0.00	0.00	62,940.51	0.00
Project 2040	9,434.85	0.00	0.00	62,940.51	0.00
Project 2040 1-acre	9,434.85	0.00	0.00	62,940.51	0.00
Baseline 2040	9,806.22	0.00	0.00	65,417.94	0.00
General Office					
Existing	4.9988	0.00	0.00	6.7826	0.00
Existing 2040	5.5250	0.00	0.00	7.4965	0.00
Project 2040	No growth				
2040 Baseline	4.9988	0.00	0.00	6.7826	0.00

[5]Energy Emissions in the ERP were broken out by residential and non-non residential only. Energy inputs in CalEEMod are consistent with energy consumption in the 2015 ERP.

Water Use

Single Family Housing[6]	Indoor	Outdoor
Existing	3,206,128,189	0
Existing 2040	3,204,821,162	0
Project 2040	179,019,122	0
Project 2040 1-acre	6,630,338	0
Baseline 2040	3,385,220,320	0

Removal of Septic		
Septic	Aerobic	Lagoons
	0.98	0.02
	10.08	0.25
0.00	97.54	2.46

[6] The 2015 ERP has total water use but is not broken out by landuse type, therefore inputs in CalEEMod are consolidated into the Single Family Residential category.

RPV
Operational Assumptions

Solid Waste Generation

Single Family Housing[7]	Waste
Existing	17,146.78
Baseline 2015	17,146.78
Existing 2040	17,140.00
Project 2040	957.43
Project 2040 1-acre	35.46
Baseline 2040	18,104.59

[6] The 2015 ERP has total solid waste generation but is not broken out by landuse type, therefore inputs in CalEEMod are consolidated into the Single Family Residential category.

RPV

GHG CalEEMod Results Compiled - SCAQMD Threshold

Construction Emissions

CalEEMod:	RPV - Growth - Construction - 2018 start year	7/7/2017
CalEEMod:	RPV - 1 Acre Single Family Residential	7/7/2017
CalEEMod:	RPV - 1 Acre Multi-Family Residential	7/7/2017

Unmitigated Construction

	CO_2e	Years	CO_2e Total
5% in one year (33 SF, 4 MF DU)	428.05	20	8,561
Amortized Emissions:			285

	CO_2e	DUs	DUs / units per acre	CO_2e Total
1 acre SF (6 du)	101.23	688.00	115	11,608
1 acre MF (22 du)	110.2066	88.00	4	441
Total Project:				12,049
Amortized Emissions:				401.62

* Note: Emissions for construction used a worst case scenario of the following two scenarios:

Scenario 1 Assumes 5% development per year over 20 years.
Emissions were determined by multiplying the emissions from one year by 20.

Scenario 2 Assumes 1 acre of development with a maximum of dwelling units per acre. For Single Family one year of development and 6 dwelling units. For multi-family one year of development assumes 22 dwelling units.

Emissions were determined by dividing the total dwelling units by the number of dwelling units per acre, then multplying emissions by that number. For example, Single Family residential assumes 6 DU per acre and total buildout is 668 dus therefore the total emissions for 6 du/acre was multiplied by 115 (668 divided by 6).

For both scenarios total emissions were amortized by 30 years consistent with SCAQMD methodology

RPV

GHG CalEEMod Results Compiled - SCAQMD Threshold

2040 Emissions

CalEEMod:	RPV - 2015 Existing Emissions	7/17/2017
CalEEMod:	RPV - 2040 Existing Conditions	7/17/2017
CalEEMod:	RPV -2040 Project Conditions	7/17/2017

Unmitigated Operational

	CO_2	CH_4	CH_4 (CO_2e)	N_2O	N_2O (CO_2e)	CO_2e
	MT/year Annual Unmitigated					
	Existing - 2015					
Area	1665.882	4.47E+00	111.805	0.0469	13.9762	1,792
Energy	99,828.96	3.6053	90.1325	1.493	444.914	100,364
Mobile	137,296.94	10.0008	250.02	0	0	137,547
Waste	3480.6414	205.7	5142.5	0	0	8,623
Water	11203.4248	33.115	827.875	2.5804	768.9592	12,800
Total Existing						261,126
	Existing - 2040					
Area	1,666	4	111	0	14	1,791
Energy	82,600	4	90	1	439	83,130
Mobile	83,967	3	77	0	0	84,044
Waste	3,479	206	5,140	0	0	8,620
Water	7,782	33	828	3	769	9,378
Total Existing						186,963
	Proposed Project					
Area	13	0	0	0	0	13
Energy	3,676	0	4	0	20	3,699
Mobile	4,690	0	4	0	0	4,694
Waste	194	11	287	0	0	481
Water	490	2	46	0	43	579
Total Project						9,467
	Net Project Increase					
Area	13	0	0	0	0	13
Energy	-13,553	0	4	0	14	-13,535
Mobile	-48,640	-7	-169	0	0	-48,809
Waste	193	11	285	0	0	478
Water	-2,932	2	46	0	43	-2,843
Total Net Increase						-64,697
Amoritized Construction						402
Operational Annual						-64,697
Total Project Annual						-64,295

RPV

GHG CalEEMod Results Compiled - SCAQMD Threshold

2040 Emissions

	Buildout 2040 (with Project)					
Area	1,679	4	112	0	14	1,804
Energy	86,276	4	94	2	459	86,829
Mobile	88,657	3	81	0	0	88,738
Waste	3,674	217	5,428	0	0	9,101
Water	8,272	35	874	3	812	9,957
2040 Without Construction						196,429
Amortized Construction						402
Total Project						196,831

2040 Withou Project Reduction from Existing	28.40%
2040 With Project Reduction from Existing	24.62%
2040 With Project Reduction from 2040 Without Project	5.01%

Appendix B

B1 Construction CalEEMod Output - 5% Construction
B2 Construction CalEEMod Output - 1 Acre Single Family Residential
B3 Construction CalEEMod Output - 1 Acre Multi-Family Residential

Appendix B1

Construction CalEEMod Output
5% Construction

RPV - Growth - Construction - 2018 start year

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	4.00	Dwelling Unit	0.20	4,000.00	11
Single Family Housing	33.00	Dwelling Unit	19.00	59,400.00	85

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)	531.74	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptions

Construction Phase - See Assumptions

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Vehicle Trips - Operations Modeled Separately

Construction Off-road Equipment Mitigation - Rule 403 Compliance for fugitive dust

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	300.00	220.00
tblConstructionPhase	PhaseEndDate	3/22/2019	2/23/2018
tblConstructionPhase	PhaseEndDate	12/28/2018	11/2/2018
tblConstructionPhase	PhaseEndDate	2/23/2018	2/9/2018
tblConstructionPhase	PhaseEndDate	1/25/2019	1/26/2018
tblConstructionPhase	PhaseStartDate	1/26/2019	1/1/2018
tblConstructionPhase	PhaseStartDate	2/24/2018	1/1/2018
tblConstructionPhase	PhaseStartDate	1/13/2018	1/1/2018
tblConstructionPhase	PhaseStartDate	12/29/2018	1/1/2018
tblLandUse	LotAcreage	0.11	0.20
tblLandUse	LotAcreage	10.71	19.00
tblLandUse	Population	94.00	85.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	531.74
tblProjectCharacteristics	OperationalYear	2018	2020

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	0.6292	3.9878	2.8878	4.7500e-003	0.2479	0.2306	0.4784	0.1110	0.2157	0.3266	0.0000	425.4300	425.4300	0.1046	0.0000	428.0448

Maximum	**0.6292**	**3.9878**	**2.8878**	**4.7500e-003**	**0.2479**	**0.2306**	**0.4784**	**0.1110**	**0.2157**	**0.3266**	**0.0000**	**425.4300**	**425.4300**	**0.1046**	**0.0000**	**428.0448**

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	0.6292	3.9878	2.8878	4.7500e-003	0.1091	0.2306	0.3397	0.0457	0.2157	0.2614	0.0000	425.4295	425.4295	0.1046	0.0000	428.0443
Maximum	**0.6292**	**3.9878**	**2.8878**	**4.7500e-003**	**0.1091**	**0.2306**	**0.3397**	**0.0457**	**0.2157**	**0.2614**	**0.0000**	**425.4295**	**425.4295**	**0.1046**	**0.0000**	**428.0443**

	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**	**55.98**	**0.00**	**29.00**	**58.78**	**0.00**	**19.97**	**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	**1-1-2018**	**3-31-2018**	2.4284	2.4284
2	**4-1-2018**	**6-30-2018**	0.8685	0.8685
3	**7-1-2018**	**9-30-2018**	0.8781	0.8781
		Highest	2.4284	2.4284

2.2 Overall Operational

Operations modeled separately

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description

1	Site Preparation	Site Preparation	1/1/2018	1/12/2018	5	10	
2	Grading	Grading	1/1/2018	2/9/2018	5	30	
3	Building Construction	Building Construction	1/1/2018	11/2/2018	5	220	
4	Paving	Paving	1/1/2018	1/26/2018	5	20	
5	Architectural Coating	Architectural Coating	1/1/2018	2/23/2018	5	40	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 128,385; Residential Outdoor: 42,795; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	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
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	15.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0228	0.2410	0.1124	1.9000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	17.3800	17.3800	5.4100e-003	0.0000	17.5152
Total	**0.0228**	**0.2410**	**0.1124**	**1.9000e-004**	**0.0903**	**0.0129**	**0.1032**	**0.0497**	**0.0119**	**0.0615**	**0.0000**	**17.3800**	**17.3800**	**5.4100e-003**	**0.0000**	**17.5152**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	4.3000e-004	4.5900e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.9799	0.9799	4.0000e-005	0.0000	0.9808
Total	**5.0000e-004**	**4.3000e-004**	**4.5900e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.9799**	**0.9799**	**4.0000e-005**	**0.0000**	**0.9808**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0335	0.0000	0.0335	0.0184	0.0000	0.0184	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0228	0.2410	0.1124	1.9000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	17.3799	17.3799	5.4100e-003	0.0000	17.5152
Total	**0.0228**	**0.2410**	**0.1124**	**1.9000e-004**	**0.0335**	**0.0129**	**0.0464**	**0.0184**	**0.0119**	**0.0303**	**0.0000**	**17.3799**	**17.3799**	**5.4100e-003**	**0.0000**	**17.5152**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	4.3000e-004	4.5900e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.9799	0.9799	4.0000e-005	0.0000	0.9808
Total	**5.0000e-004**	**4.3000e-004**	**4.5900e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.9799**	**0.9799**	**4.0000e-005**	**0.0000**	**0.9808**

3.3 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					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0764	0.8928	0.5263	9.3000e-004		0.0395	0.0395		0.0364	0.0364	0.0000	84.9728	84.9728	0.0265	0.0000	85.6341
Total	**0.0764**	**0.8928**	**0.5263**	**9.3000e-004**	**0.1301**	**0.0395**	**0.1696**	**0.0540**	**0.0364**	**0.0903**	**0.0000**	**84.9728**	**84.9728**	**0.0265**	**0.0000**	**85.6341**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6600e-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	**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**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0482	0.0000	0.0482	0.0200	0.0000	0.0200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0764	0.8928	0.5263	9.3000e-004		0.0395	0.0395		0.0364	0.0364	0.0000	84.9727	84.9727	0.0265	0.0000	85.6340
Total	**0.0764**	**0.8928**	**0.5263**	**9.3000e-004**	**0.0482**	**0.0395**	**0.0877**	**0.0200**	**0.0364**	**0.0563**	**0.0000**	**84.9727**	**84.9727**	**0.0265**	**0.0000**	**85.6340**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6600e-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	**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**

3.4 Building Construction - 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	0.2947	2.5729	1.9339	2.9600e-003		0.1650	0.1650		0.1551	0.1551	0.0000	261.5440	261.5440	0.0641	0.0000	263.1459
Total	**0.2947**	**2.5729**	**1.9339**	**2.9600e-003**		**0.1650**	**0.1650**		**0.1551**	**0.1551**	**0.0000**	**261.5440**	**261.5440**	**0.0641**	**0.0000**	**263.1459**

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	2.0600e-003	0.0551	0.0155	1.2000e-004	2.7700e-003	3.8000e-004	3.1500e-003	8.0000e-004	3.7000e-004	1.1700e-003	0.0000	11.1173	11.1173	7.6000e-004	0.0000	11.1364
Worker	9.1400e-003	7.8200e-003	0.0841	2.0000e-004	0.0181	1.6000e-004	0.0183	4.8000e-003	1.5000e-004	4.9500e-003	0.0000	17.9651	17.9651	6.8000e-004	0.0000	17.9820
Total	**0.0112**	**0.0629**	**0.0996**	**3.2000e-004**	**0.0209**	**5.4000e-004**	**0.0214**	**5.6000e-003**	**5.2000e-004**	**6.1200e-003**	**0.0000**	**29.0824**	**29.0824**	**1.4400e-003**	**0.0000**	**29.1184**

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	0.2947	2.5729	1.9338	2.9600e-003		0.1650	0.1650		0.1551	0.1551	0.0000	261.5437	261.5437	0.0641	0.0000	263.1456
Total	**0.2947**	**2.5729**	**1.9338**	**2.9600e-003**		**0.1650**	**0.1650**		**0.1551**	**0.1551**	**0.0000**	**261.5437**	**261.5437**	**0.0641**	**0.0000**	**263.1456**

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	2.0600e-003	0.0551	0.0155	1.2000e-004	2.7700e-003	3.8000e-004	3.1500e-003	8.0000e-004	3.7000e-004	1.1700e-003	0.0000	11.1173	11.1173	7.6000e-004	0.0000	11.1364
Worker	9.1400e-003	7.8200e-003	0.0841	2.0000e-004	0.0181	1.6000e-004	0.0183	4.8000e-003	1.5000e-004	4.9500e-003	0.0000	17.9651	17.9651	6.8000e-004	0.0000	17.9820
Total	**0.0112**	**0.0629**	**0.0996**	**3.2000e-004**	**0.0209**	**5.4000e-004**	**0.0214**	**5.6000e-003**	**5.2000e-004**	**6.1200e-003**	**0.0000**	**29.0824**	**29.0824**	**1.4400e-003**	**0.0000**	**29.1184**

3.5 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	0.0164	0.1752	0.1480	2.3000e-004		9.5600e-003	9.5600e-003		8.8000e-003	8.8000e-003	0.0000	20.8116	20.8116	6.4800e-003	0.0000	20.9736
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0164**	**0.1752**	**0.1480**	**2.3000e-004**		**9.5600e-003**	**9.5600e-003**		**8.8000e-003**	**8.8000e-003**	**0.0000**	**20.8116**	**20.8116**	**6.4800e-003**	**0.0000**	**20.9736**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.3000e-004	7.1000e-004	7.6500e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.6332	1.6332	6.0000e-005	0.0000	1.6347
Total	**8.3000e-004**	**7.1000e-004**	**7.6500e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.6332**	**1.6332**	**6.0000e-005**	**0.0000**	**1.6347**

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	0.0164	0.1752	0.1480	2.3000e-004		9.5600e-003	9.5600e-003		8.8000e-003	8.8000e-003	0.0000	20.8116	20.8116	6.4800e-003	0.0000	20.9736
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0164**	**0.1752**	**0.1480**	**2.3000e-004**		**9.5600e-003**	**9.5600e-003**		**8.8000e-003**	**8.8000e-003**	**0.0000**	**20.8116**	**20.8116**	**6.4800e-003**	**0.0000**	**20.9736**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.3000e-004	7.1000e-004	7.6500e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.6332	1.6332	6.0000e-005	0.0000	1.6347
Total	**8.3000e-004**	**7.1000e-004**	**7.6500e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.6332**	**1.6332**	**6.0000e-005**	**0.0000**	**1.6347**

3.6 Architectural Coating - 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					
Archit. Coating	0.1984					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9700e-003	0.0401	0.0371	6.0000e-005		3.0100e-003	3.0100e-003		3.0100e-003	3.0100e-003	0.0000	5.1065	5.1065	4.9000e-004	0.0000	5.1187
Total	**0.2043**	**0.0401**	**0.0371**	**6.0000e-005**		**3.0100e-003**	**3.0100e-003**		**3.0100e-003**	**3.0100e-003**	**0.0000**	**5.1065**	**5.1065**	**4.9000e-004**	**0.0000**	**5.1187**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.8000e-004	3.0600e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	1.0000e-005	1.8000e-004	0.0000	0.6533	0.6533	2.0000e-005	0.0000	0.6539
Total	**3.3000e-004**	**2.8000e-004**	**3.0600e-003**	**1.0000e-005**	**6.6000e-004**	**1.0000e-005**	**6.6000e-004**	**1.7000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**0.6533**	**0.6533**	**2.0000e-005**	**0.0000**	**0.6539**

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	0.1984					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9700e-003	0.0401	0.0371	6.0000e-005		3.0100e-003	3.0100e-003		3.0100e-003	3.0100e-003	0.0000	5.1065	5.1065	4.9000e-004	0.0000	5.1186
Total	**0.2043**	**0.0401**	**0.0371**	**6.0000e-005**		**3.0100e-003**	**3.0100e-003**		**3.0100e-003**	**3.0100e-003**	**0.0000**	**5.1065**	**5.1065**	**4.9000e-004**	**0.0000**	**5.1186**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.8000e-004	3.0600e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	1.0000e-005	1.8000e-004	0.0000	0.6533	0.6533	2.0000e-005	0.0000	0.6539
Total	**3.3000e-004**	**2.8000e-004**	**3.0600e-003**	**1.0000e-005**	**6.6000e-004**	**1.0000e-005**	**6.6000e-004**	**1.7000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**0.6533**	**0.6533**	**2.0000e-005**	**0.0000**	**0.6539**

4.0 Operational Detail - Mobile

Operations modeled separately

Appendix B2

Construction CalEEMod Output
1 Acre Single Family Residential

RPV - 1 Acre Single Family Residential

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	6.00	Dwelling Unit	1.00	10,800.00	15

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)	531.74	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptions

Construction Phase -

Off-road Equipment -

Woodstoves - See Assumptions

Energy Use - See Assumptions

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Construction Off-road Equipment Mitigation - Rule 403 Compliance

Table Name	Column Name	Default Value	New Value

tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblEnergyUse	LightingElect	1,608.84	1,528.40
tblEnergyUse	T24E	287.34	206.88
tblEnergyUse	T24NG	25,682.16	18,491.16
tblFireplaces	NumberGas	5.10	5.36
tblFireplaces	NumberNoFireplace	0.60	1.11
tblFireplaces	NumberWood	0.30	0.00
tblLandUse	LotAcreage	1.95	1.00
tblLandUse	Population	17.00	15.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	531.74
tblProjectCharacteristics	OperationalYear	2018	2020
tblSolidWaste	SolidWasteGenerationRate	6.15	2.19
tblWater	AerobicPercent	87.46	97.54
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.46
tblWater	IndoorWaterUseRate	390,924.15	254,100.70
tblWater	OutdoorWaterUseRate	246,452.18	184,839.14
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	0.30	0.00
tblWoodstoves	NumberNoncatalytic	0.30	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	0.1701	0.9369	0.7409	1.2000e-003	9.7100e-003	0.0561	0.0658	4.5100e-003	0.0541	0.0586	0.0000	100.7224	100.7224	0.0203	0.0000	101.2307
Maximum	**0.1701**	**0.9369**	**0.7409**	**1.2000e-003**	**9.7100e-003**	**0.0561**	**0.0658**	**4.5100e-003**	**0.0541**	**0.0586**	**0.0000**	**100.7224**	**100.7224**	**0.0203**	**0.0000**	**101.2307**

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	0.1701	0.9369	0.7409	1.2000e-003	4.7900e-003	0.0561	0.0609	1.9900e-003	0.0541	0.0561	0.0000	100.7223	100.7223	0.0203	0.0000	101.2305
Maximum	**0.1701**	**0.9369**	**0.7409**	**1.2000e-003**	**4.7900e-003**	**0.0561**	**0.0609**	**1.9900e-003**	**0.0541**	**0.0561**	**0.0000**	**100.7223**	**100.7223**	**0.0203**	**0.0000**	**101.2305**

	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**	**50.67**	**0.00**	**7.47**	**55.88**	**0.00**	**4.30**	**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	**1-1-2018**	**3-31-2018**	0.7187	0.7187
2	**4-1-2018**	**6-30-2018**	0.3457	0.3457
		Highest	0.7187	0.7187

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	0.0444	1.8300e-003	0.0626	1.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	1.3882	1.3882	1.2000e-004	2.0000e-005	1.3983
Energy	7.8000e-004	6.6400e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	19.8655	19.8655	8.1000e-004	2.8000e-004	19.9688
Mobile	0.0206	0.1069	0.2877	9.4000e-004	0.0735	9.7000e-004	0.0745	0.0197	9.1000e-004	0.0206	0.0000	86.3739	86.3739	4.8100e-003	0.0000	86.4942
Waste						0.0000	0.0000		0.0000	0.0000	0.4446	0.0000	0.4446	0.0263	0.0000	1.1014
Water						0.0000	0.0000		0.0000	0.0000	0.0899	1.2933	1.3832	2.6500e-003	2.1000e-004	1.5121
Total	**0.0658**	**0.1153**	**0.3531**	**9.9000e-004**	**0.0735**	**1.9400e-003**	**0.0755**	**0.0197**	**1.8800e-003**	**0.0216**	**0.5345**	**108.9209**	**109.4554**	**0.0347**	**5.1000e-004**	**110.4747**

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	0.0444	1.8300e-003	0.0626	1.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	1.3882	1.3882	1.2000e-004	2.0000e-005	1.3983
Energy	7.8000e-004	6.6400e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	19.8655	19.8655	8.1000e-004	2.8000e-004	19.9688
Mobile	0.0206	0.1069	0.2877	9.4000e-004	0.0735	9.7000e-004	0.0745	0.0197	9.1000e-004	0.0206	0.0000	86.3739	86.3739	4.8100e-003	0.0000	86.4942
Waste						0.0000	0.0000		0.0000	0.0000	0.4446	0.0000	0.4446	0.0263	0.0000	1.1014
Water						0.0000	0.0000		0.0000	0.0000	0.0899	1.2933	1.3832	2.6500e-003	2.1000e-004	1.5121
Total	**0.0658**	**0.1153**	**0.3531**	**9.9000e-004**	**0.0735**	**1.9400e-003**	**0.0755**	**0.0197**	**1.8800e-003**	**0.0216**	**0.5345**	**108.9209**	**109.4554**	**0.0347**	**5.1000e-004**	**110.4747**

	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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2018	1/1/2018	5	1	
2	Grading	Grading	1/1/2018	1/2/2018	5	2	
3	Building Construction	Building Construction	1/1/2018	5/18/2018	5	100	
4	Paving	Paving	1/1/2018	1/5/2018	5	5	
5	Architectural Coating	Architectural Coating	1/1/2018	1/5/2018	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0.75

Acres of Paving: 0

Residential Indoor: 21,870; Residential Outdoor: 7,290; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36

Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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
Architectural Coating	1	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	2.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 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					2.9000e-003	0.0000	2.9000e-003	1.4800e-003	0.0000	1.4800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0000e-004	0.0104	4.0400e-003	1.0000e-005		4.8000e-004	4.8000e-004		4.4000e-004	4.4000e-004	0.0000	0.7872	0.7872	2.5000e-004	0.0000	0.7933
Total	**9.0000e-004**	**0.0104**	**4.0400e-003**	**1.0000e-005**	**2.9000e-003**	**4.8000e-004**	**3.3800e-003**	**1.4800e-003**	**4.4000e-004**	**1.9200e-003**	**0.0000**	**0.7872**	**0.7872**	**2.5000e-004**	**0.0000**	**0.7933**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.0000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0436	0.0436	0.0000	0.0000	0.0436
Total	**2.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0436**	**0.0436**	**0.0000**	**0.0000**	**0.0436**

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					1.0700e-003	0.0000	1.0700e-003	5.5000e-004	0.0000	5.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0000e-004	0.0104	4.0400e-003	1.0000e-005		4.8000e-004	4.8000e-004		4.4000e-004	4.4000e-004	0.0000	0.7872	0.7872	2.5000e-004	0.0000	0.7933
Total	**9.0000e-004**	**0.0104**	**4.0400e-003**	**1.0000e-005**	**1.0700e-003**	**4.8000e-004**	**1.5500e-003**	**5.5000e-004**	**4.4000e-004**	**9.9000e-004**	**0.0000**	**0.7872**	**0.7872**	**2.5000e-004**	**0.0000**	**0.7933**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.0000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0436	0.0436	0.0000	0.0000	0.0436
Total	**2.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0436**	**0.0436**	**0.0000**	**0.0000**	**0.0436**

3.3 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					4.9100e-003	0.0000	4.9100e-003	2.5300e-003	0.0000	2.5300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-003	0.0171	6.7600e-003	1.0000e-005		7.9000e-004	7.9000e-004		7.3000e-004	7.3000e-004	0.0000	1.2894	1.2894	4.0000e-004	0.0000	1.2994
Total	**1.5000e-003**	**0.0171**	**6.7600e-003**	**1.0000e-005**	**4.9100e-003**	**7.9000e-004**	**5.7000e-003**	**2.5300e-003**	**7.3000e-004**	**3.2600e-003**	**0.0000**	**1.2894**	**1.2894**	**4.0000e-004**	**0.0000**	**1.2994**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	4.1000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0871	0.0871	0.0000	0.0000	0.0872
Total	**4.0000e-005**	**4.0000e-005**	**4.1000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0871**	**0.0871**	**0.0000**	**0.0000**	**0.0872**

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					1.8200e-003	0.0000	1.8200e-003	9.4000e-004	0.0000	9.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-003	0.0171	6.7600e-003	1.0000e-005		7.9000e-004	7.9000e-004		7.3000e-004	7.3000e-004	0.0000	1.2893	1.2893	4.0000e-004	0.0000	1.2994
Total	**1.5000e-003**	**0.0171**	**6.7600e-003**	**1.0000e-005**	**1.8200e-003**	**7.9000e-004**	**2.6100e-003**	**9.4000e-004**	**7.3000e-004**	**1.6700e-003**	**0.0000**	**1.2893**	**1.2893**	**4.0000e-004**	**0.0000**	**1.2994**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	4.1000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0871	0.0871	0.0000	0.0000	0.0872
Total	**4.0000e-005**	**4.0000e-005**	**4.1000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0871**	**0.0871**	**0.0000**	**0.0000**	**0.0872**

3.4 Building Construction - 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	0.1296	0.8714	0.6938	1.1000e-003		0.0529	0.0529		0.0511	0.0511	0.0000	92.1173	92.1173	0.0185	0.0000	92.5809
Total	**0.1296**	**0.8714**	**0.6938**	**1.1000e-003**		**0.0529**	**0.0529**		**0.0511**	**0.0511**	**0.0000**	**92.1173**	**92.1173**	**0.0185**	**0.0000**	**92.5809**

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	2.3000e-004	6.2600e-003	1.7600e-003	1.0000e-005	3.1000e-004	4.0000e-005	3.6000e-004	9.0000e-005	4.0000e-005	1.3000e-004	0.0000	1.2633	1.2633	9.0000e-005	0.0000	1.2655
Worker	5.5000e-004	4.7000e-004	5.1000e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1100e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	1.0888	1.0888	4.0000e-005	0.0000	1.0898
Total	**7.8000e-004**	**6.7300e-003**	**6.8600e-003**	**2.0000e-005**	**1.4100e-003**	**5.0000e-005**	**1.4700e-003**	**3.8000e-004**	**5.0000e-005**	**4.3000e-004**	**0.0000**	**2.3521**	**2.3521**	**1.3000e-004**	**0.0000**	**2.3553**

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	0.1296	0.8714	0.6938	1.1000e-003		0.0529	0.0529		0.0511	0.0511	0.0000	92.1172	92.1172	0.0185	0.0000	92.5808
Total	**0.1296**	**0.8714**	**0.6938**	**1.1000e-003**		**0.0529**	**0.0529**		**0.0511**	**0.0511**	**0.0000**	**92.1172**	**92.1172**	**0.0185**	**0.0000**	**92.5808**

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	2.3000e-004	6.2600e-003	1.7600e-003	1.0000e-005	3.1000e-004	4.0000e-005	3.6000e-004	9.0000e-005	4.0000e-005	1.3000e-004	0.0000	1.2633	1.2633	9.0000e-005	0.0000	1.2655
Worker	5.5000e-004	4.7000e-004	5.1000e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1100e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	1.0888	1.0888	4.0000e-005	0.0000	1.0898
Total	**7.8000e-004**	**6.7300e-003**	**6.8600e-003**	**2.0000e-005**	**1.4100e-003**	**5.0000e-005**	**1.4700e-003**	**3.8000e-004**	**5.0000e-005**	**4.3000e-004**	**0.0000**	**2.3521**	**2.3521**	**1.3000e-004**	**0.0000**	**2.3553**

3.5 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	2.5500e-003	0.0261	0.0225	3.0000e-005		1.5200e-003	1.5200e-003		1.4000e-003	1.4000e-003	0.0000	3.0537	3.0537	9.3000e-004	0.0000	3.0770
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5500e-003**	**0.0261**	**0.0225**	**3.0000e-005**		**1.5200e-003**	**1.5200e-003**		**1.4000e-003**	**1.4000e-003**	**0.0000**	**3.0537**	**3.0537**	**9.3000e-004**	**0.0000**	**3.0770**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.5000e-004	1.6600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3539	0.3539	1.0000e-005	0.0000	0.3542
Total	**1.8000e-004**	**1.5000e-004**	**1.6600e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3539**	**0.3539**	**1.0000e-005**	**0.0000**	**0.3542**

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	2.5500e-003	0.0261	0.0225	3.0000e-005		1.5200e-003	1.5200e-003		1.4000e-003	1.4000e-003	0.0000	3.0537	3.0537	9.3000e-004	0.0000	3.0770

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5500e-003**	**0.0261**	**0.0225**	**3.0000e-005**		**1.5200e-003**	**1.5200e-003**		**1.4000e-003**	**1.4000e-003**	**0.0000**	**3.0537**	**3.0537**	**9.3000e-004**	**0.0000**	**3.0770**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.5000e-004	1.6600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3539	0.3539	1.0000e-005	0.0000	0.3542
Total	**1.8000e-004**	**1.5000e-004**	**1.6600e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3539**	**0.3539**	**1.0000e-005**	**0.0000**	**0.3542**

3.6 Architectural Coating - 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					
Archit. Coating	0.0338					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5000e-004	5.0100e-003	4.6400e-003	1.0000e-005		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	0.6383	0.6383	6.0000e-005	0.0000	0.6398
Total	**0.0345**	**5.0100e-003**	**4.6400e-003**	**1.0000e-005**		**3.8000e-004**	**3.8000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**6.0000e-005**	**0.0000**	**0.6398**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	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
Total	**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**

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	0.0338					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5000e-004	5.0100e-003	4.6400e-003	1.0000e-005		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	0.6383	0.6383	6.0000e-005	0.0000	0.6398
Total	**0.0345**	**5.0100e-003**	**4.6400e-003**	**1.0000e-005**		**3.8000e-004**	**3.8000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**6.0000e-005**	**0.0000**	**0.6398**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	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
Total	**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**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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	0.0206	0.1069	0.2877	9.4000e-004	0.0735	9.7000e-004	0.0745	0.0197	9.1000e-004	0.0206	0.0000	86.3739	86.3739	4.8100e-003	0.0000	86.4942
Unmitigated	0.0206	0.1069	0.2877	9.4000e-004	0.0735	9.7000e-004	0.0745	0.0197	9.1000e-004	0.0206	0.0000	86.3739	86.3739	4.8100e-003	0.0000	86.4942

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	57.12	59.46	51.72	193,694	193,694
Total	57.12	59.46	51.72	193,694	193,694

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
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	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

	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	12.1788	12.1788	6.6000e-004	1.4000e-004	12.2364
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	12.1788	12.1788	6.6000e-004	1.4000e-004	12.2364
NaturalGas Mitigated	7.8000e-004	6.6400e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.6867	7.6867	1.5000e-004	1.4000e-004	7.7324
NaturalGas Unmitigated	7.8000e-004	6.6400e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.6867	7.6867	1.5000e-004	1.4000e-004	7.7324

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					
Single Family Housing	144043	7.8000e-004	6.6400e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.6867	7.6867	1.5000e-004	1.4000e-004	7.7324
Total		**7.8000e-004**	**6.6400e-003**	**2.8200e-003**	**4.0000e-005**		**5.4000e-004**	**5.4000e-004**		**5.4000e-004**	**5.4000e-004**	**0.0000**	**7.6867**	**7.6867**	**1.5000e-004**	**1.4000e-004**	**7.7324**

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					
Single Family Housing	144043	7.8000e-004	6.6400e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.6867	7.6867	1.5000e-004	1.4000e-004	7.7324
Total		**7.8000e-004**	**6.6400e-003**	**2.8200e-003**	**4.0000e-005**		**5.4000e-004**	**5.4000e-004**		**5.4000e-004**	**5.4000e-004**	**0.0000**	**7.6867**	**7.6867**	**1.5000e-004**	**1.4000e-004**	**7.7324**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	50494.1	12.1788	6.6000e-004	1.4000e-004	12.2364
Total		**12.1788**	**6.6000e-004**	**1.4000e-004**	**12.2364**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	50494.1	12.1788	6.6000e-004	1.4000e-004	12.2364
Total		**12.1788**	**6.6000e-004**	**1.4000e-004**	**12.2364**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	0.0444	1.8300e-003	0.0626	1.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	1.3882	1.3882	1.2000e-004	2.0000e-005	1.3983
Unmitigated	0.0444	1.8300e-003	0.0626	1.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	1.3882	1.3882	1.2000e-004	2.0000e-005	1.3983

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	3.3800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0390					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.3000e-004	1.1100e-003	4.7000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.2871	1.2871	2.0000e-005	2.0000e-005	1.2948
Landscaping	1.8900e-003	7.2000e-004	0.0621	0.0000		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004	0.0000	0.1011	0.1011	1.0000e-004	0.0000	0.1035
Total	**0.0444**	**1.8300e-003**	**0.0626**	**1.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**	**0.0000**	**1.3882**	**1.3882**	**1.2000e-004**	**2.0000e-005**	**1.3983**

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	3.3800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0390					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.3000e-004	1.1100e-003	4.7000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.2871	1.2871	2.0000e-005	2.0000e-005	1.2948
Landscaping	1.8900e-003	7.2000e-004	0.0621	0.0000		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004	0.0000	0.1011	0.1011	1.0000e-004	0.0000	0.1035
Total	**0.0444**	**1.8300e-003**	**0.0626**	**1.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**	**0.0000**	**1.3882**	**1.3882**	**1.2000e-004**	**2.0000e-005**	**1.3983**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.3832	2.6500e-003	2.1000e-004	1.5121
Unmitigated	1.3832	2.6500e-003	2.1000e-004	1.5121

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.254101 / 0.184839	1.3832	2.6500e-003	2.1000e-004	1.5121
Total		**1.3832**	**2.6500e-003**	**2.1000e-004**	**1.5121**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Single Family Housing	0.254101 / 0.184839	1.3832	2.6500e-003	2.1000e-004	1.5121
Total		**1.3832**	**2.6500e-003**	**2.1000e-004**	**1.5121**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.4446	0.0263	0.0000	1.1014
Unmitigated	0.4446	0.0263	0.0000	1.1014

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	2.19	0.4446	0.0263	0.0000	1.1014

Total		**0.4446**	**0.0263**	**0.0000**	**1.1014**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	2.19	0.4446	0.0263	0.0000	1.1014
Total		**0.4446**	**0.0263**	**0.0000**	**1.1014**

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

Appendix B3

Construction CalEEMod Output
1 Acre Multi-Family Residential

RPV - 1 Acre Multi-Family Residential

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	22.00	Dwelling Unit	1.00	22,000.00	56

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)	531.74	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptions

Construction Phase -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Woodstoves - See Assumptions

Energy Use - See Assumptions

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Construction Off-road Equipment Mitigation - Rule 403 Compliance

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	PhaseEndDate	12/31/2017	1/5/2018
tblConstructionPhase	PhaseEndDate	12/31/2017	5/18/2018
tblConstructionPhase	PhaseEndDate	12/31/2017	1/2/2018
tblConstructionPhase	PhaseEndDate	12/31/2017	1/5/2018
tblConstructionPhase	PhaseEndDate	12/31/2017	1/1/2018
tblEnergyUse	LightingElect	741.44	704.05
tblEnergyUse	T24E	211.98	152.63
tblEnergyUse	T24NG	8,530.25	6,141.78
tblFireplaces	NumberGas	18.70	19.64
tblFireplaces	NumberNoFireplace	2.20	4.07
tblFireplaces	NumberWood	1.10	0.00
tblLandUse	LotAcreage	0.58	1.00
tblLandUse	Population	63.00	56.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	531.74
tblProjectCharacteristics	OperationalYear	2018	2020
tblSolidWaste	SolidWasteGenerationRate	10.12	3.60
tblWater	AerobicPercent	87.46	97.54
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.46
tblWater	IndoorWaterUseRate	1,433,388.56	931,702.62
tblWater	OutdoorWaterUseRate	903,658.01	677,743.51
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	1.10	0.00
tblWoodstoves	NumberNoncatalytic	1.10	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	0.2093	0.9466	0.7787	1.3000e-003	0.0178	0.0562	0.0740	6.6600e-003	0.0542	0.0609	0.0000	109.6890	109.6890	0.0207	0.0000	110.2066
Maximum	**0.2093**	**0.9466**	**0.7787**	**1.3000e-003**	**0.0178**	**0.0562**	**0.0740**	**6.6600e-003**	**0.0542**	**0.0609**	**0.0000**	**109.6890**	**109.6890**	**0.0207**	**0.0000**	**110.2066**

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	0.2093	0.9466	0.7787	1.3000e-003	0.0129	0.0562	0.0691	4.1400e-003	0.0542	0.0583	0.0000	109.6889	109.6889	0.0207	0.0000	110.2065
Maximum	**0.2093**	**0.9466**	**0.7787**	**1.3000e-003**	**0.0129**	**0.0562**	**0.0691**	**4.1400e-003**	**0.0542**	**0.0583**	**0.0000**	**109.6889**	**109.6889**	**0.0207**	**0.0000**	**110.2065**

	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**	**27.67**	**0.00**	**6.63**	**37.84**	**0.00**	**4.12**	**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	**1-1-2018**	**3-31-2018**	0.7527	0.7527

2	**4-1-2018**	**6-30-2018**	0.3502	0.3502
		Highest	0.7527	0.7527

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	0.0938	6.7100e-003	0.2294	4.0000e-005		1.5800e-003	1.5800e-003		1.5800e-003	1.5800e-003	0.0000	5.0869	5.0869	4.5000e-004	9.0000e-005	5.1240
Energy	1.3800e-003	0.0118	5.0300e-003	8.0000e-005		9.6000e-004	9.6000e-004		9.6000e-004	9.6000e-004	0.0000	35.6209	35.6209	1.4600e-003	5.0000e-004	35.8059
Mobile	0.0521	0.2696	0.7258	2.3600e-003	0.1855	2.4400e-003	0.1879	0.0497	2.2900e-003	0.0520	0.0000	217.9047	217.9047	0.0121	0.0000	218.2082
Waste						0.0000	0.0000		0.0000	0.0000	0.7308	0.0000	0.7308	0.0432	0.0000	1.8105
Water						0.0000	0.0000		0.0000	0.0000	0.3296	4.7422	5.0718	9.7200e-003	7.7000e-004	5.5445
Total	**0.1472**	**0.2881**	**0.9602**	**2.4800e-003**	**0.1855**	**4.9800e-003**	**0.1905**	**0.0497**	**4.8300e-003**	**0.0546**	**1.0604**	**263.3547**	**264.4152**	**0.0670**	**1.3600e-003**	**266.4930**

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	0.0938	6.7100e-003	0.2294	4.0000e-005		1.5800e-003	1.5800e-003		1.5800e-003	1.5800e-003	0.0000	5.0869	5.0869	4.5000e-004	9.0000e-005	5.1240
Energy	1.3800e-003	0.0118	5.0300e-003	8.0000e-005		9.6000e-004	9.6000e-004		9.6000e-004	9.6000e-004	0.0000	35.6209	35.6209	1.4600e-003	5.0000e-004	35.8059
Mobile	0.0521	0.2696	0.7258	2.3600e-003	0.1855	2.4400e-003	0.1879	0.0497	2.2900e-003	0.0520	0.0000	217.9047	217.9047	0.0121	0.0000	218.2082

Waste						0.0000	0.0000		0.0000	0.0000	0.7308	0.0000	0.7308	0.0432	0.0000	1.8105
Water						0.0000	0.0000		0.0000	0.0000	0.3296	4.7422	5.0718	9.7200e-003	7.7000e-004	5.5445
Total	**0.1472**	**0.2881**	**0.9602**	**2.4800e-003**	**0.1855**	**4.9800e-003**	**0.1905**	**0.0497**	**4.8300e-003**	**0.0546**	**1.0604**	**263.3547**	**264.4152**	**0.0670**	**1.3600e-003**	**266.4930**

	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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	1/1/2018	1/5/2018	5	5	
2	Building Construction	Building Construction	1/1/2018	5/18/2018	5	100	
3	Grading	Grading	1/1/2018	1/2/2018	5	2	
4	Paving	Paving	1/1/2018	1/5/2018	5	5	
5	Site Preparation	Site Preparation	1/1/2018	1/1/2018	5	1	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0.75

Acres of Paving: 0

Residential Indoor: 44,550; Residential Outdoor: 14,850; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29

Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Building Construction	Welders	3	8.00	46	0.45

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
Architectural Coating	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	16.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Architectural Coating - 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					
Archit. Coating	0.0688					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5000e-004	5.0100e-003	4.6400e-003	1.0000e-005		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	0.6383	0.6383	6.0000e-005	0.0000	0.6398
Total	**0.0696**	**5.0100e-003**	**4.6400e-003**	**1.0000e-005**		**3.8000e-004**	**3.8000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**6.0000e-005**	**0.0000**	**0.6398**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	3.8000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0817	0.0817	0.0000	0.0000	0.0817
Total	**4.0000e-005**	**4.0000e-005**	**3.8000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0817**	**0.0817**	**0.0000**	**0.0000**	**0.0817**

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	0.0688					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5000e-004	5.0100e-003	4.6400e-003	1.0000e-005		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	0.6383	0.6383	6.0000e-005	0.0000	0.6398
Total	**0.0696**	**5.0100e-003**	**4.6400e-003**	**1.0000e-005**		**3.8000e-004**	**3.8000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**6.0000e-005**	**0.0000**	**0.6398**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	3.8000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0817	0.0817	0.0000	0.0000	0.0817
Total	**4.0000e-005**	**4.0000e-005**	**3.8000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0817**	**0.0817**	**0.0000**	**0.0000**	**0.0817**

3.3 Building Construction - 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	0.1296	0.8714	0.6938	1.1000e-003		0.0529	0.0529		0.0511	0.0511	0.0000	92.1173	92.1173	0.0185	0.0000	92.5809

Total	**0.1296**	**0.8714**	**0.6938**	**1.1000e-003**		**0.0529**	**0.0529**		**0.0511**	**0.0511**	**0.0000**	**92.1173**	**92.1173**	**0.0185**	**0.0000**	**92.5809**

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	4.7000e-004	0.0125	3.5200e-003	3.0000e-005	6.3000e-004	9.0000e-005	7.2000e-004	1.8000e-004	8.0000e-005	2.6000e-004	0.0000	2.5267	2.5267	1.7000e-004	0.0000	2.5310
Worker	4.4300e-003	3.7900e-003	0.0408	1.0000e-004	8.7700e-003	8.0000e-005	8.8500e-003	2.3300e-003	7.0000e-005	2.4000e-003	0.0000	8.7104	8.7104	3.3000e-004	0.0000	8.7186
Total	**4.9000e-003**	**0.0163**	**0.0443**	**1.3000e-004**	**9.4000e-003**	**1.7000e-004**	**9.5700e-003**	**2.5100e-003**	**1.5000e-004**	**2.6600e-003**	**0.0000**	**11.2370**	**11.2370**	**5.0000e-004**	**0.0000**	**11.2496**

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	0.1296	0.8714	0.6938	1.1000e-003		0.0529	0.0529		0.0511	0.0511	0.0000	92.1172	92.1172	0.0185	0.0000	92.5808
Total	**0.1296**	**0.8714**	**0.6938**	**1.1000e-003**		**0.0529**	**0.0529**		**0.0511**	**0.0511**	**0.0000**	**92.1172**	**92.1172**	**0.0185**	**0.0000**	**92.5808**

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	4.7000e-004	0.0125	3.5200e-003	3.0000e-005	6.3000e-004	9.0000e-005	7.2000e-004	1.8000e-004	8.0000e-005	2.6000e-004	0.0000	2.5267	2.5267	1.7000e-004	0.0000	2.5310
Worker	4.4300e-003	3.7900e-003	0.0408	1.0000e-004	8.7700e-003	8.0000e-005	8.8500e-003	2.3300e-003	7.0000e-005	2.4000e-003	0.0000	8.7104	8.7104	3.3000e-004	0.0000	8.7186
Total	**4.9000e-003**	**0.0163**	**0.0443**	**1.3000e-004**	**9.4000e-003**	**1.7000e-004**	**9.5700e-003**	**2.5100e-003**	**1.5000e-004**	**2.6600e-003**	**0.0000**	**11.2370**	**11.2370**	**5.0000e-004**	**0.0000**	**11.2496**

3.4 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					4.9100e-003	0.0000	4.9100e-003	2.5300e-003	0.0000	2.5300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-003	0.0171	6.7600e-003	1.0000e-005		7.9000e-004	7.9000e-004		7.3000e-004	7.3000e-004	0.0000	1.2894	1.2894	4.0000e-004	0.0000	1.2994
Total	**1.5000e-003**	**0.0171**	**6.7600e-003**	**1.0000e-005**	**4.9100e-003**	**7.9000e-004**	**5.7000e-003**	**2.5300e-003**	**7.3000e-004**	**3.2600e-003**	**0.0000**	**1.2894**	**1.2894**	**4.0000e-004**	**0.0000**	**1.2994**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	4.1000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0871	0.0871	0.0000	0.0000	0.0872
Total	**4.0000e-005**	**4.0000e-005**	**4.1000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0871**	**0.0871**	**0.0000**	**0.0000**	**0.0872**

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					1.8200e-003	0.0000	1.8200e-003	9.4000e-004	0.0000	9.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-003	0.0171	6.7600e-003	1.0000e-005		7.9000e-004	7.9000e-004		7.3000e-004	7.3000e-004	0.0000	1.2893	1.2893	4.0000e-004	0.0000	1.2994
Total	**1.5000e-003**	**0.0171**	**6.7600e-003**	**1.0000e-005**	**1.8200e-003**	**7.9000e-004**	**2.6100e-003**	**9.4000e-004**	**7.3000e-004**	**1.6700e-003**	**0.0000**	**1.2893**	**1.2893**	**4.0000e-004**	**0.0000**	**1.2994**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker	4.0000e-005	4.0000e-005	4.1000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0871	0.0871	0.0000	0.0000	0.0872
Total	**4.0000e-005**	**4.0000e-005**	**4.1000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0871**	**0.0871**	**0.0000**	**0.0000**	**0.0872**

3.5 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	2.5500e-003	0.0261	0.0225	3.0000e-005		1.5200e-003	1.5200e-003		1.4000e-003	1.4000e-003	0.0000	3.0537	3.0537	9.3000e-004	0.0000	3.0770
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5500e-003**	**0.0261**	**0.0225**	**3.0000e-005**		**1.5200e-003**	**1.5200e-003**		**1.4000e-003**	**1.4000e-003**	**0.0000**	**3.0537**	**3.0537**	**9.3000e-004**	**0.0000**	**3.0770**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.5000e-004	1.6600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3539	0.3539	1.0000e-005	0.0000	0.3542
Total	**1.8000e-004**	**1.5000e-004**	**1.6600e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3539**	**0.3539**	**1.0000e-005**	**0.0000**	**0.3542**

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	2.5500e-003	0.0261	0.0225	3.0000e-005		1.5200e-003	1.5200e-003		1.4000e-003	1.4000e-003	0.0000	3.0537	3.0537	9.3000e-004	0.0000	3.0770
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5500e-003**	**0.0261**	**0.0225**	**3.0000e-005**		**1.5200e-003**	**1.5200e-003**		**1.4000e-003**	**1.4000e-003**	**0.0000**	**3.0537**	**3.0537**	**9.3000e-004**	**0.0000**	**3.0770**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.5000e-004	1.6600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3539	0.3539	1.0000e-005	0.0000	0.3542
Total	**1.8000e-004**	**1.5000e-004**	**1.6600e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3539**	**0.3539**	**1.0000e-005**	**0.0000**	**0.3542**

3.6 Site Preparation - 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					2.9000e-003	0.0000	2.9000e-003	1.4800e-003	0.0000	1.4800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0000e-004	0.0104	4.0400e-003	1.0000e-005		4.8000e-004	4.8000e-004		4.4000e-004	4.4000e-004	0.0000	0.7872	0.7872	2.5000e-004	0.0000	0.7933
Total	**9.0000e-004**	**0.0104**	**4.0400e-003**	**1.0000e-005**	**2.9000e-003**	**4.8000e-004**	**3.3800e-003**	**1.4800e-003**	**4.4000e-004**	**1.9200e-003**	**0.0000**	**0.7872**	**0.7872**	**2.5000e-004**	**0.0000**	**0.7933**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.0000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0436	0.0436	0.0000	0.0000	0.0436
Total	**2.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0436**	**0.0436**	**0.0000**	**0.0000**	**0.0436**

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					1.0700e-003	0.0000	1.0700e-003	5.5000e-004	0.0000	5.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0000e-004	0.0104	4.0400e-003	1.0000e-005		4.8000e-004	4.8000e-004		4.4000e-004	4.4000e-004	0.0000	0.7872	0.7872	2.5000e-004	0.0000	0.7933

Total	**9.0000e-004**	**0.0104**	**4.0400e-003**	**1.0000e-005**	**1.0700e-003**	**4.8000e-004**	**1.5500e-003**	**5.5000e-004**	**4.4000e-004**	**9.9000e-004**	**0.0000**	**0.7872**	**0.7872**	**2.5000e-004**	**0.0000**	**0.7933**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.0000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0436	0.0436	0.0000	0.0000	0.0436
Total	**2.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0436**	**0.0436**	**0.0000**	**0.0000**	**0.0436**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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	0.0521	0.2696	0.7258	2.3600e-003	0.1855	2.4400e-003	0.1879	0.0497	2.2900e-003	0.0520	0.0000	217.9047	217.9047	0.0121	0.0000	218.2082
Unmitigated	0.0521	0.2696	0.7258	2.3600e-003	0.1855	2.4400e-003	0.1879	0.0497	2.2900e-003	0.0520	0.0000	217.9047	217.9047	0.0121	0.0000	218.2082

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	146.30	140.58	128.92	488,653	488,653
Total	146.30	140.58	128.92	488,653	488,653

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
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
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

	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	21.9347	21.9347	1.2000e-003	2.5000e-004	22.0383
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	21.9347	21.9347	1.2000e-003	2.5000e-004	22.0383

NaturalGas Mitigated	1.3800e-003	0.0118	5.0300e-003	8.0000e-005		9.6000e-004	9.6000e-004		9.6000e-004	9.6000e-004	0.0000	13.6863	13.6863	2.6000e-004	2.5000e-004	13.7676
NaturalGas Unmitigated	1.3800e-003	0.0118	5.0300e-003	8.0000e-005		9.6000e-004	9.6000e-004		9.6000e-004	9.6000e-004	0.0000	13.6863	13.6863	2.6000e-004	2.5000e-004	13.7676

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	256471	1.3800e-003	0.0118	5.0300e-003	8.0000e-005		9.6000e-004	9.6000e-004		9.6000e-004	9.6000e-004	0.0000	13.6863	13.6863	2.6000e-004	2.5000e-004	13.7676
Total		**1.3800e-003**	**0.0118**	**5.0300e-003**	**8.0000e-005**		**9.6000e-004**	**9.6000e-004**		**9.6000e-004**	**9.6000e-004**	**0.0000**	**13.6863**	**13.6863**	**2.6000e-004**	**2.5000e-004**	**13.7676**

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	256471	1.3800e-003	0.0118	5.0300e-003	8.0000e-005		9.6000e-004	9.6000e-004		9.6000e-004	9.6000e-004	0.0000	13.6863	13.6863	2.6000e-004	2.5000e-004	13.7676
Total		**1.3800e-003**	**0.0118**	**5.0300e-003**	**8.0000e-005**		**9.6000e-004**	**9.6000e-004**		**9.6000e-004**	**9.6000e-004**	**0.0000**	**13.6863**	**13.6863**	**2.6000e-004**	**2.5000e-004**	**13.7676**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	90942.3	21.9347	1.2000e-003	2.5000e-004	22.0383
Total		**21.9347**	**1.2000e-003**	**2.5000e-004**	**22.0383**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	90942.3	21.9347	1.2000e-003	2.5000e-004	22.0383
Total		**21.9347**	**1.2000e-003**	**2.5000e-004**	**22.0383**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	0.0938	6.7100e-003	0.2294	4.0000e-005		1.5800e-003	1.5800e-003		1.5800e-003	1.5800e-003	0.0000	5.0869	5.0869	4.5000e-004	9.0000e-005	5.1240
Unmitigated	0.0938	6.7100e-003	0.2294	4.0000e-005		1.5800e-003	1.5800e-003		1.5800e-003	1.5800e-003	0.0000	5.0869	5.0869	4.5000e-004	9.0000e-005	5.1240

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	6.8800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0795					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.8000e-004	4.0700e-003	1.7300e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7163	4.7163	9.0000e-005	9.0000e-005	4.7443
Landscaping	6.9300e-003	2.6300e-003	0.2276	1.0000e-005		1.2500e-003	1.2500e-003		1.2500e-003	1.2500e-003	0.0000	0.3706	0.3706	3.6000e-004	0.0000	0.3796
Total	**0.0938**	**6.7000e-003**	**0.2294**	**4.0000e-005**		**1.5800e-003**	**1.5800e-003**		**1.5800e-003**	**1.5800e-003**	**0.0000**	**5.0869**	**5.0869**	**4.5000e-004**	**9.0000e-005**	**5.1240**

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	6.8800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0795					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.8000e-004	4.0700e-003	1.7300e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7163	4.7163	9.0000e-005	9.0000e-005	4.7443
Landscaping	6.9300e-003	2.6300e-003	0.2276	1.0000e-005		1.2500e-003	1.2500e-003		1.2500e-003	1.2500e-003	0.0000	0.3706	0.3706	3.6000e-004	0.0000	0.3796
Total	**0.0938**	**6.7000e-003**	**0.2294**	**4.0000e-005**		**1.5800e-003**	**1.5800e-003**		**1.5800e-003**	**1.5800e-003**	**0.0000**	**5.0869**	**5.0869**	**4.5000e-004**	**9.0000e-005**	**5.1240**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	5.0718	9.7200e-003	7.7000e-004	5.5445
Unmitigated	5.0718	9.7200e-003	7.7000e-004	5.5445

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	0.931703 / 0.677744	5.0718	9.7200e-003	7.7000e-004	5.5445

Total		**5.0718**	**9.7200e-003**	**7.7000e-004**	**5.5445**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	0.931703 / 0.677744	5.0718	9.7200e-003	7.7000e-004	5.5445
Total		**5.0718**	**9.7200e-003**	**7.7000e-004**	**5.5445**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.7308	0.0432	0.0000	1.8105
Unmitigated	0.7308	0.0432	0.0000	1.8105

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	3.6	0.7308	0.0432	0.0000	1.8105
Total		**0.7308**	**0.0432**	**0.0000**	**1.8105**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	3.6	0.7308	0.0432	0.0000	1.8105
Total		**0.7308**	**0.0432**	**0.0000**	**1.8105**

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

Appendix C

C1 Operational CalEEMod Output - Existing - 2015
C2 Operational CalEEMod Output - Existing - 2040
C3 Operational CalEEMod Output - Project Growth - 2040

Appendix C1

Operational CalEEMod Output
Existing - 2015

RPV - 2015 Existing Emissions

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	13,534.00	Dwelling Unit	5,110.00	24,361,200.00	35351
General Office Building	13,123.00	1000sqft	1,028.00	13,123,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2015
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.74	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptions

Construction Phase - No construction

Vehicle Trips - See Assumptions

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - See Assumptions

Energy Use - See Assumptions

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	11,000.00	2.00
tblConstructionPhase	PhaseEndDate	12/31/2012	1/2/2013
tblEnergyUse	LightingElect	4.46	0.00
tblEnergyUse	LightingElect	1,608.84	0.00
tblEnergyUse	NT24E	4.94	0.00
tblEnergyUse	NT24E	6,680.41	0.00
tblEnergyUse	NT24NG	0.55	0.00
tblEnergyUse	NT24NG	5,516.00	0.00
tblEnergyUse	T24E	4.94	5.00
tblEnergyUse	T24E	287.34	9,806.22
tblEnergyUse	T24NG	8.63	6.78
tblEnergyUse	T24NG	25,682.16	65,417.94
tblFireplaces	NumberGas	11,503.90	0.00
tblLandUse	LotAcreage	4,394.16	5,110.00
tblLandUse	LotAcreage	301.26	1,028.00
tblLandUse	Population	38,707.00	35,351.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	531.74
tblProjectCharacteristics	OperationalYear	2018	2015
tblSolidWaste	SolidWasteGenerationRate	12,204.39	0.00
tblSolidWaste	SolidWasteGenerationRate	14,493.91	17,146.78
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CNW_TL	6.90	0.00
tblVehicleTrips	CW_TL	16.60	0.00
tblVehicleTrips	DV_TP	19.00	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	13.45
tblVehicleTrips	HO_TTP	40.60	0.00
tblVehicleTrips	HS_TL	5.90	13.45

tblVehicleTrips	HS_TTP	19.20	0.00
tblVehicleTrips	HW_TL	14.70	13.45
tblVehicleTrips	HW_TTP	40.20	100.00
tblVehicleTrips	PB_TP	4.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	77.00	100.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	9.91	4.22
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	8.62	4.22
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	9.52	4.22
tblWater	AerobicPercent	87.46	97.54
tblWater	AerobicPercent	87.46	97.54
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.46
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.46
tblWater	IndoorWaterUseRate	2,332,399,974.92	0.00
tblWater	IndoorWaterUseRate	881,794,582.76	3,206,128,189.00
tblWater	OutdoorWaterUseRate	1,429,535,468.50	0.00
tblWater	OutdoorWaterUseRate	555,913,976.09	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

No Construction for Existing Conditions

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	197.7702	2.8015	227.3811	0.2116		13.4921	13.4921		13.4921	13.4921	1,437.5689	228.3133	1,665.8822	4.4722	0.0469	1,791.6709
Energy	5.2540	45.1594	21.0252	0.2866		3.6300	3.6300		3.6300	3.6300	0.0000	99,828.9567	99,828.9567	3.6053	1.4930	100,364.0016
Mobile	43.0624	208.2352	669.3444	1.4970	106.2621	2.5952	108.8573	28.5093	2.4555	30.9648	0.0000	137,296.9419	137,296.9419	10.0008	0.0000	137,546.9629
Waste						0.0000	0.0000		0.0000	0.0000	3,480.6414	0.0000	3,480.6414	205.7000	0.0000	8,623.1417
Water						0.0000	0.0000		0.0000	0.0000	1,134.3332	10,069.0916	11,203.4248	33.1150	2.5804	12,800.2640
Total	**246.0866**	**256.1961**	**917.7506**	**1.9953**	**106.2621**	**19.7173**	**125.9794**	**28.5093**	**19.5776**	**48.0869**	**6,052.5434**	**247,423.3036**	**253,475.8470**	**256.8933**	**4.1204**	**261,126.0410**

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	197.7702	2.8015	227.3811	0.2116		13.4921	13.4921		13.4921	13.4921	1,437.5689	228.3133	1,665.8822	4.4722	0.0469	1,791.6709
Energy	5.2540	45.1594	21.0252	0.2866		3.6300	3.6300		3.6300	3.6300	0.0000	99,828.9567	99,828.9567	3.6053	1.4930	100,364.0016
Mobile	43.0624	208.2352	669.3444	1.4970	106.2621	2.5952	108.8573	28.5093	2.4555	30.9648	0.0000	137,296.9419	137,296.9419	10.0008	0.0000	137,546.9629
Waste						0.0000	0.0000		0.0000	0.0000	3,480.6414	0.0000	3,480.6414	205.7000	0.0000	8,623.1417
Water						0.0000	0.0000		0.0000	0.0000	1,134.3332	10,069.0916	11,203.4248	33.1150	2.5804	12,800.2640
Total	**246.0866**	**256.1961**	**917.7506**	**1.9953**	**106.2621**	**19.7173**	**125.9794**	**28.5093**	**19.5776**	**48.0869**	**6,052.5434**	**247,423.3036**	**253,475.8470**	**256.8933**	**4.1204**	**261,126.0410**

	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**

3.0 Construction Detail

No Construction for Existing Conditions

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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	43.0624	208.2352	669.3444	1.4970	106.2621	2.5952	108.8573	28.5093	2.4555	30.9648	0.0000	137,296.9419	137,296.9419	10.0008	0.0000	137,546.9629
Unmitigated	43.0624	208.2352	669.3444	1.4970	106.2621	2.5952	108.8573	28.5093	2.4555	30.9648	0.0000	137,296.9419	137,296.9419	10.0008	0.0000	137,546.9629

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Single Family Housing	57,113.48	57,113.48	57113.48	279,687,898	279,687,898
Total	57,113.48	57,113.48	57,113.48	279,687,898	279,687,898

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
General Office Building	0.00	0.00	0.00	33.00	48.00	19.00	100	0	0
Single Family Housing	13.45	13.45	13.45	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.545411	0.048190	0.195574	0.130523	0.019876	0.005677	0.017394	0.026000	0.002226	0.003081	0.004397	0.000627	0.001023
General Office Building	0.545411	0.048190	0.195574	0.130523	0.019876	0.005677	0.017394	0.026000	0.002226	0.003081	0.004397	0.000627	0.001023

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	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	47,832.6249	47,832.6249	2.6087	0.5397	48,058.6816
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	47,832.6249	47,832.6249	2.6087	0.5397	48,058.6816
NaturalGas Mitigated	5.2540	45.1594	21.0252	0.2866		3.6300	3.6300		3.6300	3.6300	0.0000	51,996.3318	51,996.3318	0.9966	0.9533	52,305.3200
NaturalGas Unmitigated	5.2540	45.1594	21.0252	0.2866		3.6300	3.6300		3.6300	3.6300	0.0000	51,996.3318	51,996.3318	0.9966	0.9533	52,305.3200

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					
General Office Building	8.90081e+007	0.4800	4.3631	3.6650	0.0262		0.3316	0.3316		0.3316	0.3316	0.0000	4,749.8090	4,749.8090	0.0910	0.0871	4,778.0348

Single Family Housing	8.85366e+008	4.7740	40.7963	17.3601	0.2604		3.2984	3.2984		3.2984	3.2984	0.0000	47,246.5228	47,246.5228	0.9056	0.8662	47,527.2853
Total		**5.2540**	**45.1594**	**21.0252**	**0.2866**		**3.6300**	**3.6300**		**3.6300**	**3.6300**	**0.0000**	**51,996.3318**	**51,996.3318**	**0.9966**	**0.9533**	**52,305.3200**

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					
General Office Building	8.90081e+007	0.4800	4.3631	3.6650	0.0262		0.3316	0.3316		0.3316	0.3316	0.0000	4,749.8090	4,749.8090	0.0910	0.0871	4,778.0348
Single Family Housing	8.85366e+008	4.7740	40.7963	17.3601	0.2604		3.2984	3.2984		3.2984	3.2984	0.0000	47,246.5228	47,246.5228	0.9056	0.8662	47,527.2853
Total		**5.2540**	**45.1594**	**21.0252**	**0.2866**		**3.6300**	**3.6300**		**3.6300**	**3.6300**	**0.0000**	**51,996.3318**	**51,996.3318**	**0.9966**	**0.9533**	**52,305.3200**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	6.55993e+007	15,822.0941	0.8629	0.1785	15,896.8692
Single Family Housing	1.32717e+008	32,010.5308	1.7458	0.3612	32,161.8124
Total		**47,832.6249**	**2.6087**	**0.5397**	**48,058.6816**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	6.55993e+007	15,822.0941	0.8629	0.1785	15,896.8692
Single Family Housing	1.32717e+008	32,010.5308	1.7458	0.3612	32,161.8124
Total		**47,832.6249**	**2.6087**	**0.5397**	**48,058.6816**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	197.7702	2.8015	227.3811	0.2116		13.4921	13.4921		13.4921	13.4921	1,437.5689	228.3133	1,665.8822	4.4722	0.0469	1,791.6709
Unmitigated	197.7702	2.8015	227.3811	0.2116		13.4921	13.4921		13.4921	13.4921	1,437.5689	228.3133	1,665.8822	4.4722	0.0469	1,791.6709

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	13.7042					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	135.4492					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	44.0508	1.1247	85.0192	0.2043		12.7301	12.7301		12.7301	12.7301	1,437.5689	0.0000	1,437.5689	4.2342	0.0469	1,557.4068
Landscaping	4.5660	1.6767	142.3619	7.3800e-003		0.7619	0.7619		0.7619	0.7619	0.0000	228.3133	228.3133	0.2380	0.0000	234.2641
Total	**197.7702**	**2.8015**	**227.3811**	**0.2116**		**13.4921**	**13.4921**		**13.4921**	**13.4921**	**1,437.5689**	**228.3133**	**1,665.8822**	**4.4722**	**0.0469**	**1,791.6709**

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	13.7042					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	135.4492					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	44.0508	1.1247	85.0192	0.2043		12.7301	12.7301		12.7301	12.7301	1,437.5689	0.0000	1,437.5689	4.2342	0.0469	1,557.4068
Landscaping	4.5660	1.6767	142.3619	7.3800e-003		0.7619	0.7619		0.7619	0.7619	0.0000	228.3133	228.3133	0.2380	0.0000	234.2641
Total	**197.7702**	**2.8015**	**227.3811**	**0.2116**		**13.4921**	**13.4921**		**13.4921**	**13.4921**	**1,437.5689**	**228.3133**	**1,665.8822**	**4.4722**	**0.0469**	**1,791.6709**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	11,203.4248	33.1150	2.5804	12,800.2640
Unmitigated	11,203.4248	33.1150	2.5804	12,800.2640

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3206.13 / 0	11,203.4248	33.1150	2.5804	12,800.2640
Total		**11,203.4248**	**33.1150**	**2.5804**	**12,800.2640**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3206.13 / 0	11,203.4248	33.1150	2.5804	12,800.2640
Total		**11,203.4248**	**33.1150**	**2.5804**	**12,800.2640**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3,480.6414	205.7000	0.0000	8,623.1417
Unmitigated	3,480.6414	205.7000	0.0000	8,623.1417

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000

Single Family Housing	17146.8	3,480.6414	205.7000	0.0000	8,623.1417
Total		**3,480.6414**	**205.7000**	**0.0000**	**8,623.1417**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	17146.8	3,480.6414	205.7000	0.0000	8,623.1417
Total		**3,480.6414**	**205.7000**	**0.0000**	**8,623.1417**

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

Appendix C2

Operational CalEEMod Output
Existing - 2040

RPV - 2040 Existing Conditions

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	13,534.00	Dwelling Unit	5,110.00	24,361,200.00	35351
General Office Building	13,123.00	1000sqft	1,028.00	13,123,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2040
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	351.22	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptions

Construction Phase - No Construction

Off-road Equipment -

Vehicle Trips - See Assumptions

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - See Assumptions

Energy Use - See Assumptions

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	11,000.00	1.00
tblConstructionPhase	PhaseEndDate	12/31/2037	1/1/2038
tblEnergyUse	LightingElect	4.46	0.00
tblEnergyUse	LightingElect	1,608.84	0.00
tblEnergyUse	NT24E	4.94	0.00
tblEnergyUse	NT24E	6,680.41	0.00
tblEnergyUse	NT24NG	0.55	0.00
tblEnergyUse	NT24NG	5,516.00	0.00
tblEnergyUse	T24E	4.94	5.53
tblEnergyUse	T24E	287.34	9,434.85
tblEnergyUse	T24NG	8.63	7.50
tblEnergyUse	T24NG	25,682.16	62,940.51
tblFireplaces	NumberGas	11,503.90	0.00
tblLandUse	LotAcreage	4,394.16	5,110.00
tblLandUse	LotAcreage	301.26	1,028.00
tblLandUse	Population	38,707.00	35,351.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	351.22
tblProjectCharacteristics	OperationalYear	2018	2040
tblSolidWaste	SolidWasteGenerationRate	12,204.39	0.00
tblSolidWaste	SolidWasteGenerationRate	14,493.91	17,140.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CNW_TL	6.90	0.00
tblVehicleTrips	CW_TL	16.60	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	13.44
tblVehicleTrips	HS_TL	5.90	13.44

tblVehicleTrips	HW_TL	14.70	13.44
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	9.91	3.94
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	8.62	3.94
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	9.52	3.94
tblWater	AerobicPercent	87.46	97.54
tblWater	AerobicPercent	87.46	97.54
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.46
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.46
tblWater	IndoorWaterUseRate	2,332,399,974.92	0.00
tblWater	IndoorWaterUseRate	881,794,582.76	3,204,821,162.00
tblWater	OutdoorWaterUseRate	1,429,535,468.50	0.00
tblWater	OutdoorWaterUseRate	555,913,976.09	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

No Construction for Existing Conditions

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	197.3755	2.7302	224.1440	0.2116		13.5047	13.5047		13.5047	13.5047	1,437.5689	228.3133	1,665.8822	4.4520	0.0469	1,791.1663
Energy	5.1237	44.0737	20.7535	0.2795		3.5400	3.5400		3.5400	3.5400	0.0000	82,600.3484	82,600.3484	3.6053	1.4745	83,129.8735
Mobile	10.3827	66.1786	153.9145	0.9002	99.0366	0.3807	99.4173	26.5407	0.3545	26.8952	0.0000	83,966.5379	83,966.5379	3.0851	0.0000	84,043.6640
Waste						0.0000	0.0000		0.0000	0.0000	3,479.2651	0.0000	3,479.2651	205.6187	0.0000	8,619.7320
Water						0.0000	0.0000		0.0000	0.0000	1,133.8708	6,648.0323	7,781.9030	33.1015	2.5794	9,378.0912
Total	**212.8820**	**112.9824**	**398.8120**	**1.3913**	**99.0366**	**17.4254**	**116.4620**	**26.5407**	**17.3992**	**43.9399**	**6,050.7047**	**173,443.2318**	**179,493.9366**	**249.8625**	**4.1008**	**186,962.5270**

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	197.3755	2.7302	224.1440	0.2116		13.5047	13.5047		13.5047	13.5047	1,437.5689	228.3133	1,665.8822	4.4520	0.0469	1,791.1663
Energy	5.1237	44.0737	20.7535	0.2795		3.5400	3.5400		3.5400	3.5400	0.0000	82,600.3484	82,600.3484	3.6053	1.4745	83,129.8735
Mobile	10.3827	66.1786	153.9145	0.9002	99.0366	0.3807	99.4173	26.5407	0.3545	26.8952	0.0000	83,966.5379	83,966.5379	3.0851	0.0000	84,043.6640
Waste						0.0000	0.0000		0.0000	0.0000	3,479.2651	0.0000	3,479.2651	205.6187	0.0000	8,619.7320
Water						0.0000	0.0000		0.0000	0.0000	1,133.8708	6,648.0323	7,781.9030	33.1015	2.5794	9,378.0912
Total	**212.8820**	**112.9824**	**398.8120**	**1.3913**	**99.0366**	**17.4254**	**116.4620**	**26.5407**	**17.3992**	**43.9399**	**6,050.7047**	**173,443.2318**	**179,493.9366**	**249.8625**	**4.1008**	**186,962.5270**

	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**

3.0 Construction Detail

No Construction for Existing Conditions

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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	10.3827	66.1786	153.9145	0.9002	99.0366	0.3807	99.4173	26.5407	0.3545	26.8952	0.0000	83,966.5379	83,966.5379	3.0851	0.0000	84,043.6640
Unmitigated	10.3827	66.1786	153.9145	0.9002	99.0366	0.3807	99.4173	26.5407	0.3545	26.8952	0.0000	83,966.5379	83,966.5379	3.0851	0.0000	84,043.6640

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Single Family Housing	53,323.96	53,323.96	53323.96	260,833,688	260,833,688
Total	53,323.96	53,323.96	53,323.96	260,833,688	260,833,688

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
General Office Building	0.00	0.00	0.00	33.00	48.00	19.00	77	19	4
Single Family Housing	13.44	13.44	13.44	40.20	19.20	40.60	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.537194	0.043713	0.210127	0.116181	0.013260	0.006460	0.022765	0.039037	0.002776	0.001599	0.005341	0.000737	0.000810
General Office Building	0.537194	0.043713	0.210127	0.116181	0.013260	0.006460	0.022765	0.039037	0.002776	0.001599	0.005341	0.000737	0.000810

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	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	31,893.3410	31,893.3410	2.6334	0.5448	32,121.5398
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	31,893.3410	31,893.3410	2.6334	0.5448	32,121.5398
NaturalGas Mitigated	5.1237	44.0737	20.7535	0.2795		3.5400	3.5400		3.5400	3.5400	0.0000	50,707.0074	50,707.0074	0.9719	0.9296	51,008.3338
NaturalGas Unmitigated	5.1237	44.0737	20.7535	0.2795		3.5400	3.5400		3.5400	3.5400	0.0000	50,707.0074	50,707.0074	0.9719	0.9296	51,008.3338

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					
General Office Building	9.83766e+007	0.5305	4.8224	4.0508	0.0289		0.3665	0.3665		0.3665	0.3665	0.0000	5,249.7484	5,249.7484	0.1006	0.0963	5,280.9450
Single Family Housing	8.51837e+008	4.5932	39.2513	16.7027	0.2505		3.1735	3.1735		3.1735	3.1735	0.0000	45,457.2590	45,457.2590	0.8713	0.8334	45,727.3887
Total		**5.1237**	**44.0737**	**20.7535**	**0.2795**		**3.5400**	**3.5400**		**3.5400**	**3.5400**	**0.0000**	**50,707.0074**	**50,707.0074**	**0.9719**	**0.9296**	**51,008.3338**

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					
General Office Building	9.83766e+007	0.5305	4.8224	4.0508	0.0289		0.3665	0.3665		0.3665	0.3665	0.0000	5,249.7484	5,249.7484	0.1006	0.0963	5,280.9450
Single Family Housing	8.51837e+008	4.5932	39.2513	16.7027	0.2505		3.1735	3.1735		3.1735	3.1735	0.0000	45,457.2590	45,457.2590	0.8713	0.8334	45,727.3887
Total		**5.1237**	**44.0737**	**20.7535**	**0.2795**		**3.5400**	**3.5400**		**3.5400**	**3.5400**	**0.0000**	**50,707.0074**	**50,707.0074**	**0.9719**	**0.9296**	**51,008.3338**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	7.25046e+007	11,550.7555	0.9537	0.1973	11,633.4018
Single Family Housing	1.27691e+008	20,342.5856	1.6797	0.3475	20,488.1380
Total		**31,893.3410**	**2.6334**	**0.5449**	**32,121.5398**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
General Office Building	7.25046e+007	11,550.7555	0.9537	0.1973	11,633.4018
Single Family Housing	1.27691e+008	20,342.5856	1.6797	0.3475	20,488.1380
Total		**31,893.3410**	**2.6334**	**0.5449**	**32,121.5398**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	197.3755	2.7302	224.1440	0.2116		13.5047	13.5047		13.5047	13.5047	1,437.5689	228.3133	1,665.8822	4.4520	0.0469	1,791.1663
Unmitigated	197.3755	2.7302	224.1440	0.2116		13.5047	13.5047		13.5047	13.5047	1,437.5689	228.3133	1,665.8822	4.4520	0.0469	1,791.1663

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	13.7042					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consumer Products	135.4492					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	44.0508	1.1247	85.0192	0.2043		12.7301	12.7301		12.7301	12.7301	1,437.5689	0.0000	1,437.5689	4.2342	0.0469	1,557.4068
Landscaping	4.1714	1.6054	139.1248	7.3800e-003		0.7746	0.7746		0.7746	0.7746	0.0000	228.3133	228.3133	0.2179	0.0000	233.7595
Total	**197.3755**	**2.7302**	**224.1440**	**0.2116**		**13.5047**	**13.5047**		**13.5047**	**13.5047**	**1,437.5689**	**228.3133**	**1,665.8822**	**4.4520**	**0.0469**	**1,791.1663**

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	13.7042					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	135.4492					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	44.0508	1.1247	85.0192	0.2043		12.7301	12.7301		12.7301	12.7301	1,437.5689	0.0000	1,437.5689	4.2342	0.0469	1,557.4068
Landscaping	4.1714	1.6054	139.1248	7.3800e-003		0.7746	0.7746		0.7746	0.7746	0.0000	228.3133	228.3133	0.2179	0.0000	233.7595
Total	**197.3755**	**2.7302**	**224.1440**	**0.2116**		**13.5047**	**13.5047**		**13.5047**	**13.5047**	**1,437.5689**	**228.3133**	**1,665.8822**	**4.4520**	**0.0469**	**1,791.1663**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			

Mitigated	7,781.9030	33.1015	2.5794	9,378.0912
Unmitigated	7,781.9030	33.1015	2.5794	9,378.0912

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3204.82 / 0	7,781.9030	33.1015	2.5794	9,378.0912
Total		**7,781.9030**	**33.1015**	**2.5794**	**9,378.0912**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3204.82 / 0	7,781.9030	33.1015	2.5794	9,378.0912
Total		**7,781.9030**	**33.1015**	**2.5794**	**9,378.0912**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3,479.2651	205.6187	0.0000	8,619.7320
Unmitigated	3,479.2651	205.6187	0.0000	8,619.7320

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	17140	3,479.2651	205.6187	0.0000	8,619.7320
Total		**3,479.2651**	**205.6187**	**0.0000**	**8,619.7320**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	17140	3,479.2651	205.6187	0.0000	8,619.7320
Total		**3,479.2651**	**205.6187**	**0.0000**	**8,619.7320**

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

Appendix C3

Operational CalEEMod Output
Project Growth - 2040

RPV - 2040 Project Conditions

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	756.00	Dwelling Unit	399.00	1,360,800.00	1927

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2040
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	351.22	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptiuons

Construction Phase - Construction modeled separately

Off-road Equipment -

Vehicle Trips - See Assumptions

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - See Assumptions

Energy Use - See Assumptions

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	440.00	2.00
tblConstructionPhase	PhaseEndDate	12/31/2037	1/4/2038
tblEnergyUse	LightingElect	1,608.84	0.00
tblEnergyUse	NT24E	6,680.41	0.00
tblEnergyUse	NT24NG	5,516.00	0.00
tblEnergyUse	T24E	287.34	9,434.85
tblEnergyUse	T24NG	25,682.16	62,940.51
tblFireplaces	NumberGas	642.60	0.00
tblFireplaces	NumberNoFireplace	75.60	139.86
tblFireplaces	NumberWood	37.80	0.00
tblLandUse	LotAcreage	245.45	399.00
tblLandUse	Population	2,162.00	1,927.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	351.22
tblProjectCharacteristics	OperationalYear	2018	2040
tblSolidWaste	SolidWasteGenerationRate	790.07	957.43
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	13.44
tblVehicleTrips	HS_TL	5.90	13.44
tblVehicleTrips	HW_TL	14.70	13.44
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	9.91	3.94
tblVehicleTrips	SU_TR	8.62	3.94
tblVehicleTrips	WD_TR	9.52	3.94
tblWater	AerobicPercent	87.46	97.54
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.46
tblWater	IndoorWaterUseRate	49,256,443.37	179,019,122.00

tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	37.80	0.00
tblWoodstoves	NumberNoncatalytic	37.80	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

No Construction for Existing Conditions

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	5.5752	0.0896	7.7621	4.1000e-004		0.0432	0.0432		0.0432	0.0432	0.0000	12.7352	12.7352	0.0121	0.0000	13.0383
Energy	0.2566	2.1926	0.9330	0.0140		0.1773	0.1773		0.1773	0.1773	0.0000	3,675.5344	3,675.5344	0.1425	0.0660	3,698.7541
Mobile	0.5800	3.6967	8.5976	0.0503	5.5321	0.0213	5.5534	1.4826	0.0198	1.5024	0.0000	4,690.3145	4,690.3145	0.1723	0.0000	4,694.6227
Waste						0.0000	0.0000		0.0000	0.0000	194.3496	0.0000	194.3496	11.4857	0.0000	481.4930
Water						0.0000	0.0000		0.0000	0.0000	63.3373	426.3165	489.6538	1.8536	0.1450	579.2090
Total	**6.4117**	**5.9788**	**17.2927**	**0.0647**	**5.5321**	**0.2418**	**5.7739**	**1.4826**	**0.2403**	**1.7229**	**257.6869**	**8,804.9006**	**9,062.5875**	**13.6662**	**0.2110**	**9,467.1171**

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	5.5752	0.0896	7.7621	4.1000e-004		0.0432	0.0432		0.0432	0.0432	0.0000	12.7352	12.7352	0.0121	0.0000	13.0383
Energy	0.2566	2.1926	0.9330	0.0140		0.1773	0.1773		0.1773	0.1773	0.0000	3,675.5344	3,675.5344	0.1425	0.0660	3,698.7541
Mobile	0.5800	3.6967	8.5976	0.0503	5.5321	0.0213	5.5534	1.4826	0.0198	1.5024	0.0000	4,690.3145	4,690.3145	0.1723	0.0000	4,694.6227
Waste						0.0000	0.0000		0.0000	0.0000	194.3496	0.0000	194.3496	11.4857	0.0000	481.4930
Water						0.0000	0.0000		0.0000	0.0000	63.3373	426.3165	489.6538	1.8536	0.1450	579.2090
Total	**6.4117**	**5.9788**	**17.2927**	**0.0647**	**5.5321**	**0.2418**	**5.7739**	**1.4826**	**0.2403**	**1.7229**	**257.6869**	**8,804.9006**	**9,062.5875**	**13.6662**	**0.2110**	**9,467.1171**

	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**

3.0 Construction Detail

No Construction for Existing Conditions

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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	0.5800	3.6967	8.5976	0.0503	5.5321	0.0213	5.5534	1.4826	0.0198	1.5024	0.0000	4,690.3145	4,690.3145	0.1723	0.0000	4,694.6227
Unmitigated	0.5800	3.6967	8.5976	0.0503	5.5321	0.0213	5.5534	1.4826	0.0198	1.5024	0.0000	4,690.3145	4,690.3145	0.1723	0.0000	4,694.6227

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	2,978.64	2,978.64	2978.64	14,569,995	14,569,995
Total	2,978.64	2,978.64	2,978.64	14,569,995	14,569,995

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
Single Family Housing	13.44	13.44	13.44	40.20	19.20	40.60	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.537194	0.043713	0.210127	0.116181	0.013260	0.006460	0.022765	0.039037	0.002776	0.001599	0.005341	0.000737	0.000810

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	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	1,136.3229	1,136.3229	0.0938	0.0194	1,144.4534
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,136.3229	1,136.3229	0.0938	0.0194	1,144.4534
NaturalGas Mitigated	0.2566	2.1926	0.9330	0.0140		0.1773	0.1773		0.1773	0.1773	0.0000	2,539.2115	2,539.2115	0.0487	0.0466	2,554.3007
NaturalGas Unmitigated	0.2566	2.1926	0.9330	0.0140		0.1773	0.1773		0.1773	0.1773	0.0000	2,539.2115	2,539.2115	0.0487	0.0466	2,554.3007

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					
Single Family Housing	4.7583e+007	0.2566	2.1926	0.9330	0.0140		0.1773	0.1773		0.1773	0.1773	0.0000	2,539.2115	2,539.2115	0.0487	0.0466	2,554.3007
Total		**0.2566**	**2.1926**	**0.9330**	**0.0140**		**0.1773**	**0.1773**		**0.1773**	**0.1773**	**0.0000**	**2,539.2115**	**2,539.2115**	**0.0487**	**0.0466**	**2,554.3007**

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					
Single Family Housing	4.7583e+007	0.2566	2.1926	0.9330	0.0140		0.1773	0.1773		0.1773	0.1773	0.0000	2,539.2115	2,539.2115	0.0487	0.0466	2,554.3007
Total		**0.2566**	**2.1926**	**0.9330**	**0.0140**		**0.1773**	**0.1773**		**0.1773**	**0.1773**	**0.0000**	**2,539.2115**	**2,539.2115**	**0.0487**	**0.0466**	**2,554.3007**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
Single Family Housing	7.13275e+006	1,136.3229	0.0938	0.0194	1,144.4534
Total		**1,136.3229**	**0.0938**	**0.0194**	**1,144.4534**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	7.13275e+006	1,136.3229	0.0938	0.0194	1,144.4534
Total		**1,136.3229**	**0.0938**	**0.0194**	**1,144.4534**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	5.5752	0.0896	7.7621	4.1000e-004		0.0432	0.0432		0.0432	0.0432	0.0000	12.7352	12.7352	0.0121	0.0000	13.0383

Unmitigated	5.5752	0.0896	7.7621	4.1000e-004		0.0432	0.0432		0.0432	0.0432	0.0000	12.7352	12.7352	0.0121	0.0000	13.0383

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	0.4257					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.9173					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	0.2322	0.0896	7.7621	4.1000e-004		0.0432	0.0432		0.0432	0.0432	0.0000	12.7352	12.7352	0.0121	0.0000	13.0383
Total	**5.5752**	**0.0896**	**7.7621**	**4.1000e-004**		**0.0432**	**0.0432**		**0.0432**	**0.0432**	**0.0000**	**12.7352**	**12.7352**	**0.0121**	**0.0000**	**13.0383**

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	0.4257					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.9173					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	0.2322	0.0896	7.7621	4.1000e-004		0.0432	0.0432		0.0432	0.0432	0.0000	12.7352	12.7352	0.0121	0.0000	13.0383

Total	**5.5752**	**0.0896**	**7.7621**	**4.1000e-004**		**0.0432**	**0.0432**		**0.0432**	**0.0432**	**0.0000**	**12.7352**	**12.7352**	**0.0121**	**0.0000**	**13.0383**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	489.6538	1.8536	0.1450	579.2090
Unmitigated	489.6538	1.8536	0.1450	579.2090

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	179.019 / 31.053	489.6538	1.8536	0.1450	579.2090
Total		**489.6538**	**1.8536**	**0.1450**	**579.2090**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	179.019 / 31.053	489.6538	1.8536	0.1450	579.2090
Total		**489.6538**	**1.8536**	**0.1450**	**579.2090**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	194.3496	11.4857	0.0000	481.4930
Unmitigated	194.3496	11.4857	0.0000	481.4930

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	957.43	194.3496	11.4857	0.0000	481.4930
Total		**194.3496**	**11.4857**	**0.0000**	**481.4930**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	957.43	194.3496	11.4857	0.0000	481.4930
Total		**194.3496**	**11.4857**	**0.0000**	**481.4930**

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