5.3 GREENHOUSE GAS EMISSIONS

1. INTRODUCTION

This section describes applicable regulations that address greenhouse gas (GHG) emissions that would be generated by the implementation of the Revised RAP at the site and assesses the potential impacts of the RP's Proposed Remedy in terms of GHGs and global climate change. State law defines GHG emissions to include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Existing conditions at the site and influences on global climate change are also described, and an analysis is provided to assess potential cumulative and project related contributions to global climate change that would be caused by implementation of the project. The analysis accounts for energy and resource conservation measures that have been incorporated into the RAP and pertinent State mandated GHG emission reduction measures. GHG emission calculations prepared for the project are provided in Appendix D.

2. ENVIRONMENTAL SETTING

Regulatory Framework

A number of statutes, regulations, plans, and policies address air quality issues. The site and vicinity are subject to air quality regulations developed and implemented at the federal, state, and local levels.

Federal Regulations

The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address GHGs. The federal government administers a wide array of public-private partnerships to reduce the GHG intensity generated in the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO_2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions. The USEPA implements numerous voluntary programs that contribute to the reduction of GHG emissions. These programs (e.g., the Energy Star labeling system for energy-efficient products) play a significant role in encouraging voluntary reductions from large corporations, consumers, industrial and commercial buildings, and many major industrial sectors.

In *Massachusetts v. Environmental Protection Agency* (Docket No. 05–1120), the U.S. Supreme Court held in April of 2007 that the USEPA has statutory authority under Section 2020 of the federal Clean Air Act (CAA) to regulate GHGs. The court did not hold that the US EPA was required to regulate GHG emissions; however, it indicated that the agency must decide whether GHGs cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare.

The U.S. President signed Executive Order 13432 on May 14, 2007, directing the USEPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responds to the Supreme Court's decision. Executive Order 13432 was codified into law by the 2009 Omnibus Appropriations Law signed on February 17, 2009. The order sets goals in the areas of energy efficiency, acquisition, renewable energy, toxics reductions, recycling, sustainable buildings, electronics stewardship,

fleets, and water conservation. In addition, the order requires more widespread use of Environmental Management Systems as the framework in which to manage and continually improve these sustainable practices. This Executive Order requires federal agencies to lead by example in advancing the nation's energy security and environmental performance by achieving the following goals:

- **Energy Efficiency:** Reduce energy intensity 30 percent by 2015, compared to a fiscal year (FY) 2003 baseline.
- **Greenhouse Gases:** Reduce GHG emissions through a 30 percent reduction of energy intensity by 2015, compared to an FY 2003 baseline.
- **Renewable Power:** At least 50 percent of current renewable energy purchases must come from new renewable sources (in service after January 1, 1999).
- **Building Performance:** Construct or renovate buildings in accordance with sustainability strategies, including resource conservation, reduction, and use; siting; and indoor environmental quality.
- **Water Conservation:** Reduce water consumption intensity 16 percent by 2015, compared to an FY 2007 baseline.
- **Vehicles:** Increase purchase of alternative fuel, hybrid, and plug-in hybrid vehicles when commercially available.
- **Petroleum Conservation:** Reduce petroleum consumption in fleet vehicles by 2 percent annually through 2015, compared to an FY 2005 baseline.
- **Alternative Fuel:** Increase use of alternative fuel consumption by at least 10 percent annually, compared to an FY 2005 baseline.
- **Pollution Prevention:** Reduce use of chemicals and toxic materials and purchase lower risk chemicals and toxic materials.
- **Procurement:** Expand purchases of environmentally sound goods and services, including bio-based products.
- **Electronics Management:** Annually, 95 percent of electronic products purchased must meet Electronic Product Environmental Assessment Tool standards where applicable; enable Energy Star® features on 100 percent of computers and monitors; and reuse, donate, sell, or recycle 100 percent of electronic products using environmentally sound management practices.

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

the USEPA, a model year 2025 vehicle would emit one-half of the GHG emissions from a model year 2010 vehicle.[1]

On December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the federal CAA. The USEPA adopted a Final Endangerment Finding for the six defined GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) on December 7, 2009. The Endangerment Finding is required before USEPA can regulate GHG emissions under Section 202(a)(1) of the CAA consistently with the U.S. Supreme Court decision. The USEPA also adopted a Cause or Contribute Finding in which the USEPA Administrator found that GHG emissions from new motor vehicle and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. These findings do not themselves impose any requirements on industry or other entities. However, these actions were a prerequisite for implementing GHG emissions standards for vehicles.

State Regulations

In response to growing scientific and political concern regarding global climate change, in the last decade California has promulgated a series of executive orders, laws, and regulations aimed at reducing both the level of GHGs in the atmosphere and emissions of GHGs from commercial and private activities within the State.

California Air Resources Board

The California Air Resources Board (CARB), a part of the California Environmental Protection Agency (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets state ambient air quality standards (California Ambient Air Quality Standards (CAAQS)), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts. The SIP is required for the State to take over implementation of the federal CAA.

Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets:

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

[1] *U.S. Environmental Protection Agency, "EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks," August 2012, http://www.epa.gov/oms/climate/documents/420f12051.pdf. Accessed August 2014.*

The Secretary of CalEPA is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Some of the agency representatives involved in the GHG reduction plan include the Secretary of the Business, Transportation and Housing Agency, the Secretary of the Department of Food and Agriculture, the Secretary of the Resources Agency, the Chairperson of CARB, the Chairperson of the California Energy Commission, and the President of the Public Utilities Commission. Representatives from these agencies comprise the California Climate Action Team (CCAT).

The CCAT provides biennial reports to the Governor and Legislature on the state of GHG reductions in the state as well as strategies for mitigating and adapting to climate change. The first CCAT Report to the Governor and the Legislature in 2006 contained recommendations and strategies to help meet the targets in Executive Order S 3-05.[2] The 2010 CCAT Report, finalized in December 2010, expands on the policy oriented 2006 assessment.[3] The new information detailed in the CCAT Report includes development of revised climate and sea-level projections using new information and tools that have become available in the last two years; and an evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts.

California Health and Safety Code, Division 25.5 – California Global Warming Solutions Act of 2006[4]

In 2006, the California State Legislature adopted Assembly Bill 32 (AB 32) (California Health and Safety Code [HSC], Division 25.5 – California Global Warming Solutions Act of 2006), focusing on reducing GHG emissions in California to 1990 levels by 2020. As required by HSC Division 25.5, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 million metric tons (MMT) carbon dioxide equivalent (CO_2e). CARB also projected the state's 2020 GHG emissions under business as usual (BAU) conditions - that is, emissions that would occur without any plans, policies, or regulations to reduce GHG emissions. CARB originally used an average of the state's GHG emissions from 2002 through 2004 and projected the 2020 levels at approximately 596 $MMTCO_2e$. Therefore, under this original projection, the state must reduce its 2020 BAU emissions by 28.4 percent in order to meet the 1990 target. CARB updated their 2020 BAU emissions estimate to account for the effect of the 2007–2009 economic recession, new estimates for future fuel and energy demand, and the reductions required by regulation that were recently adopted for motor vehicles and renewable energy.[5] CARB's revised 2020 BAU emissions estimate is 507 $MMTCO_2e$. Therefore, the emission reductions necessary to achieve the 2020 emissions target of 427 $MMTCO_2e$ would be 80 $MMTCO_2e$, or a reduction of GHG emissions by 15.8 percent.

HSC Division 25.5 defines GHGs as CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 and represents the first enforceable statewide program to limit emissions of these GHGs from all major industries with penalties for noncompliance. The law further requires that reduction measures be technologically feasible and cost

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

3 *California Environmental Protection Agency, California Climate Action Team Report to Governor Schwarzenegger and the Legislature, (2010).*

4 *Assembly Bill No. 32, http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf. Accessed August 2014.*

5 *California Air Resources Board, "Greenhouse Gas Inventory – 2020 Emissions Forecast," http://www.arb.ca.gov/cc/inventory/data/forecast.htm. 2012.*

effective. Under HSC Division 25.5, CARB has the primary responsibility for reducing GHG emissions. CARB is required to adopt rules and regulations directing state actions that would achieve GHG emissions reductions equivalent to 1990 statewide levels by 2020. On or before June 30, 2007, CARB was required to publish a list of discrete early action GHG emission reduction measures that would be implemented to be made enforceable by 2010. In 2007, CARB published its Final Report for Proposed Early Actions to Mitigate Climate Change in California.[6] This report described recommendations for discrete early action measures to reduce GHG emissions as part of California's HSC Division 25.5 GHG reduction strategy. Resulting from this are three new regulations proposed to meet the definition of "discrete early action greenhouse gas reduction measures," including the following: a low carbon fuel standard; reduction of HFC 134a (HFC used in automobile air-conditioning systems) emissions from non-professional servicing of motor vehicle air conditioning systems; and improved landfill gas capture. CARB estimates that by 2020, the reductions from those three measures would range from 13 to 26 $MMTCO_2e$. Six additional early-action regulations were adopted on October 25, 2007 that targeted: motor vehicles; auxiliary engines from docked ships; PFCs from the semiconductor industry; propellants in consumer products; automotive maintenance; and SF_6 from non-electricity sectors.

California Health and Safety Code, Section 42823 and 43018.5[7]

In response to the transportation sector accounting for more than half of California's CO_2 emissions, AB 1493 (HSC Section 42823 and 43018.5), enacted on July 22, 2002, required CARB to set GHG emission standards for passenger vehicles, light duty trucks, and other vehicles whose primary use is non-commercial personal transportation manufactured in and after 2009. In setting these standards, CARB must consider cost effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. The State of California in 2004 submitted a request for a waiver from federal clean air regulations, which ordinarily preempts state regulation of motor vehicle emission standards, to allow the state to require reduced tailpipe emissions of CO_2. In late 2007, the USEPA denied California's waiver request. In early 2008, the state brought suit against USEPA related to this denial. In January 2009, the President directed the USEPA to assess whether its denial of the waiver was appropriate under the federal CAA. In June 2009, the USEPA granted California the waiver.

However, as discussed previously, the USEPA and United States Department of Transportation (USDOT) have adopted federal standards for model year 2012 through 2016 light-duty vehicles. In light of the USEPA and USDOT standards, California - and states adopting California emissions standards - have agreed to defer to the proposed national standard through model year 2016. The 2016 endpoint of the federal and state standards is similar, although the federal standard ramps up slightly more slowly than required under the state standard. The state standards (called the Pavley standards) require additional reductions in CO_2 emissions beyond model year 2016 (referred to as Pavley Phase II standards). As noted above, the USEPA and USDOT have adopted GHG emission standards for model year 2017 through 2025 vehicles. These standards are slightly different from the Pavley Phase II standards, but the State of California has agreed not to contest these standards, in part due to the fact that while the national standard would achieve slightly less reductions in California, it would achieve greater reductions nationally and is stringent enough to meet state

[6] *California Air Resources Board, Proposed Early Actions to Mitigation Climate Change in California, (2007).*

[7] *Assembly Bill No. 1493, http://www.leginfo.ca.gov/pub/01-02/bill/asm/ab_1451-1500/ab_1493_bill_20020722_chaptered.pdf. Accessed August 2014.*

GHG emission reduction goals.[8] CARB is in the process of adopting regulations that would allow manufacturers to comply with the 2017-2025 national standards to meet state law.

Executive Order S-01-07

Executive Order S-01-07 was enacted by Governor Schwarzenegger on January 18, 2007. The order mandates the following: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and (2) that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established in California.

Senate Bill 97 (SB 97, Dutton) (Chapter 185, Statutes of 2007)[9]

Senate Bill 97 (SB 97) (Chapter 185, Statutes of 2007), enacted in 2007, amended the California Environmental Quality Act (CEQA) to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directed the California Office of Planning and Research (OPR) to develop revisions to the State CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" and directed the Resources Agency to certify and adopt these revised State CEQA Guidelines by January 2010. The revisions were completed in March 2010 and codified into the California Code of Regulations and became effective within 120 days pursuant to CEQA. The amendments provide regulatory guidance for the analysis and mitigation of the potential effects of GHG emissions. The CEQA Guidelines require:

- Inclusion of GHG analyses in CEQA documents;
- Determination of significance of GHG emissions; and
- If significant GHG emissions would occur, adoption of mitigation to address significant emissions.

Senate Bill 375 (SB 375, Steinberg) (Chapter 728, Statutes of 2008)[10]

SB 375 (Chapter 728, Statutes of 2008), which establishes mechanisms for the development of regional targets for reducing passenger vehicle greenhouse gas emissions, was adopted by the State on September 30, 2008. Under SB 375, CARB is required, in consultation with the metropolitan planning organizations (MPOs), to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035. On September 23, 2010, CARB adopted the vehicular GHG emissions reduction targets for the Southern California Association of Governments (SCAG), which is the MPO for the region in which the City of Carson is located. The target is a per capita reduction of 8 percent for 2020 and 13 percent for 2035 compared to the 2005 baseline. Of note, the proposed reduction targets explicitly exclude emission reductions expected from HSC Section 42823 and 43018.5 and the low carbon fuel standard regulations.

Under SB 375, the target must be incorporated within that region's Regional Transportation Plan (RTP), which is used for long-term transportation planning, in a Sustainable Communities Strategy (SCS). Certain

[8] *California Air Resources Board, "Advanced Clean Cars Summary," http://www.arb.ca.gov/msprog/clean_cars/acc%20summary-final.pdf. Accessed August 2014.*

[9] *Senate Bill No. 97, http://opr.ca.gov/docs/SB_97_bill_20070824_chaptered.pdf. Accessed August 2014.*

[10] *Senate Bill No. 375, http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf. Accessed August 2014.*

transportation planning and programming activities would then need to be consistent with the SCS; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., general plan) are not required to be consistent with either the RTP or SCS. On April 4, 2012, SCAG adopted the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Using growth forecasts and economic trends, the RTP/SCS provides a vision for transportation throughout the region for the next 20 years. It considers the role of transportation in the broader context of economic, environmental, and quality-of-life goals for the future, identifying regional transportation strategies to address mobility needs. The RTP/SCS successfully achieves and exceeds the greenhouse gas emission-reduction targets set by CARB by achieving a 9 percent reduction by 2020 and 16 percent reduction by 2035 compared to the 2005 level on a per capita basis. This RTP/SCS also meets criteria pollutant emission budgets set by the USEPA.

Senate Bill 1078 (SB 1078, Sher) (Chapter 516, Statutes of 2002)[11] and Senate Bill 107 (SB 107, Simitian) (Chapter 464, Statutes of 2006)[12] and Executive Order S-14-08

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which expands the State's Renewables Portfolio Standard (RPS) to 33 percent renewable power by 2020. Pursuant to Executive Order S-21-09, CARB was also preparing regulations to supplement the RPS with a Renewable Energy Standard that will result in a total renewable energy requirement for utilities of 33 percent by 2020. But on April 12, 2011, Governor Jerry Brown signed SB X1-2 to increase California's RPS to 33 percent by 2020.

CEQA Guidelines, Appendix F

Appendix F of the State *CEQA Guidelines* states that, in order to ensure that energy implications are considered in project decisions, the potential energy implications of a project shall be considered in an EIR, to the extent relevant and applicable to the project. Appendix F further states that a project's energy consumption and proposed conservation measures may be addressed, as relevant and applicable, in the Project Description, Environmental Setting and Impact Analysis portions of technical sections, as well as through mitigation measures and alternatives. In accordance with Appendix F of the State *CEQA Guidelines,* relevant information that address the energy implications of the Project are provided below in subsection 5, Project Energy Implications.

Consideration of Sustainability

In addition to the nine evaluation criteria of the National Contingent Plan (NCP), the consideration of sustainability was included in the assessment of the RP's Proposed Remedy and Alternatives, as detailed in the Revised Feasibility Study Report.[13] The assessment of sustainability, or "green remediation", can illustrate impacts that occur on local, regional, and global scales, including the direct and indirect releases of

[11] *Senate Bill No. 1078, http://www.energy.ca.gov/portfolio/documents/documents/SB1078.PDF. Accessed August 2014.*

[12] *Senate Bill No. 107, http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_0101-0150/sb_107_bill_20060926_chaptered.pdf. Accessed August 2014.*

[13] *Geosyntec Consultants, Revised Feasibility Study Report, (2014) 86-87.*

contaminants; the consumption of raw materials; and the production, collection, and disposal of wastes. Sustainability can consider factors that are sometimes intangible and unquantifiable. Nonetheless, these factors, along with others, were considered by the Water Board in its screening of remedial alternatives.

Regional

Air pollutant emissions are regulated by the South Coast Air Quality Management District (SCAQMD). The SCAQMD is responsible for promoting and improving the air quality of the Basin. This is accomplished though air quality monitoring, evaluation, education, implementation of control measures to reduce emissions from stationary sources, permitting and inspection of pollution sources, enforcement of air quality regulations, and by supporting and implementing measures to reduce emissions from motor vehicles. After AB 32 was passed, SCAQMD formed a Climate Change Committee along with a Greenhouse Gases CEQA Significance Thresholds Working Group and the SoCal Climate Solutions Exchange Technical Advisory Group. On September 5, 2008, the SCAQMD Board approved the SCAQMD Climate Change Policy, which outlines actions the District will take to assist businesses and local governments in implementing climate change measures, decrease the agency's carbon emissions, and provide information to the public regarding climate change. On December 5, 2008, the Board approved interim CEQA GHG significance thresholds for stationary source projects where it is the lead agency. The threshold is a tiered approach to determine a project's significance, with 10,000 metric tons (MT) of CO_2e as a screening numerical threshold for stationary source projects. In order to provide guidance to local lead agencies on determining the significance of GHG emissions identified in CEQA documents, the GHG CEQA Significance Threshold Working Group drafted thresholds with the intent of capturing 90 percent of development projects.[14] Under Tiers 1 and 2, projects that are exempt from CEQA or consistent with an approved local GHG reduction plan can be found to be less than significant. Under Tier 3, a project's GHG emissions are compared to the draft screening thresholds. At present, the SCAQMD has not formally adopted thresholds for use by other lead agencies, but recommends that industrial projects utilize the 10,000 $MTCO_2e$ screening level that has been adopted for SCAQMD projects. Under Tier 4, a project's GHG emissions are compared to a performance standard, such as achieving a percentage reduction in GHG emissions from a base case scenario or achieving a project-level efficiency target of 4.8 $MTCO_2e$ per service population. It should be noted that these thresholds were never adopted by the SCAQMD.

Additionally, SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil, would govern the control of air pollutant emissions from the landfill on-site. A brief summary of this rule is provided below:

Regulation XI – Source Specific Standards: Regulation XI sets emissions standards for different specific sources.

- **Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil:** This rule sets requirements to control the emission of VOCs from excavating, grading, handling and treating VOC-contaminated soil (as defined under the Rule) at or from an excavation or grading site.

[14] *South Coast Air Quality Management District, "Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group Meeting #15," September 28, 2010, http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds/page/2. Accessed August 2014.*

Local

The City's General Plan does not include any specific goals and objectives related to GHGs. However, the goals and policies in the Air Quality Element of the General Plan would also aid to reduce GHG emissions in the City. An analysis of applicable goals and policies of the Air Quality Element is provided in Section 5.1, Air Quality, of this EIR.

Existing Conditions

Greenhouse Gases

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

GHGs are those compounds in the Earth's atmosphere which play a critical role in determining temperature near the Earth's surface. More specifically, these gases allow high-frequency shortwave solar radiation to enter the Earth's atmosphere, but retain some of the low frequency infrared energy which is radiated back from the Earth towards space, resulting in a warming of the atmosphere. Not all GHGs possess the same ability to induce climate change; as a result, GHG contributions are commonly quantified in the units of equivalent mass of carbon dioxide (CO_2e). Mass emissions are calculated by converting pollutant specific emissions to CO_2e emissions by applying the proper global warming potential (GWP) value.[15] These GWP ratios are available from the United States Environmental Protection Agency (USEPA) and are published in the California Climate Action Registry (CCAR) General Reporting Protocol. By applying the GWP ratios, project-related CO_2e emissions can be tabulated in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline. Compounds that are regulated as GHGs are discussed below.

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

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

[15] *GWPs and associated CO_2e values were developed by the Intergovernmental Panel on Climate Change, and published in its Second Assessment Report in, 1996. In accordance with international and United States convention to maintain the value of the carbon dioxide 'currency', GHG emission inventories are calculated using the GWPs from the Intergovernmental Panel on Climate Change Second Assessment Report.*

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

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

Perfluorocarbons (PFCs): PFCs are fluorinated compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. The GWPs of PFCs range from 5,700 to 11,900.

Sulfur Hexafluoride (SF_6): SF_6 is a fluorinated compound consisting of sulfur and fluoride. It is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 has a GWP of 23,900.

Greenhouse Gas Emissions

Worldwide man-made emissions of GHGs were approximately 49,000 million metric tons (MMT) of CO_2e annually including ongoing emissions from industrial and agricultural sources and emissions from land use changes (e.g., deforestation).[16] Emissions of CO_2 emissions from fossil fuel use accounts for 56.6 percent of the total while CO_2 emissions from all sources accounts for 76.7 percent of the total. Methane emissions account for 14.3 percent and N_2O emissions for 7.9 percent. The European Commission's Emissions Database for Global Atmospheric Research (EDGAR) reported global emissions of carbon dioxide alone for 2012 at 34,500 MMT, an all-time high. In 2012, the United States was the world's second largest emitter of carbon dioxide at 5,190 MMT (China was the largest emitter of carbon dioxide at 9,860 MMT).[17]

The CARB compiles GHG inventories for the State of California. Based on the 2012 GHG inventory data (i.e., the latest year for which data are available from CARB), California emitted 458.7 $MMTCO_2e$ including emissions resulting from imported electrical power and 414.6 $MMTCO_2e$ excluding emissions related to imported power.[18] Between 1990 and 2012, the population of California grew by approximately 7.9 million (from 29.8 to 37.7 million).[19] This represents an increase of approximately 27 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from $773 billion in 1990 to $2.13 trillion in 2012 representing an increase of approximately 176 percent (about two and three-

[16] *Intergovernmental Panel on Climate Change,* Fourth Assessment Report: Synthesis Report*, (2007). Based on the most recent global data from 2004. While more recent data are available from Annex I countries (countries with GHG reductions obligations), Non-Annex I countries (countries without GHG reduction obligations) typically do not have more recent data.*

[17] *PBL Netherlands Environmental Assessment Agency and the European Commission Joint Research Center, Trends in Global CO_2 Emissions 2013 Report, (2013).*

[18] *California Air Resources Board, "California Greenhouse Gas 2000-2012 Inventory by Scoping Plan Category - Summary," http://www.arb.ca.gov/cc/inventory/data/data.htm. Accessed August 2014.*

[19] *U.S. Census Bureau, "California, Population of Counties by Decennial Census: 1900 to 1990," http://quickfacts.census.gov/qfd/states/06000lk.html. Accessed August 2014; California Department of Finance, "E-5 Population and Housing Estimates for Cities, Counties and the State, January 2011-2014, with 2010 Benchmark," http://www.dof.ca.gov/research/demographic/reports/estimates/e-5/2011-20/view.php. Accessed August 2014.*

quarter times the 1990 gross state product).[20] Despite the population and economic growth, California's net GHG emissions only grew by approximately 8 percent between 1990 and 2012. The California Energy Commission (CEC) attributes the slow rate of growth to the success of California's renewable energy programs and its commitment to clean air and clean energy.[21] **Table 5.3-1**, *State of California Greenhouse Gas Emissions,* identifies and quantifies statewide anthropogenic GHG emissions and sinks (e.g., carbon sequestration due to forest growth) in 1990 and 2012 (i.e., the most recent year in which data are available from CARB). As shown in Table 5.3-1, the transportation sector is the largest contributor to statewide GHG emissions at 36 percent in 2012.

Table 5.3-1

State of California Greenhouse Gas Emissions

Category	Total 1990 Emissions ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2012 Emissions ($MMTCO_2e$)	Percent of Total 2012 Emissions
Transportation	150.7	35%	167.4	36%
Electric Power	110.6	26%	95.1	21%
Commercial	14.4	3%	14.2	3%
Residential	29.7	7%	28.1	6%
Industrial	103.0	24%	89.2	19%
Recycling and Waste[a]	–	–	8.5	2%
High GWP/Non-Specified[b]	1.3	<1%	18.4	4%
Agriculture/Forestry	23.6	6%	37.9	8%
Forestry Sinks	-6.7		--[c]	--
Net Total[d]	**426.6**	**100%**	**458.7**	**100%**

[a] *Included in other categories for the 1990 emissions inventory.*

[b] *High GWP gases are not specifically called out in the 1990 emissions inventory.*

[c] *Revised methodology under development (not reported for 2012).*

[d] *Totals may not add up exactly due to rounding.*

Sources: California Air Resources Board, Staff Report – California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit, (2007); California Air Resources Board, "California Greenhouse Gas 2000-2012 Inventory by Scoping Plan Category – Summary," http://www.arb.ca.gov/cc/inventory/data/data.htm. Accessed August 2014.

Effects of Global Climate Change

The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency,

[20] *California Department of Finance, "Financial & Economic Data: Gross Domestic Product, California," http://www.dof.ca.gov/HTML/FS_DATA/LatestEconData/FS_Misc.htm. Accessed August 2014. Amounts are based on current dollars as of the date of the report (June 2014).*

[21] *California Energy Commission, Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004, (2006).*

and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model it, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the Intergovernmental Panel on Climate Change (IPCC), in its *Fourth Assessment Report*, stated that, "it is likely that there has been significant warming due to human activity over the past 50 years."[22] In addition, the *Fourth Assessment Report* holds that the impacts of future climate change will vary across regions. While "large-scale climate events have the potential to cause very large impacts," the impacts of future climate change will be mixed across regions.[23] In its *Fourth Assessment Report*, the IPCC states "Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes (see Figure SPM.6 and Table SPM.1). This evidence for human influence has grown since AR4 [*Fourth Assessment Report*]. It is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century."[24] A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity.[25]

According to CARB, the potential impacts in California due to global climate change may include: loss in snow pack; sea level rise; more extreme heat days per year; more high ozone days; more large forest fires; more drought years; increased erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems; and increased pest infestation.[26] Below is a summary of some of the potential effects, reported by an array of studies that could be experienced in California as a result of global warming and climate change.

Air Quality

Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore, its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state.[27]

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[22] *Intergovernmental Panel on Climate Change, Fourth Assessment Report, Summary for Policy Makers, (2007).*

[23] *Intergovernmental Panel on Climate Change, Fourth Assessment Report, Summary for Policy Makers (2007).*

[24] *Intergovernmental Panel on Climate Change, Fifth Assessment Report, Summary for Policy Makers, (2013) 17 (emphasis in original).*

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

[26] *California Environmental Protection Agency, Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature, (2006).*

[27] *California Energy Commission, Scenarios of Climate Change in California: An Overview, February 2006. http://www.energy.ca.gov/2005publications/CEC-500-2005-186/CEC-500-2005-186-SF.PDF. Accessed August 2014.*

In 2009, the California Natural Resources Agency (CNRA) published the *California Climate Adaptation Strategy*[28] as a response to the Governor's Executive Order S-13-2008. The CNRA report lists specific recommendations for state and local agencies to best adapt to the anticipated risks posed by a changing climate. In accordance with the *California Climate Adaptation Strategy*, the CEC was directed to develop a website on climate change scenarios and impacts that would be beneficial for local decision makers.[29] The website, known as Cal-Adapt, became operational in 2011.[30] The information provided from the Cal-Adapt website represents a projection of potential future climate scenarios. The data are comprised of the average values from a variety of scenarios and models and are meant to illustrate how the climate may change based on a variety of different potential social and economic factors. According to the Cal-Adapt website, the City of Carson in which the project site is located could result in an average increase in temperature of approximately 5 to 9 percent (about 3.2 to 5.7°F) by 2070-2090, compared to the baseline 1961-1990 period.

Water Supply

Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. Studies have found that, "Considerable uncertainty about precise impacts of climate change on California hydrology and water resources will remain until we have more precise and consistent information about how precipitation patterns, timing, and intensity will change."[31] For example, some studies identify little change in total annual precipitation in projections for California while others show significantly more precipitation.[32] Warmer, wetter winters would increase the amount of runoff available for groundwater recharge; however, this additional runoff would occur at a time when some basins are either being recharged at their maximum capacity or are already full.[33] Conversely, reductions in spring runoff and higher evapotranspiration because of higher temperatures could reduce the amount of water available for recharge.[34] The California Department of Water Resources report on climate change and effects on the State Water Project (SWP), the Central Valley Project, and the Sacramento-San Joaquin Delta, concludes that "climate change will likely have a significant effect on California's future water resources…[and] future water demand."[35] It also reports that "much uncertainty about future water demand [remains], especially [for] those aspects of future demand that will be directly affected by climate change and warming. While climate change is expected to continue through at least the end of this century, the magnitude and, in some cases, the nature of future changes is uncertain."[36] It also reports that the relationship between climate change and its potential effect on water demand is not well understood, but "[i]t is unlikely that this level of uncertainty will

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

[29] *Ibid.*

[30] *The Cal-Adapt website address is: http://cal-adapt.org.*

[31] *Pacific Institute for Studies in Development, Environment and Security, Climate Change and California Water Resources: A Survey and Summary of the Literature, July 2003. http://www.pacinst.org/reports/climate_change_and_california_water_resources.pdf. Accessed August 2014.*

[32] *Ibid.*

[33] *Ibid.*

[34] *Ibid.*

[35] *California Department of Water Resources Climate Change Report, Progress on Incorporating Climate Change into Planning and Management of California's Water Resources, July 2006. http://baydeltaoffice.water.ca.gov/climatechange/DWRClimateChangeJuly06_update8-2-07.pdf. Accessed April 2014.*

[36] *Ibid.*

diminish significantly in the foreseeable future."[37] Still, changes in water supply are expected to occur, and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows. In its *Fourth Assessment Report*, the IPCC states "Changes in the global water cycle in response to the warming over the 21st century will not be uniform. The contrast in precipitation between wet and dry regions and between wet and dry seasons will increase, although there may be regional exceptions."[38]

Hydrology and Sea Level Rise

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

Agriculture

California has a $30 billion agricultural industry that produces half the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thus affect their quality.[39]

Ecosystems and Wildlife

Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists expect that the average global surface temperature could rise by 2-11.5°F (1.1-6.4°C) by 2100, with significant regional variation.[40] Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Sea level could rise as much as two feet along most of the U.S. coast. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes such as carbon cycling and storage.[41]

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[37] *Ibid.*

[38] *Intergovernmental Panel on Climate Change, Fifth Assessment Report, Summary for Policy Makers, (2013) 20.*

[39] *California Climate Change Center, Our Changing Climate: Assessing the Risks to California, (2006).*

[40] *National Research Council, Advancing the Science of Climate Change, (2010).*

[41] *Parmesan, C., 2004. Ecological and Evolutionary Response to Recent Climate Change. Annu. Rev. Ecol. Evol. Syst. 2006. 37:637–69; Parmesan, C and Galbraith, H, 2004. Observed Ecological Impacts of Climate Change in North America. Arlington, VA: Pew. Cent. Glob. Clim. Change*

Existing Emissions

The site is occupied by 285 single-family residential properties and City streets. The existing site generates operational GHG emissions from the 285 single-family residential properties. Sources of emissions include natural gas combustion from residential heating and cooking and fossil fuel combustion from landscaping equipment. In addition, motor vehicles traveling to and from the site generate emissions from fossil fuel combustion. These emissions would occur after implementation of the RAP; therefore, no long-term change in these operational emissions is anticipated.

According to the RAP, methane resulting from degradation of petroleum hydrocarbons is present at the site in soil vapor.[42] As discussed previously, methane is defined under State law as a GHG. However, "[v]ery few instances of methane detection above 1% (i.e., 20% of the LEL) have been found in subslab soil vapor, and in all but one location, the results of methane speciation indicate the source was either a natural gas pipeline leak or sewer leak."[43] Methane resulting from biodegradation of residual petroleum hydrocarbons was identified in one sub-slab garage probe at one property; however, methane was either not detected or detected at very low levels (less than 0.01 percent) at this property.[44] Furthermore, no methane exceedances were found at this property during the indoor air screening, and methane was not detected in indoor air samples analyzed by a laboratory.[45] Thus, existing methane emissions at the site due to petroleum hydrocarbons in soil vapor is considered negligible.

3. METHODOLOGY AND THRESHOLDS

Methodology

The evaluation of potential GHG impacts that may result from the short- and long-term implementation of the RAP is conducted as follows:

Short-Term GHG Emissions

Implementation of the RAP has the potential to generate short-term criteria pollutant emissions through the use of heavy-duty construction equipment and through vehicle trips generated from workers traveling to and from the site. Site remediation, including installation of the SVE/bioventing system and street paving, would being in 2015 and is expected to take approximately 6 years. Exhaust emissions would result from the use of construction equipment, such as dozers and loaders, and from on-road vehicle, such as haul trucks and worker vehicles. Fugitive emissions, such as methane, would occur from exposing contaminated material to the ambient air due to excavation and soil handling. Construction emissions can vary substantially from day-to-day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions. The assessment of construction air quality impacts considers each of these potential sources.

[42] *Geosyntec Consultants and URS Corporation, Revised Remedial Action Plan, Former Kast Property, Carson, California, (2014) ES-2.*

[43] *Ibid., 3-7.*

[44] *Ibid., 3-7, 3-8.*

[45] *Ibid., 3-8.*

Short-term GHG emissions from heavy-duty construction equipment from vehicle trips generated from export and import of materials, visitors and workers traveling to and from the site were compiled using the mobile-source emissions factors derived from CARB's on-road and off-road emissions models (e.g., OFFROAD and EMFAC), which are emissions estimation models developed by CARB and frequently used to calculate emissions from construction activities. The output values used in this analysis were adjusted to be project-specific, based on equipment usage rates, type of fuel, and implementation schedule.

Short-term GHG emissions resulting from implementation of the RAP were developed for construction equipment that would be used on-site and on-road construction equipment which can travel on- and off-site. GHG emissions from equipment (dozers, loaders, sweepers, and other heavy-duty construction equipment) and on-road vehicles (tractor trailers, light duty trucks, employee vehicles, etc., which can travel on highways and local roads) were evaluated separately to account for the CARB's published emissions factors for both categories of equipment. GHG emissions for off-road equipment were then calculated by multiplying an emission factor by the horsepower, load factor, and operational hours for each type of equipment.

On-road equipment emissions are generated from pick-up trucks, water trucks, dump trucks, haul trucks, delivery trucks, and other on-road vehicles (i.e., vehicles licensed to travel on public roadways). Exhaust emissions from on-road on-site sources were calculated using the emission factors for CO_2 from CARB's on-road emission factor model. Emissions factors for heavy-duty diesel vehicles and trucks were based on EMFAC2011 emission factors for the "heavy-heavy-duty" vehicle classification. A complete listing of the short-term GHG emission assumptions used in this analysis is included within the CalEEMod printout sheets that are provided in Appendix D of this EIR.

The analysis of GHG impacts also considers an Expedited Implementation Option. Under the Expedited Implementation Option, rather than a cluster of up to 8 properties, the number being actively remediated could be incrementally increased with up to 16 properties active at one time. Given the overlap in activity with the clusters there could be up to 32 properties in some stage of remediation at one time. The total amount of demolished materials and excavated soils would be the same as under the project. The Expedited Implementation Option would result in a greater level of activity within the community on a given day but would not change the level of activity at an individual property. As with the RP's Proposed Remedy, under the Expedited Implementation Option, remediation would begin in 2015. However, with the increase in implementation, it is anticipated that the remediation would be complete in approximately 4 years.

Long-Term GHG Emissions

Long-term implementation of the RAP would entail periodic maintenance and monitoring as needed. Thus, long-term emissions would be caused by stationary (SVE/bioventing) and mobile (on-road and off-road) sources. The long-term net increase in emissions from new sources are expected to be minimal. Maintenance and housekeeping trips to support long-term RAP activities would occur on a monthly or less frequent basis, as needed. Stationary-source emissions from SVE/bioventing would also be minimal, given methane was non-detect at the majority of properties with only trace or low levels at a few properties. Therefore, the potential for long-term impacts are discussed qualitatively. Emissions caused by the supply of electricity to run the SVE/bioventing system as well as the sequestration of GHGs by restored vegetation on-site were not included as they are expected to be negligible.

Thresholds of Significance

For purposes of this EIR, the Regional Board has utilized the checklist questions in Appendix G of the *CEQA Guidelines* as thresholds of significance to determine whether the project would have a significant environmental impact regarding GHG and climate change. Based on the size and scope of the project and the potential for GHG impacts, the thresholds identified below are included for evaluation in this EIR.

Would the project:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, based on any applicable threshold of significance?

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHG

Section 15064.7 of the CEQA Guidelines defines a threshold of significance as an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant. CEQA leaves the determination of significance to the reasonable discretion of the lead agency and encourages lead agencies to develop and publish thresholds of significance to use in determining the significance of environmental effects. However, as of May 2014, the Regional Water Quality Control Board and the State Water Resources Control Board have not proposed or approved specific numeric thresholds for GHG emissions. Neither CARB nor SCAQMD have adopted numeric thresholds applicable to a remedial project. Thus, for CEQA purposes, the Regional Board has determined that the appropriate numeric threshold of significance to assess the short- and long-term GHG impacts of a project of this nature with respect to the first Appendix G checklist item is the SCAQMD's industrial source, 10,000 $MTCO_2e$ per year, threshold. This determination is based on the recommendation from the SCAQMD that industrial projects utilize the 10,000 $MTCO_2e$ per year threshold, which is used by the SCAQMD itself for projects where it is the lead agency under CEQA. With respect to the second checklist item, the Regional Board has determined that the appropriate threshold of significance is assessing the project's general consistency with the goals of HSC Division 25.5. While HSC Division 25.5 does not prescribe specific project-level measures, the *Climate Change Scoping Plan* provides strategies for the State to reduce GHG emissions in order to achieve the 2020 target.

Greenhouse Gas Emissions

GHG-1 Generate GHG emissions, either directly or indirectly, that would exceed 10,000 $MTCO_2e$ per year.

Greenhouse Gas Plans

GHG-2 Conflict with the GHG emissions reductions goals and strategies of HSC Division 25.5.

4. PROJECT ANALYSIS

Project Design Features

The following PDFs would result in a reduction in GHG emissions and are considered as part of the project in the analysis. A number of the PDFs listed below have been previously introduced in Section 5.1, Air Quality, of this EIR and are reproduced below. The PDFs from Section 5.1, *Air Quality*, are denoted as "PDF AQ-#."

PDF AQ-1 All off-road diesel construction equipment remaining on-site for more than 15 work days will meet USEPA Tier 3 off-road emission standards, if commercially available locally. Use of Tier 3 engines results in a substantial reduction in NO_X emissions compared to similar Tier 2 or lower engines, and has been shown to increase fuel economy over similar Tier 2 engines.[46] Documentation of all off-road diesel construction equipment on-site including Tier 3 certification will be maintained and made available to the Regional Board for inspection upon request.

PDF AQ-2 All on-road waste haul trucks exporting soil to the appropriate receiver facility will be model year 2007 or newer or retrofitted to comply with USEPA Year 2007 on-road emissions standards. Documentation of all on-road trucks exporting soil will be maintained and made available to the Regional Board for inspection upon request.

PDF AQ-3 The project will prohibit the idling of on- and off-road heavy duty diesel vehicles for more than five minutes at a time. This project design feature is consistent with California regulations and laws as well as CARB ATCM requirements.

PDF AQ-11 In order to minimize traffic congestion at or near the site, some construction worker parking will be provided at a nearby off-site location. Shuttles and/or vans will be provided to transport some of the construction workers from the off-site parking location to the site.

PDF AQ-12 To the maximum practical extent, recyclable materials, including non-hazardous construction and demolition debris, will be reused or recycled.

PDF GHG-1 The project will comply with the use of low carbon vehicle fuels as required under State law.

Analysis of Project Impacts

Greenhouse Gas Emissions

Threshold GHG-1: Would the project generate greenhouse gas emissions, either directly or indirectly, that would exceed 10,000 $MTCO_2e$ per year?

Impact Statement GHG-1: *Implementation of the RAP and the Expedited Implementation Option would result in short-term GHG emissions that would not exceed the significance threshold. Implementation of the RAP would not result in long-term emissions that exceed the significance threshold. Thus, implementation of the RAP would not generate GHG emissions, either directly or indirectly, that would*

[46] *Komatsu Technical Report, Development of Tier 3 Engine ecot3, Vol. 52, No. 157, http://www.komatsu.com/CompanyInfo/profile/report/pdf/157-03_E.pdf. 2006. Accessed August 2014.*

have a significant impact on the environment and impacts related to short-term and long-term GHG emissions would be less than significant.

Short-Term Impacts

Implementation of the RAP has the potential to generate short-term GHG emissions through the use of heavy-duty construction equipment and through vehicle trips generated from export and import of materials, visitors and workers traveling to and from the project site. In order to provide a conservative analysis, emissions associated with average daily and peak daily activity were estimated. Assumptions for each construction phase and the equipment that would be used during RAP implementation are provided in Appendix D of this EIR.

Emissions of GHGs were estimated for each year during the 6 year duration. The emissions were calculated for the activities described previously (i.e., residential excavation and associated activities, street trenching/pipe installation, well installation, and street paving) and include exhaust emissions and fugitive GHG emissions from contaminated soil (i.e., methane) that could be released to the atmosphere during soil handling activities. The emissions estimates take into account PDFs implemented during the construction activities that would limit, minimize, and reduce short-term GHG emissions. The majority of the emissions would be attributed to haul trucks exporting on-site materials or importing soil for the protective cover. Results of this analysis are presented in **Table 5.3-2**, *Unmitigated Short-Term Greenhouse Gas Emissions*. The estimated short-term GHG operational emissions are below the SCAQMD interim industrial standard of 10,000 $MTCO_2e$ per year (See Table 5.3-2).

Table 5.3-1

Unmitigated Short-Term Greenhouse Gas Emissions

Emission Source	Maximum Annual CO_2e (Metric Tons/year) [a]
Implementation of the RAP (6 years)	1,976
Applicable threshold	**10,000**
Exceeds Significance Threshold?	**No**

[a] *Emissions calculations are included in Appendix D of this EIR.*

Source: PCR Services Corporation, 2014

Expedited Implementation Option

Under the Expedited Implementation Option, the number of properties being remediated at one time could increase. Therefore, GHG emissions occurring in a single year would increase as a result of the use of additional heavy-duty construction equipment, increased excavation amounts, and increased numbers of haul trucks, vendor trucks, and construction worker trips. However, the overall number of years associated with implementation of the RAP would decrease.

Emissions of GHGs were estimated for each year of activity. The emissions were calculated for the activities described previously (i.e., residential excavation and associated activities, street trenching/pipe installation, well installation, and street paving) and include exhaust emissions and fugitive GHG emissions from

contaminated soil (i.e., methane) that could be released to the atmosphere during soil handling activities. The emissions estimates take into account PDFs implemented during the construction activities that would limit, minimize, and reduce short-term GHG emissions. The majority of the emissions would be attributed to haul trucks exporting on-site materials or importing soil for the protective cover. Results of this analysis are presented in **Table 5.3-3**, *Unmitigated Short-Term Greenhouse Gas Emissions – Expedited Implementation Option*. As shown in Table 5.3-3 the short-term GHG emissions would not exceed SCAQMD's 10,000 $MTCO_2e$ per year threshold.

Table 5.3-3

Unmitigated Short-Term Greenhouse Gas Emissions
Expedited Implementation Option

Emission Source	Maximum Annual CO_2e (Metric Tons/year) [a]
Expedited Implementation Option (4 years)	3,480
Applicable threshold	**10,000**
Exceeds Significance Threshold?	**No**

[a] *Emissions calculations are included in Appendix D of this EIR.*

Source: PCR Services Corporation, 2014

Long-Term Impacts

Emissions of GHGs resulting with long-term operations associated with the RAP would be generated by long-term activities, which include worker commute trips to support monitoring and maintenance activities. As described in Section 2.0, Project Description, long-term activities may include monthly or less frequent LNAPL recovery, quarterly or less frequent groundwater monitoring, and monitoring of utility vaults and street soil vapor probes. In addition, annual inspections to verify that the SSD systems are operating (monitoring of the vacuum and flow rate of the SSD fan) would be conducted. Therefore, the number of vehicle trips to the site would be negligible and annual long-term GHG emissions would be several orders of magnitude smaller than the short-term GHG emissions. As discussed previously, methane detected at one property from biodegradation of residual petroleum hydrocarbons was detected at very low concentrations (less than 0.01 percent) at this property.[47] Furthermore, no methane exceedances were found at this property during the indoor air screening, and methane was not detected in indoor air samples analyzed by a laboratory.[48] Thus, methane emissions from the SVE/bioventing system would be negligible. As a result, impacts related to regional emissions from long-term operations of the proposed RAP would be less than significant.

Greenhouse Gas Plan Conflicts

Threshold GHG-2: Would the project conflict with the greenhouse gas emissions reductions goals and strategies of HSC Division 25.5?

[47] *Ibid., 3-7, 3-8.*

[48] *Ibid., 3-8.*

Impact Statement GHG-2: *Implementation of the RAP would incorporate GHG reduction strategies that would be consistent with applicable GHG reduction plans. Therefore, implementation of the RAP under the Expedited Implementation Option would not conflict with plans for reducing GHG emissions and impacts relative to this threshold would be less than significant.*

Short-Term Impacts

As discussed in the Regulatory Framework section above, the State has promulgated regulations and programs for the purpose of reducing GHG emissions. The GHG emissions analysis in this EIR was performed in accordance with SCAQMD and CARB guidance developed in compliance with, and as a result of, those regulations and programs. The result of the analysis of the project's potential impacts in terms of GHG and global climate change indicates that the short-term and long-term GHG emissions from the project alone would not be expected to cause a direct physical change in the environment. Therefore, the project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHG.

The underlying purpose of the RAP is to remediate the site consistent with the Regional Board's Cleanup and Abatement Order (CAO) R4-2011-0046 dated March 11, 2011, as amended. The project objectives include limiting or minimizing environmental impacts associated with the cleanup activities. Although implementation of the RAP would result in a temporary increase in GHG emissions in the short-term, overall, the project would be considered consistent with the general goals of HSC Division 25.5 in that it would comply with applicable GHG reduction strategies. In support of HSC Division 25.5, the State has promulgated laws and strategies aimed at reducing GHG emissions, some of which are applicable to the remediation activities. Consistent with HSC Division 25.5, the Project would minimize short-term GHG emissions by using equipment that meet stringent USEPA emissions standards, using low carbon vehicle fuels as required under state law, and prohibiting diesel-fueled commercial motor vehicle idling consistent with CARB requirements. Additionally, the project would meet other applicable GHG reduction goals by incorporating strategies such as recycling non-hazardous on-site material to the maximum extent possible.

Since HSC Division 25.5 sets statewide targets for future GHG emissions, the Scoping Plan and other implementing tools of the law are clear that the reductions are not expected to occur uniformly from all sources or sectors. **Table 5.3-4,** *Greenhouse Gas Reduction Strategies*, contains a list of GHG-reduction strategies applicable to the project. Because the RAP would not conflict with strategies to reduce GHG emissions, it would be consistent with the overarching regulation to reduce GHG emissions. Therefore, implementation of the RAP would not conflict with plans for reducing GHG emissions and impacts relative to this threshold would be less than significant.

Expedited Implementation Option

The Expedited Implementation Option would incorporate the same GHG reduction strategies as the project (see Table 5.3-4). In addition, similar to the project, the Expedited Implementation Option would recycle non-hazardous on-site material to the maximum extent possible. Therefore, the Expedited Implementation Option would not conflict with plans for reducing GHG emissions and impacts relative to this threshold would be less than significant.

Table 5.3-4

Greenhouse Gas Reduction Strategies

Source	Description	Demonstration of Project Consistency
HSC Section 42823 and 43018.5 (Pavley Regulations)	Reduces GHG emissions in new passenger vehicles from 2012 through 2016. Also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020	Applies to all new vehicles.
Low Carbon Fuel Standard	Establishes protocols for measuring life-cycle carbon intensity of transportation fuels and helps to establish use of alternative fuels.	Applies to fuels utilized by the Project.
Climate Action Team	Reduce diesel-fueled commercial motor vehicle idling.	Project is committed to implementing.

Source: Climate Action Team, Attorney General's Office, 2011; PCR Services Corporation, 2014

Long-Term Impacts

As discussed above, emissions of GHGs associated with long-term operations would be generated by long-term activities, which include worker commute trips to support monitoring and maintenance activities. These sources of long-term GHG emissions would not conflict with applicable GHG reduction strategies shown in Table 5.3-4. Therefore, impacts relative to this threshold would be less than significant.

5. PROJECT ENERGY IMPLICATIONS

Short-Term - Project

Consistent with Appendix F, Energy Conservation, of the State *CEQA Guidelines*, the potential energy implications that would occur with the implementation of the RAP are evaluated. Since energy consumption is related to emissions of GHGs, this section includes relevant information and analyses that address the energy implications of the project as described in Appendix F of the State *CEQA Guidelines*. This section represents a summary of the project's anticipated short-term energy needs, impacts, and conservation measures.

Active remediation to implement the RAP would last for approximately 6 years. Heavy-duty equipment associated with RAP implementation activities would include diesel-fueled equipment and haul trucks. Heavy-duty equipment associated with remediation would include bobcats, generators, small excavators, pumps, compactors, street sweepers, and pavers. The majority of the equipment would likely be diesel-fueled; however, smaller equipment, such as air compressors and lifts may be electric-, gas-, or natural gas-fueled. Based on the number and type of construction equipment that would be used during project construction, and based on the estimated duration of construction, implementation of the RAP would use approximately 31,525 gallons of diesel fuel for heavy-duty equipment.[49]

[49] *Fuel consumption is estimated based on fuel consumption factors in the OFFROAD2011 emissions model and the project-specific equipment horsepower and load factor ratings.*

The demolition, excavation, trenching, well installation, and street paving activities would generate debris and soil requiring off-site disposal. In addition, backfill materials and equipment supplies would be delivered to the site. These activities would require diesel-fueled haul and delivery trucks. It is estimated that haul and delivery trucks would travel a total of approximately 2,683,006 miles to transport material to and from the site. Based on the number of truck miles traveled, implementation of the RAP would use approximately 465,200 gallons of diesel fuel for hauling and delivery of demolition debris, excavation materials, backfill materials, and equipment supplies.[50]

The number of site workers that would be required would vary based on the activity taking place. The transportation fuel required by construction workers would depend on the total number of worker trips estimated for the duration of RAP implementation. A 2009 study by the California Department of Transportation (Caltrans) found that the statewide average fuel economy for all vehicle types (automobiles, trucks, and motorcycles) was 18.133 miles per gallon.[51] In 2012, California consumed a total of 337,666 thousand barrels of gasoline for transportation, which is equivalent to a total annual consumption of 14.1 billion gallons by the transportation sector.[52] For diesel, California consumed a total of 72,945 thousand barrels for transportation, which is equivalent to a total annual consumption of 3 billion gallons by the transportation sector.[53] According to the California Emissions Estimator Model (CalEEMod), worker roundtrips are assumed to be approximately 21.6 miles per round trip. Based on this data, approximately 82 percent of fuel by volume used in the transportation sector is gasoline. Assuming construction worker vehicles have an average fuel economy consistent with the Caltrans study and assuming the gasoline to diesel ratio is similar to the data provided above, based on the projected number of workers during all activities associated with RAP implementation, approximately 60,319 gallons of gasoline and 13,241 gallons of diesel fuel would be used for worker trips.

Based on the fuel usage amounts presented above, implementation of the RAP would use approximately 60,319 gallons of gasoline and 478,441gallons of diesel, assuming heavy-duty construction equipment is primarily diesel-fueled. Based on the statewide 2012 fuel use data for the transportation sector provided above, implementation of the RAP would use approximately 0.0004 percent of the statewide annual gasoline consumption and 0.02 percent of the statewide annual diesel consumption in the short-term.

As discussed previously, implementation of the RAP would incorporate PDFs to minimize equipment idling and traffic congestion. The project would prohibit the idling of on- and off-road heavy duty diesel vehicles for more than five minutes at a time (PDF AQ-3) and would provide a dedicated off-site worker parking area to minimize traffic congestion at or near the site (PDF AQ-11). In addition, newer Tier 3 equipment would be used for on-site remediation activities (PDF AQ-1) and model year 2007 of later haul trucks would be used to transport materials to and from the site (PDF AQ-2). Idling restrictions and the use of newer engines and equipment would result in less fuel combustion and energy consumption. Compliance with the above anti-idling and emissions regulations would result in efficient use of construction-related energy and the

[50] *Fuel consumption is estimated based on fuel consumption factors in the EMFAC2011 on-road vehicle emissions model for heavy-heavy-duty construction trucks and trip distances in the California Emissions Estimator Model (CalEEMod).*

[51] *California Department of Transportation, 2008 California Motor Vehicle Stock, Travel and Fuel Forecast, Table 7, (2009).*

[52] *U.S. Energy Information Administration, Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2012, http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_mg.html&sid=US. Accessed July 2014.*

[53] *U.S. Energy Information Administration, Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2012, http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_use_df.html&sid=US. Accessed July 2014.*

minimization or elimination of wasteful and unnecessary consumption of energy. The efficient use of energy and the minimization or elimination of wasteful and unnecessary consumption of energy leads to the minimization or elimination of wasteful and unnecessary GHG emissions, which is consistent with the State's goals and regulations intended to reduce GHG emissions.

Short-Term - Expedited Implementation Option

Consistent with Appendix F, Energy Conservation, of the State *CEQA Guidelines*, the potential energy implications that would occur with the implementation of the RAP are evaluated. The Expedited Implementation Option would take approximately 4 years and would require the same types of heavy-duty equipment as the RP's Proposed Remedy. While the Expedited Implementation Option would result in increased daily activities at the site, the total amount of activity would remain the same as the RP's Proposed Remedy. Therefore, the Expedited Implementation Option would result in the same total short-term fuel and energy use as discussed for the RP's Proposed Remedy.

The Expedited Implementation Option would incorporate the same PDFs as the RP's Proposed Remedy to minimize equipment idling and traffic congestion. Idling restrictions and the use of newer engines and equipment would result in less fuel combustion and energy consumption. Similar to the RP's Proposed Remedy, compliance with the anti-idling and emissions regulations, as well as the use of newer equipment and trucks, would result in efficient use of construction-related energy and the minimization or elimination of wasteful and unnecessary consumption of energy. The efficient use of construction-related energy and the minimization or elimination of wasteful and unnecessary consumption of energy leads to the minimization or elimination of wasteful and unnecessary GHG emissions, which provides additional support that the Expedited Implementation Option would not conflict with the State's plans and strategies to reduce GHG emissions.

Long-Term

With respect to Appendix F of the State *CEQA Guidelines*, long-term energy implications would be generally negligible. Worker commute trips to support monitoring and maintenance activities would be minimal. As described in Section 2.0, *Project Description*, long-term activities may include monthly or less frequent LNAPL recovery, quarterly or less frequent groundwater monitoring, and monitoring of utility vaults and street soil vapor probes. In addition, annual inspections to verify that the SSD systems are operating (monitoring of the vacuum and flow rate of the SSD fan) would be conducted. Therefore, the number of vehicle trips to the site would be negligible. The fuel used for these vehicle trips would be several orders of magnitude smaller than the short-term fuel use numbers discussed above. The electricity to run the SVE/bioventing system would be negligible. The system would be regularly maintained to ensure equipment is operating as intended, and minimize the potential for wasteful and unnecessary consumption of energy from equipment in the long-term.

6. ALTERNATIVES ANALYSIS

Analysis of Impacts Associated with Alternative 1 (No Project Alternative)

The No Project Alternative would not involve any excavation of soils or change to existing conditions that would result in new sources of GHG emissions at the site. The No Project Alternative would avoid any

potential excavation-related impacts associated with GHG emissions, which were determined to be less than significant under the RAP with the implementation of PDFs. Thus, the No Project Alternative would avoid the RAP's GHG impacts.

Analysis of Impacts Associated with Alternative 2 (Excavation Beneath Landscape and Hardscape to 10 Feet Alternative)

This Alternative would entail excavation of soils from landscaping and beneath residential hardscape to a depth of 10 feet below ground surface (bgs) at all affected properties. Unlike the RP's Proposed Remedy, which would require approximately 6 years, this Alternative would require proportionately additional years in order to excavate the additional materials. This Alternative would also implement the same PDFs as described previously.

Greenhouse Gas Emissions

Short-Term Impacts

Alternative 2 has the potential to create short-term GHG impacts through the use of heavy-duty construction equipment and through vehicle trips generated from haul trucks, vendor trucks, and construction workers and visitors traveling to and from the site. Daily activity levels under this Alternative would be the same as the RP's Proposed Remedy. Remedial activities would occur for a greater number of days overall to account for the additional excavated material. The GHG emissions estimates take into account the same PDFs as the RP's Proposed Remedy. As shown in **Table 5.3-5**, *Unmitigated Short-Term Greenhouse Gas Emissions – Alternative 2,* the total short-term GHG emissions under this Alternative would not exceed SCAQMD's 10,000 $MTCO_2e$ per year threshold and impacts would be less than significant.

Table 5.3-5

Unmitigated Short-Term Greenhouse Gas Emissions – Alternative 2

Emission Source	Maximum Annual CO_2e (Metric Tons/year)
Alternative 2 – Implementation of the RAP (6 years)	1,976
Applicable threshold	**10,000**
Exceeds Significance Threshold?	**No**

Source: PCR Services Corporation, 2014

Long-Term Impacts

Alternative 2 would include the same long-term activities and equipment as the RP's Proposed Remedy. As a result, emissions of GHGs associated with long-term operations under Alternative 2 would be the same as the RP's Proposed Remedy. As a result, impacts related to GHG emissions from long-term operations under this Alternative would be less than significant.

Greenhouse Gas Plan Conflicts

Short-Term Impacts

The PDFs under Alternative 2, which would be the same as the RP's Proposed Remedy, would minimize equipment idling and traffic congestion. While this alternative would result in a temporary increase in GHG emissions in the short-term, overall, Alternative 2 would be considered consistent with the general goals of HSC Division 25.5 in that it would comply with applicable GHG reduction strategies. Consistent with HSC Division 25.5, this Alternative would minimize short-term GHG emissions by using equipment that meet stringent USEPA emissions standards, using low carbon vehicle fuels as required under state law, and prohibiting diesel-fueled commercial motor vehicle idling consistent with CARB requirements. Additionally, this Alternative would meet other applicable GHG reduction goals by incorporating strategies such as recycling non-hazardous on-site material to the maximum extent possible. Because this alternative would not conflict with strategies to reduce GHG emissions, it would be consistent with the overarching regulation to reduce GHG emissions. Therefore, this Alternative would not conflict with plans for reducing GHG emissions and impacts relative to this threshold would be less than significant.

This Alternative would incorporate the same PDFs as the RP's Proposed Remedy to minimize equipment idling and traffic congestion. Idling restrictions and the use of newer engines and equipment would result in less fuel combustion and energy consumption. Similar to the RP's Proposed Remedy, compliance with the anti-idling and emissions regulations, as well as the use of newer equipment and trucks, would result in efficient use of construction-related energy and the minimization or elimination of wasteful and unnecessary consumption of energy. However, since this Alternative would include excavation to 10 feet bgs at properties requiring excavation, it would result in the removal of soils that do not warrant excavation as per the Site-Specific Cleanup Goals (SSCGs). As such, this Alternative would require the use of additional transportation fuels to transport the increased amounts of excavation and backfill materials to and from the site as compared to the RP's Proposed Remedy. From a transportation energy perspective, this Alternative would less efficient than the RP's Proposed Remedy due to the need to transport materials that do not warrant excavation as per the SSCGs.

Long-Term Impacts

As discussed above, emissions of GHGs associated with long-term operations would be the same under Alternative 2 as the RP's Proposed Remedy. Similar to the RP's Proposed Alternative, long-term GHG emissions would not conflict with applicable GHG reduction strategies shown in Table 5.3-4. Therefore, impacts relative to this threshold would be less than significant.

Energy Implications

Short-Term Impacts

In accordance with Appendix F of the State *CEQA Guidelines*, in order to ensure that energy implications are considered in project decisions, the potential energy implications of this Alternative are considered. Since energy consumption is related to emissions of GHGs, this section includes relevant information that address the energy implications of the project as described in Appendix F of the State *CEQA Guidelines*. This Alternative would take approximately 8 years and would require the same types of heavy-duty equipment as the RP's Proposed Remedy. Based on the number and type of construction equipment that would be used, and based on the estimated duration of RAP implementation under this Alternative, approximately 43,936

gallons of diesel fuel would be used for heavy-duty equipment.[54] Similar to the RP's Proposed Remedy, this Alternative would require diesel-fueled haul and delivery trucks. Based on the additional, excavation and backfill materials needed for this Alternative, approximately 743,657 gallons of diesel would be used to transport materials to and from the site. Under this Alternative, based on the projected number of workers during all remediation activities, approximately 75,819 gallons of gasoline and 16,643 gallons of diesel fuel would be used for worker trips. Thus, the Alternative 2 would use in total approximately 75,819 gallons of gasoline and 760,300 gallons of diesel, assuming heavy-duty construction equipment is primarily diesel-fueled. Based on the statewide 2012 fuel use data for the transportation sector provided above, implementation of the RAP would use approximately 0.0005 percent of the statewide annual gasoline consumption and 0.03 percent of the statewide annual diesel consumption in the short-term.

Long-Term Impacts

With respect to Appendix F of the State *CEQA Guidelines*, as would be the case with the RP's Proposed Remedy, long-term energy implications under this Alternative would be generally negligible. Worker commute trips would be limited to monthly or less frequent trips for LNAPL recovery and quarterly or less frequent trips for groundwater monitoring and monitoring of utility vaults and street soil vapor probes. Annual inspection trips would occur for SSD systems maintenance. Therefore, the number of vehicle trips to the site would be negligible. The fuel used for these vehicle trips would be orders of magnitude smaller than the short-term fuel use numbers discussed above. The electricity to run the SVE/bioventing system would be negligible. The system would be regularly maintained to ensure equipment is operating as intended. Regular maintenance would minimize or eliminate the potential for wasteful and unnecessary consumption of energy from equipment.

Analysis of Impacts Associated with Alternative 3 (No Excavation Beneath Hardscape – 5 Feet With Targeted 10 Feet Alternative)

Alternative 3 would not remove hardscape features or entail excavation of soils from beneath residential hardscape. As with the RP's Proposed Remedy, excavation would be to a depth of 5 feet with targeted 10 feet excavations where needed. Because excavations would not occur beneath hardscape features and no hardscape features would be removed, less excavation of COC-containing soils and inert debris would occur over individual residential properties. Total remediation would occur over an approximately 4-year period compared to approximately 6 years under the RP's Proposed Alternative. Daily demolition and excavation volumes, truck trips, and worker commutes are anticipated to be the same as the project. This Alternative would also implement the same PDFs described above.

Short-Term Impacts

Alternative 3 has the potential to create short-term GHG impacts through the use of heavy-duty construction equipment and through vehicle trips generated from haul trucks, vendor trucks, and construction workers and visitors traveling to and from the site. Daily activity levels under this Alternative would be the same as the RP's Proposed Remedy. Remedial activities would occur for a fewer number of days overall to account for the reduced volume of excavated material. The GHG emissions estimates take into account PDFs

[54] *Fuel consumption is estimated based on fuel consumption factors in the OFFROAD2011 emissions model and the project-specific equipment horsepower and load factor ratings.*

implemented during the construction activities that would limit, minimize, and reduce short-term GHG emissions include: utilizing construction equipment meeting the USEPA Tier 3 off-road emission standards (PDF AQ-1); utilizing on-road export haul trucks that at a minimum comply with the USEPA 2007 on-road emissions standards (PDF AQ-2); prohibit the idling of on- and off-road heavy duty diesel vehicles for more than five minutes at a time (PDF AQ-3); utilizing low carbon fuels as required by state law (PDF GHG-1); and, to the maximum practical extent, recyclable materials, including non-hazardous construction and demolition debris, would be reused or recycled (PDF AQ-12). The majority of the emissions would be attributed to haul trucks exporting on-site materials or importing backfill materials. As shown in **Table 5.3-6**, *Unmitigated Short-Term Greenhouse Gas Emissions – Alternative 3,* the total short-term GHG emissions under this Alternative would not exceed SCAQMD's 10,000 $MTCO_2e$ per year threshold and impacts would be less than significant.

Table 5.3-6

Unmitigated Short-Term Greenhouse Gas Emissions – Alternative 3

Emission Source	Maximum Annual CO_2e (Metric Tons/year)
Alternative 3 – Implementation of the RAP (4 years)	1,976
Applicable threshold	**10,000**
Exceeds Significance Threshold?	**No**

Source: PCR Services Corporation, 2014

Long-Term Impacts

Alternative 3 would include the same long-term activities and equipment as the RP's Proposed Remedy. As a result, emissions of GHGs associated with long-term operations under Alternative 2 would be similar to the RP's Proposed Remedy. As a result, impacts related to GHG emissions from long-term operations under this Alternative would be less than significant.

Greenhouse Gas Plan Conflicts

Short-Term Impacts

The PDFs under Alternative 3, which would be the same as the RP's Proposed Remedy, would minimize equipment idling and traffic congestion. While this alternative would result in a temporary increase in GHG emissions in the short-term, overall, Alternative 3 would be considered consistent with the general goals of HSC Division 25.5 in that it would comply with applicable GHG reduction strategies. Consistent with HSC Division 25.5, this Alternative would minimize short-term GHG emissions by using equipment that meet stringent USEPA emissions standards, using low carbon vehicle fuels as required under state law, and prohibiting diesel-fueled commercial motor vehicle idling consistent with CARB requirements. Additionally, this Alternative would meet other applicable GHG reduction goals by incorporating strategies such as recycling non-hazardous on-site material to the maximum extent possible. Because this alternative would not conflict with strategies to reduce GHG emissions, it would be consistent with the overarching regulation to reduce GHG emissions. Therefore, this Alternative would not conflict with plans for reducing GHG emissions and impacts relative to this threshold would be less than significant.

This Alternative would incorporate the same PDFs as the RP's Proposed Remedy to minimize equipment idling and traffic congestion. Idling restrictions and the use of newer engines and equipment would result in less fuel combustion and energy consumption. Similar to the RP's Proposed Remedy, compliance with the anti-idling and emissions regulations, as well as the use of newer equipment and trucks, would result in efficient use of construction-related energy and the minimization or elimination of wasteful and unnecessary consumption of energy. Since this Alternative would not excavate soils from beneath residential hardscape, it would result in the removal of less soil compared to the RP's Proposed Remedy. As such, this Alternative would require the use of less transportation fuels to transport the reduced amounts of excavation and backfill materials to and from the site as compared to the RP's Proposed Remedy.

Long-Term Impacts

As discussed above, emissions of GHGs associated with long-term operations would be similar under Alternative 2 as the RP's Proposed Remedy. Similar to the RP's Proposed Alternative, long-term GHG emissions would not conflict with applicable GHG reduction strategies shown in Table 5.3-4. Therefore, impacts relative to this threshold would be less than significant.

Energy Implications

Short-Term Impacts

In accordance with Appendix F of the State *CEQA Guidelines*, in order to ensure that energy implications are considered in project decisions, the potential energy implications of this Alternative are considered. Since energy consumption is related to emissions of GHGs, this section includes relevant information that address the energy implications of the project as described in Appendix F of the State *CEQA Guidelines*. This Alternative would take approximately 4 years and would require the same types of heavy-duty equipment as the RP's Proposed Remedy. Based on the number and type of construction equipment that would be used, and based on the estimated duration of RAP implementation under this Alternative, approximately 19,505 gallons of diesel fuel would be used for heavy-duty equipment.[55] Similar to the RP's Proposed Remedy, this Alternative would require diesel-fueled haul and delivery trucks. Based on the additional, excavation and backfill materials needed for this Alternative, approximately 205,329 gallons of diesel would be used to transport materials to and from the site. Under this Alternative, based on the projected number of workers during all remediation activities, approximately 35,781 gallons of gasoline and 7,854 gallons of diesel fuel would be used for worker trips. Thus, Alternative 3 would use approximately 35,781 gallons of gasoline and 213,163 gallons of diesel, assuming heavy-duty construction equipment is primarily diesel-fueled. Based on the statewide 2012 fuel use data for the transportation sector provided above, implementation of the RAP would use approximately 0.0003 percent of the statewide annual gasoline consumption and 0.007 percent of the statewide annual diesel consumption in the short-term.

Long-Term Impacts

With respect to Appendix F of the State *CEQA Guidelines*, as would be the case with the RP's Proposed Remedy, long-term energy implications under this Alternative would be generally negligible. Worker commute trips would be limited to monthly or less frequent trips for LNAPL recovery and quarterly or less

[55] *Fuel consumption is estimated based on fuel consumption factors in the OFFROAD2011 emissions model and the project-specific equipment horsepower and load factor ratings.*

frequent trips for groundwater monitoring and monitoring of utility vaults and street soil vapor probes. Annual inspection trips would occur for SSD systems maintenance. Therefore, the number of vehicle trips to the site would be negligible. The fuel used for these vehicle trips would be orders of magnitude smaller than the short-term fuel use numbers discussed above. The electricity to run the SVE/bioventing system would be negligible. The system would be regularly maintained to ensure equipment is operating as intended. Regular maintenance would minimize or eliminate the potential for wasteful and unnecessary consumption of energy from equipment.

6. CUMULATIVE IMPACTS

Emitting GHGs into the atmosphere is not itself an adverse environmental effect. Rather, it is the increased accumulation of GHGs in the atmosphere that may result in global climate change. The resultant consequences of that climate change can cause adverse environmental effects. Due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, it is not possible to predict the specific impact, if any, to global climate change from one project's relatively small incremental increase in emissions.

As shown in Table 5.3-4, implementation of the RAP would incorporate GHG reduction strategies consistent with GHG reduction plans. Because of the complex physical, chemical and atmospheric mechanisms involved in global climate change, there is no basis for concluding that an emissions increase resulting from the project and the related projects could actually cause a measurable increase in global GHG emissions sufficient to force global climate change. In addition, emissions models used for project-level evaluations do not fully reflect improvements in technology and other reductions in GHG emissions that are likely to occur pursuant to State regulations, such as HSC Section 42823 and 43018.5, SB 1368, HSC Division 25.5, and Executive Order S-3-5, as well as future federal and/or state regulations. Therefore, it is not possible or meaningful to calculate emissions from each of the identified related projects and compare that with a numeric threshold or reduction target.

The project would cause a temporary increase in GHG emissions in the short-term, but is not expected to exceed the applicable significance threshold. The project would minimize short-term GHG emissions by using newer, cleaner, and energy efficient equipment as available. Long-term GHG emissions would be relatively minimal and consistent with applicable GHG reduction strategies. Therefore, implementation of the RAP would have a less than significant impact on the environment based on the above mentioned thresholds. Based on the above considerations, the project would not cause a cumulatively considerable impact and mitigation measures would not be required.

7. MITIGATION MEASURES

With the implementation of existing regulations and PDFs described above, the RP's Proposed Remedy nor the Expedited Implementation Option would result in significant impacts with respect to GHG emissions. Therefore, no mitigation measures would be necessary for the RP's Proposed Remedy or the Expedited Implementation Option.

With regard to alternatives, the No Project Alternative would not involve any excavation or other physical activity and would not result in any net new GHG emissions. Therefore, mitigation measures would not be

required for this Alternative. Alternative 2 and Alternative 3 would not result in significant impacts with respect to GHG emissions. Therefore, no mitigation measures would be necessary for Alternative 2 or Alternative 3.

8. LEVEL OF SIGNIFICANCE AFTER MITIGATION

No potentially significant impacts with respect to GHG emissions have been identified. No mitigation measures would be necessary. Because the RP's Proposed Remedy, Alternative 2, and Alternative 3 would be consistent with the applicable GHG reduction plans, mitigation measures would not be required. No significant impacts with respect to GHG emissions would occur. Alternative 1, the No Project Alternative, would not involve any physical activity or result in any net new GHG emissions. Therefore, no impacts are associated with the No Project Alternative.

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