

4.6 GREENHOUSE GAS EMISSIONS

The Air Quality and Greenhouse Gas Technical Report (AQ/GHG Report) prepared by Yorke Engineering, LLC, and dated September 2017 has been prepared in support of the Draft Environmental Impact Report (Draft EIR) for the proposed Inglewood Oil Field Specific Plan (Specific Plan or Project). The AQ/GHG Report can be found in Appendix C-1 of this Draft EIR. This Draft EIR section addresses the potential environmental impacts associated with full implementation of the Project, in accordance with the requirements of the Specific Plan. Direct, indirect, and cumulative impacts are addressed for each threshold criteria below, and growth-inducing impacts are described in Sections 6.0, CEQA-Mandated Analyses, of this Draft EIR.

Throughout this Draft EIR, the City's portion of the Inglewood Oil Field (77.8 acres) is referred to as the "Project Site" or the "City IOF." The entire surface boundary limits of the Inglewood Oil Field, including lands within both the City and County, is referred to as "Inglewood Oil Field." The portion of the Inglewood Oil Field that is only within the jurisdiction of the County of Los Angeles is referred to as the "County IOF."

The Specific Plan contains guidance on an extensive list of provisions to help reduce climate change impacts. These include emission offsets; oil tank pressure monitoring and venting; closed systems for produced oil and water; requirements for off-road diesel construction equipment engines; requirements for drill rig engines; inspection and maintenance program information requirements; and greenhouse gas recordkeeping and cap and trade program information.

4.6.1 METHODOLOGY

Greenhouse Gas Emissions

Greenhouse gas emissions for the implementation of the Specific Plan were manually calculated on detailed spreadsheets included as Appendix A to the Yorke Engineering's AQ/GHG Report, which is Appendix C-1 of this Draft EIR. The assumptions used for the calculations are detailed in the Yorke spreadsheets and are primarily based on the Maximum Buildout Scenario described in Section 3.2 of this Draft EIR. The applicable requirements of the Specific Plan, as summarized in Section 4.6.5 below, have been accounted for in the modeling assumptions and are assumed to be incorporated during Project implementation, as required. Emission factors for off-road equipment are taken from the California Emissions Estimator Model (CalEEMod) Version 2013.2.2 technical appendix tables of OFFROAD Equipment Emission Factors. CalEEMod is a computer program that was developed by California air districts and is used to calculate anticipated emissions associated with land development projects in California. On-road vehicle emission factors are from the California Air Resources Board's (CARB) EMFAC 2011 model. The EMFAC emissions model is developed and used by CARB to assess emissions from on-road vehicles including cars, trucks, and buses in California.

4.6.2 ENVIRONMENTAL SETTING

Background

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods" (UNFCCC 2014). Pursuant to California Health and Safety Code Section 38505(g), the seven principal greenhouse gases (GHGs) include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons

(PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). GHGs occur naturally because of volcanoes, forest fires, and biological processes, such as enteric fermentation and aerobic decomposition. They are also produced by the combustion of fuels, industrial processes, agricultural operations, waste management, and land use changes, such conversion of farmland to urban uses. Emissions caused by human activities are called anthropogenic emissions.

In its Fourth Assessment Report (2007), the Intergovernmental Panel on Climate Change (IPCC) stated that warming of the Earth's climate is unequivocal and that warming is very likely attributable to increases in atmospheric GHGs caused by human activities. The IPCC further stated that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts, are linked to changes in the climate system and that some changes might be irreversible.

In its Fifth Assessment Report (2013), the IPCC reinforced evidence for the warming of the climate system since the 1950s based on observed changes over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, the sea level has risen, and the concentrations of GHGs have increased. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. In the Northern Hemisphere, 1983-2012 was likely the warmest 30-year period of the last 1,400 years. The IPCC also reports (IPCC 2013):

- The atmospheric concentrations of CO₂, CH₄, and N₂O have all increased since 1750 due to human activity. In 2011, average concentrations of CO₂, CH₄, and N₂O were 390 ppm, 1.8 ppm, and 0.3 ppm, respectively, which are higher than pre-industrial levels by about 40 percent, 150 percent, and 20 percent, respectively.
- The globally averaged combined land and ocean surface temperature data, as calculated by a linear trend, showed an average warming of 0.85°C (1.5°F) over the period 1880 to 2012. The average total increase between the 1850-1900 period and the 2003-2012 period was 0.78°C (1.4°F).
- Ocean warming dominates the increase in energy stored in the climate system, accounting for more than 90 percent of the energy accumulated between 1971 and 2010. The rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia. Over the period 1901-2010, global mean sea level rose by 0.19 meter (0.62 foot).
- Over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers have continued to shrink almost worldwide, and Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent.

According to the National Oceanic and Atmospheric Administration (NOAA), there is strong evidence that the global sea level is now rising at an increased rate and will continue to rise during this century. While studies show that sea levels changed little from AD 0 until 1900, sea levels began to climb in the 20th century. The two major causes of global sea level rise are thermal expansion caused by the warming of the oceans (since water expands as it warms) and the loss of land-based ice (such as glaciers and polar ice caps) due to increased melting. Records and research show that the sea level has been steadily rising at a rate of one-eighth of an inch per year. This rate may be increasing. This is a significantly higher rate than the sea level rise averaged over the last several thousand years (NOAA 2017).

Common GHGs

The most common GHG from human activity (fuel combustion) is CO₂, followed by CH₄ and N₂O (USEPA 2017). The Project is not expected to emit HFCs, PFCs, SF₆, or NF₃; therefore, throughout this analysis, the term GHG refers to combustion byproducts: CO₂, CH₄, and N₂O.

Carbon Dioxide: CO₂ is primarily produced by aerobic organisms through respiration and through the process of decay of organic materials. In nature, carbon is cycled between various atmospheric, oceanic, biologic, and mineral reservoirs. Atmospheric CO₂ is part of this global carbon cycle. CO₂ concentrations in the atmosphere increased from 278 parts per million by volume (ppmv) in pre-industrial times to 390 ppmv in 2011, a 40 percent increase. The IPCC notes that “the present CO₂ concentration has not been exceeded during the past 420,000 years, and likely not during the past 20 million years. The rate of increase over the past century is unprecedented, at least during the past 20,000 years.” The IPCC definitively states that “the present atmospheric CO₂ increase is caused by anthropogenic emissions of CO₂” (USEPA 2017; IPCC 2007).

The potential heat trapping ability of different GHGs in the atmosphere varies significantly. To account for these differences in warming effect, GHGs are defined by their global warming potential (GWP). The GWP value for a GHG depends on the time span over which it is calculated and on how the gas concentration decays in the atmosphere over time. Gases with a higher GWP absorb more energy, per pound, than gases with a lower GWP, and thus contribute more to warming Earth (USEPA 2017). Under this United States Environmental Protection Agency (USEPA) methodology, the GWP of CO₂ is set to 1, the GWP of CH₄ is 21, and the GWP of N₂O is 310. Carbon dioxide equivalents (CO₂e) are calculated by summing the products of mass GHG emissions by species times their respective GWP coefficients (USEPA 2017).

Methane: CH₄ is primarily produced through anaerobic decomposition of organic matter in biological systems. Agricultural processes, such as wetland rice cultivation, enteric fermentation in animals, and the decomposition of animal wastes emit CH₄, as does the decomposition of municipal solid wastes. CH₄ is also emitted during the production and distribution of natural gas and petroleum and is released as a byproduct of coal mining and incomplete fossil fuel combustion. Atmospheric CH₄ concentrations have increased by about 150 percent since pre-industrial times, although the rate of increase has been declining. The IPCC has estimated that slightly more than half of the current CH₄ flux to the atmosphere is anthropogenic from human activities, such as agriculture, fossil fuel use, and waste disposal. The 100-year GWP coefficient of CH₄ is 25 (IPCC 2007).

Nitrous Oxide: Anthropogenic sources of N₂O emissions include agricultural soils, especially the use of synthetic and manure fertilizers; fossil fuel combustion, especially from combustion in mobile sources; adipic (nylon) and nitric acid production; wastewater treatment and waste combustion; and industrial biomass burning (e.g., electric power generation). The global atmospheric N₂O concentration increased from a pre-industrial value of about 270 ppb to 319 ppb in 2005, a concentration that has not been exceeded during the last thousand years. The 100-year GWP coefficient of N₂O ranges from 298 (IPCC 2007) to 310 (USEPA 2017).

Regional and Local Setting

The environmental setting for GHG emissions and climate change is larger than the immediate Project area. The sections below describe the context for climate change as being the Earth and the properties of GHGs to affect global climate change.

Sources of GHG Emissions

The USEPA tracks GHG emissions in the United States and publishes the Inventory of U.S. Greenhouse Gas Emissions and Sinks, which is updated annually. This detailed report contains estimates of the total national GHG emissions and removals associated with human activities in all 50 states. From the current report, the main sources of GHG emissions in the United States are identified below (USEPA 2017):

- Electric power generation accounts for about 32 percent of GHG emissions nationwide. Over 70 percent of electric power is generated by burning fossil fuels, mainly coal and natural gas. GHG emissions from electric power generation in the United States have increased by about 24 percent since 1990 as demand for electric power has grown and fossil fuels have remained the dominant energy source for generation due to their low cost and high reliability.
- Transportation accounts for about 28 percent of GHG emissions nationwide. GHG emissions from transportation result from burning fossil fuels in automobiles, trucks, trains, ships, and aircraft. About 90 percent of the fuel used for transportation is petroleum-based, which includes gasoline, diesel, and jet fuel.
- Industry accounts for about 20 percent of GHG emissions nationwide. GHG emissions from industry are associated mainly with burning fossil fuels (coal and natural gas) for heat energy, as well as emissions from certain chemical reactions necessary to produce goods from raw materials.
- Commercial and residential uses account for about 10 percent of GHG emissions nationwide. GHG emissions from businesses and homes result primarily from fossil fuels burned for heat, the use of certain products that contain GHGs, and the handling and disposal of domestic wastes.
- Agriculture accounts for about 10 percent of GHG emissions nationwide. GHG emissions from agriculture are caused by livestock, such as cows (enteric fermentation), soil management practices, and rice farming.
- Land use and forestry offsets (absorbs or sequesters) about 15 percent of GHG emissions nationwide. Land areas can act as GHG sinks (absorbing CO₂ from the atmosphere) or GHG sources. Since 1990, well-managed forests and other lands have absorbed more CO₂ from the atmosphere than they emit.

More recent work by NOAA and the Cooperative Institute for Research in Environmental Sciences (CIRES) has indicated that methane emissions from fossil fuel development around the world are up to 60 percent greater than estimated by previous studies. The study found that fossil fuel activities contribute between 132 million and 165 million tons of the 623 million tons of methane emitted by all sources every year. This equates to about 20 to 25 percent of total global methane emissions, and 20 to 60 percent more than previous studies had estimated. Despite improvements in industry practices that have reduced leaks from oil and gas facilities, dramatic production increases have canceled out efficiency gains, keeping the overall contribution from fossil fuel activities constant.

However, the findings also confirm other work by NOAA scientists that conclude fossil fuel facilities are not directly responsible for the increased rate of global atmospheric methane emissions measured in the atmosphere since 2007. According to the study's lead author Stefan Schwietzke, "[W]e believe methane produced by microbial sources – cows, agriculture, landfills,

wetlands, and fresh waters – are responsible for the increase, but we cannot yet pinpoint which are the primary drivers” (Yorke Engineering 2017).

GHG Emission Trends

The California Global Warming Solutions Act of 2006 [Assembly Bill (AB) 32, see Section 4.6.3 below] required the California Air Resources Board (CARB) to prepare a Scoping Plan to achieve substantial GHG emissions reductions, both from within the state and from “exported” emissions, such as importing electric power generated at coal-fired power plants located in neighboring western states. The 2008 Scoping Plan outlines a wide range of strategies for reducing statewide GHG emissions to 1990 levels by 2020. This will be achieved by cutting about 30 percent from business-as-usual emission levels projected for 2020, or about 15 percent from 2008 levels. Allowing for population growth, the goal is to reduce annual per capita emissions from 14 metric tons (MT) of CO₂e down to about 10 MT CO₂e per capita by 2020 (CARB 2008).

Annual GHG emission inventories provide the basis for establishing historical emission trends. Trends are useful in tracking progress toward a specific goal or target. There are many factors affecting GHG emissions, including the state of the economy, changes in demography, improved efficiency, and changes in environmental conditions, such as drought. Consistent with the goals of the Scoping Plan, the following trends are apparent:

- From 2000-2012, California’s gross GHG emissions decreased by 1.6 percent from 466.3 to 458.7 million metric tons (MMT) CO₂e, with a maximum of 492.7 MMTCO₂e in 2004. During the same period, California’s population grew by 11 percent from 33.9 to 37.8 million people. As a result, California’s per capita GHG emissions have generally decreased over the last 12 years, from 13.7 MTCO₂e per person in 2000 to 12.1 MT CO₂e per person in 2012 (CARB 2014).
- California’s Gross Domestic Product (GDP) increased from \$1.47 trillion in 2000 to \$1.75 trillion in 2012 (in 2005 dollars). While California’s economy has continued to grow, the “carbon intensity” of the economy (MTCO₂e/\$GDP) has continually declined since 2001 and has decreased from 316.6 MTCO₂e per million dollars in 2000 to 261.9 MTCO₂e per million dollars in 2012 (CARB 2014).
- Since 1990, U.S. GHG emissions have increased by about 5 percent overall; however, GHG emissions in 2012 were 10 percent below 2005 levels. From year to year, emissions can rise and fall due to changes in the economy, the price of fuel, and other factors. In 2012, U.S. GHG emissions decreased 3.4 percent compared to 2011 levels. This decrease was primarily due to a decrease in the carbon intensity of fuels consumed to generate electricity due to a decrease in coal consumption, with corresponding increases in natural gas consumption, and increased hydropower use in some regions of the country. Other factors include improvements in fuel efficiency in vehicles with reductions in miles traveled, and year-to-year changes in the prevailing weather. In 2012, total nationwide GHG emissions were 6,526 MMTCO₂e (USEPA 2017).

Statewide GHG Emissions Inventory

Table 4.6-1 shows California statewide GHG inventory results by economic sector for 2006 through 2013, the most recent data released by CARB. These data are gross basis (i.e., CO₂e emissions only), not including CO₂ sinks, such as forestry and agriculture. Oil and gas extraction, a subsector of the industrial sector, emissions in 2013 were 19.65 MTCO₂e. As noted above, in 2012, total nationwide GHG emissions were 6,526 MMTCO₂e, which indicates that California

accounts for about 7 percent of gross CO₂e emissions in the U.S. annually. Since 2007, statewide GHG emissions have declined by about 6 percent overall (CARB 2014).

**TABLE 4.6-1
CALIFORNIA STATEWIDE GREENHOUSE GAS EMISSIONS INVENTORY**

Source Category/Sector	Estimated CO ₂ e Emissions (MMT/year)								Sector Percent (2013)
	2006	2007	2008	2009	2010	2011	2012	2013	
Transportation	188.8	190.0	177.8	171.1	170.3	168.0	167.4	169.0	37%
Electric Power Generation	104.5	113.9	120.1	101.3	90.3	88.0	95.1	90.5	20%
Commercial and Residential	42.9	43.2	43.5	43.7	44.9	45.5	42.9	43.5	9%
Industrial Processes	94.1	90.8	91.4	88.8	92.1	92.0	92.5	92.7	20%
Recycling and Waste	8.0	8.1	8.3	8.4	8.5	8.8	8.8	8.9	2%
High GWP Gases	10.9	11.6	12.6	13.8	15.5	16.8	17.8	18.5	4%
Agriculture	36.3	36.0	36.5	34.9	34.5	35.7	36.4	36.2	8%
Statewide Totals	485.7	492.6	490.1	462.1	456.0	454.6	460.82	459.3	100%

MMT- million metric ton; 1 metric ton = 1,000 kilograms or 2,204.6 pounds
Source: CARB 2015.

4.6.3 REGULATORY SETTING

A number of regulatory actions have been implemented over the past few years, especially at the State level, which pertain to GHG emissions and climate change. The following section is limited to the regulatory requirements that are most important or directly applicable to the proposed Project.

Federal

40 CFR Part 60, Subpart OOOO—Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

On August 18, 2015, the USEPA [final rule has been adopted] proposed updates to its 2012 New Source Performance Standards for the oil and gas industry to reduce emissions of greenhouse gases – most notably methane - along with smog-forming VOCs. The updates added methane to the pollutants covered by the rule, and added requirements to limit emissions from hydraulically fractured oil well completions and pneumatic pumps, in addition to requirements for detecting and repairing leaks at oil well sites.

USEPA requires owners/operators of hydraulically fractured oil wells to capture the natural gas that currently escapes into the air. Capturing the gas will both reduce methane and VOC emissions and maximize natural gas recovery from well completions. This significant emissions reduction – nearly 95 percent - would be accomplished primarily through the use of a proven process known as a “reduced emissions completion” or “green completion.” In a green completion, special equipment separates gas and liquid hydrocarbons from the flowback that

comes from the well as it is being prepared for production. The gas and hydrocarbons can then be treated and used or sold, avoiding the waste of natural resources.

40 CFR Parts 51, 52, 70, and 71 – PSD and Title V Permitting Programs

On June 23, 2014, the U.S. Supreme Court issued its decision in *Utility Air Regulatory Group v. USEPA* (No. 12-1146). The Court ruled that the USEPA may not treat GHGs as air pollutants for purposes of determining whether a source is a major source required to obtain a Prevention of Significant Deterioration (PSD) or Title V permit. The Court also stated that PSD permits that are otherwise required (based on emissions of criteria pollutants, such as NO_x and SO_x) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT). The USEPA is currently evaluating the implications of the Court's decision and awaiting further action by the U.S. Courts. As the USEPA gains a better understanding of the full impact of the decision on PSD and Title V permitting regulations, the USEPA will provide relevant guidance and information on GHG permitting requirements.

Notwithstanding the Supreme Court's decision, beginning January 2, 2011, GHG emissions from the largest stationary sources are covered by the PSD and Title V Operating Permit Programs. These permitting programs, required under the Federal Clean Air Act (FCAA), are established mechanisms for protecting air quality and are now being used to regulate GHG emissions. However, the major source thresholds established by the FCAA (i.e., 100 or 250 MT per year depending on pollutant and attainment status) were designed for criteria pollutants, such as NO_x and SO_x, and were not designed to be applied to GHGs, which are emitted in much larger quantities. In response, on May 13, 2010, the USEPA issued the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule [Federal Register (FR) Volume 75 Page 31514, 40 CFR Parts 51, 52, 70, and 71, effective August 2, 2010], which established a new quantitative approach to permitting GHG emissions under PSD and Title V. The Tailoring Rule set initial emission thresholds, designated as Steps 1 and 2, for permitting based on CO₂e emissions. Step 3 of the rule introduced plant-wide applicability limitations (PALs) for GHG emissions from certain types of facilities.

State

Global Warming Solutions Act (Assembly Bill [AB] 32)

The Global Warming Solutions Act of 2006 (AB 32, Núñez, Chapter 488, Statutes of 2006) codifies California's goal of reducing statewide emissions of GHGs to 1990 levels by 2020, down to about 427 MMTCO₂e on a statewide basis (CARB 2008). This reduction will be accomplished through an enforceable statewide cap on GHG emissions commencing in 2012 (see Cap and Trade section below) to achieve maximum technologically feasible and cost-effective GHG emission reductions. In order to effectively implement the cap, AB 32 directs CARB to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels.

In June 2007, CARB directed staff to pursue 37 early actions for reducing GHG emissions under AB 32. The broad spectrum of strategies included a Low Carbon Fuel Standard (LCFS), regulations for refrigerants with high GWPs, guidance and protocols for local governments to facilitate GHG reductions, and "green ports" (CARB 2007).

In December 2008, CARB approved the AB 32 Scoping Plan outlining the State's strategy to achieve the 2020 GHG emissions limit. This Scoping Plan, developed by CARB in coordination with the Climate Action Team, proposes a comprehensive set of actions designed to reduce

overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health (CARB 2008).

The Scoping Plan includes the following recommended action relative to oil and gas extraction (CARB 2008):

11. Industrial Emissions

Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.

Oil and Gas Recovery Operations and Transmission/Refineries

California is a major oil and gas producer. Crude oil, both from in-state and imported sources, is processed at 21 oil refineries in the state. In addition to conforming to the requirements of the cap-and-trade program and the audit measure, CARB has identified four specific measures for development and implementation, two for oil and gas recovery operations and gas transmission, and two for refineries. Other industrial measures that were under consideration affect greenhouse gas emissions sources that are fully regulated under cap and trade, which CARB concluded would provide cost-effective reductions of greenhouse gas emissions. All measures would be designed to secure a combination of cost-effective reductions in greenhouse gas emissions, criteria air pollutants and air toxics. Two measures would be developed to reduce methane emissions in the oil and gas production and gas transmission processes from leaks and incomplete combustion of methane (used as fuel). These measures would include improved leak detection, process modifications, equipment retrofits, installation of new equipment, and best management practices. The first measure would affect oil and gas producers. The second would impact operators of natural gas pipeline systems. These fugitive emissions are not proposed to be covered by a cap and trade program, although combustion-related emissions from these operations are proposed to be covered.

Scoping Plan Measure I-2 is titled Oil and Gas Extraction GHG Emission Reduction and was forecasted to result in a reduction of 0.2 MMTCO₂e in 2020 (CARB 2008). Measure I-2 is further described in Appendix C-1 to the 2008 Scoping Plan as follows:

This measure would address fugitive emissions from the extraction process of California's large oil and gas industry, including on and off-shore sources. Fugitive emissions—mostly in the form of methane—account for approximately five percent of the GHG emissions from this part of the sector and are estimated to be 0.3 MMTCO₂e in 2020. These emissions are from well and process equipment venting: leaks of flanges, valves and other fittings on the wells and equipment; and from separation and storage units such as sumps and storage tanks. This level of emissions follows the historical trend of statewide extraction rates. However, increases in crude oil prices have resulted in increased oil extraction and may increase emissions. If so, this measure would yield greater benefits. This measure may also eventually address combustion sources that are not captured by the Cap and Trade Program.

Controls for the fugitive sources range from applying simple fixes to existing technologies, to deploying new technologies to replace inefficient equipment and detect leaks and would include: improving operating practices to reduce emissions when compressors are taken off-line; installing compressor rod packing systems; substituting high bleed with low bleed pneumatic devices; improving leak detection; installing electronic flare ignition devices; replacing older equipment (flanges, valves, and fittings); and installing vapor recovery devices. These are proven technologies in the U.S. EPA's Natural Gas operations efficiency program, or STAR program, that will pay back investments in a short period of time through saleable gas savings.

The measure described here is expected to reduce fugitive methane emissions by approximately 0.2 MMT CO₂E per year, beginning in 2015 and continuing to 2020 and beyond. Staff estimated the fugitive emission reductions by applying the natural gas savings from the STAR program actions described above to a number of such units in the current emissions inventory. These emission reductions may be underestimated if an industry survey reveals that there are additional sources of emissions.

First Update to the Climate Change Scoping Plan

In 2014, CARB approved the *First Update to the Climate Change Scoping Plan* (First Update or 2013 Update) (CARB 2014). The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments; defines CARB's climate change priorities for the next five years; and sets the groundwork to reach California's long-term climate goals set forth in Executive Order S-3-05 (CARB 2015).

The First Update states that California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32. The set of actions the State is taking is driving down greenhouse emissions and moving the State steadily in the direction of a cleaner energy economy.

The First Update identifies sectors and corresponding sector-specific actions. The sectors are Energy; Transportation (Vehicles/Equipment, Sustainable Communities, Housing, Fuels, and Infrastructure); Agriculture; Water; Waste Management; Natural and Working Lands; Short-lived Climate Pollutants; Green Buildings; and Cap-and-Trade Regulation. Industry is a sub-section of the Energy sector and includes the following discussion relative to oil and gas extraction:

Several recent analyses of atmospheric measurements suggest that actual methane emissions may be 1.3 to 1.7 times higher than estimated in CARB's emission inventory. Recent research suggests that methane emissions from a broad variety of sources could be higher than previously expected, including leaks in natural gas distribution systems, oil and gas extraction facilities, and natural seeps such as the La Brea Tar Pits. Underestimations may explain the discrepancies between the inventory and atmospheric measurements. With the greater GWP assessed in recent IPCC and other studies, reductions in methane emissions will have greater benefits.

ARB is continuing to research potential sources of methane emissions to determine the source of higher-than-expected ambient methane measurements, and whether additional controls are technologically feasible and cost-effective.

Most emission reductions from industry will be realized through California's Cap-and-Trade Program, which includes large industrial sources (i.e., sources emitting more than 25,000 MTCO₂e/year). As with other activities covered by the Cap-and-Trade Regulation, CARB also assessed the potential for direct regulation measures that could be implemented at these facilities. In addition, fugitive emissions from industrial facilities (primarily methane emissions) are not part of the Cap-and-Trade Program. Therefore, direct regulations were also considered for industrial sources with significant fugitive GHG emissions—oil and gas extraction, natural gas transmission, and refineries.

Regarding fugitive emissions, CARB undertook a survey of the oil and gas extraction sector, on items such as compressor seals, storage tanks, valves, flanges, and connectors, to improve the emission inventory. The key findings of this survey are influencing CARB's approach to developing a new measure in 2014 to reduce fugitive GHG emissions from these operations.

Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

Following implementation of 2008 Scoping Plan Measure I-2, the Office of Administrative Law (OAL) approved the Final *Regulation Order Subarticle 13: Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities § 95665*, and filed it with the Secretary of State on July 17, 2017. The effective date is October 1, 2017 (CARB 2017a). This regulation addresses fugitive and vented emissions from new and existing oil and gas facilities. The regulation covers greenhouse gas emissions, predominately methane, from production, gathering and boosting stations, and processing as well as natural gas storage and transmission compressor stations. It addresses both vented (intentional) and fugitive (unintentional) releases of greenhouse gases by processes at facilities in the following sectors: (1) onshore and offshore crude oil or natural gas production; (2) crude oil, condensate and produced water separation and storage; (3) natural gas underground storage; (4) natural gas gathering and boosting stations; (5) natural gas processing plants; and (6) natural gas transmission compressor stations. This regulation establishes emission standards for active and idle equipment and components at these facilities.

The specific provisions of the regulations include: 1. Collection and use (or destruction) of methane and associated gases from uncontrolled oil and water separators and storage tanks with emissions above a set methane standard; 2. Collection and use (or destruction) of methane and associated gases from all uncontrolled well stimulation circulation tanks; 3. Leak Detection and Repair (LDAR) requirements for active and idle components, such as valves, flanges, and connectors, currently not covered by local air district rules; 4. Methane emission standards for large reciprocating compressors in addition to LDAR for the other large compressor components and smaller compressors; 5. Collection and use (or destruction) of methane and associated gases from specified centrifugal compressors, or replacement of higher emitting "wet seals" with lower emitting "dry seals;" 6. Use of "no bleed" pneumatic pumps and "no bleed" continuous bleed pneumatic devices with limited exemptions and restrictions on intermittent bleed pneumatic devices; 7. Enhanced monitoring for underground natural gas storage facilities including leak detection and ambient air monitoring; and 8. Reporting requirements for liquids unloading and well casing vents (CARB 2016). The implementation schedule is January 1, 2018 for the majority of the regulations, and January 1, 2019 for the vapor collection on separator and tank systems and pneumatic devices, and January 1, 2020 for the circulation tank vapor collection requirement (CARB 2017b).

Cap and Trade

Under AB 32, CARB's "Cap and Trade" regulation (Subchapter 10, Article 5, Sections 95800 to 96023, Title 17, California Code of Regulations) is a set of rules (effective September 1, 2012) that establishes a limit on GHG emissions from the largest sources of GHGs in the state. The purpose of the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms is to reduce emissions of GHGs from affected stationary sources through the establishment, administration, and enforcement of an aggregate GHG allowance budget and to provide a trading mechanism for compliance instruments (i.e., "GHG allowances" or "carbon credits").

Executive Order S-3-05

On June 1, 2005, Executive Order S-3-05 was issued by the Governor of California, establishing GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Executive Order S-1-07

On January 18, 2007, the LCFS was issued by the Governor of California, mandating a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. It instructed the California EPA to coordinate activities among the University of California, the California Energy Commission (CEC), and other state agencies to develop and propose a draft compliance schedule to meet the 2020 target. Furthermore, it directed CARB to consider initiating regulatory proceedings to establish and implement the LCFS. In response, CARB identified the LCFS as an early action item with a regulation to be adopted and implemented by 2010.

The LCFS, administered by CARB, uses a market-based cap-and-trade approach to lowering the GHG emissions from petroleum-based transportation fuels, like reformulated gasoline and diesel. The LCFS requires producers of petroleum-based fuels to reduce the carbon intensity of their products, beginning with a quarter of a percent in 2011 and culminating in a 10 percent total reduction in 2020. Petroleum importers, refiners, and wholesalers can either develop their own low carbon fuel products or buy LCFS credits from other companies that develop and sell low carbon alternative fuels, such as biofuels, electricity, natural gas, or hydrogen (CEC 2017).

Senate Bill 1368

California SB 1368 adds Sections 8340 and 8341 to the Public Utilities Code (effective January 1, 2007) with the intent "to prevent long-term investments in power plants with GHG emissions in excess of those produced by a combined-cycle natural gas power plant" with the aim of "reducing emissions of GHGs from the state's electricity consumption, not just the state's electricity production." SB 1368 provides a mechanism for reducing the GHG emissions of electricity providers, both in-state and out-of-state, thereby assisting CARB in meeting its mandate under AB 32, the Global Warming Solutions Act of 2006.

Senate Bill 605, Short-lived Climate Pollutants

SB 605 requires that the State complete an inventory of sources and emissions of short-lived climate pollutants (including methane) in the state based on available data, identify research needs to address any data gaps, identify existing and potential new control measures to reduce emissions, prioritize the development of new measures for short-lived climate pollutants that offer

co-benefits by improving water quality or reducing other air pollutants; and coordinate with other state agencies and districts to develop measures identified as part of the comprehensive strategy.

Senate Bill 97 (CEQA Guidelines Revisions)

In 2007, the state legislature passed Senate Bill (SB) 97, which required amendment of CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA. The California Natural Resources Agency adopted these amendments on December 30, 2009. Following review by the Office of Administrative Law and filing with the Secretary of State for inclusion in the California Code of Regulations, the CEQA Guidelines revisions became effective March 18, 2010.

The 2010 CEQA Guidelines revisions include a section (§15064.4) that specifically addresses the potential significance of GHG emissions. Section 15064.4 calls for a “good faith effort” to “describe, calculate or estimate” GHG emissions; Section 15064.4 further states that the analysis of the significance of any GHG impacts should include consideration of the extent to which the project would: increase or reduce GHG emissions; exceed a locally applicable threshold of significance; and comply with “regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.”

The CEQA Guidelines also state that a project may be found to have a less than significant impact on GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions [§15064(h)(3)]. However, the Guidelines do not require or recommend a specific analytical methodology or provide quantitative criteria for determining the significance of GHG emissions. Importantly, the CEQA Guidelines do not contain statewide quantitative standards of significance for GHG impacts. Similar to air pollutant thresholds, the applicable threshold is determined by the CEQA Lead Agency, taking guidance from the applicable air district on an individual basis.

Executive Order B-30-15

California EO B-30-15 (April 29, 2015) set an “interim” statewide emission target to reduce greenhouse emissions to 40 percent below 1990 levels by 2030, and directed state agencies with jurisdiction over greenhouse gas emissions to implement measures pursuant to statutory authority to achieve this 2030 target and the 2050 target of 80 percent below 1990 levels. Specifically, the Executive Order directed CARB to update the Scoping Plan to express this 2030 target in metric tons. Since CARB has not yet prepared a GHG Inventory for 2030, it is not possible to prepare a numeric analysis that incorporates the 2030 target.

Senate Bill 350

SB 350, Signed October 7, 2015, is the *Clean Energy and Pollution Reduction Act of 2015*. SB 350 implements some of the goals of EO B-30-15. The objectives of SB 350 are as follows:

- To increase from 33 percent to 50 percent, the procurement of our electricity from renewable sources.
- To double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation (California Legislative Information 2016a).

The text of SB 350 sets a December 31, 2030, target for 50 percent of electricity to be generated from renewable sources.

Senate Bill 32/Assembly Bill 197

SB 32, signed September 8, 2016, implements a goal of EO B-30-15. Under SB 32, in "adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions," CARB must ensure that statewide greenhouse gas emissions are reduced to 40 percent below the 1990 level by 2030. SB 32's findings state that CARB will "achieve the state's more stringent greenhouse gas emission reductions in a manner that benefits the state's most disadvantaged communities and is transparent and accountable to the public and the Legislature." AB 197, a companion to SB 32, adds two members to the CARB and requires measures to increase transparency about GHG emissions, climate policies, and GHG reduction actions.

Regional

Southern California Association of Governments and Senate Bill (SB) 375

Signed September 30, 2008, SB 375 provides for a new planning process to coordinate land use planning, regional transportation plans, and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB 375 requires Metropolitan Planning Organizations, including the Southern California Association of Governments (SCAG) to incorporate a Sustainable Communities Strategy (SCS) in their regional transportation plans that will achieve GHG emission reduction targets set by CARB by reducing vehicle miles traveled (VMT) and encouraging more compact, complete, and efficient communities for the future. SCAG's draft SCS is included in the SCAG Draft 2012 Regional Transportation Plan Sustainable Communities Strategy (RTP/SCS) (SCAG 2012). The document was released for public review and comment on December 20, 2011 and was adopted April 4, 2012. The goals and policies of the RTP/SCS focus on transportation and land use planning that include building compact infill projects; locating residents closer to where they work and play; designing walkable environments; and designing communities so there is access to high quality transit service.

The SCAG 2016-2040 RTP/SCS was adopted on April 7, 2016 (SCAG 2016). The goals of the 2016-2040 RTP/SCS are the same as in the 2012 RTP/SCS.

SB 375 and the SCAG RTP/SCS were developed for land use (transportation and housing planning) and transportation projects, and do not address industrial projects. Thus, the RTP/SCS is not directly applicable to the proposed Project.

South Coast Air Quality Management District

As previously discussed in Section 4.2, Air Quality, air quality in the Project area is regulated by the South Coast Air Quality Management District (SCAQMD), the agency principally responsible for comprehensive air pollution control in the South Coast Air Basin (SoCAB). To that end, the SCAQMD, a regional agency, works directly with SCAG, County transportation commissions, and local governments and cooperates actively with all federal and State government agencies. The SCAQMD develops rules and regulations; establishes permitting requirements for stationary sources; inspects emissions sources; and enforces such measures through educational programs or fines, when necessary. To date, the SCAQMD Board has adopted an interim CEQA significance threshold for GHGs for industrial projects where the SCAQMD is the lead agency,

and continues to consider screening levels under CEQA for residential, commercial, and mixed use projects.

Beginning in April 2008, the SCAQMD convened a working group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. The Working Group meets approximately once per month. On December 5, 2008, the SCAQMD Governing Board adopted its staff proposal for an interim CEQA GHG significance threshold for industrial projects where the SCAQMD is the lead agency (SCAQMD 2008). The interim screening threshold for industrial projects is 10,000 metric tons of CO₂e per year (MTCO₂e/year).

Local

City of Culver City General Plan

Land Use Element

Land Use Element Policy 1.B. Protect the City's residential neighborhoods from the encroachment of incompatible land uses and environmental hazards which may have negative impacts on the quality of life (such as traffic, noise, air pollution, building scale and bulk, and visual intrusions).

4.6.4 SPECIFIC PLAN AND REGULATORY REQUIREMENTS

Specific Plan Drilling Regulations

Section 21. Air Quality, Public Health and Climate Change. The Operator shall at all times conduct Oil Operations in accordance with the best available technology, safety devices and measures for the prevention of the release, escape, or emission of dangerous, hazardous, harmful and/or noxious gases, vapors, odors, substances or greenhouse gases, and shall comply with the following provisions:

C. Air Monitoring

- 1. Air Monitoring Plan.** Operator shall submit an Air Monitoring Plan to be reviewed and approved or conditionally approved by the Community Development Director. At a minimum, the Air Monitoring Plan shall address related air pollutant emissions monitoring and tracking requirements as required by the SCAQMD and the MMP, and shall include any measure requested by the Community Development Director. The Air Monitoring Plan shall be designed to ensure the public health, safety and welfare, and the environment through the reduction in air toxics and odorous emissions and reduce greenhouse gas emissions from Oil Operations. The Air Monitoring Plan shall also specify the number, type and location of monitors that will be used, and provide detailed information concerning the reliability of the instrumentation, frequency of calibration and other similar information. The Air Monitoring Plan shall also be designed to assess the risk of both acute and chronic exposure to air contaminants from Oil Operations within the Oil Field, and endeavor to determine and distinguish the source of emissions, to the extent feasible, using available and affordable monitoring technology. Additionally, air monitoring may also be required, as requested by the Community Development Director, along the Outer Boundary of the Oil Field to assess the risk of both acute and chronic exposure to air contaminants

from Oil Operations in the portion of the Inglewood Oil Field under the jurisdiction of Los Angeles County. During drilling, re-drilling, or reworking operations, the Operator shall monitor for hydrogen sulfide and total hydrocarbon vapors as specified in the approved Air Monitoring Plan. Hydrogen sulfide shall also be monitored using mobile monitoring equipment in response to odor complaints or when onsite odors are encountered by operating personnel. Total hydrocarbon vapors shall be monitored, so as to comply with the requirements of SCAQMD Rule 1173, using mobile monitoring equipment at locations surrounding the wells, tanks, piping, piping components, etc. at the locations and frequencies, no less frequent than quarterly, that shall be specified in the approved Air Monitoring Plan. The approved monitors shall provide automatic alarms that are triggered by the detection of hydrogen sulfide or total hydrocarbon vapors at levels designated in the approved Air Monitoring Plan. For drilling, re-drilling or reworking monitors, the alarms shall be audible and/or visible to the person operating the drilling, re-drilling or reworking equipment. When specified alarm levels are reached, the following actions shall be taken:

- a.** At a hydrogen sulfide concentration of equal to or greater than one part per million but less than 10 parts per million, the Operator shall, immediately, and not later than 30 minutes after the alarm, investigate the source of the hydrogen sulfide emissions and take immediate corrective action to eliminate the source. The corrective action taken shall be documented in the drilling, re-drilling and reworking log, or applicable inspection and maintenance logs. If the concentration is not reduced to less than one part per million within 30 minutes of the first occurrence of such concentration, the Operator shall shut down the drilling, re-drilling, reworking or operations or other source in a safe and controlled manner, until the source of the hydrogen sulfide emissions has been eliminated, unless shutdown creates a health and safety hazard.
- b.** At a hydrogen sulfide concentration equal to or greater than 10 parts per million, the Operator shall promptly commence the shutdown of the drilling, re-drilling, or reworking operations or other source in a safe and controlled manner until the source of the hydrogen sulfide emissions has been eliminated, unless shutdown creates a health and safety hazard. The corrective action taken shall be documented in the drilling, re-drilling, or reworking log, or applicable inspection and maintenance logs. When an alarm is received, the Operator shall immediately notify, and provide access and the right to investigate the event as necessary to all agencies with jurisdiction over the Oil Field, including, but not limited to, the Culver City Fire Department, the Los Angeles County Fire Department - Health Hazardous Materials Division, DOGGR, and SCAQMD.
- c.** At a total hydrocarbon concentration equal to or greater than 500 parts per million but less than 1,000 parts per million, the Operator shall immediately investigate the source of the hydrocarbon emissions and take immediate corrective action to eliminate the source. The corrective action taken shall be documented in the

drilling, redrilling, reworking or maintenance log, or applicable inspection and maintenance logs. If the concentration is not reduced to less than 500 parts per million within 30 minutes of the first occurrence of such concentration, the Operator shall shut down the drilling, redrilling or reworking in a safe and controlled manner, until the source of the hydrocarbon emissions has been eliminated, unless shutdown creates a health and safety hazard.

- d. At a total hydrocarbon concentration equal to or greater than 1,000 parts per million, the Operator shall promptly commence the shutdown of the drilling, redrilling or reworking operations, or other source, in a safe and controlled manner, until the source of the hydrocarbon emissions has been eliminated, unless shutdown creates a health and safety hazard. The corrective action taken shall be documented in the drilling, redrilling, reworking or maintenance log, or applicable inspection and maintenance logs. When an alarm is received, the Operator shall immediately notify and provide access and the right to investigate the event as necessary to all agencies with jurisdiction over the Oil Field, including; the Culver City Fire Department, the Los Angeles County Fire Department - Health Hazardous Materials Division, DOGGR, and SCAQMD.
 - e. The Operator shall keep a record of the levels of total hydrocarbons and hydrogen sulfide detected at each of the monitors, which shall be retained for at least five years. The Operator shall notify the Fire Chief within 48 hours in the event of the occurrence of any hydrogen sulfide concentration of one part per million or more, or any total hydrocarbon concentration of 500 parts per million or more. At the request of the Fire Chief, the Operator shall make available the retained records from the monitoring equipment.
- 2. City Testing.** In the event of a gas release in the Oil Field or in response to complaints received regarding odors in the Oil Field, substantiated by City personnel called to the location of the odor, the City may take grab samples of the air outside the Oil Field boundary to test for airborne toxins including hydrogen sulfide. The Operator shall be required to pay for all of the City's cost to sample the air including, without limitation, the costs to obtain vacuum canisters and teflar bags for air sampling, the costs to contract with a local laboratory to pick up the canisters and teflar bags immediately after sampling takes place and transport the samples to a laboratory for immediate analysis as required to obtain a valid and accurate test of the air and report for the presence and concentration of airborne toxins. The Operator shall also be responsible for the costs for City personnel to be trained in the proper techniques for conducting the air sampling.

D. Portable Flare for Drilling. To reduce air toxics emissions, odorous substances emissions, and greenhouse gas emissions, the Operator shall have a gas buster and a portable flare, approved by SCAQMD, at the Oil Field and available for immediate use to remove any gas encountered during drilling operations from drilling muds prior to the muds being sent to the shaker table, and to direct such gas to the portable flare for combustion.

The portable flare shall record the volume of gas that is burned in the flare. The volume of gas burned in the flare shall be documented in the drilling log. The Operator shall notify the Fire Chief and SCAQMD within 48 hours in the event gas is burned by the flare, and shall specify the volume of gas that was burned in the flare. No drilling or redrilling shall be conducted in areas that are known to penetrate the Nodular Shale zone, or where pressurized methane is known or reasonably suspected to exist, unless a fully operational and properly maintained gas buster and portable flare are installed on the rig. All other drilling and redrilling operations shall be conducted so that any measurable gas that is encountered can, and will, be retained in the well bore until the gas buster and portable flare are installed on the rig, after which the gas will be run through the system. The Operator shall immediately notify the Fire Chief and SCAQMD in the event any gas from drilling or redrilling operations is released into the atmosphere without being directed to and burned in the flare.

E. Oil Tank Pressure Monitoring and Venting. All oil tanks that contain or could contain oil shall have a fully operational pressure monitoring system, of a type and design approved by the Fire Chief that continuously measures and digitally records the pressure in the vapor space of each tank. The detection system shall notify the Operator via an alarm when the pressure in the tank reaches within 10 percent of the tank relief pressure. In the event of an alarm, the Operator shall immediately take corrective action to reduce the tank pressure. The corrective action shall be documented in the applicable inspection and maintenance log. The Operator shall notify the Fire Chief and SCAQMD within 24 hours if the pressure in any tank covered by this Subsection ever exceeds such tank's relief pressure or if the hatches on the tank(s) have lifted and allowed gas to vent to atmosphere. Within seven calendar days after any tank vapor release, the Operator shall submit a report of the incident to SCAQMD as a breakdown event pursuant to Rule 430, and shall provide the Fire Chief with a written report of the event and the corrective measures undertaken and to be undertaken to avoid future oil tank vapor releases. The Operator shall make any changes to such report that may be required to obtain approval from the Fire Chief and SCAQMD, shall promptly institute all corrective measures called for by the report, and shall report the completion of the corrective measures to the Fire Chief and the Community Development Director within one week of their completion.

H. Off-Road Diesel Construction Equipment Engines. All off-road diesel construction equipment shall comply with the following provisions:

1. Utilize CARB/EPA Certification Tier 3 or better certified engines for engines below 750 horsepower and Tier 2 engines for engines at or above 750 horsepower or other methods approved by CARB as meeting or exceeding the Tier 2 or Tier 3 standards.
2. Utilize a CARB Verified Level 3 diesel catalyst. The catalyst shall be capable of achieving an 85 percent reduction for diesel particulate matter. Copies of the CARB verification shall be provided to the Community Development Director. Said catalysts shall be properly maintained and operational at all times when the diesel engines are

running. CARB Verified Level 3 catalysts are not required for engines that meet Tier 4 standards.

- I. **Drill Rig Engines.** All drilling, redrilling, reworking and maintenance rig diesel engines, except rigs powered by on-road engines, shall comply with the following provisions:
 1. Utilize CARB/EPA Certification Tier 2 or better certified engines or other methods approved by CARB as meeting or exceeding the Tier 2 standard.
 2. Utilize second generation heavy duty diesel catalysts capable of achieving 90 percent reductions for hydrocarbons and for particulate matter smaller than 10 microns. Said catalysts shall be properly maintained and operational at all times when the diesel engines are running.
 3. Utilize natural gas-powered drill rigs or other engine technologies that are capable of reducing environmental impacts in comparison to the requirements set forth in Subsections 15.14.100.I.1 and 15.14.100.I.2, hereinabove, when such technologies have been determined to be feasible and commercially available through a Clean Technology Assessment in the Annual Consolidation and Drilling Plan.

- L. **Inspection and Maintenance Program Information.** Upon request and reasonable prior notification, the Operator shall make available for inspection by City staff all required SCAQMD, CARB, and EPA inspection and maintenance program records. This requirement applies to all sites subject to SCAQMD, CARB, and EPA inspection and maintenance programs within City limits.

- M. **Greenhouse Gas Recordkeeping and Cap and Trade Program Information.** Upon request, the Operator shall make available for inspection by City staff all required CARB and EPA greenhouse gas inventories and inventory verifications that include emission from activities within the Oil Field, and CARB Cap and Trade program compliance documentation.

Regulatory Requirements

The Oil Field Operator and all activities conducted under the authorization of the proposed specific plan would be required to comply with all applicable CARB and SCAQMD rules and regulations. The SCAQMD rules most applicable to oil field operations are listed in Section 4.2, Air Quality of this Draft EIR. Many rules developed for the purpose of minimizing criteria pollutant and toxic air pollutant emissions will also reduce GHG emissions.

4.6.5 THRESHOLDS OF SIGNIFICANCE

The Initial Study for the Project concludes that additional project-level analysis of the following thresholds of significance is required in this Draft EIR. According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project would have a significant adverse environmental impact on greenhouse gas emissions if it would:

Threshold 6-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Threshold 6-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The analysis of GHG impacts is different from the analysis of criteria pollutants. For criteria pollutants, significance thresholds are based on daily emissions because the attainment or non-attainment status is based on hourly or daily exceedances of applicable ambient air quality standards. Furthermore, several ambient air quality standards are based on the relatively short-term exposure effects on human health (e.g., 1-hour and 8-hour). On the contrary, because the half-life of CO₂ is approximately 100 years, the effects of GHGs are longer-term and affect global climate over a relatively long time frame. Thus, the SCAQMD's current position is to evaluate GHG effects over a longer time frame than a single day.

In October 2008, the SCAQMD prepared the "Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Thresholds." This draft guidance proposes a tiered approach to determining GHG significance of projects. The first two tiers involve 1) exempting the project because of potential reductions of GHG emissions allowed under CEQA, and 2) demonstrating that the project's GHG emissions are consistent with an approved local GHG reduction plan (e.g., a Climate Action Plan) that may be part of a general plan. Because neither of these tiers is applicable for the proposed Project, the analysis shifts to Tier 3. Tier 3 attempts to identify small projects that would not likely contribute to significant cumulative GHG impacts. The Tier 3 recommends a numerical threshold of 10,000 MTCO₂e per year as the incremental increase representing significance for industrial projects when SCAQMD is the lead agency. Additional recommendations were made for residential/commercial projects. Projects with incremental increases below the screening thresholds are not considered to be cumulatively considerable. Projects with increases exceeding the screening threshold would proceed to Tier 4.

Tier 4 included three relatively undeveloped options: (1) Calculation of GHG emissions using a Business-as Usual (BAU) methodology; (2) early compliance with AB 32 Scoping Plan measures; and (3) establishing sector-based performance standards. If the lead agency or project proponent cannot achieve the performance standards on any of the compliance options in Tier 4, GHG emissions would be considered significant. Tier 5 then provided mitigation. Under Tier 5, the lead agency would quantify GHG emissions from the project and the project proponent would implement offsite mitigation (GHG reduction projects) or purchase offsets to reduce GHG emission impacts to less than the proposed screening level.

On December 5, 2008, the SCAQMD adopted Tier 1, Tier 2, and Tier 3 standards for industrial projects when SCAQMD is the lead agency. In September 2010, the SCAQMD GHG Working Group proposed extending the 10,000 MTCO₂e/year screening threshold currently applicable to industrial projects where the SCAQMD is the lead agency (Tier 3), described above, to other lead agency industrial projects. For all other projects, SCAQMD staff proposed a multiple tier analysis to determine the appropriate threshold to be used. The Working Group has not convened since the fall of 2010. As of the publication of this EIR, proposals to establish additional GHG thresholds have not been considered or approved for use by the SCAQMD Board.

To determine whether or not incremental GHG emissions from the proposed Project may be significant, GHG emissions are compared to the 10,000 MTCO₂e/year guidance threshold for industrial sources.

4.6.6 IMPACT ANALYSIS

Threshold 6-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The proposed Project is expected to emit GHG emissions from both the periodic construction activities and long-term operations. "Construction" activities are considered to be discrete events that do not occur on a daily basis, such as site clearing and grading, well drilling, re-drilling, well completion, and well stimulation activities. "Operational" activities are limited to the subsequent long-term operation of the wells, and the periodic maintenance activities required to support the wells.

Detailed GHG emission estimates that are assumed for the construction activities, including activity type, equipment types, number of devices, load factors, and emissions factors, etc., are provided in Appendix C-1 of this Draft EIR. A summary of these assumptions for construction-related activities, as reflected in the Maximum Buildout Scenario assumptions, include the following:

Well Pad Construction Grading: 0.5-acres; 1 water/vendor truck; 1 bulldozer; 1 off-road truck; 7 workers commuting; 2,000 cy of cut/fill balanced on-site; 5 days of site preparation; 4 days of grading

Well Drilling Mobilization: 14 workers commuting; 6 work trucks; 13 hauler trucks; 2 water/vendor trucks; 1 crane; 5 days for mobilization

Daytime/Nighttime Drilling: 14 workers commuting; 6 work trucks; 13 hauler trucks; 3 water/vendor/cement trucks; 1 crane; 1 drill rig; 2 mud pumps; 1 generator; 4 diesel powered night lights; 30 days for drilling

Demobilization: 14 workers commuting; 6 work trucks; 13 hauler trucks; 14 hauler trucks; 1 water/vendor trucks; 1 crane; 3 days for demobilization

Well Completion Without Fracking: 14 workers commuting; 6 work trucks; 1 hauler truck; 2 water/vendor/cement trucks; 1 crane; 1 service rig; 3 days for well completion

With Fracking-Site Preparation: 7 workers commuting; 28 water trucks; 6 work trucks; 11 hauler trucks; 1 water/vendor truck; 1 crane; 5 days for site preparation

With Fracking- Main Activities: 18 workers commuting; 2 water/vendor/cement trucks; 5 hauler trucks; 2 vans; 6 pieces of heavy equipment; 4 mobile pump trucks; 1 crane; 2 days for main activities

With Fracking- Flowback: 7 workers commuting; 1 water/vendor truck; 7 hauler trucks; 29 flowback trucks; 1 crane; 14 days for flowback

Well Rework 4 workers commuting per shift per well; 4 truck trips per day per well;
1 service rig per well; up to 12 hours per week per well.

Each phase of the construction activities would involve the operation of fuel combustion equipment (e.g., bulldozers, drill rig engines, pump engines) and would require workers to commute to the job site. Gaseous emissions from the shaker table would be vented to a flare for destruction of the VOC and H₂S emissions. Combustion of VOCs will result in GHG emissions. As shown, each construction activity is assumed to occur a finite number of times over the course of the Specific Plan Buildout. For example, a maximum of 30 new wells would be drilled per the Specific Plan requirements; therefore, the site preparation, grading, mobilization, drilling, demobilization are assumed to occur 30 times. It is assumed that WST would be used on 10 of the 30 new wells, while conventional well completion activities would occur for 20 of the 30 new wells. An average of three well reworks are anticipated per year, resulting in 30 rework events. Table 4.6-2 shows the estimated total GHG emissions for new well construction, well completion (including fracking events), and well rework over the course time allowed by the Specific Plan. As shown, these activities would result in an estimated 44,997 metric tons of CO₂e.

**TABLE 4.6-2
SUMMARY OF PROJECT CONSTRUCTION GHG EMISSIONS**

Activity/Phase	CO ₂ e (lb/well)	Total Events	Total Project CO ₂ e in pounds (lb)	Total Project CO ₂ e in metric tons (MT)
Site Preparation	6,103	30	183,103	83
Grading	10,216	30	306,477	139
Mobilization and Setup (for drilling)	43,872	30	1,316,144	597
Drilling	3,186,009	30	95,580,273	43,347
Demobilization	4,210	30	126,289	57
Well Completion	14,814	20	296,271	134
Well Stimulation (site preparation)	7,200	10	72,000	33
Well Stimulation	106,033	10	1,060,334	481
Well Stimulation (flow-back)	10,377	10	103,768	47
Well Rework	5,785	30	173,537	79
Total	3,382,619		9,921,820	44,997

Source: Yorke Engineering 2017.

At the completion of the construction activities assumed to occur over the course of time allowed by the Specific Plan, as discussed above, the Project would result in the long-term operation of 30 new wells. Long-term GHG emissions are estimated based on the operation of 30 new wells; fugitive leaks of gas (CH₄ and CO₂) from components in the well cellars and piping systems; vehicle emissions associated with worker commuting; and indirect GHG emissions from the operation of electric oil pumps. Detailed GHG emission estimates from operational activities, including activity, equipment types, number of devices, load factors, and emissions factors, etc., are provided in Appendix C-1 of this Draft EIR. In summary, routine operation and maintenance of the 30 new wells is anticipated to require 20 daytime workers; 2 weekend workers; 1 nighttime worker; and 2 work trucks occurring 365 days per year. Electrical use for each well is assumed to require 168 MTCO₂e/year. Annual operational GHG emissions are summarized in Table 4.6-3. As shown, these activities would result in an estimated 5,581 MTCO₂e.

**TABLE 4.6-3
SUMMARY OF PROJECT OPERATIONAL GHG EMISSIONS**

Phase	CO ₂ (lb/day)	CH ₄ (lb/day)	CO _{2e} (lb/day)	CO _{2e} (MT/year)
Worker Activities	527.46	~0.003	528	87
Fugitive Gas Emissions	18.51	110.38	2,778	460
Indirect Emissions (GHG emissions from electricity production)	--	--	--	5,034
Total				5,581
Source: Yorke Engineering 2017.				

In accordance with SCAQMD policy, construction emissions are amortized over the life of the Project. In this case, the useful life of the wells is assumed to be 30 years. GHG emissions are summarized and compared to the significance threshold in Table 4.6-4. As shown in Table 4.6-4, GHG emissions from the proposed Project are less than the significance threshold.

**TABLE 4.6-4
COMBINED GHG EMISSIONS**

Phase	CO _{2e} (MT/year)
Construction Activities ^a	1,500
Operational Activities	5,581
Total	7,081
<i>CEQA Significance Threshold</i>	<i>10,000</i>
Significant? (Yes/No)	No
^a Total construction GHG emissions are amortized over a 30-year useful life. Source: Yorke Engineering 2017.	

Before imposing any mitigation measures, the annual emissions are estimated at less than the SCAQMD significance threshold of 10,000 MTCO_{2e}/year. As discussed above, the SCAQMD Tier 3 recommends a numerical threshold of 10,000 MTCO_{2e}/year as the incremental increase representing significance for industrial projects. Projects with incremental increases below the screening thresholds are not considered to be cumulatively considerable. Thus, construction and operational GHG emissions of the proposed Project, including the construction, completion, and operation of the 30 new wells, would result in a less than significant impact on the environment and no mitigation is required.

Threshold 6-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

As described in Section 4.6.3, California has enacted several pieces of legislation that relate to GHG emissions and climate change, much of which sets aggressive goals for GHG reductions within the State. The first and most far-reaching is AB 32, now followed by SB 32, in which CARB must ensure that statewide greenhouse gas emissions are reduced to 40 percent below the 1990 level by 2030. While AB 32 establishes control measures that would apply to light, medium, and heavy-duty vehicles, and the proposed Project will operate those types of vehicles, these

measures are being implemented at the State level and the proposed Project would not interfere with the implementation of the control measures.

Implementation of AB 32 control measures for reduced vehicle emissions would decrease GHG emissions from the proposed Project. Similarly, measures requiring utilities to increase renewable energy sources are not implemented by the proposed Project, and the Project would not conflict with implementation; however, the Project would consume electricity for the operation of the wells. Therefore, Project-related GHG emissions would be reduced as utilities purchase electrical power generated from sources with lower GHG emissions.

As also described above, CARB approved additional regulation to reduce fugitive and vented emissions from new and existing oil and gas facilities, implementing Measure I-2 of the AB 32 Scoping Plan. The Oil Field Operator is required to comply with this regulation, thus reducing GHG emissions and being consistent with the AB 32 Scoping Plan, the First Update to the Scoping Plan, and the *Regulation Order Subarticle 13: Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities § 95665*.

In its recent decision, *Center for Biological Diversity v. Department of Fish and Wildlife* (Cal. Supreme Ct., November 30, 2015, No. S217763; “Newhall”), the California Supreme Court evaluated the California Department of Fish and Wildlife’s (CDFW’s) analysis of potential impacts caused by GHG emissions contained in the EIR for the proposed land development called Newhall Ranch. In that EIR, the GHG emissions were analyzed under AB 32, using the business-as-usual (BAU) comparison (described below) as its sole criterion of significance.

In Newhall, the California Supreme Court concluded that a finding of consistency with meeting statewide emission reduction goals is a legally permissible criterion of significance when analyzing potential impacts of GHG emissions under CEQA. However, the Court found that the EIR’s conclusion that the project’s emissions would be less than significant under that criterion was not supported by substantial evidence, and remanded back to the appellate court the narrow issue of whether substantial evidence supported the application of AB 32 statewide GHG reduction goal of 29 percent to new land use projects. On February 17, 2016, the Supreme Court denied a petition for rehearing.

The Court then identified “potential options” for lead agencies evaluating cumulative significance of a proposed land use development’s GHG emissions in future CEQA documents, but the Court was careful to note that there was no “guarantee” that any of these would be sufficient. The Court ruling states the following:

We do not, of course, guarantee that any of these approaches will be found to satisfy CEQA’s demands as to any particular project; what follows is merely a description of potential pathways to compliance, depending on the circumstances of a given project.

Two of the six “potential pathways to compliance” suggested by the Court and considered appropriate for the Project are as follows:

- **Compliance With Regulatory Programs Designed To Reduce Greenhouse Gas Emissions:** The Court suggests that a lead agency could rely on a showing of compliance with regulatory programs designed to reduce GHG emissions in order to demonstrate consistency with AB 32 and SB 32’s goals. The Court clarifies that a significance analysis based on compliance with such statewide regulations only goes to impacts within the area governed by the regulations.

- **Numerical Greenhouse Gas Significance Thresholds:** Although noting that the use of such thresholds are not required, the Court favorably cited to the Bay Area Air Quality Management District's (BAAQMD's) GHG significance thresholds, based on compliance with AB 32, which use a "service population" GHG ratio threshold for land use projects and a 10,000 ton annual GHG emission threshold for industrial projects. The Court remanded for further consideration the application of the 29 percent overall Scoping Plan metric, which is used by several Air Districts and, like the favorably-cited BAAQMD metric, is based on AB 32.

The other four "pathways"—the Business As Usual (BAU) Model, the Local Climate Action Plan or Other "Geographically Specific Greenhouse Gas Emission Reduction Plans", Regional Sustainable Community Strategy (SCS), and Executive Order Nos. S-3-05 and B-30-15—are either not applicable to the Project or considered inappropriate for the evaluation of Project impacts.

First, the BAU Model, while used in the past for large development projects, primarily demonstrates the effectiveness of State measures adopted for the purpose of reducing GHG emissions such as the passenger and light-duty truck standards, energy-efficient building standards, and renewable power standards. Residential and commercial developments can add to those measures by exceeding building efficiency standards, locating development near public transit and providing on-site renewable energy. The BAU model does not adapt to industrial projects because most of the quantifiable State measures adopted for reducing GHG emissions only apply in small measure to industrial projects. It is noted that the only GHG emissions screening threshold adopted by SCAQMD is for industrial projects.

Second, the Local Climate Action Plan method is not applicable to the Project because the City has not adopted a Climate Action Plan.

Third, consistency with the Regional SCS is not appropriate for the Project because, as previously discussed, the 2012 SCAG RTP/SCS and Final 2016 SCAG RTP/SCS do not include strategies for industrial projects.

Lastly, Executive Order (EO) S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050 and EO B-30-15 set an "interim" statewide emission target to reduce greenhouse emissions to 40 percent below 1990 levels by 2030. In the Newhall decision, the Court cautioned that those EIRs taking a goal-consistency approach to CEQA significance may "in the near future" need to consider the project's effects on meeting emissions reduction targets beyond 2020. CARB's Scoping Plan to implement AB 32 looked beyond 2020 to assess whether implementing the Scoping Plan would achieve the State's long-term climate goals and determined that it would. The Scoping Plan states, "Climate scientists tell us that the 2050 target represents the level of greenhouse gas emissions that advanced economies must reach if the climate is to be stabilized in the latter half of the 21st century. Full implementation of the Scoping Plan will put California on a path toward these required long-term reductions. Just as importantly, it will put into place many of the measures needed to keep us on that path" (CARB 2008).

The 2014 Scoping Plan Update confirms this: "California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32"; and it recognizes the potential for California to "reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050." (CARB 2014). However, the 2014 Scoping Plan Update also concludes that additional actions will be needed to continue reducing emissions

and meet the 2050 goals in the face of anticipated population and economic growth. In fact, overwhelming scientific evidence supports the conclusion that significant technological innovation, well beyond the scope of an individual development project, are absolutely necessary components of any plausible path to achieving the EO S-3-05's 2050 target. These new innovations to change fuel technology and energy generation are entirely outside the jurisdiction and control of the City. Achieving these goals will require wholesale shifts in fuel and energy technology, neither of which are currently available, rendering any further analysis of a given Project's impacts relative to the 2050 target too speculative for purposes of determining CEQA significance.

The impact analysis included under Threshold 6-1 evaluates the Project's estimated GHG emissions against a numerical GHG significance threshold (i.e., SCAQMD's screening threshold for industrial projects). Under Threshold 6-2, this impact analysis evaluates consistency with AB 32, including the Scoping Plan, the First Update to the Scoping Plan, and *Regulation Order Subarticle 13: Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities § 95665*. In summary, this impact analysis utilizes two "potential compliance pathways" described by the Court in the Newhall decision and, as described above, considered applicable and appropriate to the Project. The proposed Project would need to comply with the specific requirements consistent with Scoping Plan Measure I-2 for the purpose of reducing fugitive GHG emissions, mostly in the form of methane.

As discussed above, the specific provisions of the regulation includes: 1. Collection and use (or destruction) of methane and associated gases from uncontrolled oil and water separators and storage tanks with emissions above a set methane standard; 2. Collection and use (or destruction) of methane and associated gases from all uncontrolled well stimulation circulation tanks; 3. Leak Detection and Repair (LDAR) requirements for active and idle components, such as valves, flanges, and connectors, currently not covered by local air district rules; 4. Methane emission standards for large reciprocating compressors in addition to LDAR for the other large compressor components and smaller compressors; 5. Collection and use (or destruction) of methane and associated gases from specified centrifugal compressors, or replacement of higher emitting "wet seals" with lower emitting "dry seals;" 6. Use of "no bleed" pneumatic pumps and "no bleed" continuous bleed pneumatic devices with limited exemptions and restrictions on intermittent bleed pneumatic devices; 7. Enhanced monitoring for underground natural gas storage facilities including leak detection and ambient air monitoring; and 8. Reporting requirements for liquids unloading and well casing vents (CARB 2016). The implementation schedule is January 1, 2018 for the majority of the regulations, and January 1, 2019 for the vapor collection on separator and tank systems and pneumatic devices, and January 1, 2020 for the circulation tank vapor collection requirement (CARB 2017b). Compliance with the Scoping Plan Measure I-2 requirements would ensure that the proposed Project would not conflict with AB 32 or SB 32.

There are mitigation measures in the DOGGR's Draft Mitigation Policy Manual prepared pursuant to the SB4 EIR, which is included in Appendix B-2 of this Draft EIR, and are applicable to this analysis. The DOGGR encourages Lead Agencies to include mitigation measures in their CEQA documentation that are feasible and meet or are substantially consistent with the Draft Mitigation Policy Manual, where such measures are relevant and applicable (DOC 2015a). Therefore, this Draft EIR includes corresponding MM GHG-1 (see SB4 AQ-2a), MM GHG-2 (see SB4 GHG-1a), MM GHG-3 (see SB4 GHG-1b), and MM GHG-4 (see SB4 GHG-1c) to implement the requirements of applicable SB4 measures, revised to reflect site-specific conditions and impacts while being the same or substantially consistent with the DOGGR's measures. These MMs address the needs of the City IOF in a manner that can be implemented by the City of Culver City and do not adhere to the exact wording set forth by the DOGGR. Therefore, MM GHG-1 through MM GHG-4 would be required.

The DOGGR MMs presented in the SB4 EIR are accompanied by the following: “Where an agency other than DOGGR (e.g., a local government or another State agency) is the CEQA Lead Agency for a proposed project including well stimulation treatment, while DOGGR is acting as a Responsible Agency, the DOGGR shall encourage the Lead Agency to include in the draft environmental document circulated for public review proposed mitigation measure(s) and condition(s) of approval necessary to satisfy the requirements of SB4. The SB4 EIR states that, where the Lead Agency has already imposed mitigation measure(s) or condition(s) of approval that meet or are substantially consistent with the requirements described in the SB4 EIR, the DOGGR need not impose duplicative condition(s) of approval in the well stimulation treatment permit, and may conclude that the Lead Agency’s adopted measure(s) or condition(s) of approval are sufficiently effective and protective. When warranted by circumstances, the DOGGR shall also include condition(s) of approval requiring compliance with the requirements even where the DOGGR determines that approval of a particular well stimulation treatment permit is exempt from CEQA” (DOC 2015).

As discussed above, implementation of the steps to prevent methane loss would be conducted in compliance with the CARB requirements in *Regulation Order Subarticle 13: Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities § 95665*. Additionally, with implementation of MM GHG-1 through MM GHG-4, impacts would be less than significant.

4.6.7 CUMULATIVE IMPACTS

As noted above, it is accepted as very unlikely that any individual development project would have GHG emissions of a magnitude to directly impact global climate change; therefore, the impacts analysis above is considered on a cumulative basis. Impacts from the Project on cumulative GHG emissions would be less than significant with mitigation.

4.6.8 MITIGATION MEASURES

MM GHG-1 (see SB4 AQ-2a) Prior to the commencement of any well stimulation activities, the Oil Field Operator shall demonstrate to the City of Culver City a plan for the implementation of reduced emissions completions (“green completions”) or completion combustion devices, during oil and gas well completions. The Oil Field Operator shall prepare a proposal for the best feasible strategy to reduce hydrocarbon and GHG emissions, subject to review and approval by the City of Culver City and South Coast Air Quality Management District (SCAQMD). Documentation of the coordination with the City and SCAQMD and documentation of the completion methodology shall be submitted to the Community Development Director. Products of combustion would include NOx and other pollutants that may require a permit through the local air district. Potential hydrocarbon emission control strategies for completions are named in the USEPA April 15, 2014 White Paper: *Oil and Natural Gas Sector Hydraulically Fractured Oil Well Completions and Associated Gas during Ongoing Production* (USEPA 2014), and defined as follows:

Reduced emission completions are a well completion following fracturing or refracturing where gas flowback that is otherwise vented is captured, cleaned, and routed to the flow line or collection system, re-injected into the well or another well, used as an on-site fuel source, or used for other useful purpose that a purchased fuel or raw material would serve, with no direct release to the atmosphere. Site-specific feasibility of implementing a reduced emission completion depends on: proximity of nearby sales line; sufficient pressure in

produced gas; and inert gas makeup of the flowback being suitable to meet specifications of line. The recovered liquids should be routed into one or more storage vessels or re-injected the recovered liquids into the well or another well.

Completion combustion is a high-temperature oxidation process to burn combustible components, mostly hydrocarbons, found in gas streams. Completion combustion devices can be as simple as a pipe with a basic ignition mechanism and discharge over a pit near the wellhead. However, the flow directed to a completion combustion device may or may not be combustible depending on the inert gas composition of flowback gas, which would require a continuous ignition source. Completion combustion devices provide a means of minimizing vented gas during a well completion and are generally preferable to venting, due to reduced air emissions.

This mitigation measure and its requirements shall cease to have effect as soon as requirements established by the California Air Resources Board (CARB) or the local air district to address the impacts that cause an increase in criteria pollutants or precursor pollutants to levels that violate an air quality standard or contribute substantially to an existing or projected air quality violation become effective. If the new requirements only address one or some of the pollutants then this measure will continue to apply to those pollutants not covered by CARB or local air district requirements.

MM GHG-2 (see SB4 GHG-1a) Prior to the commencement of any well stimulation activities, the Oil Field Operator shall demonstrate to the City of Culver City a plan for the implementation of “Gold-level” protocols established by the EPA Natural Gas STAR Program (EPA 2017c) to recover for reuse or destroy CH₄ in associated gas and casinghead gas as follows:

- Recover for beneficial use all associated gas produced from the reservoir, regardless of well type, except for gas produced from wildcat and delineation wells or as a result of system failures and emergencies. Beneficial use does not include flaring. Recovery for beneficial use includes capture for resale or reuse of the gas as a fuel or feedstock.
- For each well with annual average emissions of casinghead gas greater than or equal to 60 grams per hour or a mass emissions equivalent of a 10,000 ppm leak of natural gas, levels targeted by the EPA Natural Gas STAR Program, capture casinghead gas for beneficial reuse or route casinghead gas to a flare if on a CO₂-equivalent basis the amount of gas for maintaining the pilot is less than the amount of vented casinghead gas.

Documentation of the beneficial reuse shall be submitted to the Community Development Director. This mitigation measure and its requirements shall cease to have effect as soon as requirements established by the Air Resources Board (ARB) or the local air district to address the generation of greenhouse gas emissions become effective.

MM GHG-3 (see SB4 GHG-1b) Prior to the commencement of any well stimulation activities, the Oil Field Operator shall demonstrate to the City of Culver City a plan for the implementation of the following emission control strategies defined by UNFCCC

“Approved Methodologies” for projects in the Clean Development Mechanism (CDM) program, as follows:

- Recovery and utilization of gas from oil fields that would otherwise be flared or vented. (AM0009. Version 7.0 (11/8/2013).)
- Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities. (AM0023. Version 4.0.0 (9/29/2011).)
- Flare (or vent) reduction and utilization of gas from oil wells as a feedstock. (AM0037. Version 2.1 (3/28/2008).)
- Recovery of gas from oil wells that would otherwise be vented or flared and its delivery to specific end-users. (AM0077. Version 1.0 (2/12/2009).)

Documentation of the implemented emission control strategies shall be submitted to the Community Development Director. This mitigation measure and its requirements shall cease to have effect as soon as requirements established by the Air Resources Board (ARB) or the local air district to address the generation of greenhouse gas emissions become effective.

MM GHG-4 (see SB4 GHG-1c) Prior to the commencement of any well stimulation activities, the Oil Field Operator shall demonstrate to the City of Culver City a plan for the installation of methane and carbon dioxide sensors at existing wells and new wells within the radius of influence of a planned well stimulation in order to monitor possible leaks or venting of methane gas. The radius of influence shall be determined by the Oil Field Operator, subject to review and approval by the City of Culver City and the SCAQMD. The CARB Draft Test Protocol: Detection and Quantification of Fugitive and Vented Methane, Carbon Dioxide, and Volatile Organic Compounds from Crude Oil and Natural Gas Facilities (December 2010) may be used as a means of complying with this measure. Documentation of the installation of the sensors shall be submitted to the Community Development Director. When an alarm for a leak or venting of methane is received, the Oil Field Operator shall immediately notify and provide access and the right to investigate the event as necessary to all agencies with jurisdiction over the Oil Field, including; the Culver City Fire Department, the Los Angeles County Fire Department – Health Hazardous Materials Division, the DOGGR, and the SCAQMD.

This mitigation measure and its requirements shall cease to have effect as soon as requirements established by CARB or the local air district to address the impact of greenhouse gas emissions from well stimulation activities become effective, as determined by the Community Development Director.

4.6.9 LEVEL OF SIGNIFICANCE

Compliance with the Scoping Plan Measure I-2 requirements and implementation of MM GHG-1 through MM GHG-4, would ensure that the Project does not conflict with AB 32 or SB 32, and the Project’s contribution of GHG emissions would not be cumulatively considerable. Table 4.6-5 below summarizes the significance finding of each threshold addressed in this section before and after mitigation, where applicable.

**TABLE 4.6-5
SIGNIFICANCE SUMMARY**

Threshold	Project Level of Significance	Mitigation Measure(s)	Level of Significance after Mitigation
6-1 Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less than Significant	N/A	Less than Significant
6-2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Potentially Significant	MM GHG-1 through MM GHG-4	Less than Significant With Mitigation
N/A: not applicable			

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