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## 4.17 - Climate Change and Greenhouse Gases

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### 4.17.1 - Introduction

This section describes the existing air quality setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information contained in the Climate Change Analysis prepared by MBA. The report is contained in Appendix G of this EIR.

This analysis addresses the impact of the PSEC project on climate change. The conclusions and findings that may be reached based on the technical information and analysis contained in this report represent the independent judgment of the County of Riverside as the CEQA Lead Agency. This analysis is specific to this project and may not apply to other projects.

In 2006, Governor Arnold Schwarzenegger signed Assembly Bill 32 (AB 32), which charged the California Air Resources Board (ARB) with developing regulations on how the State would address climate change (also known as “global warming”). The ARB, the California Environmental Protection Agency, the EPA, or other appropriate governmental organizations have not yet developed guidelines on how to prepare a CEQA assessment for climate change. In absence of published CEQA thresholds, this analysis includes CEQA-level discussions that suggests thresholds of significance and evaluates the potential impact of the project with regard to its contribution to greenhouse gases based on the intent of AB 32.

### 4.17.2 - Existing Conditions

Climate change is a change in the average weather of the earth that may be measured by changes in wind patterns, storms, precipitation, and temperature. In California, climate change may result in consequences such as loss of snow-pack, increased risk of large wildfires, and reductions in the quality and quantity of certain agricultural products.

Gases that trap heat in the atmosphere are greenhouse gases, analogous to the way a greenhouse retains heat. The accumulation of greenhouse gases in the atmosphere regulates the earth’s temperature to be suitable for life. However, human activities have increased the amount of greenhouse gases in the atmosphere. Some greenhouse gases can remain in the atmosphere for hundreds of years. The following is a brief description of the most common greenhouse gases.

- Water vapor is the most abundant, important, and variable greenhouse gas. It is not considered a pollutant; in the atmosphere, it maintains a climate necessary for life.
- Ozone is known as a photochemical pollutant and is a greenhouse gas; however, unlike other greenhouse gases, ozone in the troposphere is relatively short-lived and therefore is not global in nature. Ozone is not emitted directly into the atmosphere but is formed by a complex series of chemical reactions between volatile organic compounds, nitrogen oxides, and sunlight.

- Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.
- Carbon dioxide (CO<sub>2</sub>) is an odorless, colorless natural greenhouse gas. Carbon dioxide is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
- Methane is a flammable greenhouse gas. A natural source of methane is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and ruminants such as cattle.
- Nitrous oxide, also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer that contains nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load.
- Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. CFCs destroy stratospheric ozone; therefore, their production was stopped as required by the Montreal Protocol in 1987.
- Hydrofluorocarbons (HFCs) are synthetic chemicals that are used as a substitute for CFCs. Of all the greenhouse gases, they are one of three groups with the highest global warming potential. HFCs are human made for applications such as air conditioners and refrigerants.
- Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere; therefore, PFCs have long atmospheric lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.
- Sulfur hexafluoride is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest global warming potential of any gas evaluated, 23,900. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

#### 4.17.3 - Regulatory Setting

Climate change is a result of greenhouse gases emitted all around the world from natural and human caused sources such as the combustion of fuel for transportation and heat, cement manufacture, and

refrigerant emissions. The State of California has enacted key legislation in an effort to reduce its contribution to climate change, as discussed below.

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

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels; and
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

To meet these targets, the Climate Action Team prepared a report to the Governor in 2006 that contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met (2006 CAT Report).

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020. ARB is the State agency charged with monitoring and regulating sources of emissions of greenhouse gases. AB 32 requires ARB to adopt and implement a list of discrete and early action greenhouse gas reduction measures, which was completed in October 2007. The ARB approved the 1990 greenhouse gas emissions level of 427 million metric tons of carbon dioxide equivalent (MMTCO<sub>2</sub>e) on December 6, 2007. Therefore, in 2020, emissions in California are required to be at or below 427 MMTCO<sub>2</sub>e.

#### 4.17.4 - Thresholds of Significance

There are currently no published thresholds of significance established by any state or regional regulatory agency for measuring the impact of climate change on or from a project. The significance thresholds for this project are as follows:

**Impact CC-1** Does the project comply with the provisions of an adopted Greenhouse Gas Reduction Plan or Strategy? If no such Plan or Strategy is applicable, would the project significantly hinder or delay California's ability to meet the reduction targets contained in AB 32 through greenhouse gases emitted during construction?

**Impact CC-2** Does the project comply with the provisions of an adopted Greenhouse Gas Reduction Plan or Strategy? If no such Plan or Strategy is applicable, would the project significantly hinder or delay California's ability to meet the reduction targets contained in AB 32 through greenhouse gases emitted during operation?

**Impact CC-3** Would the impacts of climate change significantly impact the project?

The thresholds and the analysis contained below may not be relevant to other projects. The County has decided to utilize the most current strategies available until such a time that official standards and thresholds are developed. Therefore, this analysis does not establish thresholds for the County or set precedence for the type of analysis in a climate change analysis, as this discipline is still evolving and is expected to undergo multiple renditions before standards and thresholds are published.

**4.17.5 - Project Impacts and Mitigation Measures**

The following impact analysis addresses the project-level impact of the project’s greenhouse gas emissions on climate change.

**Construction**

**Impact CC-1:** Does the project comply with the provisions of an adopted Greenhouse Gas Reduction Plan or Strategy? If no such Plan or Strategy is applicable, would the project significantly hinder or delay California’s ability to meet the reduction targets contained in AB 32 through greenhouse gases emitted during construction?

**Inventory of Greenhouse Gases**

The project would emit greenhouse gases from upstream emission sources (the manufacture of building materials such as cement) and direct sources (combustion of fuels from worker vehicles and construction equipment).

Emissions from the combustion of fuel from construction equipment and associated worker vehicles were estimated using URBEMIS2007. The emissions of carbon dioxide from project construction equipment and worker vehicles are shown in Table 4.17-1 below. Emissions of nitrous oxide and methane are negligible. As shown in Table 4.17-1, emissions to construct all sites total 2,750 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>e).

**Table 4.17-1: Construction Exhaust Greenhouse Gas Emissions (Unmitigated)**

Source	Carbon Dioxide Emissions (tons)	Emissions (MTCO <sub>2</sub> e)
One site		
Grading/Excavation	16	15
Building	44	40
All sites (50 sites)		
Grading/Excavation	800	750
Building	2,200	2,000
Total - all sites	3,000	2,750
MTCO <sub>2</sub> e = tons * 0.9072 = metric tons of carbon dioxide equivalent Source: Climate Change Analysis (Appendix G)		

**Level of Significance Before Mitigation**

Less than significant.

There is no adopted Greenhouse Gas Reduction Plan or applicable strategy in the jurisdiction of the project. Therefore, this assessment looks at whether or not the project would hinder or delay California's ability to meet the reduction targets contained in AB 32.

Construction of the project would occur prior to the year 2020 and, therefore, would not hinder or delay implementation of AB 32, as AB 32 assesses the State's emissions (not the concentration) in the year 2020. Additionally, mitigation measures as proposed within the air quality analysis for this project would reduce greenhouse gas emissions associated with unnecessary idling and construction employee trips.

**Mitigation Measures**

No mitigation measures are required.

**Level of Significance After Mitigation**

Less than significant.

**Operation**

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<b>Impact CC-1:</b>	<b>Does the project comply with the provisions of an adopted Greenhouse Gas Reduction Plan or Strategy? If no such Plan or Strategy is applicable, would the project significantly hinder or delay California's ability to meet the reduction targets contained in AB 32 through greenhouse gases emitted during operation?</b>
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**Inventory of Greenhouse Gases**

Operational, or long-term, emissions occur over the life of the project. The only sources of operational emission from the project are from generators, fugitive refrigerants, and worker trips for site maintenance.

Two sites require full time generator power. The remaining sites would have a generator for emergency power purposes, and would be tested once per week for a half an hour. The primary electrical draw at communication sites is usually not the electronic equipment, but rather the HVAC units required to maintain the electronics at a suitable temperature.

Air conditioning units can leak small amounts of the refrigerant, which is a greenhouse gas. These emissions were estimated based on 100 units (two per site) using a screening approach published by the EPA.

A summary of the estimated greenhouse gas emissions from operation of the project is presented in Table 4.17-2. As shown in Table 4.17-2, emissions are approximately 1,820 MTCO<sub>2</sub>e per year. The main source of emissions is from fugitive refrigerants.

**Table 4.17-2: Operational Exhaust Greenhouse Gas Emissions (Unmitigated)**

Source	Carbon Dioxide Emissions (tons per year)	Emissions (MTCO <sub>2</sub> e per year)
Maintenance vehicles	19	17
Full time diesel generator	146	132
Full time LPG generator	262	238
Emergency generator testing (50)	39	35
Indirect electricity for all sites	111	101
Refrigerants	**	1,297
<b>Total</b>	<b>577</b>	<b>1,820</b>
MTCO <sub>2</sub> e = (tons/year) * (0.9072) * (global warming potential) = metric tons of carbon dioxide equivalent ** Note that fugitive refrigerant emissions are not carbon dioxide emissions, but hydrochlorofluorocarbons (HCFCs), which have a greater global warming potential. Source: Climate Change Analysis (Appendix G).		

**Compliance with State Strategies**

One of the greenhouse gas emission reduction targets proposed through Executive Order S-3-05 is to reduce the state's greenhouse gas emissions to 1990 levels by 2020. AB 32 sets a mandatory requirement to achieve the same reduction.

The 2006 CAT Report is not in response to AB 32; however, the 2006 CAT Report introduces strategies that can be implemented by the ARB and other California agencies to reduce California's emissions to 1990 levels by 2020, which is the same target for AB 32. In addition, the 2006 CAT Report is consistent with the intent of AB 32. AB 32 contains a timeline for development and approval of strategies to reduce state emissions. The bulk of the strategies are not yet developed. Therefore, in the absence of climate change thresholds and standards, the strategies published for Executive Order S-3-05 are used because it contains the most complete list of strategies as of the date of this analysis.

A full assessment of project consistency with the 2006 CAT Report strategies is contained in the Climate Change Analysis. The majority of the strategies are not applicable to the project. One strategy is to encourage solar power. The County has investigated the use of solar power to provide power to the two sites that require full time generators, but has determined that the provision of solar power is not feasible. The size of the solar panel arrays that would be required to generate sufficient power would be enormous, and would add significantly to the site footprint and the aesthetic impacts at the sites. The arrays would be vulnerable to vandalism and other damage, and would not be able to guarantee the reliability that is required for an emergency services communication system. For these reasons, the County is not proposing the use of solar power.

### **Project Design Features that Reduce Greenhouse Gases**

The project has incorporated the following design features that would reduce greenhouse emissions.

- All sites except for two would be connected to the electricity power grid, which would reduce direct emissions associated with generator power (diesel or propane).
- By its design, the project will provide a more efficient and reliable communication system, which may reduce unnecessary vehicle miles traveled from vehicles that are in communication black outs.
- The project is required to comply with current Title 24 energy efficiency requirements; doing so will reduce indirect emissions from electricity generation.
- Implementation of the project will assist fire fighters in communication during fire events. One of the anticipated effects of climate change is an increase in the frequency of wildland fire events. Therefore, the project would provide adaptation to climate change impacts.
- The project will install energy efficient lighting and lighting control systems.
- The project will ensure that roofs meet EPA cool roof requirements. There are a variety of cool roof products available, including coatings (typically of a white color), cool single-ply membranes, reflective tiles, or EPA Energy Star metal roofs. The project could use coatings (a paint of white color) or EPA Energy Star certified metal roofs.
- The project will install EPA Energy Star air conditioning units or similar unit with equal or better energy savings. These units use less energy to operate.
- The EPA is phasing out use of refrigerants HCFC-22 or HCFC-142b in the year 2010. The project will not be using those refrigerants in the air conditioning units.

### **Level of Significance Before Mitigation**

Less than significant.

There is no adopted Greenhouse Gas Reduction Plan or applicable strategy in the jurisdiction of the project. Therefore, this assessment looks at whether or not the project would hinder or delay California's ability to meet the reduction targets contained in AB 32.

During operation of the project, 1,820 MTCO<sub>2</sub>e of greenhouse gases would be emitted per year. However, the project is also implementing many design features that reduce its emissions of greenhouse gases.

The project will connect all but two sites to the electrical power grid, which results in approximately two MTCO<sub>2</sub>e per year per site for indirect emissions associated with electricity generation. Emissions from the full time generators are approximately 200 MTCO<sub>2</sub>e per year per site (approximately 400 MTCO<sub>2</sub>e total). By utilizing the electrical grid for most of its sites, the project is offsetting approximately 9,600 MTCO<sub>2</sub>e per year (200 MTCO<sub>2</sub>e \* 48 sites).

project design features also increase the energy efficiency of the buildings. For example, cool roofs reflect sunlight thereby reducing the cooling load inside of the building. Energy efficient lighting also reduces electricity demand. EPA-certified air conditioning units use less energy to operate. According to a simplified life cycle estimate of the air conditioning units, the County could save approximately \$11,000 by installing Energy Star air conditioning units and could reduce 274,000 pounds of carbon dioxide emissions (124 MTCO<sub>2</sub>e) during the life cycle of all the units.

Implementation of the project will assist fire fighters in communication during fire events. One of the anticipated effects of climate change is an increase in the frequency of wildland fire events. In essence, the project is providing adaptation to climate change impacts. Therefore, the project's project-level impact to climate change is less than significant and it is not anticipated that the project would hinder or delay the implementation of AB 32.

#### ***Mitigation Measures***

No mitigation measures are required.

#### ***Level of Significance After Mitigation***

Less than significant.

#### **Impacts to Project from Climate Change**

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##### **Impact CC-3: Would the impacts of climate change significantly impact the project?**

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AB 32 indicates that "the potential effects 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 snow pack, 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 incidence of infections, disease, asthma, and other health-related problems" (State of California 2006, AB 32, Section 38501[a]).

The California Climate Change Center published a report that assesses the risks of climate change to California. The following is a summary of the potential risks to California from that report:

- A reduction in the Sierra snow pack could result a reduction in hydropower, which comprises about 15 percent of California's in-state electricity production.
- A reduction in the Sierra snow pack could result in a loss of winter recreation from insufficient snow for skiing and snowboarding.
- A decrease in water supply could negatively impact the food supply.
- Climate change could increase temperatures, leading to decreased supply of certain agricultural products such as wine, fruit, nuts, and milk. California farmers may also have to face increasing threats from pests and pathogens.



- Climate change could result in increasing wildfires. If temperatures rise into the medium range, the risk of fires in California could increase as much as 55 percent.
- Climate change could result in plant and animal species relocating to cooler more habitable “up slope” locations.
- Climate change could negatively affect the health and productivity of California’s forests. The productivity of mixed conifer forests is expected to diminish as much as 18 percent by the end of the century.
- A rise in sea levels could result in increased coastal floods and shrinking beaches.

### ***Analysis of Potential Impacts***

The following is an analysis of potential impacts of climate change to the project.

- The project sites are typically in elevated locations and therefore would not be threatened from rising waters.
- The project EIR determined that the project would result in less than significant fire impacts (refer to Section 4.07, Impact HHM-8 in this EIR).
- The project would not require water. Therefore, secondary effects of climate change that include water shortages would not directly influence the project.

In summary, climate change impacts to the project are less than significant.

### ***Level of Significance Before Mitigation***

Less than significant.

### ***Mitigation Measures***

No mitigation measures required.

### ***Level of Significance After Mitigation***

Less than significant.

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