4.3 Greenhouse Gas Emissions

4.3.1 Introduction

This greenhouse gas (GHG) analysis examines potential GHG and global climate change (GCC) impacts that could result from construction and operational activities associated with the proposed Project. This section describes applicable Federal, State, and local regulations that address GHG emissions and GCC in California and the City of Los Angeles; existing climate conditions and influences on GCC are also described. The analysis accounts for energy and resource conservation measures that have been incorporated into the proposed Project, as well as pertinent State mandated GHG emission reduction measures. The analysis also assesses potential cumulative and project-related contributions to GCC that could result from the proposed Project. Air quality effects associated with criteria pollutant (ambient air pollutant) emissions are discussed in Chapter 4.1, *Air Quality*, of this EIR. GHG emission calculations prepared for the proposed Project are provided in Appendix B, *Air Quality and Greenhouse Gas Emissions*, of this EIR.

4.3.1.1 Global Climate Change (GCC)

Briefly stated, GCC is a change in the average climatic conditions of the earth, as characterized by changes in wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. Many of the recent concerns over GCC use these data to extrapolate a level of statistical significance, specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) developed several emission projections of GHGs needed to stabilize global temperatures and climate change impacts. The IPCC predicted that the range of global mean temperature change from 1990 to 2100, given six scenarios, could range from 1.1 to 6.4 degrees Celsius (C).[1] Regardless of analytical methodology, global average temperature and mean sea level are expected to rise under all scenarios.

Climate models applied to California's conditions project that, under different scenarios, temperatures in California are expected to increase by 3 to 10.5 degrees Fahrenheit (F).[2] Almost all climate scenarios include a continuing trend of warming through the end of the century given the substantial amounts of GHGs already released, and the difficulties associated with reducing emissions to a level that would stabilize the climate. According to the *2006 California Climate Action Team Report*, the following climate change effects are predicted in California over the course of the next century.[3]

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1 Intergovernmental Panel on Climate Change, Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007.

2 California Climate Change Center, Our Changing Climate: Assessing the Risks to California, 2006.

3 California Environmental Protection Agency, Climate Action Team, Report to Governor Schwarzenegger and the California Legislature, March 2006.

- A diminishing Sierra snowpack declining by 70 to 90 percent, threatening the state's water supply.
- Increasing temperatures, as noted above, of up to approximately 10 degrees F under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas.
- Coastal erosion along the length of California and seawater intrusion into the Sacramento-San Joaquin River Delta from a 4- to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions.
- Increased vulnerability of forests due to pest infestation and increased temperatures.
- Increased challenges for the state's important agricultural industry from water shortages, increasing temperatures, and saltwater intrusion into the Sacramento-San Joaquin River Delta.
- Increased electricity demand, particularly in the hot summer months.

As such, temperature increases would lead to adverse environmental impacts in a wide variety of areas, including: sea level rise, reduced snowpack resulting in changes to existing water resources, increased risk of wildfires, and public health hazards associated with higher peak temperatures, heat waves, and decreased air quality.

4.3.1.2 Greenhouse Gases

Parts of the earth's atmosphere act as an insulating blanket, trapping sufficient solar energy to keep the global average temperature in a suitable range. The blanket is a collection of atmospheric gases called GHGs. These gases – primarily water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) – all act as effective global insulators, reflecting back to earth visible light and infrared radiation. Human activities, such as producing electricity and driving vehicles, have elevated the concentrations of these gases in the atmosphere. Many scientists believe that these elevated levels, in turn, are causing the earth's temperature to rise. A warmer earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Climate change is driven by "forcings" and "feedbacks." Radiative forcing is the difference between the incoming energy and outgoing energy in the climate system. A feedback is "an internal climate process that amplifies or dampens the climate response to a specific forcing."[4] The global warming potential (GWP) is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas."[5] Individual GHG species have varying GWP and atmospheric lifetimes. The carbon dioxide equivalent (CO_2e) --

[4] National Research Council of the National Academies, Radiative Forcing of Climate Change: Expanding the Concept and Addressing Uncertainties, 2005.

[5] U.S. Environmental Protection Agency, Glossary of Climate Terms, Available: www.epa.gov/climatechange/glossary.html, Accessed October 10, 2013.

the mass emissions of an individual GHG multiplied by its GWP -- is a consistent methodology for comparing GHG emissions because it normalizes various GHG emissions to a consistent metric. The reference gas for GWP is CO_2; CO_2 has a GWP of 1. Compared to CH_4's GWP of 21, CH_4 has a greater global warming effect than CO_2 on a molecule-per-molecule basis. **Table 4.3-1** identifies the GWP of several select GHGs.

Table 4.3-1

Global Warming Potentials and Atmospheric Lifetimes of Select Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100 Year Time Horizon)
Carbon Dioxide	50 - 200	1
Methane	12 + 3	21
Nitrous Oxide	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Perfluromethane (CF_4)	50,000	6,500
PFC: Perfluoroethane (C_2F_6)	10,000	9,200
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: Intergovernmental Panel on Climate Change, Climate Change 1995: The Science of Climate Change. Contribution of Working Group I to the Second Assessment Report (SAR) of the Intergovernmental Panel on Climate Change, 1996.[6]

In estimating the GHG emissions, the *GHG Protocol Corporate Accounting and Reporting Standard* (GHG Protocol), developed by the World Business Council for Sustainable Development and World Resources Institute,[7] provides standards and guidance for preparing a GHG emissions inventory. The standard is written primarily from the perspective of a business developing a GHG inventory. The GHG Protocol provides the accounting framework for nearly every GHG standard and program in the world from the International Standards Organization to the European Union Emissions Trading Scheme to the California Climate Action Registry (CCAR), as well as hundreds of GHG inventories prepared by individual companies. Other organizations, such as the Transportation Research Board's Airport Cooperative Research Program Report 11 *Guidance for Preparing Airport Greenhouse Gas Inventories* and the FAA (FAA Order 1050.1E, Change 1, Guidance Memo #3) were also considered.

[6] GWP values have been updated in IPCC's subsequent assessment reports (e.g., Third Assessment Report [TAR], etc.). However, in accordance with international and U.S. convention to maintain the value of the carbon dioxide 'currency', GHG emission inventories are calculated using the GWPs from the IPCC SAR.

[7] World Business Council for Sustainable Development and World Resources Institute, The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition, April 2004, Available: http://www.ghgprotocol.org/files/ghgp/public/ghg-protocol-revised.pdf.

The GHG Protocol divides GHG emissions into three source types or "scopes," ranging from GHGs produced directly by the business to more indirect sources of GHG emissions, such as employee travel and commuting. Direct and indirect emissions can be generally separated into three broad scopes as follows:

- Scope 1. All direct GHG emissions.
- Scope 2. Indirect GHG emissions from consumption of purchased electricity, heat, or steam (i.e., GHG emissions generated at the power plant that provides electricity at the demand of the site/facility).
- Scope 3. Other indirect (optional) GHG emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g., transmission and distribution losses) not covered in Scope 2, outsourced activities, waste disposal, and construction.

4.3.2 Methodology

A number of methodologies and significance thresholds have been proposed for analyzing impacts on GCC. However, at this time no definitive thresholds or methodologies that are applicable to the proposed Project have been adopted for determining the significance of the Project's cumulative contribution to GCC in CEQA documents.

For the purposes of this EIR, as explained in more detail below, total GHG emissions from the proposed Project were quantified to determine whether the proposed Project would be consistent with the Global Warming Solutions Act of 2006, also known as AB 32 (i.e., reduction of State-wide GHG emissions to 1990 levels by 2020). The mandate of AB 32 demonstrates California's commitment to reducing GHG emissions and the State's associated contribution to climate change, without intending to limit population or economic growth within the State.

Various guidance documents, such as The Climate Registry *General Reporting Protocol* (version 2.0, March 2013), the joint California Air Resources Board (CARB), California Climate Action Registry (CCAR), and International Council for Local Environmental Initiatives (ICLEI) *Local Government Operations Protocol* (LGOP) (version 1.1, May 2010), and the Association of Environmental Professionals (AEP) *Community-wide GHG Emissions Protocol*, propose generally consistent methodologies for preparing GHG inventories. However, these methodologies have been developed for varying purposes and not specifically for CEQA. Relying on these guidance documents, this analysis will only address direct GHG emissions. Direct emissions related to the proposed Project only include the construction period, which would consist of the temporary change in airfield operations, construction and operation equipment, construction haul trips, and construction worker commute trips. Indirect emissions, which can include consumption of purchased electricity, solid waste disposal, water usage, and wastewater treatment, are not included in this analysis as no building facilities will be constructed.

Future operations of the proposed Project would not result in long-term operational changes to aircraft operations or surface traffic activity and flows within the Airport study area, since the proposed Project would have no effect on the number or type of aircraft operations at LAX nor would it change the movement of aircraft in the air or on the airfield. The proposed Project

would not change the number of airline passengers traveling to/through the airport and thus, vehicular traffic is not analyzed in this EIR.

Methodologies used to analyze GHG emissions, as discussed in the following sections, meet the requirements of the South Coast Air Quality Management District (SCAQMD) and CARB for evaluations conducted under CEQA.

4.3.2.1 Construction

GHG emissions associated with construction of the proposed Project were calculated based on methodologies provided in The Climate Registry *General Reporting Protocol* (GRP) Version 2.0.[8] The GRP is the guidance document that LAWA and other members of The Climate Registry must use to prepare annual GHG inventories for the Registry. Therefore, for consistency, the GRP also was used in this study. However, to adapt the GRP for CEQA purposes, a refinement to the GRP operational and geographical boundaries was necessary. The GRP requires all emissions to be reported, as well as all direct and indirect emissions owned or controlled by the reporting entity (in this case, LAWA). As discussed above, this analysis focuses on direct GHG emissions of the proposed Project.

In accordance with SCAQMD guidance, GHG emissions from construction have been amortized over the 30-year lifetime of the proposed Project to enable comparison to the SCAQMD and LA CEQA thresholds of significance (i.e., total construction GHG emissions were divided by 30 to determine an annual construction emissions estimate comparable to operational emissions).

Construction Activity

The proposed Project-related construction sources for which GHG emissions were calculated include:

- Off-road construction equipment
- On-road equipment and delivery/haul trucks
- Construction worker commute vehicles
- Aircraft operations during runway closure

The parameters used to develop construction GHG emissions for these sources, including construction schedule, equipment usage, and load factors, are generally the same as those outlined for construction criteria air pollutant emissions, presented in Section 4.1, *Air Quality*.

Temporary Shift in Aircraft Operations

Emissions inventories were also developed for the aircraft operational emissions during construction. To allow for the rehabilitation of portions of the Runway 6L-24R pavement, the runway must be temporarily closed for an extended period of time (estimated at 4 months). In addition, to allow for completion of the construction work on the Argo Ditch, Runway 6L-24R must operate at a reduced length of 7,000 feet for a period of 60 days (2 months). During the

[8] California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009.

period of runway closure, the operations from this runway must be accommodated through the use of other runways at LAX. During the 2-month period of reduced runway length, some operations (primarily larger commercial aircraft, ADG IV or higher) must be shifted to other runways. This shift in operations may cause airfield and/or airspace delays resulting in increased arrival and departure taxi times. An increase in taxi travel times can result in increased emissions.

In order to determine air quality impacts during this period, airport simulation models (SIMMOD) were developed for the 2015 normal operations and the 2015 runway closure period. Information on the number and types of aircraft operations considered at LAX for 2015 were developed specifically for the Project. These data were used to develop SIMMOD of aircraft operations in order to determine Project-specific taxi/idle times. The SIMMOD used information about facilities and operations to predict specific timing, volume, and location (e.g., runway used) for aircraft operations.

The incremental differences in taxi/idle times were used for the analysis of aircraft emissions associated with the shift in aircraft operations during the runway closure period and the shortened runway period; taxi/idle times during both of these periods will be slightly greater than normal operations during 2015. A summary of the taxi times are shown in **Table 4.3-2**.

Table 4.3-2

Modeled Aircraft Taxi Times, 2015

Year/Scenario	Days in 2015	Taxi-In Time (minutes per operation)	Taxi-Out Time (minutes per operation)
2015 Without Project	183	9.21	12.05
2015 Runway Closure Period	122	9.26	12.62
2015 Shortened Runway Period	60	9.39	12.05

Source: Ricondo & Associates, Inc., 2014.

Operational aircraft CO_2 emissions for the above scenarios were calculated using the taxi times in Table 4.3-2 and FAA's Emissions and Dispersion Modeling System (EDMS), Version 5.1.4.1. EDMS is a USEPA approved air quality model that estimates emissions from airport sources based on information input into the model. Aircraft emissions occur during approach, taxi-in (from runway to apron including landing roll), engine startup at the apron, taxi-out (from apron to runway), takeoff, and climb-out; emissions for each of these operational modes were calculated for each scenario. The taxi/idle times were derived from the SIMMOD results. However, as none of the other operational phases would be affected by the runway closure, the EDMS default times-in-mode were the basis for climbout, approach, and takeoff times; however, climbout and approach times were adjusted according to the average mixing height adjustment parameters contained in EDMS. For LAX, a mixing height of 1,806 feet above mean sea level was used in the emissions modeling.

The aircraft fleet mix and operational levels for the 2015 normal operations and the 2015 runway closure period were assigned within the EDMS as outlined in Appendix B. Where possible, aircraft engines representing the actual in-use fleet at LAX were applied in EDMS

using LAWA's Aircraft Noise and Operations Monitoring System (ANOMS) data, and cross-referenced with proprietary fleet data for air carrier and business jet operations, on the basis of reported aircraft tail number. In segments of the fleet where such matches were not possible, EDMS default engine selections were retained.

Annual emissions outputs from EDMS for the runway closure, shortened runway period, and normal operations, were annualized based on the number of days for each phase. The incremental change in emissions between the Without Project and the annualized emissions for the runway closure period and shortened runway period scenarios would be the Project's construction impact from aircraft.

CH_4 and N_2O emissions are not directly estimated by EDMS; therefore, it was necessary to estimate emissions using other methods. Emissions were calculated using fuel burn from EDMS and emission factors from the U.S. Energy Information Administration.[9]

4.3.2.2 Operations

As discussed in Chapter 2, *Project Description*, the intent of the proposed Project is to comply with federal requirements for RSA design standards by the end of 2015. Operation of the proposed Project would not result in changes to fleet composition, air traffic patterns, an increase in airport operations, aircraft taxi routes, stationary sources, motor vehicles, or aircraft ground support equipment. However, since significance is based on the combined impacts of construction and operations of the proposed Project, an operational GHG inventory for aircraft is provided.

The operational GHG inventory follows the same methodology as the runway closure period during the construction phase, as outlined in Section 4.3.2.1. As no operational changes are expected as a result of the proposed Project, the 2015 normal operations SIMMOD results (as discussed previously) are representative of both the 2015 Without and With Project scenarios.

4.3.3 Existing Conditions

4.3.3.1 Regulatory Setting

International and Federal Regulations and Directives

International Governmental Panel on Climate Change (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 risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation."

[9] U.S. Energy Information Administration, "Voluntary Reporting of Greenhouse Gases Program Fuel Emission Coefficients," January 31, 2011, available: www.eia.gov/oiaf/1605/coefficients.html#tbl7.

United Nations Framework Convention on Climate Change

On March 21, 1994, the U.S. joined other countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

Kyoto Protocol

The Kyoto Protocol is a treaty made under the UNFCCC. Countries can sign the treaty to demonstrate their commitment to reduce their emissions of GHGs or engage in emissions trading. More than 160 countries, accounting for 55 percent of global emissions, are under the protocol. The U.S. symbolically signed the Kyoto Protocol in 1998. However, in order for the Kyoto Protocol to be formally ratified, it must be adopted by the U.S. Senate, which has not been done to date. The original GHG reduction commitments made under the Kyoto Protocol expired at the end of 2012. A second commitment period was agreed to at the Doha, Qatar, meeting held December 8, 2012, which extended the commitment period to December 31, 2020.

Massachusetts et al. v. United States Environmental Protection Agency et al.

Massachusetts et. al. v. Environmental Protection Agency et. al. (549 U.S. 497 [2007]) was argued before the U.S. Supreme Court on November 29, 2006, in which it was petitioned that USEPA regulate four GHGs, including CO_2, under Section 202(a)(1) of the Clean Air Act (CAA). The Court issued an opinion on April 2, 2007, in which it held that petitioners have standing to challenge the USEPA and that the USEPA has statutory authority to regulate emissions of GHGs from motor vehicles.

Endangerment Finding

The USEPA subsequently published its endangerment finding for GHGs in the Federal Register,[10] which responds to the court case noted above. The USEPA Administrator determined that six GHGs, taken in combination, endanger both the public health and welfare of current and future generations. Although the endangerment finding discusses the effects of six GHGs, it acknowledges that transportation sources only emit four of the key GHGs: CO_2, CH_4, N_2O, and HFCs. Further, the USEPA Administrator found that the combined emissions of these GHGs from new motor vehicles contribute to air pollution that endangers the public health and welfare under the CAA, Section 202(a).

[10] U.S. Environmental Protection Agency, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the CAA, Federal Register 74 (15 December 2009): 66496-66546.

GHG and Fuel Efficiency Standards for Passenger Cars and Light-Duty Trucks

In April 2010, the USEPA and National Highway Traffic Safety Administration (NHTSA) finalized GHG standards for new (model year 2012 through 2016) passenger cars, light-duty trucks, and medium-duty passenger vehicles. Under these standards, CO_2 emission limits would decrease from 295 grams per mile (g/mi) in 2012 to 250 g/mi in 2016 for a combined fleet of cars and light trucks. If all of the necessary emission reductions were made from fuel economy improvements, then the standards would correspond to a combined fuel economy of 30.1 miles per gallon (mpg) in 2012 and 35.5 mpg in 2016. The agencies issued a joint Final Rule for a coordinated National Program for model years 2017 to 2025 light-duty vehicles on August 28, 2012, that would correspond to a combined fuel economy of 36.6 mpg in 2017 and 54.5 mpg in 2025.

GHG and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles

In October 2010, the USEPA and NHTSA announced a program to reduce GHG emissions and to improve fuel efficiency for medium- and heavy-duty vehicles (model years 2014 through 2018). These standards were signed into law on August 9, 2011. The two agencies' complementary standards form a new Heavy-Duty National Program that has the potential to reduce GHG emissions by 270 million metric tons and to reduce oil consumption by 530 million barrels over the life of the affected vehicles.

State Regulations and Directives

Title 24 Energy Standards

Although not originally intended to reduce GHG emissions, California's Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. The latest amendments were made in April 2008 and went into effect on January 1, 2010. The premise for the standards is that energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in GHG emissions. Therefore, increased energy efficiency in buildings results in fewer GHG emissions on a building-by-building basis.

California Assembly Bill 1493 (AB 1493) - Pavley

Enacted on July 22, 2002, this bill required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Regulations adopted by CARB apply to 2009 and later model year vehicles. CARB estimates that the regulation will reduce GHG emissions from the light-duty and passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030, compared to recent years. In 2011, the U.S. Department of Transportation, USEPA, and California announced a single timeframe for proposing fuel and economy standards, thereby aligning the Pavley standards with the federal standards for

passenger cars and light-duty trucks. Emission estimates included in this analysis account for the Pavley standards.

Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets for all of California: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

California Assembly Bill 32 (AB 32)

AB 32, titled The California Global Warming Solutions Act of 2006 and signed by Governor Schwarzenegger in September 2006, requires CARB to adopt regulations to require the reporting and verification of Statewide GHG emissions and to monitor and enforce compliance with the program. In general, the bill requires CARB to reduce Statewide GHG emissions to the equivalent of those in 1990 by 2020. CARB adopted regulations in December 2007 for mandatory GHG emissions reporting. On August 24, 2011, CARB adopted the scoping plan indicating how emission reductions will be achieved. Part of the scoping plan includes an economy-wide cap-and-trade program. The final cap-and-trade plan was approved on October 21, 2011 and went into effect on January 1, 2013.

California Senate Bill 375 (SB 375)

SB 375 requires CARB to set regional targets for 2020 and 2035 to reduce GHG emissions from passenger vehicles. A regional target will be developed for each of the 18 metropolitan planning organizations (MPOs) in the State; the Southern California Association of Governments (SCAG) is the MPO that has jurisdiction over the LAX area. A Regional Targets Advisory Committee (RTAC) was appointed by CARB to provide recommendations to be considered and methodologies to be used in CARB's target setting process. The final RTAC report was released on January 23, 2009.

Each MPO is required to develop Sustainable Community Strategies through integrated land use and transportation planning and to demonstrate an ability to attain the proposed reduction targets by 2020 and 2035. CARB issued an eight percent per capita reduction target to the SCAG region for 2020 and a target of 13 percent per capita reduction by 2035. SCAG adopted the Regional Transportation Plan/Sustainable Community Strategies for the six-county Southern California region on April 4, 2012.

Executive Order S-01-07 and the Low Carbon Fuel Standard

California Executive Order S-01-07 established a Statewide goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020 from 2005. The Executive Order also mandated the creation of Low Carbon Fuel Standard (LCFS) for transportation fuels. The LCFS requires that the life-cycle GHG emissions for the mix of fuels sold in California decline on average. Each fuel provider may meet the standard by selling fuel with lower carbon content, using previously banked credits from selling fuel that exceeded the

LCFS, or purchasing credit from other fuel providers who have earned credits.[11] On December 29, 2011, U.S. District Judge Lawrence O'Neill granted an injunction to prevent CARB from implementing the LCFS because it violates a federal law on interstate commerce. CARB's motion to stay the decision was also subsequently denied on January 24, 2012 (Rocky Mountain Farmers Union v. Goldstene, E.D. Cal., No. 09-cv-02234).

Senate Bill 97 (SB 97)

SB 97 requires the Office of Planning and Research (OPR) to prepare guidelines to submit to the California Natural Resources Agency (CNRA) regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by CEQA. The CNRA adopted amendments to the State *CEQA Guidelines* for GHG emissions on December 30, 2009. The amendments became effective on March 18, 2010. The guidelines apply retroactively to any incomplete EIR, negative declaration, mitigated negative declaration, or other related document, and are reflected in this EIR.[12]

Renewables Portfolio Standard

Senate Bill 1078 (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, the Governor signed Executive Order S-14-08, which expands the State's Renewable (Energy) Portfolio Standard (RPS) to 33 percent renewable power by 2020. On September 15, 2009, the Governor issued Executive Order S-21-0911 requiring CARB, under its AB 32 authority, to adopt regulations to meet a 33 percent RPS target by 2020. The CARB regulations would use a phased-in or tiered requirement to increase the amount of electricity from eligible renewable sources over an eight year period beginning in 2012. CARB adopted the regulations in September 2010. In March 2011, the Legislature passed SB X1-2, which was signed into law by the Governor the following month. SB X1-2 requires utilities to procure renewable energy products equal to 33 percent of retail sales by December 31, 2020 and also establishes interim targets: 20 percent by December 31, 2013 and 25 percent by December 31, 2016. SB X1-2 also applies to publicly-owned utilities in California. According to the most recent data available from the Los Angeles Department of Water and Power (LADWP), the utility provider for the City of Los Angeles, approximately 19 percent of its electricity purchases in 2011 were from eligible renewable sources.[13]

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11 17 California Code of Regulations, Section 95480 et seq., "Low Carbon Fuel Standard."

12 Senate Bill 97, August 24, 2007.

13 Los Angeles Department of Water and Power, "Power Content Label," https://www.ladwp.com. Accessed August 2013.

Regional Regulations and Directives

California Air Pollution Control Officers Association (CAPCOA) Guidance

CAPCOA published a white paper to provide a common platform of information and tools to address climate change in CEQA analyses, including the evaluation and mitigation of GHG emissions from proposed projects and identifying significance thresholds options. The white paper addresses issues inherent in establishing CEQA thresholds, evaluates tools, catalogues mitigation measures, and provides air districts and lead agencies with options for incorporating climate change into their programs.

SCAQMD Guidance

The South Coast Air Quality Management District (SCAQMD) has convened a GHG CEQA Significance Threshold Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that will provide input to the SCAQMD staff on developing GHG CEQA significance thresholds. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The SCAQMD has not adopted guidance for CEQA projects under other lead agencies.

Local Regulations and Directives

Green LA

In May 2007, the City of Los Angeles introduced *Green LA - An Action Plan to Lead the Nation in Fighting Global Warming* (Green LA).[14] Green LA presents a framework targeted to reduce the City's GHG emissions by 35 percent below 1990 levels by 2030. The plan calls for an increase in the City's use of renewable energy to 35 percent by 2020 in combination with promoting water conservation, improving the transportation system, reducing waste generation, greening the ports and airports, creating more parks and open space, and greening the economic sector. Green LA identifies objectives and actions in various focus areas, including airports. The goal for LA's airports is to "green the airports," and the following actions are identified: 1) fully implement the Sustainability Performance Improvement Management System (discussed below); 2) develop and implement policies to meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) green building rating standards in future construction; 3) improve recycling, increase use of alternative fuel sources, increase use of recycled water, increase water conservation, reduce energy needs, and reduce GHG emissions; and 4) evaluate options to reduce aircraft-related GHG emissions.

[14] City of Los Angeles, Green LA - An Action Plan to Lead the Nation in Fighting Global Warming, 2007.

Climate LA

In 2008, the City of Los Angeles followed up Green LA with an implementation plan called *Climate LA - Municipal Program Implementing the Green LA Climate Action Plan* (Climate LA).[15] A Departmental Action Plan for LAWA is included in Climate LA, which identifies goals to reduce CO_2 emissions 35 percent below 1990 levels by 2030 at LAX and the other three LAWA airports, implement sustainability practices, and develop programs to reduce the generation of waste and pollutants. Actions are specified in the areas of aircraft operations, ground vehicles, electrical consumption, building, and other actions.

Executive Directive No. 10

In July 2007, Mayor Antonio Villaraigosa issued Executive Directive No. 10 regarding environmental stewardship practices. Executive Directive No. 10 requires that City departments, including LAWA, create and adopt a "Statement of Sustainable Building Policies," which should encompass sustainable design, energy and atmosphere, materials and resources, water efficiency, landscaping, and transportation resources. In addition, City departments and offices must create and adopt sustainability plans that include all the policies, procedures, programs, and policies that are designed to improve internal environmental efficiency. Finally, City departments are required to submit annual sustainability reports to the Mayor for review.[16]

City of Los Angeles Green Building Code (LAGBC)

In December 2010, the Los Angeles City Council approved Ordinance No. 181,481, which amended Chapter IX of the Los Angeles Municipal Code (LAMC) by adding a new Article 9 to incorporate various provisions of the 2010 CALGreen Code. The requirements of the adopted LAGBC apply to new building construction, building renovations, and building additions within the City of Los Angeles. Specific mandatory requirements and elective measures are provided for three categories: (1) low-rise residential buildings; (2) nonresidential and high-rise residential buildings; and (3) additions and alterations to nonresidential and high-rise residential buildings. Key measures in the LAGBC that apply to nonresidential buildings include, but are not limited to, the following:

- Construction – A Storm Water Pollution Prevention Plan conforming to the State Storm Water National Pollutant Discharge Elimination System Construction Permit or local ordinance, whichever is stricter, is required for a project regardless of acreage disturbed;
- Construction – Construction waste reduction of at least 50 percent of construction debris;
- Construction – 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled;
- Transportation Demand – Designated parking for any combination of low emitting, fuel-efficient, and carpool/vanpool vehicles shall be provided;

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15 City of Los Angeles, Climate LA - Municipal Program Implementing the Green LA Climate Action Plan, 2008.

16 Antonio R. Villaraigosa, *Executive Directive No. 10, Sustainable Practices in the City of Los Angeles,* July 2007.

- Energy Conservation – Electric vehicle supply wiring for a minimum of 5 percent of the total number of parking spaces shall be provided;
- Energy Conservation – Energy conservation for new buildings must exceed California Energy Commission (CEC) requirements, based on the 2008 Energy Efficiency Standards, by 15 percent using an Alternative Calculation Method approved by the CEC;
- Energy Conservation – Each appliance provided and installed shall meet Energy Star requirements, if an Energy Star designation is applicable for that appliance;
- Renewable Energy – Future access, off-grid prewiring, and space for electrical solar systems shall be provided;
- Water – A schedule of plumbing fixtures and fixture fittings shall be provided that will reduce the overall use of potable water within the building by at least 20 percent based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code; and
- Wastewater – Each building shall reduce wastewater by 20 percent based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code.

LAWA Sustainability Plan

LAWA's Sustainability Plan,[17] developed in April 2008, describes LAWA's current sustainability practices and sets goals and actions that LAWA will undertake to implement the initiatives described above (Green LA, Climate LA, and LAGBC). The Sustainability Plan presents initiatives for the fiscal year 2008-2009 and long-term objectives and targets to meet the fundamental objectives identified above.

LAWA has developed *Sustainable Airport Planning, Design and Construction Guidelines for Implementation on All Airport Projects* (LAWA Guidelines).[18] The LAWA Guidelines were developed to provide a comprehensive set of performance standards focusing on sustainability specifically for Airport projects on a project-level basis. A portion of the LAWA Guidelines is based on the LEED® rating systems for buildings. The LAWA Guidelines incorporate a "LAWA-Sustainable Rating System" based on the number of planning and design points and construction points a project achieves, based on the criteria and performance standards defined in the LAWA Guidelines.

Based on the above, LAWA has taken steps to increase its sustainability practices related to daily Airport operations, many of which directly or indirectly contribute to a reduction in GHG emissions. Actions that LAWA has been undertaking include promoting and expanding the Fly Away non-stop shuttle service to the Airport in an effort to reduce the number of vehicle trips to the Airport, establishment of an employee Rideshare Program, use of alternative fuel vehicles, purchasing renewably generated Green Power from LADWP, and reducing electricity

[17] City of Los Angeles, Los Angeles World Airports, Sustainability Plan, April 2008.

[18] City of Los Angeles, Los Angeles World Airports, Sustainable Airport Planning, Design and Construction Guidelines for Implementation on All Airport Projects, February 2010.

consumption by installing energy-efficient lighting, variable demand motors on terminal escalators, and variable frequency drives on fan units at terminals and LAWA buildings.

LAWA defines sustainability (and measures our sustainable performance) as the Triple Bottom Line, consistent with the Global Reporting Initiative (GRI) and CEQA, which are the social, economic, and environmental impacts of its organization. All projects are subject to various sustainable requirements in the City of Los Angeles and at LAWA, including, but not limited to:

- LAGBC (Ordinance 181479);
- Low Impact Development (Ordinance 181899);
- Standard Urban Stormwater Mitigation Plan (Ordinance 173494);
- Demolition Debris Recycling Program (Ordinance 181519);
- LAX Construction & Maintenance Services – Recycling Program; and
- LAX Master Plan – Mitigation Monitoring and Reporting Program (MMRP). Highlights of the LAX Master Plan MMRP include, but are not limited to the following measures:
  - C-1: Work with LAWA to approve and coordinate staging areas, haul routes, etc.;
  - MM-AQ-2: Utilize on-site rock-crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck-haul trips; and
  - W-1: Maximize use of Reclaimed Water.

All building projects in the City of Los Angeles are subject to the LAGBC, which is based on CALGreen with some modifications unique to the City of Los Angeles. The LAGBC is a code-requirement that is part of Title 24, and is enforced by the Los Angeles Department of Building & Safety (LADBS).

Given that the LAGBC has replaced LEED® in the Los Angeles Municipal Code, LAWA has based its new sustainable construction standards on the mandatory and voluntary tiers defined in the LAGBC. All building projects with an LADBS permit-valuation over $200,000 shall achieve LAGBC Tier 1 conformance, to be certified by LADBS during final plan check (on the issued building permit) and validated by the LADBS inspector during final inspection (on the Certificate of Occupancy). Tier 1 refers specific practices that are to be incorporated into projects to "achieving enhanced construction levels by incorporating additional green building measures." Should a project pose unique issues/circumstances based on the scope and/or location of work, LAWA may require more prescriptive approaches to resolving issues such as energy performance, site drainage, etc.

4.3.3.2 Existing Greenhouse Gas Setting

According to the IPCC in 2007, worldwide man-made emissions of GHGs were approximately 40,000 million metric tons of CO_2e ($MMTCO_2e$), including ongoing emissions from industrial and agricultural sources, but excluding emissions from land use changes (i.e., deforestation, biomass decay). Total U.S. GHG emissions in 2011 were 6,702 $MMTCO_2e$, or about 17 percent

of worldwide GHG emissions.[19] California is a substantial contributor of global GHGs as it is the second largest contributor in the United States (Texas is number one). As mandated by the Global Warming Solutions Act of 2006 (AB32), CARB is required to compile GHG inventories for the State of California, including establishment of the 1990 Greenhouse Gas Emissions Level. Inventories have been prepared for 2000 through 2011. Based on the 2011 GHG inventory data (i.e., the latest year for which data are available), California emitted 448 $MMTCO_2e$ *including* emissions resulting from imported electrical power in 2011 and 401 $MMTCO_2e$ *excluding* emissions related to imported power.[20] **Table 4.3-3** identifies and quantifies statewide anthropogenic GHG emissions and sinks in 1990 and 2011. California emissions are due in part to its large size and large population. By contrast, California had the fifth lowest CO_2 emissions per capita from fossil fuel combustion in the U.S., due to the success of its energy efficiency and renewable energy programs and commitments that have lowered the State's GHG emissions rate of growth by more than half of what it would have been otherwise.[21]

Between 1990 and 2010, the population of California grew by approximately 7.5 million (from 29.8 to 37.3 million).[22] This represents an increase of approximately 25 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from $773 billion in 1990 to $1.88 trillion in 2010 representing an increase of approximately 143 percent (over twice the 1990 gross state product).[23] Despite the population and economic growth, California's net GHG emissions only grew by approximately 6 percent. The California Energy Commission attributes the slow rate of growth to the success of California's renewable energy programs and its commitment to clean air and clean energy.[24]

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19 U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011, April 12, 2013. Available: www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Main-Text.pdf, Accessed March 2014.

20 California Air Resources Board, California Greenhouse Gas 2000-2011 Inventory by Scoping Plan Category - Summary, Available: www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-11_2013-08-01.pdf, Accessed March 2014.

21 California Air Resources Board, California Greenhouse Gas 2000-2010 Inventory by Scoping Plan Category - Summary, Available: www.arb.ca.gov/cc/inventory/data/data.htm, accessed October 2013.

22 U.S. Census Bureau, Data Finders, Available: www.census.gov/, Accessed April 2013; California Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, January 2011 and 2012, with 2000 Benchmark, Available: www.dof.ca.gov/research/demographic/reports/estimates/e-5/2011-20/view.php, Accessed October 2013.

23 California Department of Finance, Gross Domestic Product, California, Available: www.dof.ca.gov/html/fs_data/latestecondata/FS_Misc.htm, Accessed April 2013. Estimated gross state product for 1990 and 2012 are based on current dollars as of June 2012.

24 California Energy Commission, Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004, (2006).

Table 4.3-3

State of California GHG Emissions [1]

Category	Total 1990 Emissions ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2011 Emissions ($MMTCO_2e$)	Percent of Total 2011 Emissions
Transportation	150.7	35%	168.4	38%
Electric Power	110.6	26%	86.6	19%
Commercial	14.4	3%	15.6	3%
Residential	29.7	7%	29.9	7%
Industrial	103.0	24%	93.2	21%
Recycling and Waste [2]	–	–	7.0	2%
High GWP/Non-Specified [3]	1.3	<1%	15.2	3%
Agriculture	23.4	5%	32.2	7%
Forestry	0.2	<1%	0.2	<1%
Forestry Sinks	-6.7	–	– [4]	–
Net Total	**426.6**	**100%**	**448.1**	**100%**

Notes:
1 Numbers may not add up exactly due to rounding.
2 Included in other categories for the 1990 emissions inventory.
3 High GWP gases are not specifically called out in the 1990 emissions inventory.
4 Revised methodology under development (not reported for 2010).

Source: California Air Resources Board, "California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit," available: http://www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf, November 16, 2007, Accessed March 2014; California Air Resources Board, "California Greenhouse Gas Inventory for 2000-2011 – by Category as Defined in the 2008 Scoping Plan," available: www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-11_2013-08-01.pdf, Accessed March 2014.

The baseline operational emissions (2012) for on-airport sources, including those from aircraft, GSE, busing operations, and on-airport roadways, are shown in **Table 4.3-4**.

Table 4.3-4

Existing (2012) On-Airport Operational GHG Emissions

	Annual Emissions (metric tons CO_2e [1,2] per year)			
Emission Source	**CO_2 [3]**	**CH_4 [4,9]**	**N_2O [5,9]**	**Total**
Aircraft	688,996	399	6,764	696,159
Ground Support Equipment	31,305	217	768	32,290
Auxiliary Power Units [6]	N/A	N/A	N/A	N/A
Busing Operations [7]	321	<1	<1	321
On-Airport Roadways [8]	46,253	174	1,099	47,526
On-Airport Emissions	**766,875**	**790**	**8,631**	**776,296**

Notes:
1 CO_2e = carbon dioxide equivalent
2 CO_2e emissions are determined by multiplying the individual pollutant emissions by its respective GWP. The GWP for CH_4 is 21 and the GWP for N_2O is 310.
3 CO_2 = carbon dioxide
4 CH_4 = methane
5 N_2O = nitrous oxide
6 The EDMS model does not provide GHG emissions or fuel consumption data for APUs; therefore GHG emissions cannot be estimated.
7 Busing emissions only include GHG emissions from diesel-fueled buses (approximately 54 percent of the existing fleet); emissions factors for GHG pollutants were not available for alternatively-fueled buses.
8 This inventory only includes traffic traveling through the central terminal area (CTA).
9 CH_4 and N_2O emissions were estimated from the Los Angeles World Airports *GHG Emissions Inventory* (CDM, 2008).

Source: Ricondo & Associates, Inc., 2013.

4.3.4 Thresholds of Significance

As noted in the Initial Study for the proposed Project (see Appendix A), for the purposes of this EIR, and in accordance with Appendix G of the State *CEQA Guidelines*, environmental impacts related to GHG emissions are considered significant if the proposed Project would:

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

The *L.A. CEQA Thresholds Guide* does not contain significance thresholds or criteria for use in evaluating GHGs.

Section 15064.7 of the State *CEQA Guidelines* defines a threshold of significance as an identifiable quantitative, qualitative, or performance level of a particular environmental effect, compliance with which determines the level of impact significance. CEQA gives wide latitude to lead agencies in determining what impacts are significant and does not prescribe thresholds of significance, analytical methodologies, or specific mitigation measures. CEQA leaves the determination of significance to the reasonable discretion of the lead agency and encourages lead agencies to develop and publish thresholds of significance to use in determining the significance of environmental effects. However, neither the SCAQMD nor the City of Los

Angeles has yet established specific quantitative significance thresholds for GHG emissions for residential or commercial projects. In the latest State *CEQA Guidelines* amendments, which went into effect on March 18, 2010, the Governor's Office of Planning and Research (OPR) encourages lead agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses. However, the City of Los Angeles has not yet developed a Greenhouse Reduction Plan meeting the requirements set forth in the latest OPR guidelines.

In addition to the above guidelines, in October 2008, CARB published draft preliminary guidance to agencies on how to establish interim significance thresholds for analyzing GHG emissions in *Recommended Approaches for Setting Interim Thresholds for Greenhouse Gases under the California Environmental Quality Act*. For industrial projects, the CARB guidance proposed that projects that emit less than 7,000 $MTCO_2e$ per year (with a 30-year amortization of emissions), as well as meeting performance standards for construction and transportation, may be considered less than significant. This threshold would apply to project-related emissions above the baseline.

SCAQMD released a draft guidance document regarding interim CEQA GHG significance thresholds in October 2008 and adopted this proposal in December 2008. SCAQMD proposed a tiered approach, whereby the level of detail and refinement needed to determine significance increases with a project's total GHG emissions. SCAQMD also proposed a screening level of 10,000 $MTCO_2e$ per year for industrial projects and 3,000 $MTCO_2e$ per year for residential and commercial projects, under which project impacts are considered "less than significant." The 10,000 $MTCO_2e$ per year screening level was intended to achieve the same policy objective of capturing 90 percent of the GHG emissions from new development projects in the industrial sector; similarly, the 3,000 $MTCO_2e$ per year screening level was intended to achieve the same policy objective of capturing 90 percent of the GHG emissions from new development projects in the residential and commercial sector.[25] For projects with GHG emissions increases greater than 10,000 $MTCO_2e$ per year (for industrial projects) or 3,000 $MTCO_2e$ (for residential and commercial projects), the use of a percent emission reduction target (e.g., 30 percent) was proposed to determine significance. This emission reduction target is a reduction below what is considered "business as usual." As noted earlier, SCAQMD also proposes that projects amortize construction emissions over the 30-year lifetime of any given project for comparison relative to these thresholds. Proposed project construction emissions can be amortized by calculating total construction period emissions and dividing by the 30-year lifetime of the project.

Since there are currently no formally adopted significance thresholds for daily GHG emission for either construction or transportation operations, amortized emissions from the proposed Project were compared to the10,000 $MTCO_2e$ SCAQMD threshold (total GHG emissions above the baseline) for industrial projects.

[25] South Coast Air Quality Management District, Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold, (2008).

4.3.5 Applicable LAX Master Plan Commitments and Mitigation Measures

As part of the LAX Master Plan, LAWA adopted commitments and control measures pertaining to air quality (denoted with "AQ") in the LAX Master Plan (Alternative D MMRP). Of the three commitments and four control measures that were designed to address air quality impacts related to implementation of the LAX Master Plan, none of the commitments are applicable to the proposed Project, but two of the control measures are applicable and were considered in the GHG analysis herein (denoted below as LAX-AQ-1 and LAX-AQ-2). The portions of the air quality control measures that would be applicable to the proposed Project and that would provide co-benefits of reducing GHG emissions are summarized below in **Tables 4.3-5** and **4.3-6**.

LAX-AQ-1 – General Air Quality Control Measures

- This measure describes a variety of specific actions to reduce air quality impacts associated with projects at LAX, and applies to all projects. Some components of LAX-AQ-1 are not readily quantifiable, but would be implemented as part of the proposed Project. Specific measures are identified in Table 4.3-5.

Table 4.3-5

General Air Quality Control Measures [1]

Measure Number	Measure	Type of Measure	Quantified Emissions Reductions
1f	Prohibit idling or queuing of diesel-fueled vehicles and equipment in excess of five minutes. This requirement will be included in specifications for any LAX projects requiring on-site construction.[2]	On- and Off-Road Mobile	NQ
1g	Require that all construction equipment working on-site is properly maintained (including engine tuning) at all times in accordance with manufacturers' specifications and schedules.	Mobile and Stationary	NQ

Notes:
NQ = Not Quantified
1 These measures are from LAX Master Plan Mitigation Measure MM-AQ-1, unless otherwise noted.
2 From LAX Master Plan Mitigation Measure MM-AQ-2 and Community Benefits Agreement Measure X.M and LAWA's Design and Construction Handbook, Section 1.31.9.

Sources: City of Los Angeles, Los Angeles World Airports (LAWA), and FAA, Final Environmental Impact Statement/Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, April 2004; Los Angeles World Airports and LAX Coalition for Economic, Environmental, and Educational Justice, Cooperation Agreement, Los Angeles International Airport Master Plan Program, December 2004; Los Angeles World Airports, Design and Construction Handbook, November 2012.

LAX-AQ-2 – LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures

- This measure describes numerous specific actions to reduce fugitive dust emissions and exhaust emissions from on-road and off-road construction-related mobile and stationary sources used in construction. Some components of LAX-AQ-2 are not readily quantifiable, but will be implemented as part of the proposed Project. Several of these mitigation strategies, presented in Table 4.3-6 are expected to further reduce construction-related CO_2 emissions associated with the proposed Project.

Table 4.3-6

Construction-Related Control Measures [1]

Measure Number	Measure	Type of Measure	Quantified Emissions Reductions
2d	To the extent feasible, have construction employees' work/commute during off-peak hours.	On-Road Mobile	NQ
2e	Make available on-site lunch trucks during construction to minimize off-site worker vehicle trips.	On-Road Mobile	NQ
2f	Utilize on-site rock crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck haul trips.	On-Road Mobile	NQ
2g	Specify combination of electricity from power poles and portable diesel- or gasoline-fueled generators using "clean burning diesel" fuel and exhaust emission controls.[2]	Stationary Point Source Controls	NQ
2i	Utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job).	Mobile and Stationary	NQ
2j	Prohibit tampering with construction equipment to increase horsepower or to defeat emission control devices.	Mobile and Stationary	NQ
2k	The contractor or builder shall designate a person or persons to ensure the implementation of all components of the construction-related measure through direct inspections, record reviews, and investigations of complaints.	Administrative	NQ
2m	LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.[3]	Mobile	NQ

Table 4.3-6

Construction-Related Control Measures [1]

Measure Number	Measure	Type of Measure	Quantified Emissions Reductions
2o	Prior to January 1, 2015, all off-road diesel-powered construction equipment greater than 50 horsepower shall meet USEPA Tier 3 off-road emission standards. After December 31, 2014, all off-road diesel-power construction equipment greater than 50 horsepower shall meet USEPA Tier 4 off-road emissions standards. Tier 4 equipment shall be considered based on availability at the time the construction bid is issued. LAWA will encourage construction contractors to apply for SCAQMD "SOON" funds to accelerate clean-up of off-road diesel engine emissions.[4]	Off-Road Mobile	Assumed in modeling

Notes:
NQ = Not Quantified
1 These measures are from LAX Master Plan Mitigation Measure MM-AQ-2, unless otherwise noted.
2 From LAX Master Plan Mitigation Measure MM-AQ-2 and LAWA's Design and Construction Handbook, Section 1.31.9.
3 From Community Benefits Agreement Measure X.N.
4 From LAX Specific Plan Amendment Study Measure MM-AQ (SPAS)-1.

Sources: City of Los Angeles, Los Angeles World Airports (LAWA), and FAA, Final Environmental Impact Statement/Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, April 2004; Los Angeles World Airports and LAX Coalition for Economic, Environmental, and Educational Justice, Cooperation Agreement, Los Angeles International Airport Master Plan Program, December 2004; Los Angeles World Airports, Specific Plan Amendment Study, Final Environmental Impact Report, January 2013.

4.3.6 Impact Analysis

4.3.6.1 Construction

Construction of the proposed Project is expected to begin in March 2015 and be completed by December 2015, resulting in less than a year of construction. Construction-related GHG emissions for the proposed Project are associated with construction equipment, vehicle exhaust, and the shift in operations during the Runway 6L-24R closure and shortened runway period. Consistent with SCAQMD guidance, GHG emissions have been quantified from on-site construction activities, off-site hauling, vendor deliveries, and construction worker commuting as generated by the proposed Project. GHG emissions by source for construction of the proposed Project are presented in **Table 4.3-7**.

SCAQMD recommends that construction emissions be amortized over the lifetime of a proposed project, which is assumed to be 30 years. The total CO_2e amortized over the life of the proposed Project is equal to 232 $MTCO_2e$ per year. Construction-related significance is not determined on an individual basis for GHG emissions; rather, it is evaluated based on significance of the combined construction- and operations-related GHG emissions for the proposed Project. Section 4.3.6.2 below evaluates the significance of the combined construction- and operations-related GHG emissions for the proposed Project.

Table 4.3-7

Construction Greenhouse Gas Emissions

	CO_2e (Metric Tons)
Emission Source	**2015**
On-site Equipment	1,719
On-site Trucks	15
Off-site Deliveries/Worker Trips	1,253
Pavement Crushing	8
Aircraft Taxi Times during Runway Closure	3,951
Total [1]	6,946
30 year Amortized Total	**232**

Note:
1 Numbers may not total due to rounding.

Source: Ricondo & Associates, Inc., 2014.

4.3.6.2 Operations

Operation of the proposed Project would not result in changes to air traffic patterns, an increase in airport operations, aircraft taxi routes, or supporting functions (GSE, busing operations, etc). Therefore, no operational GHG impacts would occur. However, since significance is based on the combined impacts of construction and operations of the proposed Project, the analysis presented below compares emissions from the 2012 With Project compared to the 2012 existing conditions, and the 2015 With Project compared to the 2015 Without Project scenario. These emissions are presented in **Tables 4.3-8** and **4.3-9** respectively.

As shown, GHG emissions resulting from the proposed Project construction and operations would not have a significant impact on climate change over the 2012 existing conditions, or 2015 Without Project scenario based on a significance threshold of 10,000 $MTCO_2e$ per year.

Table 4.3-8

2012 Proposed Project Greenhouse Gas Emissions Compared to Existing (2012) Conditions

Emission Source	2012 Existing Conditions CO_2e (Metric Tons)	2012 Proposed Project CO_2e (Metric Tons)	Incremental Difference CO_2e (Metric Tons)
Aircraft	696,159	696,159	-
Construction (Amortized)	-	232	232
Total Net	**696,159**	**696,391**	**232**
SCAQMD GHG Threshold for Industrial Projects			10,000
Above the Threshold?			**No**

Source: Ricondo & Associates, Inc., 2014.

Table 4.3-9

2015 Future With Proposed Project Greenhouse Gas Emissions Compared to 2015 Future Without Proposed Project Conditions

Emission Source	2015 Without Project CO_2e (Metric Tons)	2015 Proposed Project CO_2e (Metric Tons)	Incremental Difference CO_2e (Metric Tons)
Aircraft	737,485	737,485	-
Construction (Amortized)	-	232	232
Total Net	**737,485**	**737,717**	**232**
SCAQMD GHG Threshold for Industrial Projects			10,000
Above the Threshold?			**No**

Source: Ricondo & Associates, Inc., 2014.

4.3.6.3 Consistency with Greenhouse Gas Reduction Plans

As discussed previously, the proposed Project would comply with the LAGBC Tier 1 requirements. LAWA has based its new sustainable construction standards on the mandatory and voluntary tiers defined in the LAGBC. Certain measures of note include but are not limited to compliance with enhanced construction waste reduction goals, exceeding the California Energy Code requirements (based on the 2008 Energy Efficiency Standards) by 15 percent and collection of non-hazardous materials for recycling, and use of low-emitting adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, caulks, and other materials. Therefore, the proposed Project would be consistent with plans to reduce GHG emissions and impacts would be less than significant.

4.3.6.4 Summary of Impacts

Based on the information presented above in Sections 4.3.6.1, construction of the proposed Project would result in the generation of 6,946 metric tons of construction-related GHG, primarily in the form of CO_2 in 2015. Construction activities would comply with LAWA's current program for sustainability and reducing GHG emissions in project design and construction and would not result in a substantial increase of construction GHG emissions.

Operational GHG emissions of the proposed Project would have no incremental increase over the Without Project scenario. Therefore, the proposed Project would not result in a significant impact to GHG emissions or climate change.

4.3.7 Cumulative Impacts

As discussed previously in Section 4.3.4 (Thresholds of Significance), the State *CEQA Guidelines* do not include or recommend any particular threshold of significance; instead, they leave that decision to the discretion of the lead agency (§15064.4).[26] The California Natural Resources Agency (CNRA) noted in its Public Notice for the added sections on GHG, that the impacts of GHG emissions should be considered in the context of a cumulative impact, rather than a project impact. The Public Notice states:[27]

> "While the Proposed Amendments do not foreclose the possibility that a single project may result in greenhouse gas emissions with a direct impact on the environment, the evidence before [CNRA] indicates that in most cases, the impact will be cumulative. Therefore, the Proposed Amendments emphasize that the analysis of greenhouse gas emissions should center on whether a project's incremental contribution of greenhouse gas emissions is cumulatively considerable."

It is the accumulation of GHGs in the atmosphere that may result in global climate change. Climate change impacts are cumulative in nature, and thus no typical single project would result in emissions of such a magnitude that it, in and of itself, would be significant on a project basis. A typical single project's GHG emissions will be small relative to total global or even statewide GHG emissions. Thus, the analysis of significance of potential impacts from GHG emissions related to a single project is already representative of the long-term impacts on a cumulative basis. Therefore, projects that exceed the project-specific significance thresholds are considered to be cumulatively considerable. Conversely, projects that do not exceed the project-specific thresholds for GHG emissions are not considered to be cumulatively considerable.

As discussed in Section 4.3.6, *Impact Analysis*, the proposed Project's amortized construction GHG emissions would not exceed the significance threshold of 10,000 $MTCO_2e$ per year.

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[26] Natural Resources Agency, Guidelines for Implementation of the California Environmental Quality Act, Available at: http://ceres.ca.gov/ceqa/docs/FINAL_Text_of_Proposed_Amendemts.pdf. Accessed: October 2013.

[27] Natural Resources Agency, Guidelines for Implementation of the California Environmental Quality Act, Available at: http://ceres.ca.gov/ceqa/docs/Notice_of_Proposed_Action.pdf Accessed: October 2013.

Therefore, in accordance with the discussion above, the proposed Project would not cause cumulatively considerable impacts with respect to GHG emissions.

4.3.8 Mitigation Measures

The proposed Project would result in less than significant impacts related to GHG emissions and, therefore, no additional mitigation measures are required.