



5.2 Greenhouse Gas Emissions



5.2 GREENHOUSE GAS EMISSIONS

This section evaluates greenhouse gas (GHG) emissions associated with the proposed project and Project Alternative and analyzes compliance with applicable regulations. Consideration of the project's consistency with applicable plans, policies, and regulations, as well as the introduction of new sources of GHGs, is included in this section. Information in this section is based primarily on the *Serrano Summit Air Quality Analysis* (dated December 2009), prepared by LSA Associates; refer to [Appendix 12.3, *Air Quality Analysis*](#). Additional emission modeling is included in [Appendix 12.4, *Air Quality and Greenhouse Gas Data*](#).

5.2.1 EXISTING SETTING

The project site lies within the southern portion of the South Coast Air Basin (Basin). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The Basin's terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

SCOPE OF ANALYSIS FOR CLIMATE CHANGE

The study area for climate change and the analysis of GHG emissions is broad as climate change is influenced by world-wide emissions and their global effects. However, the study area is also limited by the CEQA Guidelines [Section 15064(d)], which directs lead agencies to consider an "indirect physical change" only if that change is a reasonably foreseeable impact which may be caused by the project.

The baseline against which to compare potential impacts of the project includes the natural and anthropogenic drivers of global climate change, including world-wide GHG emissions from human activities that have grown more than 70 percent between 1970 and 2004. The State of California is leading the nation in managing GHG emissions. Accordingly, the impact analysis for this project relies on guidelines, analyses, policy, and plans for reducing GHG emissions established by the California Air Resources Board (CARB).

The analysis is largely a cumulative impact assessment because GHG emissions contribute, by their nature on a cumulative basis, to the adverse environmental impacts of global climate change. Cumulative impacts are summarized below.



GLOBAL CLIMATE CHANGE – GREENHOUSE GASES

The natural process through which heat is retained in the troposphere is called the “greenhouse effect.”¹ The greenhouse effect traps heat in the troposphere through a three fold process as follows: Short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHG in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This “trapping” of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide (CO₂). Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long wave radiation. The GWP of a gas is determined using CO₂ as the reference gas with a GWP of 1.

GHGs normally associated with the proposed project include the following:²

- Water Vapor (H₂O). Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a Global Warming Potential for water vapor.

- Carbon Dioxide (CO₂). Carbon dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of carbon dioxide in the atmosphere has increased 35 percent.³ Carbon dioxide is the most widely emitted GHG and is the reference gas (Global Warming Potential of 1) for determining Global Warming Potentials for other GHGs.
- Methane (CH₄). Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation.

¹ The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth’s surface to 10 to 12 kilometers.

² All Global Warming Potentials are given as 100 year GWP. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. Climate Change (Intergovernmental Panel on Climate Change, *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*, 1996).

³ United States Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2004*, April 2006.



Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The Global Warming Potential of methane is 21.

- Nitrous Oxide (N_2O). Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The Global Warming Potential of nitrous oxide is 310.
- Hydrofluorocarbons (HFCs). HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The Global Warming Potential of HFCs range from 140 for HFC-152a to 11,700 for HFC-23.⁴
- Perfluorocarbons (PFCs). Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semi conductor manufacturing. Perfluorocarbons are potent GHGs with a Global Warming Potential several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).⁵ The Global Warming Potential of PFCs range from 6,500 to 9,200.
- Sulfur hexafluoride (SF_6). Sulfur hexafluoride 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. Sulfur hexafluoride is the most potent GHG that has been evaluated by the Intergovernmental Panel on Climate Change with a Global Warming Potential of 23,900. However, its global warming contribution is not as high as the Global Warming Potential would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).⁶

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone (O_3) depleters; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- Hydrochlorofluorocarbons (HCFCs). HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The

⁴ United States Environmental Protection Agency, *High GWP Gases and Climate Change*, June 22, 2010. <http://www.epa.gov/highgwp/scientific.html>.

⁵ Ibid.

⁶ Ibid.



Global Warming Potentials of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.⁷

- *1,1,1 trichloroethane.* 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The Global Warming Potential of methyl chloroform is 110 times that of carbon dioxide.⁸
- *Chlorofluorocarbons (CFCs).* CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the U.S. Environmental Protection Agency's (EPA) Final Rule (57 FR 3374) for the phase out of O₃ depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with Global Warming Potentials ranging from 4,600 for CFC 11 to 14,000 for CFC 13.⁹

5.2.2 REGULATORY FRAMEWORK

FEDERAL

The Federal government is extensively engaged in international climate change activities in areas such as science, mitigation, and environmental monitoring. The EPA actively participates in multilateral and bilateral activities by establishing partnerships and providing leadership and technical expertise. Multilaterally, the United States is a strong supporter of activities under the United Nations Framework Convention on Climate Change (UNFCCC) and the IPCC.

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis of human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus around the evidence that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

In December 2007, Congress passed the first increase in corporate average fleet fuel economy (CAFE) standards. The new CAFE standards represent an increase to 35 miles per gallon (mpg) by 2020. In March 2009, the Obama Administration announced that for the 2011 model year, the standard for cars and light trucks will be 27.3 mpg, the standard for cars will be 30.2 mpg; and standard for trucks would be 24.1 mpg. Additionally, in May 2009 President Barack Obama announced plans for a national fuel-economy and GHG emissions standard that would significantly

⁷ United States Environmental Protection Agency, *Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone Depleting Substances*, dated November 7, 2006. <http://www.epa.gov/EPA-AIR/1996/January/Day-19/pr-372.html>.

⁸ Ibid.

⁹ United States Environmental Protection Agency, *Class I Ozone Depleting Substances*, March 7, 2006. <http://www.epa.gov/ozone/ods.html>.



increase mileage requirements for cars and trucks by 2016. The new requirements represent an average standard of 39 mpg for cars and 30 mpg for trucks by 2016.

In September 2009, the EPA finalized a GHG reporting and monitoring system that began on January 1, 2010. In general, this national reporting requirement will provide the EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons (MT) or more of CO₂ per year. This publicly available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective emissions reduction strategies. This new program covers approximately 85 percent of the nation's GHG emissions and applies to approximately 10,000 facilities. The reporting system is intended to provide a better understanding of where GHGs are coming from and will guide development of the best possible policies and programs to reduce emissions.

Currently, the EPA is moving forward with two key climate change regulatory proposals, one to establish a mandatory GHG reporting system and one to address the 2007 Supreme Court decision in *Massachusetts v. EPA* (Supreme Court Case 05-1120) regarding the EPA's obligation to make an endangerment finding under Section 202(a) of the Federal Clean Air Act (FCAA) with respect to GHGs. *Massachusetts v. EPA* was argued before the United States Supreme Court on November 29, 2006. A coalition of 12 U.S. states and cities (including New York and California), in conjunction with several environmental organizations, challenged the EPA's refusal to regulate GHGs as a pollutant under the FCAA. The plaintiffs contended that the FCAA gives the EPA the necessary authority, and the mandate, to address GHGs in light of the scientific evidence on global climate change. The EPA had concluded that it had no authority under existing law to regulate GHGs, and for a variety of policy reasons, it would not use that authority even if it possessed it. The U.S. Supreme Court held that the EPA has statutory authority to regulate GHG emissions from new motor vehicles. Under the FCAA, the EPA is now obligated to issue rules regulating global warming pollution from all major sources. In April 2009, the EPA concluded that GHGs are a danger to public health and welfare, establishing the basis for GHG regulation. However, as of January 2011 there are no federal regulations or policies regarding GHG emissions applicable to the proposed project.

STATE

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), which was adopted in 1988. 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.

Assembly Bill 1493. In response to the transportation sector accounting for more than half of California's CO₂ emissions, Assembly Bill (AB) 1493 (AB 1493, Pavley) was enacted on July 22, 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light duty trucks, and other vehicles whose primary use is noncommercial personal transportation in the State. The bill required that CARB set the GHG emission standards for motor vehicles manufactured in



2009 and all subsequent model years. In setting these standards, CARB must consider cost effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. CARB adopted the standards in September 2004. (See Title 13, Cal. Code of Regs., Section 1900, 1961.) 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 less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for the 2016 model year are approximately 37 percent lower than the limits for the first year of the regulations, the 2009 model year. For light-duty trucks with LVW of 3,751 pounds to gross vehicle weight (GVW) of 8,500 pounds, as well as medium-duty passenger vehicles, GHG emissions would be reduced approximately 24 percent between 2009 and 2016. These standards are intended to reduce emissions of carbon dioxide and other GHGs (i.e., nitrous oxide and methane). Some currently used technologies that achieve GHG reductions include small engines with superchargers, continuously variable transmissions, and hybrid electric drive.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against CARB to prevent enforcement of 13 CCR Sections 1900 and 1961 as amended by AB 1493 and 13 CCR 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board, et al.*). The automobile-makers' suit in the U.S. District Court for the Eastern District of California, contended California's implementation of regulations that, in effect, regulate vehicle fuel economy, violates various Federal laws, regulations, and policies.

On December 12, 2007, the court found that if California receives appropriate authorization from the EPA (the last remaining factor in enforcing the standard), then these regulations would be consistent with and have the force of Federal law, thus, rejecting the automobile-makers' claim. This authorization to implement more stringent standards in California was requested in the form of a FCAA Section 209(b), waiver in 2005. Since that time, the EPA failed to act on granting California authorization to implement the standards. Then Governor Schwarzenegger and then Attorney General Edmund G. Brown filed suit against EPA for the delay. In December 2007, EPA Administrator Stephen Johnson denied California's request for the waiver to implement AB 1493. Johnson cited the need for a national approach to reducing GHG emissions, the lack of a "need to meet compelling and extraordinary conditions," and the emissions reductions that would be achieved through the Energy Independence and Security Act of 2007 as the reasoning for the denial.

The State of California filed suit against the EPA for its decision to deny the FCAA waiver. The change in presidential administration resulted in the EPA reexamining its position for denial of California's FCAA waiver and for its past opposition to GHG emissions regulation. California received the waiver on June 30, 2009.

Assembly Bill 32. The Legislature enacted AB 32 (AB 32, Nuñez), the California Global Warming Solutions Act of 2006, which former Governor Schwarzenegger signed on September 27, 2006 to further the goals of Executive Order S-3-05 (Health & Safety Code, Section 38500 et seq.). AB 32



requires CARB to adopt statewide GHG emissions limits to achieve statewide GHG emissions levels realized in 1990 by 2020. A longer-range goal requires an 80 percent reduction in GHG emissions from 1990 levels by 2050. CARB adopted the 2020 statewide target and mandatory reporting requirements in December 2007, and a statewide scoping plan in December 2008 (the AB 32 Scoping Plan). AB 32 represents the first enforceable statewide program to limit GHG emissions from all major industries, with penalties for noncompliance. CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. The foremost objective of CARB is to adopt regulations that require the reporting and verification of statewide GHG emissions. This program would be used to monitor and enforce compliance with the established standards. In passing the bill, the California Legislature found that:

Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems [California Health & Safety Code, Sec. 38500, Division 25.5, Part 1].

CARB is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. In December 2008, CARB adopted a Scoping Plan to achieve reductions in GHG emissions in California. The plan indicates how reductions in significant GHG sources would be achieved through regulations, market mechanisms, and other actions.

On December 16, 2010, CARB endorsed the long-awaited regulation implementing California's GHG cap-and-trade program. Pursuant to AB 32, and subject to a variety of final actions by the Executive Director and approval by the Office of Administrative Law (OAL), the regulations will be included within Title 17 of the California Code of Regulation, sections 95800-96022, entitled "California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms."

The cap-and-trade program covers approximately 80 percent of the State's total GHG emissions and is considered a key element in achieving the overall strategy set forth in the Scoping Plan. The program, as implemented through the regulation, "caps" GHG emissions by issuing annual allowances (each covering the equivalent of one metric ton of carbon dioxide equivalent [MTCO₂eq¹⁰]) to regulated entities. Covered entities include those that meet the inclusion threshold of 25,000 MTCO₂eq per year and engage in: cement production; cogeneration; glass production; hydrogen production; iron and steel production; lime manufacturing; nitric acid production; oil and natural gas systems; petroleum refining; paper and pulp manufacturing; electricity generating facilities (including operators located in California or electricity importers); and natural gas suppliers. The regulation also allows entities that engage in the above production and manufacturing activities to opt-in even if they do not meet the 25,000 metric ton inclusion threshold. Others may also voluntarily associate into the program. By opening the program to non-covered entities, CARB

¹⁰ Carbon Dioxide Equivalent (CO₂eq) – A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.



hopes to create a trading market in which investment banks, citizens groups and the general public would be allowed to hold allowances and would be subject to the registration and reporting requirements. The first compliance phase begins on January 1, 2012 through December 31, 2014, and will cover all major industrial sources, including the electricity industry and large industrial plants that manufacture glass, paper, concrete and other products. The second compliance phase begins On January 1, 2015 through December 31, 2017, and will cover distributors of transportation fuels, natural gas and other fuels. A third compliance period starts on January 1, 2018 through December 31, 2020.

As noted above, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted. In order to advise the Board, CARB staff convened an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee.

Executive Order S-3-05. In June 2005, then Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2050. The Secretary of the California Environmental Protection Agency (the Secretary) is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Some of the agencies involved in the GHG reduction plan include Secretary of Business, Transportation, and Housing Agency, Secretary of Department of Food and Agriculture, Secretary of Resources Agency, Chairperson of CARB, Chairperson of the Energy Commission, and the President of the Public Utilities Commission. The Secretary is required to submit a biannual progress report to the Governor and State Legislature disclosing the progress made toward GHG emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, and the coastline and forestry, and reporting possible mitigation and adaptation plans to combat these impacts.

Executive Order S-1-07. On January 18, 2007, California further solidified its dedication to reducing GHGs by setting a new Low Carbon Fuel Standard for transportation fuels sold within the State. Executive Order S-1-07 sets a declining standard for GHG emissions measured in carbon dioxide equivalent gram per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least ten percent by 2020. The Low Carbon Fuel Standard applies to refiners, blenders, producers, and importers of transportation fuels and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods. The Executive Order requires the Secretary of the California Environmental Protection Agency to coordinate with actions of the California Energy Commission, CARB, the University of California, and other agencies to develop a protocol to measure the "life cycle carbon intensity" of transportation fuels.

Senate Bill 97. Senate Bill (SB) 97 of 2007 requires the California Office of Planning and Research (OPR) to develop CEQA guidelines for analysis and, if necessary, the mitigation of effects of GHG emissions to the Resources Agency. These guidelines for analysis and mitigation must address, but are not limited to, GHG emissions effects associated with transportation or energy consumption.



On December 30, 2009, the Natural Resources Agency adopted the CEQA Guidelines Amendments prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010. These new guidelines require a survey of existing climate change analyses performed by various lead agencies under CEQA.¹¹ In his signing statement, then Governor Arnold Schwarzenegger noted:

Current uncertainty as to what type of analysis of greenhouse gas emissions is required under the California Environmental Quality Act has led to legal claims being asserted, which would stop these important infrastructure projects. Litigation under CEQA is not the best approach to reduce greenhouse gas emissions and maintain a sound and vibrant economy. To achieve these goals, we need a coordinated policy, not a piecemeal approach dictated by litigation.

Senate Bill 375. SB 375 requires metropolitan planning organizations (MPOs) to include sustainable communities strategies in their regional transportation plans. The purpose of SB 375 is to reduce GHG emissions from automobiles and light trucks, require CARB to provide GHG emission reduction targets from the automobile and light truck sector for 2020 and 2035 by January 1, 2010, and update the regional targets until 2050. SB 375 requires certain transportation planning and programming activities to be consistent with the sustainable communities strategies contained in the regional transportation plan. The bill also requires affected regional agencies to prepare an alternative planning strategy to the sustainable communities strategies if the sustainable communities strategy is unable to achieve the GHG emissions reduction targets. The Governor signed and approved SB 375 on September 30, 2008.

SB 375 includes the ability to streamline certain projects which are consistent with an MPO's Sustainable Communities Strategy (See CEQA Guidelines, Section 15183.5, subd. (c)). CARB released its staff report on proposed regional GHG reduction targets for passenger cars and light trucks as well as its CEQA Functional Equivalent Document on August 9, 2010.

Senate Bills 1078 and 107 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, then Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Energy Standard to 33 percent renewable power by 2020. On April 12, 2011, Governor Jerry Brown reinforced the requirements of Executive Order S-14-08, and signed Senate Bill 2, which requires California to get 33 percent of its electricity from renewable sources by the year 2020.

CARB 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.¹² CARB's Scoping Plan contains the main strategies California will implement to reduce

¹¹ http://ceres.ca.gov/ceqa/docs/Adopted_Text_of_SB97_CEQA_Guidelines_Amendments.pdf. Accessed March 2010.

¹² California Air Resources Board, *Climate Change Scoping Plan, A Framework for Change*, December 2008.



CO₂eq emissions by 174 million metric tons (MMT), or approximately 30 percent, from the State's projected 2020 emissions level of 596 MMT of CO₂eq under a business as usual (BAU)¹³ scenario (this is a reduction of 42 MMT CO₂eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020).

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 (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 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. However, the San Francisco Superior Court has recently issued a ruling that suspends the implementation of the Scoping Plan pending additional CEQA review.

In *Association of Irrigated Residents, et al. v. California Air Resources Board, et al.*, the Superior Court of California for the County of San Francisco (Superior Court) issued a "Statement of Decision" on March 18, 2011 that prevents CARB from implementing a statewide GHG regulatory program under AB 32 until the agency complies with the requirements of CEQA. The decision partially grants a petition for a writ of mandate brought by a coalition of environmental justice organizations (Petitioners) that alleged that CARB's Scoping Plan violated both AB 32 and CEQA.

The California Supreme Court held in the favor of CARB on all substantive challenges to the State's compliance with AB 32 mandates. The Court noted that "as the agency with technical expertise and the responsibility for the protection of California's air resources, CARB has substantial discretion to determine the mix of measures needed to 'facilitate' the achievement of GHG reductions."¹⁴ Although the Superior Court denied all claims related to AB 32, the court found that CARB: 1) failed to adequately discuss and analyze the impacts of alternatives in its proposed Scoping Plan as required by its CEQA implementing regulations; and 2) improperly approved the Scoping Plan prior to completing the environmental review required by CEQA. In upholding the Petitioners' challenge on these two CEQA issues, the Superior Court issued a Peremptory Writ of Mandate and enjoined CARB from further implementation of the Scoping Plan until it complies with all CEQA requirements.

LOCAL

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) adopted a *Policy on Global Warming and Stratospheric Ozone Depletion* in April 1990. The policy commits the SCAQMD to consider global

¹³ "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

¹⁴ Superior Court of California, County of San Francisco, *Statement of Decision: Association of Irrigated Residents, et al v. California Air Resources Board*, March 18, 2011.



impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- Phase out the use and corresponding emissions of CFCs, methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- Phase out the large quantity use and corresponding emissions of HCFCs by the year 2000;
- Develop recycling regulations for HCFCs (e.g., SCAQMD Rules 1411 and 1415);
- Develop an emissions inventory and control strategy for methyl bromide; and
- Support the adoption of a California GHG emission reduction goal.

The legislative and regulatory activity detailed above is expected to require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

City of Lake Forest

The City of Lake Forest does not have any plans, policies, regulations, significance thresholds, or laws addressing climate change at this time. The Recreation and Resources Element of the General Plan also includes goals and policies addressing energy conservation. The General Plan states that energy requirements can be diminished through innovative architectural design, building construction, structural orientation and landscaping. The City has established ECONomic, which is a voluntary green home education program. The City, through ECONomic, encourages homeowners and building professionals to incorporate green building design into construction projects. The City also promotes utility company incentive programs to retrofit existing development with energy efficient lighting, air conditioning and heating systems to reduce energy consumption.

The *Serrano Summit Area Plan* includes a Green Builder Program and Sustainability Development Regulations that establish guidelines and programs for the Serrano Summit community (included in [Appendix 12.3, Air Quality Analysis](#)). The Green Builder Program requires the project to incorporate green development techniques, which may be achieved through energy conservation, reduction of non-renewable resources, and California appropriate landscape practices. The Sustainability Development Regulations focus on specific sustainability regulations related to structures and site development, as well as landscape sustainability. The structures and site development regulations require homes to be equipped to accommodate recharging of “plug in hybrid” vehicles, technology for computer internet access, programmable thermostats, low energy windows, energy efficient lighting, among others. The landscape sustainability regulations require drought tolerant plants, low flow irrigation, and efficient controllers.



5.2.3 IMPACT THRESHOLDS AND SIGNIFICANCE CRITERIA AND METHODOLOGY

METHODOLOGY

The analysis of GHG impacts is based on modeling using the California Emissions Estimator Model (CalEEMod). CalEEMod quantifies direct emissions from construction and operation (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The model incorporates Pavley vehicle standards and Low Carbon Fuel standards into the mobile source emission factors. Further, the model identifies potential mitigation measures to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from measures chosen by the user. The methodology for estimating the reductions associated with GHG mitigation measures were recently developed by the California Air Pollution Control Officers Association (CAPCOA).

CEQA Significance Criteria

At this time, there is no absolute consensus in the State of California among CEQA lead agencies regarding the analysis of global climate change and the selection of significance criteria. In fact, numerous organizations, both public and private, have released advisories and guidance with recommendations designed to assist decision-makers in the evaluation of GHG emissions given the current uncertainty regarding when emissions reach the point of significance. That being said, several options are available to lead agencies.

First, lead agencies may elect to rely on thresholds of significance recommended or adopted by state or regional agencies with expertise in the field of global climate change. (See *CEQA Guidelines* Section 15064.7(c).) However, to date, neither CARB nor the SCAQMD have adopted significance thresholds for GHG emissions for residential or commercial development under *CEQA*.¹⁵ CARB has suspended all efforts to develop a threshold, and SCAQMD's threshold remains in draft form. Accordingly, this option (i.e., reliance on an adopted threshold) is not viable for the City of Lake Forest.

Second, lead agencies may elect to conclude that the significance of GHG emissions under *CEQA* is too speculative. However, this option is not viable due to the important focus on global climate change created by the various regulatory schemes and scientific determinations cited in this section.

Third, lead agencies may elect to use a zero-based threshold, such that any emission of GHGs is significant and unavoidable. However, this type of threshold may indirectly truncate the analysis

¹⁵ Of note, in December 2009, the San Joaquin Valley Unified Air Pollution Control District adopted guidance for use by lead agencies in the valley, in assessing the significance of a project's GHG emissions under *CEQA*. The guidance relies on the use of performance-based standards, and requires that projects demonstrate a 29 percent reduction in GHG emissions, from business-as-usual, to determine that a project would have a less than significant impact. The guidance is for valley land use agencies and not applicable to areas outside the district. The Bay Area Air Quality Management District adopted its own GHG thresholds of significance on June 2, 2010. The threshold is based on quantitative standards including a per capita emission standard and project emission standard as well as a qualitative standard based on compliance with a qualified GHG reduction strategy. The BAAQMD thresholds are based on an analysis of local inventories of GHG emissions and local reduction programs; therefore, they would not be an appropriate basis for a GHG significance threshold in the City of Lake Forest.



provided in CEQA documents and the mitigation commitments secured from new development. Moreover, no state or regional agency with expertise in global climate change has endorsed a zero-based threshold, which would likely result in the preparation of extensive environmental documentation for even the smallest of projects, thereby inundating lead agencies and creating an administrative burden. Moreover, because the GHG analysis is a cumulative analysis, a zero based threshold would be inconsistent with CEQA Guidelines Section 15130(a)(3), which requires that cumulatively significant impacts, such as GHG emissions, be “cumulatively considerable”, as defined by Section 15065(a)(3).

Fourth, lead agencies may elect to utilize their own significance criteria, so long as such criteria are informed and supported by substantial evidence. Recent amendments to the *CEQA Guidelines*, and specifically the addition of *CEQA Guidelines* Section 15064.4, subdivision (b), informed the City’s selection of a significance criterion:

A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

- (1) *The extent to which the project may increase or reduce greenhouse gas 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;*
- (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 greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project’s incremental contribution of greenhouse gas 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.*

CEQA Guidelines Appendix G also has been revised to provide some guidance regarding the criteria that may be used to assess whether a project’s impacts on global climate change are significant. The Appendix G environmental checklist form asks whether a project would: (i) generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or (ii) conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

Based on the above factors (and particularly the adopted addition of *CEQA Guidelines* Section 15064.4, subdivisions (b)(2) and (b)(3)), the analysis (the lead agency for the proposed project) will rely on AB 32 implementation guidance (such as the CARB Scoping Plan) as a benchmark for purposes of this EIR and use the statute to inform their judgment as to whether the proposed project’s GHG emissions would result in a significant impact. (See *CEQA Guidelines* Section 15064, subdivision (f)(1)). Accordingly, the following significance criterion is used to assess impacts:

Will the project’s GHG emissions impede compliance with the GHG emissions reductions mandated in AB 32?



The GHG emission levels will be analyzed to determine whether project approval would impede compliance with the GHG emissions reduction mandate established by the AB 32, which requires that California's GHG emissions limit be reduced to 1990 levels by 2020. As noted in the Scoping Plan,¹⁶ a reduction of 28.5 percent below the "business as usual" scenario is required to meet the goals of AB 32. Therefore, should the project reduce its GHG emissions by 28.5 percent or greater, impacts would be less than significant.

INITIAL STUDY CHECKLIST

The environmental analysis in this section is patterned after the Initial Study Checklist recommended by Appendix G of the *CEQA Guidelines*, as amended, and used by the City of Lake Forest in its environmental review process. The Initial Study Checklist includes questions relating to greenhouse gas emissions. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant adverse environmental impact if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; refer to Impact Statement GHG-1.
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases; refer to Impact Statement GHG-2.

5.2.4 IMPACTS AND MITIGATION MEASURES

GREENHOUSE GAS EMISSIONS

GHG-1 GREENHOUSE GAS EMISSIONS GENERATED BY THE PROJECT WOULD NOT HAVE A SIGNIFICANT IMPACT ON GLOBAL CLIMATE CHANGE.

Impact Analysis: Direct project-related GHG emissions for "business as usual" conditions include emissions from construction activities, area sources, and mobile sources. Table 5.2-1, *Business As Usual Greenhouse Gas Emissions*, presents the estimated CO₂, N₂O, and CH₄ emissions.

The CalEEMod computer model outputs contained within the Appendix 12.4 *Air Quality and Greenhouse Gas Data*, were used to calculate mobile source, area source, and construction GHG emissions. Operational GHG estimations are based on energy emissions from natural gas usage and automobile emissions. The CalEEMod model relies upon construction phasing and project specific land use data within the *Air Quality Analysis* (refer to Appendix 12.3; CalEEMod data is provided in Appendix 12.4, *Air Quality and Greenhouse Gas Data*) to calculate emissions. GHGs associated with area sources and mobile sources would be 459.24 MTCO₂eq/yr and 9,648.28 MTCO₂eq/yr, respectively. GHG emissions from construction would result in 3,847.5 MTCO₂eq for all construction phases. Construction GHG emissions are typically summed and amortized over the

¹⁶ California Air Resources Board, *Climate Change Proposed Scoping Plan: A Framework for Change*, adopted December 2008.



lifetime of the project (assumed to be 30 years), then added to the operational emissions.¹⁷ Total project-related direct operational emissions would result in 10,235.77 MTCO₂eq/yr.

**Table 5.2-1
Business As Usual Greenhouse Gas Emissions**

Source	CO ₂	CH ₄		N ₂ O		Total Metric Tons of CO ₂ eq
	Metric Tons/yr ¹	Metric Tons/yr ¹	Metric Tons of CO ₂ eq ²	Metric Tons/yr ¹	Metric Tons of CO ₂ eq ²	
Direct Emissions						
▪ Construction (amortized over 30 years)	128.01	0.01	0.21	0.00	0.03	128.25
▪ Area Source	452.01	0.21	4.41	0.01	3.10	459.24
▪ Mobile Source	9,640.30	0.38	7.98	0.00	0.00	9,648.28
<i>Total Unmitigated Direct Emissions³</i>	<i>10,220.32</i>	<i>0.60</i>	<i>12.60</i>	<i>0.01</i>	<i>3.13</i>	<i>10,235.77</i>
Indirect Emissions						
▪ Energy	2,364.01	0.08	1.68	0.04	12.40	2,378.65
▪ Solid Waste	100.28	5.93	124.53	0.00	0.00	224.72
▪ Water Demand	363.79	1.93	40.53	0.05	15.50	420.85
<i>Total Unmitigated Indirect Emissions³</i>	<i>2,828.08</i>	<i>7.94</i>	<i>166.74</i>	<i>0.09</i>	<i>27.90</i>	<i>3,024.22</i>
<i>Total Project-Related Emissions³</i>	<i>13,259.99 MTCO₂eq/yr</i>					
Notes:						
1. Emissions calculated using CalEEMod computer model.						
2. CO ₂ Equivalent values calculated using the EPA Website, <i>Greenhouse Gas Equivalencies Calculator</i> , http://www.epa.gov/cleanenergy/energy-resources/calculator.html , accessed June 2011.						
3. Totals may be slightly off due to rounding.						
Refer to Appendix 12.4, <i>Air Quality and Greenhouse Gas Modeling Data</i> , for detailed model input/output data.						

Indirect Project Related Sources of Greenhouse Gases

Energy Consumption. Energy Consumption emissions were calculated using the CalEEMod model and project-specific land use data. Electricity would be provided to the project site via Southern California Edison. The project would indirectly result in 2,378.65 MTCO₂eq/year due to energy consumption; refer to Table 5.2-1.

Solid Waste. Solid waste associated with operations of the proposed project would result in 224.72 MTCO₂eq/year; refer to Table 5.2-1.

Water Demand. The Irvine Ranch Water District would be the main water supply provider to the proposed project. Approximately 50 percent of the project's water supply would be provided by imported sources and the balance of the potable supplies would come from local groundwater. Emissions from indirect energy impacts due to water supply would result in 420.85 MTCO₂eq/year.

Total Project-Related Sources of Greenhouse Gases. As shown in Table 5.2-1, the total amount of project-related "business as usual" GHG emissions from direct and indirect sources combined would total 13,259.99 MTCO₂eq/yr.

¹⁷ The project lifetime is based on the standard 30 year assumption of the South Coast Air Quality Management District (<http://www.aqmd.gov/hb/2008/December/081231a.htm>).



Consistency With Greenhouse Gas Emission Reduction Strategies

The proposed project would incorporate several design features that are consistent with the California Office of the Attorney General’s recommended measures to reduce GHG emissions. A list of the Attorney General’s recommended measures and the proposed project’s compliance with each applicable measure are listed in Table 5.2-2, *Project Consistency with the GHG Emissions Reductions Strategies*. It should be noted that these measures are recommendations from the California Attorney General’s Office and are not legally mandated or part of a statewide GHG reduction strategy. The proposed project would incorporate sustainable practices which include transportation, water, energy, solid waste, and land use efficiency measures. To ensure that the proposed project complies with and would not conflict with or impede the implementation of reduction goals identified in AB 32 and other strategies to help reduce GHGs, the proposed project also adopted in its Area Plan (*Serrano Summit Area Plan*, dated October 1, 2009) Green Builder Program and Sustainability Development Regulations to reduce project-related GHG emissions.

**Table 5.2-2
 Project Consistency with GHG Emissions Reductions Strategies**

Project Design Feature	Project Applicability
Energy Efficiency	
Install energy efficient lighting (e.g., light emitting diodes (LEDs)), heating and cooling systems, appliances (e.g., faucets, dishwasher, clothes washer, fan, refrigerator), equipment, and control systems.	Compliant. The proposed project would be required to comply with the updated Title 24 standards for building construction. In addition, the project would implement the Green Builder Program and Sustainability Development Regulations in its adopted Area Plan to incorporate energy-efficient building design features.
Install efficient lighting, (including LEDs) for traffic, street and other outdoor lighting.	
Incorporate green building practices and design elements.	
Meet recognized green building and energy efficiency benchmarks.	The Green Builder Program includes guidelines for high efficiency lighting, low energy cooling systems, improved insulation, cool roofs, and low emissivity windows. Mitigation GHG-1 requires all buildings to achieve the applicable Tier 1 voluntary measures of the <i>2010 California Green Building Standards Code</i> (California Code of Regulations, Title 24, Part 11).
Reduce unnecessary outdoor lighting.	Compliant. The proposed buildings and parking lots would only include lighting necessary to ensure safety, and would not be excessive.
Install light colored “cool” roofs and cool pavements.	Compliant. As described above, the Green Builder Program includes requirements for light colored roofs and pavements throughout the project site.
Water Conservation and Efficiency	
Incorporate water-reducing features into building and landscape design.	Compliant. The project proposes to incorporate water-efficient landscapes into the project design. Watering methods would be restricted and runoff would be controlled. Water-efficient irrigation systems and devices would be installed throughout the project site. The project would implement the Green Builder Program and Sustainability Development Regulations in its adopted Area Plan to increase water use efficiency. These reductions are also required in Mitigation Measure GHG-1.
Create water-efficient landscapes (e.g., turf reduction area, gal/yr maximum applied water allowance, gal/yr estimated total water use).	
Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls and use water-efficient irrigation methods.	



Table 5.2-2 (continued)
Project Consistency with GHG Emissions Reductions Strategies

Project Design Feature	Project Applicability
Solid Waste Measures	
Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).	Compliant. Data available from the California Integrated Waste Management Board indicates that the City of Lake Forest has not achieved the 50 percent diversion rate. The proposed project would implement the Green Builder Program and Sustainability Development Regulations in its adopted Area Plan, including measures to increase solid waste diversion, composting, and recycling. The project would reuse and recycle construction and demolition waste during project construction activities. The project would also provide exterior storage areas for recyclables in public areas throughout the project site. Mitigation Measure GHG-1 requires a solid waste diversion rate of at least 50 percent for the project.
Provide easy and convenient recycling opportunities for residents, the public, and tenant businesses.	
Land Use Measures	
Ensure consistency with "smart growth" principles – mixed-use, infill, and higher density projects that provide alternatives to individual vehicle travel and promote the efficient delivery of services and goods.	Compliant. The proposed project is considered to be an infill project, as it would facilitate development on an underutilized and previously disturbed site in the City located near housing, jobs, and existing transit.
Develop "brownfields" and other underused or defunct properties near existing public transportation and jobs.	
Incorporate public transit into the project's design.	Compliant. The project site is served by bus transit lines operated by the Orange County Transportation Authority (OCTA) along various roadways surrounding the project site including Commercentre Drive, Dimension Drive, Bake Parkway, Lake Forest Drive, and Trabuco Road. Approximately nine stops are within a quarter-mile of the project site.
Ensure that the project enhances, and does not disrupt or create barriers to, non-motorized transportation.	Compliant. The project would include sidewalks and paths connecting the project site to the surrounding circulation network.
Protect existing trees and encourage the planting of new trees. Adopt a tree protection and replacement ordinance.	Compliant. Trees would be planted throughout the project site.
Source: State of California Department of Justice, Attorney General's Office, <i>Addressing Climate Change at the Project Level</i> , updated January 6, 2010.	

Mitigated Greenhouse Gas Emissions

Implementation of the project design features and recommended Mitigation Measure GHG-1 would result in reduced project-related GHG emissions. GHG reductions were applied using the CalEEMod model. *Table 5.2-3, Mitigated Greenhouse Gas Emissions*, shows the reduced GHG emissions associated with the project design features required by Mitigation Measure GHG-1 regarding water, energy, solid waste, and land use efficiency measures.



Reduction measures accounted for in [Table 5.2-3](#) and required by Mitigation Measure GHG-1 include the following:

- Pedestrian connections to the off-site circulation network;
- Trip reduction program, for which all residents and employees are eligible to participate;
- Ride sharing program, for which all employees are eligible to participate;
- Energy efficient buildings, 15 percent above Title 24 requirements;
- Install high efficiency lights for public street and area lighting;
- Light colored “cool” roofs and cool pavements, and strategically placed shade trees;
- High efficiency lighting, and energy efficient heating and cooling systems;
- Reduced unnecessary outdoor lighting;
- Water-efficient irrigation systems;
- Low-flow faucets and toilets;
- Reduce turf (per requirements in the Green Builder Program);
- Reuse and recycling of construction and demolition waste;
- Interior and exterior storage areas for recyclables and adequate recycling containers located in public areas; and
- Institute recycling and composting services to reduce solid waste by at least 50 percent.

**Table 5.2-3
Mitigated Greenhouse Gas Emissions**

Source	CO ₂	CH ₄		N ₂ O		Total Metric Tons of CO ₂ eq
	Metric Tons/yr ¹	Metric Tons/yr ¹	Metric Tons of CO ₂ eq ²	Metric Tons/yr ¹	Metric Tons of CO ₂ eq ²	
Direct Emissions						
▪ Construction (amortized over 30 years)	128.01	0.01	0.21	0.00	0.03	128.25
▪ Area Source	15.12	0.01	0.21	0.00	0.10	15.43
▪ Mobile Source	6,408.99	0.26	5.46	0.00	0.04	6,414.49
Total Mitigated Direct Emissions	6,552.12	0.28	5.88	0.00	0.17	6,558.17
Indirect Emissions						
▪ Energy	2,054.73	0.07	0.62	0.04	12.10	2,067.45
▪ Water Demand	298.74	1.54	33.30	0.04	12.40	344.44
▪ Waste	50.14	2.96	62.16	0.00	0.06	112.36
Total Mitigated Indirect Emissions³	2,403.61	4.57	96.08	0.08	24.56	2,524.25
Total Mitigated Project-Related Emissions³	9,082.42 MTCO₂eq/yr					
Total Business As Usual Project-Related Emissions³	13,259.99 MTCO₂eq/yr					
Total % Reduction From Business As Usual	31.5 %					
GHG Threshold	28.5 % reduction from Business As Usual emissions					
Mitigated GHG Emissions Meet Reduction Target?	Yes					
	Less Than Significant Impact					
Notes:						
1. Mitigated emissions calculated using CalEEMod computer model.						
2. CO ₂ Equivalent values calculated using the U.S. EPA Website, <i>Greenhouse Gas Equivalencies Calculator</i> , http://www.epa.gov/cleanenergy/energy-resources/calculator.html , accessed June 2011.						
3. Totals may be slightly off due to rounding.						
Refer to Appendix 12.4, Air Quality and Greenhouse Gas Modeling Data , for detailed model input/output data.						



As seen in Table 5.2-3, implementation of project design features and Mitigation Measure GHG-1 would result in a 31.5 percent reduction in emissions from “business as usual” conditions. Therefore, the project would not hinder the State reduction goals of AB 32. Impacts in this regard would be less than significant with implementation of Mitigation Measure GHG-1.

Conclusion

As shown in Table 5.2-1, operational-related “business as usual” emissions would be 13,259.99 MTCO₂eq/yr. The project would implement the project design features of the Green Builder Program and the Sustainability Development Regulations within the *Serrano Summit Area Plan* and required by Mitigation Measure GHG-1. These sustainability measures target the transportation, water, energy, solid waste, and land use emission sectors and are consistent with the Attorney General’s recommended design features. Implementation of these measures would reduce GHG emissions to 9,082.42 MTCO₂eq/yr, which equates to a 31.5 percent reduction. AB 32 requires the reduction of GHG emissions to 1990 levels, which would require a minimum 28.5 percent reduction in “business as usual” GHG emissions for the entire State. Therefore, as implementation of Mitigation Measure GHG-1 would reduce “business as usual” emissions by 31.5 percent, the proposed project would be considered to be consistent with the reduction goals of AB 32 and constitute a less than significant impact.

PROJECT ALTERNATIVE

Table 5.2-4, *Project Alternative Business As Usual Greenhouse Gas Emissions*, presents the estimated CO₂, N₂O, and CH₄ emissions. GHGs associated with area sources and mobile sources would be 629.18 MTCO₂eq/yr and 9,125.00 MTCO₂eq/yr, respectively. GHG emissions from construction would result in 3,847.5 MTCO₂eq for all construction phases. Construction GHG emissions are summed and amortized over the lifetime of the project (assumed to be 30 years), then added to the operational emissions.¹⁸ Total direct operational emissions would result in 9,882.43 MTCO₂eq/yr from the Project Alternative.

Indirect Project Alternative Related Sources of Greenhouse Gases

Energy Consumption. The Project Alternative would indirectly result in 2,286.06 MTCO₂eq/year due to energy consumption; refer to Table 5.2-4.

Solid Waste. Solid waste associated with operations of the Project Alternative would result in 226.83 MTCO₂eq/year; refer to Table 5.2-4.

Water Demand. Emissions from indirect energy impacts due to water supply would result in 366.84 MTCO₂eq/year.

Total Project-Related Sources of Greenhouse Gases. As shown in Table 5.2-4, the total amount of “business as usual” GHG emissions from direct and indirect sources combined would total 12,762.16 MTCO₂eq/yr for the Project Alternative.

¹⁸ The project lifetime is based on the standard 30 year assumption of the South Coast Air Quality Management District (<http://www.aqmd.gov/hb/2008/December/081231a.htm>).



**Table 5.2-4
Project Alternative Business As Usual Greenhouse Gas Emissions**

Source	CO ₂	CH ₄		N ₂ O		Total Metric Tons of CO ₂ eq
	Metric Tons/yr ¹	Metric Tons/yr ¹	Metric Tons of CO ₂ eq ²	Metric Tons/yr ¹	Metric Tons of CO ₂ eq ²	
Direct Emissions						
▪ Construction (amortized over 30 years)	128.01	0.01	0.21	0.00	0.03	128.25
▪ Area Source	619.29	0.29	6.09	0.01	3.80	629.18
▪ Mobile Source	9,117.50	0.36	7.50	0.00	0.00	9,125.00
Total Unmitigated Direct Emissions³	9,864.80	0.66	13.80	0.01	3.83	9,882.43
Indirect Emissions						
▪ Energy	2,272.03	0.07	1.47	0.04	12.56	2,286.06
▪ Solid Waste	101.22	5.98	125.58	0.00	0.03	226.83
▪ Water Demand	317.25	1.67	35.07	0.05	14.52	366.84
Total Unmitigated Indirect Emissions³	2,690.50	7.72	162.12	0.09	27.11	2,879.73
Total Project-Related Emissions³	12,762.16 MTCO₂eq/yr					
Notes:						
1. Emissions calculated using CalEEMod computer model.						
2. CO ₂ Equivalent values calculated using the U.S. EPA Website, <i>Greenhouse Gas Equivalencies Calculator</i> , http://www.epa.gov/cleanenergy/energy-resources/calculator.html , accessed June 2011.						
3. Totals may be slightly off due to rounding.						
Refer to Appendix 12.4, <i>Air Quality and Greenhouse Gas Modeling Data</i> , for detailed model input/output data.						

Mitigated Greenhouse Gas Emissions

Implementation of the project design features and recommended Mitigation Measure GHG-1 would result in reduced GHG emissions for the Project Alternative. GHG reductions were applied using the CalEEMod model. Table 5.2-5, *Project Alternative Mitigated Greenhouse Gas Emissions*, shows the reduced GHG emissions associated with the project design features required by Mitigation Measure GHG-1 regarding water, energy, solid waste, and land use efficiency measures.

Reduction measures accounted for in Table 5.2-5 and required by Mitigation Measure GHG-1 include the following:

- Pedestrian connections to the off-site circulation network;
- Trip reduction program, for which all residents and employees are eligible to participate;
- Ride sharing program, for which all employees are eligible to participate;
- Energy efficient buildings, 15 percent above Title 24 requirements;
- Install high efficiency lights for public street and area lighting;
- Light colored “cool” roofs and cool pavements, and strategically placed shade trees;
- High efficiency lighting, and energy efficient heating and cooling systems;
- Reduced unnecessary outdoor lighting;
- Water-efficient irrigation systems;
- Low-flow faucets and toilets;
- Reduce turf (per requirements in the Green Builder Program);
- Reuse and recycling of construction and demolition waste;



- Interior and exterior storage areas for recyclables and adequate recycling containers located in public areas; and
- Institute recycling and composting services to reduce solid waste by at least 50 percent.

As seen in [Table 5.2-5](#), implementation of project design features and Mitigation Measure GHG-1 would result in a 30.9 percent reduction in emissions from “business as usual” conditions. Therefore, the Project Alternative would not hinder the State reduction goals of AB 32. Impacts in this regard would be less than significant with implementation of Mitigation Measure GHG-1.

**Table 5.2-5
 Project Alternative Mitigated Greenhouse Gas Emissions**

Source	CO ₂	CH ₄		N ₂ O		Total Metric Tons of CO ₂ eq
	Metric Tons/yr ¹	Metric Tons/yr ¹	Metric Tons of CO ₂ eq ²	Metric Tons/yr ¹	Metric Tons of CO ₂ eq ²	
Direct Emissions						
▪ Construction (amortized over 30 years)	128.01	0.01	0.21	0.00	0.03	128.25
▪ Area Source	20.72	0.02	0.42	0.00	0.00	21.14
▪ Mobile Source	6,234.53	0.25	5.25	0.00	0.03	6,239.81
Total Mitigated Direct Emissions	6,383.26	0.28	5.88	0.00	0.06	6,389.20
Indirect Emissions						
▪ Energy	2,003.12	0.06	1.26	0.04	11.11	2,015.49
▪ Solid Waste	50.61	2.99	62.79	0.00	0.02	113.42
▪ Water Demand	256.09	1.34	28.14	0.04	11.55	295.78
Total Mitigated Indirect Emissions³	2,309.82	4.39	92.19	0.08	22.68	2,424.69
Total Mitigated Project-Related Emissions³	8,813.89 MTCO₂eq/yr					
Total Business As Usual Project-Related Emissions³	12,762.16 MTCO₂eq/yr					
Total % Reduction From Business As Usual	30.9 %					
GHG Threshold	28.5 % reduction from Business As Usual emissions					
Mitigated GHG Emissions Meet Reduction Target?	Yes					
	Less Than Significant Impact					
Notes:						
1. Mitigated emissions calculated using CalEEMod computer model.						
2. CO ₂ Equivalent values calculated using the U.S. EPA Website, <i>Greenhouse Gas Equivalencies Calculator</i> , http://www.epa.gov/cleanenergy/energy-resources/calculator.html , accessed June 2011.						
3. Totals may be slightly off due to rounding.						
Refer to Appendix 12.4, Air Quality and Greenhouse Gas Modeling Data , for detailed model input/output data.						

Conclusion

As shown in [Table 5.2-4](#), operational-related “business as usual” emissions would be 12,762.16 MTCO₂eq/yr. The Project Alternative would implement the project design features of the Green Builder Program and the Sustainability Development Regulations within the *Serrano Summit Area Plan* and required by Mitigation Measure GHG-1. These sustainability measures target the transportation, water, energy, solid waste, and land use emission sectors and are consistent with the Attorney General’s recommended design features. Implementation of these measures would reduce



GHG emissions to 8,813.89 MTCO₂eq/yr, which equates to a 30.9 percent reduction. AB 32 requires the reduction of GHG emissions to 1990 levels, which would require a minimum 28.5 percent reduction in “business as usual” GHG emissions for the entire State. Therefore, as implementation of Mitigation Measure GHG-1 would reduce “business as usual” emissions by 30.9 percent, the Project Alternative would be considered to be consistent with the reduction goals of AB 32. A less than significant impact would occur in this regard.

Mitigation Measures:

GHG-1 The proposed project shall include, but not be limited to, the following list of potential design features. These features shall be incorporated into the project design to ensure consistency with adopted statewide plans and programs. The project applicant shall demonstrate the incorporation of the following project design features prior to the issuance of building or occupancy permits as applicable.

Transportation

- Provide pedestrian connections to the off-site circulation network (building permit).
- Implement a trip reduction program, for which all employees shall be eligible to participate (occupancy permit). This measure is not applicable to residential uses.
- Provide a ride sharing program, for which all employees shall be eligible to participate (occupancy permit). This measure is not applicable to residential uses.

Energy Efficiency

- Design buildings to be energy efficient, 15 percent above Title 24 requirements (building permit).
- The landscape plan shall utilize strategically placed trees that shall shade building walls, particularly those containing the most windows (building permit).
- Install high efficiency lighting, and energy efficient heating and cooling systems (building permit).
- Reduce unnecessary outdoor lighting (building permit).

Water Conservation and Efficiency

- Install water-efficient irrigation systems (building permit).
- Comply with the landscape sustainability measures in the Sustainability Development Regulations of the *Serrano Summit Area Plan* (building permit).
- Install low-flow faucets and toilets (building permit).



Solid Waste

- Reuse and recycle construction waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard) (building permit).
- Provide interior and exterior storage areas for recyclables and adequate recycling containers located in public areas (occupancy permit).

Level of Significance: Less Than Significant Impact With Mitigation Incorporated.

CONSISTENCY WITH APPLICABLE GHG PLANS, POLICIES, OR REGULATIONS

GHG-2 IMPLEMENTATION OF THE PROPOSED PROJECT WOULD NOT CONFLICT WITH AN APPLICABLE GREENHOUSE GAS REDUCTION PLAN, POLICY, OR REGULATION.

Impact Analysis: The City of Lake Forest does not have an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. The proposed project has adopted an Area Plan (*Serrano Summit Area Plan*, dated October 1, 2009) that contains a Green Builder Program. This program establishes guidelines and programs for the Serrano Summit community to achieve energy conservation through building design and reduction of non-renewable resources, and implement California-appropriate landscape practices. This program would be enforced by the project master developer. The adopted *Serrano Summit Area Plan* also establishes Sustainability Development Regulations for the structures and site development and increases the landscape sustainability throughout the community. These regulations would also be enforced by the project master developer. The Green Builder Program and Sustainability Development Regulations are provided in [Appendix 12.3, *Air Quality Analysis*](#).

In addition, the project would also be subject to all applicable regulatory requirements, which would also reduce the GHG emissions of the project. After implementation of Mitigation Measure GHG-1 and the project's Green Builder Program and Sustainability Development Regulations and application of regulatory requirements, the project would implement appropriate GHG reduction strategies and would not conflict with or impede implementation of reduction goals identified in AB 32 and other strategies to help reduce GHG emissions. Therefore, the project would not conflict with an applicable GHG reduction plan, policy, or regulation and impacts would be less than significant in this regard.

PROJECT ALTERNATIVE

As with the proposed project, the Project Alternative would not conflict with an adopted plan, policy, or regulation pertaining to GHGs. The Project Alternative would be required to comply with the Green Builder Program and Sustainability Development Regulations that are part of the development regulations in the *Serrano Summit Area Plan*. These regulations would be enforced by the project master developer. Additionally, the project would be subject to all applicable regulatory requirements, which would also reduce the GHG emissions of the project. Implementation of Mitigation Measure GHG-1, the project's Green Builder Program and Sustainability Development



Regulations, and other regulatory requirements would ensure that the project would not conflict with or impede implementation of reduction goals identified in AB 32 and other strategies to help reduce GHG emissions.

Mitigation Measures: Refer to Mitigation Measure GHG-1.

Level of Significance: Less Than Significant Impact With Mitigation Incorporated.

5.2.5 CUMULATIVE IMPACTS

- **GREENHOUSE GAS EMISSIONS RESULTING FROM DEVELOPMENT ASSOCIATED WITH IMPLEMENTATION OF THE PROPOSED PROJECT WOULD NOT IMPACT GREENHOUSE GAS LEVELS ON A CUMULATIVELY CONSIDERABLE BASIS.**

Impact Analysis:

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

As stated above, based on project design elements and Mitigation Measure GHG-1, the proposed project would not result in a significant impact regarding GHG emissions. The project would implement the project design features of the Green Builder Program and the Sustainability Development Regulations within the *Serrano Summit Area Plan* and required by Mitigation Measure GHG-1. These sustainability measures would reduce GHG emissions to be consistent with the reduction goals of AB 32.

On December 30, 2009, the Natural Resources Agency adopted the CEQA Guideline Amendments prepared by Office of Planning and Research (OPR), as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010. The Natural Resources Agency originally proposed to add subdivision (f) to section 15130 to clarify that sections 21083 and 21083.05 of the Public Resources Code do not require a detailed analysis of GHG emissions solely due to the emissions of other projects (i.e., State CEQA Guidelines, Section 15130(a)(1); *Santa Monica Chamber of Commerce v. City of Santa Monica* (2002) 101 Cal.App.4th 786, 799). Rather, the proposed subdivision (f) would have provided that a detailed analysis is required when evidence shows that the incremental contribution of the project's GHG emissions is cumulatively considerable when added to other cumulative projects (i.e., *Communities for a Better Environment v. California Resources Agency* (2002), supra, 103 Cal.App.4th at 119-120). In essence, the proposed addition would be a restatement of law as applied to GHG emissions. Analysis of GHG emissions as a cumulative impact is consistent with case law arising under the National Environmental Policy Act (e.g., *Center for Biological Diversity v. National Highway Traffic Safety Administration*, 538 F.3d 1172, 1215-1217 [9th Cir. 2008]). Other portions of the CEQA Guideline Amendments address how lead agencies may determine whether a project's emissions are cumulatively considerable (e.g., Proposed Sections 1506(h)(3) and 15064.4). However, public comments noted that the new subdivision



merely restated the law, and was capable of misinterpretation. The Natural Resources Agency, therefore, determined that because other provisions of the CEQA Guideline Amendments address the analysis of GHG emissions as a cumulative impact, and because the reasoning of those is fully explained in the Initial Statement of Reasons, subdivision (f) should not be added to the CEQA Guidelines. The deletion was reflected in the revisions that were made available for further public review and comment on October 23, 2009.

It is generally the case that an individual project of this size and nature is of insufficient magnitude by itself to influence climate change or result in a substantial contribution to the global GHG inventory.¹⁹ GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective.²⁰ The additive effect of the project's GHG emissions would not result in a reasonably foreseeable cumulatively considerable contribution to global climate change. In addition, the proposed project as well as other cumulative related projects would also be subject to all applicable regulatory requirements, which would also reduce the GHG emissions of the project. For the reasons discussed in this section and because the project incorporates GHG reduction measures and design features, the project's cumulative GHG emissions would have a less than significant impact on the environment.

PROJECT ALTERNATIVE

The development of the Project Alternative would exclude the Civic Center, allowing in its place the development of additional residential uses. The Project Alternative would also be required to implement the Green Builder Program and the Sustainability Development Regulations within the *Serrano Summit Area Plan* and required by Mitigation Measure GHG-1. These sustainability measures would reduce GHG emissions to be consistent with the reduction goals of AB 32. The additive effect of the Project Alternative's GHG emissions would not result in a reasonably foreseeable cumulatively considerable contribution to global climate change. In addition, the Project Alternative, as well as other cumulative related projects would also be subject to all applicable regulatory requirements, which would also reduce the GHG emissions. Therefore, the Project Alternative's cumulative GHG emissions would have a less than significant impact on the environment.

Mitigation Measures: Refer to Mitigation Measures GHG-1. No additional mitigation measures are required.

Level of Significance After Mitigation:

Overall Cumulative Impact – Less Than Significant Impact.

Project Cumulative Contribution – Less Than Significant Impact.

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

¹⁹ California Air Pollution Control Officers Association, *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, 2008.

²⁰ Ibid.



As described above, the proposed project would not conflict with an adopted plan, policy, or regulation pertaining to GHGs and would be required to comply with the Green Builder Program and Sustainability Development Regulations that are part of the development regulations in the *Serrano Summit Area Plan*. Additionally, the proposed project and all related cumulative projects would be subject to all applicable regulatory requirements, which would also reduce the GHG emissions of the project. Implementation of Mitigation Measure GHG-1, the project's Green Builder Program and Sustainability Development Regulations, and other regulatory requirements would ensure that the project would not conflict with or impede implementation of reduction goals identified in AB 32 and other strategies to help reduce GHG emissions. Cumulative projects would be required to be consistent with the reduction goals of AB 32 and other state strategies to avoid significant GHG impacts. The proposed project would not generate a significant amount of GHGs and the proposed project would not result in a cumulatively considerable impact with regard to a conflict with an adopted GHG reduction plan, policy, or regulation. There are no other applicable plans, policies, or regulations that have been adopted by the City or other regulating agency for the purpose of reducing GHG emissions. Therefore, impacts in this regard would be less than significant.

PROJECT ALTERNATIVE

As with the proposed project, the Project Alternative would not conflict with an adopted plan, policy, or regulation pertaining to GHGs. After implementation of Mitigation Measure GHG-1 and the Green Builder Program and Sustainability Development Regulations and application of regulatory requirements, the Project Alternative would implement appropriate GHG reduction strategies and would not conflict with or impede implementation of reduction goals identified in AB 32. Therefore, the Project Alternative's cumulative contribution in this regard would be reduced to a less than significant level.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation:

Overall Cumulative Impact – Less Than Significant Impact.

Project Cumulative Contribution – Less Than Significant Impact.

5.2.6 SIGNIFICANT UNAVOIDABLE IMPACTS

No unavoidable significant impacts related to greenhouse gas emissions have been identified in this section.