3.7 Greenhouse Gas Emissions

This section provides a discussion of existing climate conditions and global climate change, existing regulations pertaining to global climate change, climate change science, and potential greenhouse gas (GHG) emissions resulting from development of the proposed project as well as the current state of GHG emissions and its sources in California.

Impacts related to GHG emissions are analyzed and mitigation measures are provided for any potentially significant impacts. The methods of analyzing emissions described in this section are consistent with the Department of Water Resources' (DWR's) Greenhouse Gas Emissions Reduction Plan (GGERP).

3.7.1 Environmental Setting

Climate Change Overview

Various gases in the earth's atmosphere, classified as GHGs, play a critical role in determining its surface temperature. Solar radiation enters the earth's atmosphere from space, and a portion of the radiation is absorbed by the earth's surface. The earth reradiates this energy back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation (that otherwise would have escaped back into space) is now retained in the atmosphere, and results in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), chlorofluorocarbons (CFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Much of the scientific literature suggests that human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of earth's climate, known as global climate change or global warming. While there has been debate regarding this issue, science now shows with a 95 percent certainty that the dominant cause of climate change since the mid-20th century results from human activities. It is likely that more than half of the increase in average global temperature between 1951 and 2010 is the result of human activities (IPCC, 2013);

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 57 percent is sequestered through ocean uptake (28 percent),

uptake by northern hemisphere forest regrowth, and other terrestrial sinks (29 percent), whereas the remaining 43 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC, 2013).

Similarly, impacts of GHGs are borne globally, as opposed to localized air quality effects of criteria air pollutants and toxic air contaminants. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, it is clear that the quantity is enormous, and no single project would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climates. From the standpoint of the California Environmental Quality Act (CEQA), GHG impacts to global climate change are inherently cumulative.

Greenhouse Gas Emission Sources

According to much of the scientific literature on this topic, emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural sectors (CARB, 2014a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CARB, 2014a). Emissions of CO_2 are by-products of fossil fuel combustion. CH_4, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, and are two of the most common processes of CO_2 sequestration.

California is the 12th to 16th largest emitter of CO_2 in the world (CEC, 2006). California produced approximately 459 million gross metric tons of CO_2 equivalent (CO_2e) in 2012 (CARB, 2014a). CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. Expressing emissions in CO_2e takes the contributions to the greenhouse effect of all GHG emissions and converts them to the equivalent effect that would occur if only CO_2 were being emitted. This measurement, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 25 tons of CO_2 (IPCC, 2007)[1]. Therefore, CH_4 is a much more potent GHG than CO_2.

[1] GHG emissions in the current CARB Climate Change Scoping Plan were calculated using the 100 year GWPs identified in the IPCC's Fourth Assessment Report released in 2007. Therefore these GWPs are used in this report for consistency.

3.7.2 Regulatory Framework

Federal

Federal Clean Air Act

The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to define national ambient air quality standards to protect public health and welfare in the United States. The CAA does not specifically regulate GHG emissions; however, on April 2, 2007, the *U.S. Supreme Court in Massachusetts v. U.S. Environmental Protection Agency*, determined that GHGs are pollutants that can be regulated under the CAA. Currently, there are no federal regulations that establish ambient air quality standards for GHGs.

On December 7, 2009, USEPA adopted its Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding). The Endangerment Finding is based on Section 202(a) of the CAA, which states that the USEPA Administrator should regulate and develop standards for "emission[s] of air pollution from any class or classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The rule addresses Section 202(a) in two distinct findings. The first addresses whether the concentrations of the six key GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and, therefore, contribute to the threat of climate change.

The USEPA Administrator determined that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wild fires, droughts, sea level rise, higher intensity storms) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and welfare of current and future generations.

The USEPA Administrator also found that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHGs fit within the CAA definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but, rather, allow EPA to finalize the GHG standards proposed earlier in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.

Specific GHG regulations that USEPA has adopted to date are as follows:

> **40 Code of Federal Regulations (CFR) Part 98. Mandatory Reporting of Greenhouse Gases Rule.** This rule requires mandatory reporting of GHG emissions for

facilities that emit more than 25,000 metric tons of CO_2e emissions per year. Additionally, reporting of emissions is required for owners of SF_6- and PFC-insulated equipment when the total nameplate capacity of these insulating gases is above 17,280 pounds.

40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule. This rule sets GHG emissions thresholds that define when permits under the USEPA's New Source Review Prevention Significant Deterioration (PSD) and Title V Operating Permit programs would be required for new and existing industrial facilities. The first step of the USEPA's tailoring rule, which took effect January 2, 2011, required sources that were already subject to PSD requirements to obtain permits for their GHG emissions if they emit 75,000 tons of CO_2e per year. Beginning July 1, 2011, the second phase applied permitting requirements to all stationary sources with GHG emissions of at least 100,000 tons of CO_2e annually or that made modifications increasing their emissions by at least 75,000 tons per year. The requirements applied to sources even if they were not previously subject to permitting for other pollutants.

State

California Air Resources Board

The California Air Resources Board (CARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California. Various statewide and local initiatives to reduce the state's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is under way and there is a real potential for severe adverse environmental, social, and economic effects in the long term. Because every nation emits GHGs and therefore makes an incremental cumulative contribution to global climate change, cooperation on a global scale will be required to reduce the rate of GHG emissions to a level that can help to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing CARB to develop actions to reduce GHG emissions, and several state legislative actions related to climate change and GHG emissions have come to realization in the past decade.

Assembly Bill 1493 (Pavley)

In 2002, former Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 required that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, in 2004 CARB approved amendments to the California Code of Regulations (CCR) adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating of less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year.

On September 15, 2009, EPA and the Department of Transportation's National Highway Safety Administration (NHTSA) proposed a National Program to reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States. The combined EPA and NHTSA standards that made up the proposed National Program applied to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They required these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, equivalent to 35.5 miles per gallon (mpg). In December 2011, NHTSA and EPA issued a joint proposal to extend the National Program to further improve fuel economy and reduce GHG emissions for passenger and light-duty vehicles for model years 2017–2025. This would be accomplished through new proposed Corporate Average Fuel Economy (CAFE) standards by NHTSA and new GHG emission standards by EPA. The proposed CAFE standards are projected to require, on an average industry-fleet-wide basis for cars and trucks combined, 40.1 mpg in model year 2021, and 49.6 mpg in model year 2025. EPA's proposed GHG standards, which would be harmonized with NHTSA's CAFE standards, are projected to require 163 grams/mile (54.5 mpg) of CO_2 in model year 2025.

Executive Order S-03-05

Executive Order S-03-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions were to be reduced to the 2000 level by 2010 and are to be further reduced to the 1990 level by 2020 and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing progress made toward reaching the emission targets, impacts of global warming on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of CalEPA created the California Climate Action Team (CCAT) made up of members from various state agencies and commissions. CCAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government, and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32 (California Global Warming Solutions Act of 2006)

In September 2006, Governor Arnold Schwarzenegger signed the California Global Warming Solutions Act (AB 32; California Health and Safety Code Division 25.5, Sections 38500 through 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that began to be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. According to CARB's Scoping Plan, the 2020 target of 427 million metric tons (MMT) CO_2e requires the reduction of 169 MMT CO_2e, or approximately 28.4 percent, from the state's projected 2020 business-as-usual (BAU) emissions level of 596 MMT CO_2e. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions. In August 2011, the Scoping Plan was reapproved by the CARB and includes the Final Supplement to the Scoping Plan Functional Equivalent Document. This document includes expanded analysis of project alternatives as well as updates the 2020 emission projections in light of the current economic forecasts. Considering the updated 2020 BAU estimate of 507 MMT CO_2e, a 16 percent reduction below the estimated BAU levels would be necessary to return to 1990 levels by 2020. The document also excludes one measure identified in the 2008 Scoping Plan that has been adopted and one measure that is no longer under consideration by CARB (CARB, 2011).

As required by AB 32, the Scoping Plan must be updated at least every 5 years to evaluate the mix of AB 32 policies to ensure that California is on track to meet the targets set out in the legislation. As such, a draft Update to the initial Scoping Plan was developed by CARB in collaboration with the CCAT and was presented to CARB's Board for discussion at its February 20, 2014 meeting. The draft Update builds upon the initial Scoping Plan with new strategies and expanded measures, and identifies opportunities to leverage existing and new funds to drive GHG emission reductions through strategic planning and targeted program investments. The first update to the AB 32 Scoping Plan was approved on May 22, 2014, by CARB (CARB, 2014b).

Senate Bill 97

Senate Bill (SB) 97, signed August 2007 (Chapter 185, Statutes of 2007; Public Resources Code Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. The bill directs the California Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Natural Resources Agency, guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify or adopt those guidelines by January 1, 2010. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the CEQA Guidelines for GHG emissions, as required by SB 97. On February 16, 2010, the Office of Administrative Law approved the amendments and filed them with the Secretary of State for inclusion in the CCR. The amendments became effective on March 18, 2010.

California Air Resources Board Early Action Measures

In June 2007, CARB directed staff to pursue 37 early actions for reducing GHG emissions under AB 32. The broad spectrum of strategies to be developed—including a Low Carbon Fuel Standard (LCFS), regulations for refrigerants with high GWP, guidance and protocols for local governments to facilitate GHG reductions, and green ports—reflects the government's responsive actions to immediately address GHGs.

In addition to approving the 37 GHG reduction strategies, CARB directed staff to further evaluate early action recommendations made at the June 2007 meeting, and to report back to CARB within 6 months. CARB's approach suggested a desire to try to pursue greater GHG emissions reductions in California in the near-term. CARB staff evaluated all recommendations submitted by several stakeholders and several internally-generated staff ideas, and published a draft list of early action measures in September 2007. The list was expanded to 44 measures in October 2007 (CARB, 2007). The Board has also identified nine Discrete Early Action measures to date, including potential regulations affecting landfills, motor vehicle fuels, refrigerants in cars, port operations, and other sources.

California Air Resources Board Climate Change Scoping Plan

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations (CARB, 2008). CARB's Scoping Plan contains the main strategies California will implement to reduce CO_2e emissions by 169 MMT, or approximately 28.4 percent, from the state's projected 2020 emissions level of 596 MMT CO_2e under a BAU scenario. In August 2011, the Scoping Plan was reapproved by the Board and includes the Final Supplement to the Scoping Plan Functional Equivalent Document.

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (transportation, electrical power, commercial and residential, industrial, etc.). CARB used 3-year average emissions, by sector, for 2002–2004 to forecast

emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

CARB's Scoping Plan also breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the state's GHG inventory. CARB's Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e)
- The LCFS (15.0 MMT CO_2e)
- Energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems (26.3 MMT CO_2e)
- A renewable portfolio standard for electricity production (21.3 MMT CO_2e)

CARB has identified a GHG reduction target of 5 MMT (of the 174 MMT total) for local land use changes (Table 2 of CARB's Scoping Plan) by implementation of Reduction Strategy T-3 regarding Regional Transportation-Related GHG Targets. Additional land use reductions may be achieved as SB 375 is implemented. CARB's Scoping Plan states that successful implementation of the plan relies on local governments' land use, planning, and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. CARB further acknowledges that decisions on how land is used will have large effects on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. CARB's Scoping Plan does not include any direct discussion about GHG emissions generated by construction activity.

Table 3.7-1 shows the Recommended Actions contained in Appendices C and E of CARB's Scoping Plan. As discussed previously, a draft Update to the initial Scoping Plan was developed by CARB in collaboration with the CCAT to address the requirement by AB 32 that the Scoping Plan be updated at least every 5 years. The draft Update to the initial Scoping Plan developed by CARB in collaboration with the CCAT was presented to CARB's Board for discussion at its February 20, 2014, meeting. The draft Update builds upon the initial Scoping Plan with new strategies and expanded measures, and identifies opportunities to leverage existing and new funds to drive GHG emission reductions through strategic planning and targeted program investments. The first update to the AB 32 Scoping Plan was approved on May 22, 2014, by CARB.

As part of the proposed update to the Scoping Plan, the emissions reductions required to meet the 2020 statewide GHG emissions limit were further adjusted. The primary reason for adjusting the 2020 statewide emissions limit was based on the fact that the original Scoping Plan relied on the Intergovernmental Panel on Climate Change (IPCC) 1996 Second Assessment Report (SAR) to assign GHG GWPs. Recently, in accordance the United Nations Framework Convention on Climate Change (UNFCCC), international climate agencies

TABLE 3.7-1
RECOMMENDED ACTIONS FROM CARB CLIMATE CHANGE SCOPING PLAN

ID #	Sector	Strategy Name
T-1	Transportation	Pavley I and II – Light-Duty Vehicle GHG Standards
T-2	Transportation	LCFS (Discrete Early Action)
T-3	Transportation	Regional Transportation-Related GHG Targets
T-4	Transportation	Vehicle Efficiency Measures
T-5	Transportation	Ship Electrification at Ports (Discrete Early Action)
T-6	Transportation	Goods-movement Efficiency Measures
T-7	Transportation	Heavy Duty Vehicle GHG Emission Reduction Measure – Aerodynamic Efficiency (Discrete Early Action)
T-8	Transportation	Medium and Heavy-Duty Vehicle Hybridization
T-9	Transportation	High Speed Rail
E-1	Electricity and Natural Gas	Increased Utility Energy efficiency programs More stringent Building and Appliance Standards
E-2	Electricity and Natural Gas	Increase Combined Heat and Power Use by 30,000GWh
E-3	Electricity and Natural Gas	Renewables Portfolio Standard
E-4	Electricity and Natural Gas	Million Solar Roofs
CR-1	Electricity and Natural Gas	Energy Efficiency
CR-2	Electricity and Natural Gas	Solar Water Heating
GB-1	Green Buildings	Green Buildings
W-1	Water	Water Use Efficiency
W-2	Water	Water Recycling
W-3	Water	Water System Energy Efficiency
W-4	Water	Reuse Urban Runoff
W-5	Water	Increase Renewable Energy Production
W-6	Water	Public Goods Charge (Water)
I-1	Industry	Energy Efficiency and Co-benefits Audits for Large Industrial Sources
I-2	Industry	Oil and Gas Extraction GHG Emission Reduction
I-3	Industry	GHG Leak Reduction from Oil and Gas Transmission
I-4	Industry	Refinery Flare Recovery Process Improvements
I-5	Industry	Removal of CH_4 Exemption from Existing Refinery Regulations
RW-1	Recycling and Waste Management	Landfill CH_4 Control (Discrete Early Action)
RW-2	Recycling and Waste Management	Additional Reductions in Landfill CH_4 – Capture Improvements
RW-3	Recycling and Waste Management	High Recycling/Zero Waste
F-1	Forestry	Sustainable Forest Target
H-1	High GWP Gases	Motor Vehicle Air Conditioning Systems (Discrete Early Action)
H-2	High GWP Gases	SF_6 Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)
H-3	High GWP Gases	Reduction in PFCs in Semiconductor Manufacturing (Discrete Early Action)
H-4	High GWP Gases	Limit High GWP Use in Consumer Products (Discrete Early Action, Adopted June 2008)
H-5	High GWP Gases	High GWP Reductions from Mobile Sources
H-6	High GWP Gases	High GWP Reductions from Stationary Sources
H-7[a]	High GWP Gases	Mitigation Fee on High GWP Gases
A-1	Agriculture	CH_4 Capture at Large Dairies

[a] This original measure in the 2008 Scoping Plan was subsequently excluded by CARB in the Final Supplement to the Scoping Plan Functional Equivalent Document in 2011, as CARB staff concluded that implementation of this measure would not be feasible.

SOURCE: CARB, 2008.

have agreed to begin using the scientifically updated GWP values in the IPCC's Fourth Assessment Report (AR4) that was released in 2007. Because CARB has begun to transition to the use of the AR4 100-year GWPs in its climate change programs, CARB recalculated the Scoping Plan's 1990 GHG emissions level with the AR4 GWPs. As the recalculation resulted in 431 MMT CO_2e, the 2020 GHG emissions limit established in response to AB 32 is now slightly higher than the 427 MMT CO_2e in the initial Scoping Plan. Considering that the proposed update also adjusted the 2020 BAU forecast of GHG emissions to 509 MMT CO_2e, a 15 percent reduction below the estimated BAU levels was determined to be necessary to return to 1990 levels by 2020 (CARB, 2014b).

California Office of Planning and Research's 2008 Technical Advisory

On June 19, 2008, OPR published a technical advisory on CEQA and climate change. The advisory provided OPR's perspective on the emerging role of CEQA in addressing climate change and GHG emissions, while recognizing that approaches and methodologies for calculating GHG emissions and addressing environmental impacts through CEQA review are rapidly evolving. The advisory recognized that OPR would develop amendments to the CEQA Guidelines pursuant to SB 97 as was done in 2010. The Natural Resources Agency would then adopt these amendments. The technical advisory pointed out that neither CEQA nor the CEQA Guidelines prescribe quantitative thresholds of significance or particular methodologies for performing an impact analysis by stating, "This is left to lead agency judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable" (OPR, 2008). This deference to lead agencies was memorialized in the CEQA Guidelines Section 15064.4 as discussed below. OPR recommended, at the time, that "the global nature of climate change warrants investigation of a statewide threshold of significance for GHG emissions" (OPR, 2008).

Until such a standard is established, OPR advises that each lead agency should develop its own approach to performing analyses for projects that generate greenhouse gas emissions (OPR, 2008). Agencies should then assess whether the emissions are "cumulatively considerable" even though a project's GHG emissions may be individually limited. OPR states, "Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment" (OPR, 2008). Based on this, individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice (OPR, 2008).

If the lead agency determines emissions are a cumulatively considerable contribution to a significant cumulative impact, then the lead agency must investigate and implement ways to mitigate the emissions (OPR, 2008). OPR states that "Mitigation measures will vary with the type of project being contemplated, but may include alternative project designs or locations that conserve energy and water, measures that reduce vehicle miles traveled (VMT) by fossil-fueled vehicles, measures that contribute to established regional or programmatic mitigation strategies, and measures that sequester carbon to offset the emissions from the project" (OPR, 2008). OPR concludes that "a lead agency is not responsible for wholly eliminating all GHG emissions from a project; the CEQA standard is to mitigate to a level that is "less than significant" (OPR, 2008).

The technical advisory includes a list of mitigation measures that can be applied on a project-by-project basis.

California Environmental Quality Act Guidelines Revisions

In 2007, the State Legislature passed SB 97, which required amendment of the CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA. The California Natural Resources Agency adopted these amendments on December 30, 2009, and they took effect on March 18, 2010, after review by the Office of Administrative Law and filing with the Secretary of State for inclusion in the CCR.

The CEQA Guidelines revisions include a new section (Section 15064.4) that specifically addresses the potential significance of GHG emissions. Section 15064.4 calls for a "good-faith effort" to "describe, calculate or estimate" GHG emissions; Section 15064.4 further states that the analysis of the significance of any GHG impacts should include consideration of the extent to which the project would increase or reduce GHG emissions; exceed a locally applicable threshold of significance; and comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions." The new Guidelines also state that a project may be found to have a less-than-significant impact on GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (Section 15064(h)(3)). However, the Guidelines do not require or recommend a specific analytical methodology or provide quantitative criteria for determining the significance of GHG emissions.

No quantitative significance threshold is included in the Amendments. The CEQA Guidelines afford the customary deference provided to lead agencies in their analysis and methodologies. OPR emphasizes the necessity of having a consistent threshold available to analyze projects, and the analyses should be performed based on the best available information. For example, if a lead agency determines that GHGs may be generated by a proposed project, the agency is responsible for assessing GHG emissions by type and source. The CEQA Guidelines Amendments provide the following recommendations for determining the significance of GHG emissions under Section 15064.4:

(a) The determination of the significance of GHG emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

    (1) Use a model or methodology to quantify GHG emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or

    (2) Rely on a qualitative analysis or performance based standards.

(b) A lead agency may consider the following when assessing the significance of impacts from GHG emissions on the environment:

(1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and

(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

The Amendments also include a new Subdivision 15064.7(c), which clarifies that in developing thresholds of significance, a lead agency may appropriately review thresholds developed by other public agencies, or recommended by other experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

In addition, the Amendments include a new Section 15183.5 that provides for tiering and streamlining the analysis of GHG emissions. Project-specific environmental documents may rely on an Environmental Impact Report (EIR) containing a programmatic analysis of GHG emissions in the region over a specified time period.

Finally, the Amendments add a new set of environmental checklist questions (VII. Greenhouse Gas Emissions) to the CEQA Guidelines Appendix G, which are provided in this section under *Thresholds of Significance*.

California Department of Water Resources Greenhouse Gas Emissions Reduction Plan

In an effort to reduce its impact on the environment, DWR developed and approved its Climate Action Plan Phase I: GGERP on May 24, 2012, to guide its project development and decision making with respect to energy use and GHG emissions. The GGERP, which addresses reduction of GHG emissions from DWR activities, represents the first phase of DWR's Climate Action Plan. Future phases of the Climate Action Plan, which are currently under development, will address technical approaches for characterizing and analyzing the impacts of climate change on DWR activities (both existing and planned), and measures for resiliency and adaption to future conditions expected as a result of climate change.

Specifically, the GGERP shows how DWR will make substantial reductions in its GHG emissions in the near-term (present to 2020) and how it will continue to reduce emissions beyond 2020 to achieve its long-term (2050) GHG emissions reduction goals. To this end, the GGERP

lays out both near-term and long-term GHG emissions reduction goals to guide decision making though 2050:

- Near-term goal – reduce emissions by 50 percent below 1990 levels by 2020
- Long-term goal – reduce emissions by 80 percent below 1990 levels by 2050

To meet these GHG emissions reduction goals, DWR identified 11 GHG emissions reduction measures that it will implement. These 11 GHG emissions reduction measures include DWR's termination of its participation and associated delivery of electricity from a coal-fired power plant, efficiency improvements to DWR's existing facilities, purchase and development of renewable and high-efficiency electricity supplies, comprehensive improvements to DWR's construction practices, and improvements to DWR's business activities that will reduce GHG emissions. In total, these measures will reduce annual GHG emissions in 2020 by over 1 MMT and by over 2.5 MMT in 2050.

3.7.3 Impacts and Mitigation Measures

Significance Criteria

Based on Appendix G of the CEQA Guidelines, a project would have a significant effect on GHG emissions if it would:

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

Methodology

In May 2012, DWR adopted the GGERP, which details DWR's efforts to reduce its GHG emissions consistent with Executive Order S-3-05 and the Global Warming Solutions Act of 2006 (AB 32). DWR also adopted the Initial Study/Negative Declaration prepared for the GGERP in accordance with the CEQA Guidelines review and public process. Both the GGERP and Initial Study/Negative Declaration are incorporated herein by reference and are available at: http://www.water.ca.gov/climatechange/CAP.cfm. The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices (e.g. building-related energy use). The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve these goals.

DWR prepared its GGERP as a "Plan for the Reduction of Greenhouse Gas Emissions" for purposes of CEQA Guidelines Section 15183.5. That section provides that such a document, which must meet certain specified requirements, "may be used in the cumulative impacts analysis of later projects." Because global climate change, by its very nature, is a global cumulative impact, an individual project's compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project's incremental contribution to that cumulative impact to a level that is not "cumulatively considerable" (see CEQA Guidelines, Section 15064, subd. [h][3].)

More specifically, "[l]ater project-specific environmental documents may tier from and/or incorporate by reference" the "programmatic review" conducted for the GHG emissions reduction plan. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." (CEQA Guidelines, Section 15183.5, subd. [b][2].) The GGERP is used in this EIR to streamline the CEQA analysis and by analyzing the project's potential to contribute to the cumulative impact of increased GHG concentrations in the atmosphere.

Section 12 of the GGERP outlines the steps that each DWR project will take to demonstrate consistency with the GGERP. These steps include:

1. Identify, quantify, and analyze the GHG emissions from the proposed project and alternatives using a method consistent with that described in DWR internal guidance: "Guidance for Quantifying Greenhouse Gas Emissions and Determining the Significance of their Contribution to Global Climate Change for CEQA Purposes," as such guidance document may be revised.
2. Determine that construction emissions levels do not exceed the Extraordinary Construction Project threshold of 25,000 metric ton (MT) CO_2e for the entire construction phase of the project nor do they exceed 12,500 MT CO_2e in any single year of construction.
3. Incorporate into the design or implementation plan for the project all project-level GHG emissions reduction measures listed in Section VII of the Greenhouse Gas Emissions Reduction Plan or explain why measures that have not been incorporated do not apply to the project.
4. Determine that the project does not conflict with DWR's ability to implement any of the specific project GHG Emissions reduction measures listed in Section VII of the GGERP.
5. If implementation of the proposed project would result in additional energy demand on the State Water Project (SWP) system of 15 gigawatt hours per year (GWh/yr) or greater the project must get written confirmation from the DWR SWP Power and Risk Office stating that the Renewable Power Procurement Plan will be updated to accommodate the additional load resulting from the proposed project at such time as the proposed project is ultimately implemented.

The GGERP requires calculation of GHG emissions for each project. For this project, GHG emissions were calculated using a similar methodology to that described for criteria air pollutants in Section 3.2 *Air Quality*. The project's construction-related GHG emissions were estimated using California Emissions Estimator Model (CalEEMod), which calculates the emissions of CO_2, CH_4, and N_2O associated with construction-related GHG sources such as off-road construction equipment, material delivery trucks, soil haul trucks, and construction worker vehicles. The GHG analysis incorporates similar assumptions as the air quality analysis for consistency.

Consistent with these requirements, a GGERP Consistency Determination Checklist is attached documenting that the project has met each of the required elements.

Impact Analysis

Impact 3.7-1: The project could have a significant impact if it would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

The proposed project would primarily generate GHG emissions from construction activities at the project site. In addition, prior to the start of the project's 3-year construction period, rock materials for the levees would be obtained from the Perris Dam quarry in the Bernasconi Hills north of the dam as a continuation of construction activities associated with the construction of the Dam Remediation Project and stockpiled within a staging area below the dam (Figure 2-5). This activity, which would involve blasting at the Perris Dam quarry and the transportation of rock material from the quarry to the staging area below the dam by dump trucks, would also generate GHG emissions. Once this activity and the subsequent project construction activities have been completed, the project's operations would only generate GHG emissions from mobile sources associated with the periodic site visits by DWR worker staff for inspection of the conveyance facilities and general maintenance purposes. Operation of the proposed project would not involve any stationary equipment that would generate GHG emissions. Since worker staff visits would be periodic and sporadic in nature and would only consist of a single vehicle on most occasions, the mobile emissions of GHGs generated by project operations on a given day would be negligible when compared to the project's construction-related GHG emissions. Therefore, the analysis of the project's GHG emissions is focused on those generated during construction activities at the site.

While any increase in GHG emissions would add to the quantity of emissions that contribute to global climate change, emissions associated with construction of the proposed project would occur over a limited period, and emissions would be reduced to the extent feasible through implementation of Best Management Practices (BMPs) and compliance with local air district requirements as described in Section 3.2, *Air Quality*.

The project's total annual GHG emissions resulting from the rock blasting and hauling activities along with the project's construction activities are shown in **Table 3.7-2**. As shown, the total GHG emissions that are anticipated from project construction would be approximately 5,066 MT CO_2e. Thus, the project's construction-related GHG emissions would not exceed 12,500 MT CO_2e on an annual basis, nor would the total emissions exceed 25,000 MT CO_2e. DWR projects must also incorporate relevant reduction measures identified in Appendix D of the GGERP for construction activities. Implementation of GGERP BMPs would reduce GHG emissions by minimizing fuel usage by construction equipment, reducing fuel consumption for transportation of construction materials, reducing the amount of landfill material, and reducing emissions from the production of cement.

TABLE 3.7-2
ESTIMATED PROJECT CONSTRUCTION-RELATED GREENHOUSE GAS EMISSIONS

Construction Year	Proposed Project Emissions CO_2e (MT/yr)
Rock Blasting and Hauling	43[a]
First Year	1,878
Second Year	1,441
Third Year	*1,747.57*
Total	*5,065.74*
Total Project Emissions Exceed 25,000 MT CO_2e Threshold?	No
Annual Construction Emissions Exceed 12,500 MT CO_2e/yr Threshold?	No

NOTES: CO_2e= carbon dioxide equivalent; MT/yr = metric tons per year; see Appendix B for GHG emissions calculations.

[a] For the purpose of presenting a conservative analysis, the emissions presented does not account for implementation of Mitigation Measure AQ-1 from Section 3.2, Air Quality, that would be required to reduce the pollutant emissions during the blasting and hauling activities. With implementation of Mitigation Measure AQ-1, the GHG emissions generated from these activities would decrease to approximately 37 MT CO_2e per year.

The proposed project would not conflict with DWR's ability to implement any of the specific project GHG emissions reduction measures listed in Section VII of the GGERP. Furthermore, operation of the proposed project would not involve any stationary equipment that would require additional energy demands on the system.

Based on the analysis provided in the GGERP and the demonstration that the proposed project is consistent with the GGERP (as shown in the Consistency Determination Checklist included in Appendix B), DWR, as the lead agency has determined that the proposed project's incremental contribution to the cumulative impact of increasing atmospheric levels of GHGs is less than cumulatively considerable and, therefore, less than significant.

Significance Determination: Less than Significant.

Impact 3.7-2: The project could have a significant impact if it would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

As discussed in Impact 3.7-1, the proposed project's total and annual GHG emissions would not exceed the 25,000 MT CO_2e and 12,500 MT CO_2e per year levels, respectively, identified in DWR's GGERP. The project would generate an estimated total of 5,066 MT CO_2e over its entire construction period along with the rock blasting and hauling activities that are a continuation of the activities of the Dam Remediation Project. With the exception of periodic vehicle trips to and from the project site by facility workers, the operation of the proposed project would not involve any other source of GHG emissions. The proposed project consists of upgrades to the existing emergency release structure at Perris Dam and the installation of conveyance facilities in the form of levees and channels to connect the emergency release structure to the Perris Valley Channel. One of the primary objectives of the proposed project is to ensure that release flows from Perris

Reservoir in the event of an emergency drawdown would be contained such that public safety is enhanced and the risks of property and environmental damage minimized. Thus, given that the project's structural components (i.e., emergency release structure, levees, and channels) would operate passively and would not generate any GHG emissions, the project would not pose any apparent conflict with either DWR's GGERP or the CARB Scoping Plan Recommended Actions listed in **Table 3.7-1**. Therefore, the proposed project would not hinder the State's ability to achieve AB 32's goal of achieving 1990 levels of GHG emissions by 2020. Therefore, impacts would be considered less than significant.

Significance Determination: Less than Significant.

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