# 5.1 Air Quality

This section describes and evaluates the air quality effects of the Redondo Beach Energy Project (RBEP). Subsection 5.1.2 provides an overview of the project related to air quality. Subsection 5.1.3 provides an overview of the existing air quality settings. Subsection 5.1.4 provides an overview of air quality standards. Subsection 5.1.5 presents information on the existing air quality in the region and in the general area of the project. Subsection 5.1.6 provides the project's environmental analysis related to air quality, the emission estimates for the facility, and the methodology used to determine the potential air quality impacts associated with the construction, commissioning, and operation of the RBEP. Subsection 5.1.7 evaluates potential cumulative effects to air quality, and Subsection 5.1.8 addresses proposed mitigation measures that would avoid or minimize any adverse impacts. Subsection 5.1.9 describes the laws, ordinances, regulations, and standards (LORS) that apply to the project, and Subsection 5.1.10 presents agencies and agencies' contacts. Subsection 5.1.11 identifies the permits and permit schedule related to air quality, and Subsection 5.1.12 contains the references used to prepare this section. Potential public health risks posed by emissions of toxic air contaminants (TAC), including ammonia, are addressed in Section 5.9, Public Health.

## 5.1.1 Setting

The RBEP is located on the site of the existing Redondo Beach Generating Station, an operating power plant, at 1100 North Harbor Drive, Redondo Beach, CA 90277. The RBEP site is located near sea level on the California coast and is bounded to the north by residential areas, to the east by a storage facility and office buildings, to the south by mixed use residential and commercial areas, and to the west by King Harbor marina and the Pacific Ocean. The site is located on a gently sloping coastal plain.

RBEP is a combined-cycle power plant with a net generating capacity of 496 megawatts (MW)[1] and gross generating capacity of 511 MW. The power block is composed of three combustion turbines with supplemental fired heat recovery steam generators (HRSG), a steam turbine generator (STG), an air-cooled condenser, and ancillary facilities.

The project will use potable water, provided by the California Water Service Company, for construction water and for operational process and sanitary uses. During operation of the RBEP, stormwater and process wastewater will be discharged to the Pacific Ocean via an existing collection system, retention basin, and outfall. Sanitary wastewater will be conveyed to the Sanitation District of Los Angeles County via an interconnection to the City of Redondo Beach sewer system. The 230 kilovolt (kV) transmission interconnection will connect the RBEP to the existing SCE 230 kV switchyard located within the Redondo Beach Generating Station property boundary.

RBEP will reuse existing onsite potable water, natural gas, stormwater, process wastewater, sanitary pipelines, and electrical transmission facilities to the maximum extent possible; however, some modification and interconnection of the RBEP facility into these systems will require construction activity.

Construction and demolition activities at the project site are anticipated to last 60 months, from January 2016 until December 2020. The first activities to occur onsite will be the dismantling and partial removal of existing Units 1-4. The major generating equipment (including steam turbines, generators, boilers, and duct work) will be removed, leaving the administration building and western portion of the building that houses Units 1-4 intact. These buildings will be left standing temporarily to provide screening between the construction site of the new power block and Harbor Drive. Construction of the new power block will begin in the first quarter 2017 and continue to the end of the second quarter 2019, when it will be ready for commercial operation. Although operational, construction will continue through 2019, including construction of the new control building and the relocation of the Wyland Whaling Wall. The existing Units 5-8 and auxiliary boiler No. 17 will remain in service until the second quarter 2018. Units 5-8 and auxiliary boiler No. 17 will be demolished starting the first quarter

[1] The net generating capacity including auxiliary load is 496 MW, gross output as measured at the generator terminals is 511 MW, referenced to site ambient average temperature (SAAT) conditions of 63.3°F dry bulb and 58.5°F wet bulb temperature.

2019 through the fourth quarter 2020. During the demolition and removal of Units 5-8, the Wyland Whaling Wall will be dismantled and moved to a new location directly in front of the new power block. Finally, the remaining buildings and structures left standing will be demolished and removed by the end of 2020.

All laydown and construction parking areas will be located within the existing 50-acre Redondo Beach Generating Station fenceline as shown in Figure 2.1-1 (Section 2.0). A total of approximately 17 acres of the Redondo Beach Generating Station site will be used for construction laydown and parking. All construction equipment and supplies will be trucked directly to the site.

## 5.1.2 Project Overview as it Relates to Air Quality

The RBEP 3-on-1 combined-cycle power block will consist of three Mitsubishi Power Systems Americas (MPSA) 501DA combustion turbine generators (CTG), one steam turbine, and an air-cooled condenser. Each combustion turbine will be equipped with an HRSG and will employ supplemental natural gas firing (duct firing). The turbines will use dry low oxides of nitrogen ($NO_x$) burners and selective catalytic reduction (SCR) to limit $NO_x$ emissions to 2 parts per million by volume (ppmv). Emissions of carbon monoxide (CO) will be limited to 2 ppmv and volatile organic compounds (VOC) to 1 ppmv through the use of best combustion practices and the use of an oxidation catalyst. Best combustion practices and burning pipeline-quality natural gas will minimize emissions of the remaining pollutants.

Two electric fire pumps, connected to two independent power feeds from the Southern California Edison distribution system, will be used to provide onsite fire protection. Because the electric fire pumps will not be a source of air emissions, they were not included in the air quality health analysis for RBEP.

The ability to meet the project's objectives is also contingent on the use of the offset provisions contained in South Coast Air Quality Management District's (SCAQMD) Rule 1304(a)(2). Rule 1304 allows the replacement of older, less efficient electric utility steam boilers with specific new generation technologies on a megawatt-to-megawatt basis (that is, the replacement megawatts are equal or less than the megawatts from the electric utility steam boilers).

## 5.1.3 Existing Site Conditions

The RBEP will be constructed entirely within the 50-acre site of the existing Redondo Beach Generating Station, an operating power plant in the City of Redondo Beach, CA. The project site is located in Redondo Beach at 1100 North Harbor Drive, and the northern boundary of the plant is adjacent to the City of Hermosa Beach.

### 5.1.3.1 Geography and Topography

The existing Redondo Beach Generating Station is located on a gently sloping coastal terrace above the King Harbor marina, and the topography of the site ranges from approximately 3 to 20 feet above mean sea level. The nearest complex terrain (terrain exceeding stack height) in relation to RBEP is approximately 0.25-0.5 mile to the east. The area with the highest elevation nearest to the site is located approximately 7.5 miles south of the site on the Palos Verdes Peninsula, with a peak elevation of approximately 1,450 feet. The nearest Class I area is the San Gabriel Wilderness, which is approximately 33 miles (approximately 53 kilometers [km]) northeast of the RBEP site.

### 5.1.3.2 Climate and Meteorology

The climate of the South Coast Air Basin is determined by its terrain and geographical location. The basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds (SCAQMD, 1993).

The annual average temperature varies little throughout the 6,600-square-mile Basin, averaging 62 degrees Fahrenheit (°F). However, with a less pronounced oceanic influence, the eastern portion shows greater variability in annual minimum and maximum temperatures. Practically all of the annual rainfall in the Basin falls during the

November-April period. Summer rainfall normally is restricted to widely scattered thundershowers near the coast and slightly heavier shower activity in the east and over the mountains. Annual average rainfall varies from 9 inches in Riverside to 14 inches in downtown Los Angeles; however, higher amounts are measured at foothill locations. Monthly and yearly rainfall totals are extremely variable. Rainy days vary from 5 to 10 percent of all days in the Basin, the frequency of such days being higher near the coast. Except for infrequent periods when dry, continental air is brought into the Basin by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent; and low stratus clouds, sometimes referred to as “high fog,” are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the Basin (SCAQMD, 1993).

Long-term average temperature and precipitation data have been collected from the Los Angeles WSO Airport surface climatological station near RBEP. The data indicate that the normal daily maximum temperatures are relatively consistent throughout the year, with average daily maximum temperatures ranging from 65.2 to 76.2°F, and a normal daily minimum ranging from 47.5 to 63.7°F (WRCC, 2012). The Los Angeles location receives an average of 12 inches of rain annually (WRCC, 2012).

Atmospheric stability and mixing heights are important parameters in the determination of pollutant dispersion. Atmospheric stability reflects the amount of atmospheric turbulence and mixing. In general, the less stable an atmosphere, the greater the turbulence, which results in more mixing and better dispersion. The mixing height, measured from the ground upward, is the height of the atmospheric layer in which convection and mechanical turbulence promote mixing. Good ventilation results from a high mixing height and at least moderate wind speeds within the mixing layer.

With very light average wind speeds, the Basin's atmosphere has a limited capability to disperse air contaminants horizontally. Downtown Los Angeles wind speeds average 5.7 miles per hour with little seasonal variation. Summer wind speeds average slightly higher than winter wind speeds. Inland areas record slightly lower wind speeds than downtown Los Angeles, while coastal wind speeds average about 2 miles per hour higher than downtown Los Angeles. The dominant daily wind pattern is a daytime sea breeze and a nighttime land breeze. This regime is broken only by occasional winter storms and infrequent strong northeasterly Santa Ana flows from the mountains and deserts north of the Basin (SCAQMD, 1993).

Along the southern California coast, surface air temperatures are relatively cool. The resultant shallow layer of cool air at the surface, coupled with warm, dry, subsiding air from aloft, produces early morning inversions on approximately 87 percent of the days of the year. The Basin-wide average occurrence of inversions at the ground surface is 11 days per month; the averages vary from 2 days in June to 22 days in December and January. Higher inversions, but less than 2,500 feet above sea level, occur 22 days each month—occurring on an average of 25 days in June and July to 4 days in December and January. Restricted maximum mixing heights, 3,500 feet above sea level or less, average 191 days each year. The potential for high concentrations varies seasonally for many contaminants. During late spring, summer, and early fall, light winds, low mixing heights, and brilliant sunshine combine to produce conditions favorable for the maximum production of photochemical oxidants, mainly ozone. During the spring and summer, when fairly deep marine layers are frequently found in the Basin, sulfate concentrations are at their peak (SCAQMD, 1993).

### 5.1.4 Overview of Air Quality Standards

The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for the following seven pollutants, termed criteria pollutants: ozone, nitrogen dioxide ($NO_2$), CO, sulfur dioxide ($SO_2$), particulate matter with aerodynamic diameter less than or equal to 10 microns ($PM_{10}$), particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and airborne lead. The federal Clean Air Act (CAA) requires EPA to designate areas (counties) as attainment or non-attainment with respect to each criteria pollutant, depending on whether the areas meet the NAAQS. An area that is designated non-attainment means the area is not meeting the NAAQS and is subject to planning requirements to attain the standard.

In addition to the seven pollutants listed above, the California Air Resources Board (ARB) has established state standards for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. Similar to EPA, ARB

designates counties in California as attainment or non-attainment with respect to the California ambient air quality standards (CAAQS). The state standards were designed to protect the most sensitive members of the population, such as children, the elderly, and people who suffer from lung or heart diseases.

Both state and federal air quality standards are based on two variables: maximum concentration and an averaging time over which the concentration would be measured. Maximum concentrations were based on levels that may have an adverse effect on human health. The averaging times were based on whether the damage caused by the pollutant would occur during exposures to a high concentration for a short time (for example, 1 hour), or during exposures to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). For some pollutants, there is more than one air quality standard, reflecting both short- and long-term effects. Table 5.1-1 presents the NAAQS and CAAQS.

TABLE 5.1-1
**Ambient Air Quality Standards**

| Pollutant | Averaging Time | California | National |
|---|---|---|---|
| Ozone | 1-hour<br>8 hour | 0.09 ppm (180 µg/m$^3$)<br>0.07 ppm (137 µg/m$^3$) | —<br>0.075 ppm (147 µg/m$^3$) |
| CO | 1-hour<br>8-hour | 20 ppm (23 mg/m$^3$)<br>9.0 ppm (10 mg/m$^3$) | 35 ppm (40 mg/m$^3$)<br>9 ppm (10 mg/m$^3$) |
| $NO_2$ | 1-hour<br>Annual arithmetic mean | 0.18 ppm (339 µg/m$^3$)<br>0.030 (57 µg/m$^3$) | 100 ppb (188 µg/m$^3$) [a]<br>53 ppb (100 µg/m$^3$) |
| $SO_2$ [b] | 1-hour<br>3-hour (secondary standard)<br>24-hour | 0.25 ppm (655 µg/m$^3$)<br>—<br>0.04 ppm (105 µg/m$^3$) | 75 ppb (196 µg/m$^3$)<br>0.5 ppm (1,300 µg/m$^3$)<br>— |
| $PM_{10}$ | 24-hour<br>Annual arithmetic mean | 50 µg/m$^3$<br>20 µg/m$^3$ | 150 µg/m$^3$<br>— |
| $PM_{2.5}$ | 24-hour<br>Annual arithmetic mean | —<br>12 µg/m$^3$ | 35 µg/m$^3$ [c]<br>15.0 µg/m$^3$ [d] |
| Sulfates | 24-hour | 25 µg/m$^3$ | — |
| Lead | 30-day average<br>Calendar quarter | 1.5 µg/m$^3$<br>— | —<br>1.5 µg/m$^3$ |
| $H_2S$ | 1-hour | 0.03 ppm (42 µg/m$^3$) | — |
| Vinyl chloride | 24-hour | 0.010 ppm (26 µg/m$^3$) | — |
| Visibility-reducing particles | 8-hour<br>(10 a.m. to 6 p.m. PST) | In sufficient amount to produce an extinction coefficient of 0.23/km due to particles when the relative humidity is less than 70 percent. | — |

[a] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb.

[b] On June 2, 2010, EPA established a new 1-hour $SO_2$ standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The EPA also revoked both the 24-hour $SO_2$ standard of 0.14 ppm and the annual primary $SO_2$ standard of 0.030 ppm, effective August 23, 2010. The secondary $SO_2$ standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA.

[c] The 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[d] 3-year average of the weighted annual mean concentrations.

mg/m$^3$ = milligram(s) per cubic meter
µg/m$^3$ = microgram(s) per cubic meter
$H_2S$ = hydrogen sulfide
ppb = part(s) per billion
ppm = part(s) per million

Source: ARB, 2012a

### 5.1.5 Existing Air Quality

The federal CAA requires EPA to classify areas in the country as attainment or non-attainment with respect to each criteria pollutant, depending on whether areas meet the national standards. In addition, ARB makes area designations within California for state ambient air quality standards (AAQS). The attainment statuses for the NAAQS and CAAQS are listed in Table 5.1-2.

TABLE 5.1-2
**State and Federal Air Quality Designations for Los Angeles County, California**

| Pollutant | State Designation | Federal Designation |
|---|---|---|
| Ozone | 1-Hour: Non-attainment (Extreme)<br>8-Hour: Non-attainment | 1-Hour: N/A<br>8-Hour: Non-attainment |
| CO | 1-Hour: Attainment<br>8-Hour: Attainment | 1-Hour: Attainment<br>8-Hour: Attainment |
| $NO_2$ | 1-Hour: Non-attainment<br>Annual: Non-attainment | 1-Hour: Attainment<br>Annual: Attainment |
| $SO_2$ | 1-Hour: Attainment<br>24-Hour: Attainment | 1-Hour: Attainment<br>24-Hour: N/A |
| $PM_{10}$ | 24-Hour: Non-attainment<br>Annual: Non-attainment | 24-Hour: Non-attainment<br>Annual: N/A |
| $PM_{2.5}$ | 24-Hour: N/A<br>Annual: Non-attainment | 24-Hour: Non-attainment<br>Annual: Non-attainment |
| Lead | Non-attainment | Non-attainment |
| $H_2S$, Sulfates | Unclassified, Attainment | No federal standard, No federal standard |

N/A = Not Applicable
$H_2S$ = hydrogen sulfide
Source: California Air Resources Board (ARB), 2011; U.S. Environmental Protection Agency (EPA), 2011.

According to Appendix B (g)(8)(G) of the California Energy Commission (CEC) data adequacy checklist, the ambient concentrations of all criteria pollutants for the previous 3 years as measured at the three ARB-certified monitoring stations closest to the project site, along with an analysis of whether these data are representative of conditions at the project site, is required. The applicant may also substitute an explanation regarding why information from one, two, or all stations is either not available or unnecessary.

Several monitoring sites are located near the RBEP site, including monitoring sites in the cities of Los Angeles, Compton, and Long Beach. The monitoring site in Compton was relocated from the Lynwood location in 2008, and a new monitoring site in Long Beach (EPA ID06-037-4006) was commissioned in 2010. Overall, the three closest ARB-certified monitoring sites relative to the RBEP site with three or more years of data available are located approximately 7.2 miles north-northwest of the project site near the Los Angeles International Airport (LAX); approximately 11.3-miles to the east-northeast of the project site in Compton; and approximately 11.9 miles to the east-southeast of the project site in Long Beach (South Coastal Los Angeles County 1). The two other Long Beach monitoring stations (South Coastal Los Angeles County Station 2 and EPA Long Beach AQS ID:06-037-4006) are also ARB-certified monitoring sites located near the project site. The South Coastal Los Angeles County 2 monitoring station is approximately 13.2 miles to the southeast of the project site in Los Angeles County, and the EPA Long Beach (AQS ID:06-037-4006) site recently established in 2010 is approximately 10.6 miles to the southeast of the project site.

Table 5.1-3 lists the pollutants monitored at each of the monitoring stations. A discussion of the representativeness of each station is included in Section 5.1.6.3.

The ambient air quality data are based on data published by ARB (ADAM Web site), SCAQMD (SCAQMD Web site), and EPA (AIRS Web site). The SCAQMD data summaries were used as the primary source of data, and the ARB and

EPA AIRS database summaries were used when data were unavailable on the SCAQMD Web site. The maximum ambient background concentrations will be combined with the modeled concentrations and used for comparison to the AAQS.

TABLE 5.1-3
**Summary of the Nearest Monitoring Stations and the Pollutants at Each Station**

| Monitoring Location | Ozone | $NO_2$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | Lead |
|---|---|---|---|---|---|---|---|
| South Coastal Los Angeles County 1 (Long Beach) | X | X | X | X | X | X | X |
| South Coastal Los Angeles County 2 (South Long Beach) | NA | NA | NA | NA | X | X | X |
| Southwest Coastal Los Angeles County (LAX) | X | X | X | X | X | NA | X |
| South Central Los Angeles County (Compton) | X | X | X | NA | NA | X | X |
| EPA Long Beach AQS ID:06-037-4006 (Long Beach)* | X | X | X | X | NA | NA | NA |

*Station was commissioned in 2010. Therefore, data were not available for inclusion in the analysis of the existing conditions but the station has been presented for informational purposes.

X = Pollutant was monitored at this location.

NA = Pollutant was not monitored at this location.

### 5.1.5.1 Nitrogen Dioxide

$NO_2$ is a byproduct of combustion sources such as on-road and off-road motor vehicles or stationary fuel-combustion sources. The principle form of nitrogen oxide produced by combustion is nitric oxide (NO); however, NO reacts quickly to form $NO_2$, creating a mixture of NO and $NO_2$ commonly called $NO_x$ (SCAQMD, 1993). Exposures to $NO_2$, along with pollutants from vehicle exhaust, are associated with respiratory symptoms, episodes of respiratory illness, and impaired lung function (ARB, 2012b). The South Coast Air Basin is currently designated attainment status for $NO_2$ by EPA and non-attainment status by ARB.

As shown in Table 5.1-4, $NO_2$ concentrations measured at the three nearest stations have not exceeded either the state or federal standards for the previous 3 years.

TABLE 5.1-4
**Background $NO_2$ Concentrations ($\mu g/m^3$)**

| Station | Averaging Time | CAAQS/NAAQS | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| South Coastal Los Angeles County 1 (Long Beach) | 1-hour (max) | 339/— | 235.2 | 208.8 | 174.6 |
| | 1-hour (98th percentile) | —/188 | 165.6 | 131.7 | 132.1 |
| | Annual* | 57/100 | 39.1 | 39.9 | 37.3 |
| Southwest Coastal Los Angeles County (LAX) | 1-hour (max) | 339/— | 169.3 | 150.5 | 142.6 |
| | 1-hour (98th percentile) | —/188 | 143.0 | 131.7 | 114.6 |
| | Annual* | 57/100 | 26.9 | 29.9 | 22.8 |
| South Central Los Angeles County (Compton) | 1-hour (max) | 339/— | 225.8 | 169.3 | 144.5 |
| | 1-hour (98th percentile) | —/188 | 182.5 | 131.7 | 129.4 |
| | Annual* | 57/100 | 56.6 | 40.3 | 33.7 |

*Annual Arithmetic Mean

Source: SCAQMD, 2012a; ARB, 2012c; and EPA, 2012

### 5.1.5.2 Ozone

Ozone is a photochemical oxidant that is formed when VOCs and $NO_x$ react in the presence of ultraviolet sunlight. The principal sources of $NO_x$ and VOC, often termed ozone precursors, are combustion processes (including motor vehicle engines) and evaporation of solvents, paints, and fuels.

Exposure to levels of ozone above the current ambient air quality standard can lead to human health effects such as lung inflammation, lung tissue damage, and impaired lung functioning. Ozone exposure is also associated with

symptoms such as coughing, chest tightness, shortness of breath, and the worsening of asthma symptoms. The greatest risk for harmful health effects belongs to outdoor workers, athletes, children, and others who spend greater amounts of time outdoors during smoggy periods. Elevated ozone levels can reduce crop and timber yields, as well as damage native plants. Ozone can also damage materials such as rubber, fabrics, and plastics (ARB, 2012b). The South Coast Air Basin is designated as a non-attainment area for ozone by both EPA and ARB.

As shown in Table 5.1-5, the current state regulatory 1-hour ozone concentration standards were exceeded at the Compton monitoring station in 2009 and at the Long Beach monitoring station in 2008 and 2010. The air quality standards were not exceeded at the LAX monitoring station. The measured 8-hour ozone concentrations equaled or exceeded the federal and state standards with some exceptions. The concentrations in 2009 and 2010 at the LAX monitoring station were below the federal standard. At the Compton monitoring station, ozone concentrations in 2008 and 2010 were below state and federal standards. At the Long Beach monitoring station, ozone concentrations were below the federal standard in 2008 and below state and federal standards in 2009.

TABLE 5.1-5
**Background Ozone Concentrations (µg/m$^3$)**

| Station | Averaging Time | CAAQS/NAAQS | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Southwest Coastal Los Angeles County (LAX) | 1-hour | 180/— | 169 | 151 | 175 |
| | 8-hour | 137/147 | 147 | 137 | 137 |
| South Central Los Angeles County (Compton) | 1-hour | 180/— | 153 | 204 | 159 |
| | 8-hour | 137/147 | 118 | 169 | 122 |
| South Coastal LA County 1 (Long Beach) | 1-hour | 180/— | 183 | 175 | 198 |
| | 8-hour | 137/147 | 145 | 134 | 165 |

Source: SCAQMD, 2012a; ARB, 2012c; and EPA, 2012

### 5.1.5.3 Sulfur Dioxide

Sulfur dioxide is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Effects from $SO_2$ exposures at levels near the 1-hour standard include broncho-constriction accompanied by symptoms that may include wheezing, shortness of breath, and chest tightness, especially during exercise or physical activity (ARB, 2012b). The South Coast Air Basin is designated as attainment for $SO_2$ by both EPA and ARB.

As shown in Table 5.1-6, the 1-hour, 3-hour, and 24-hour $SO_2$ concentrations measured at the LAX and Long Beach monitoring stations have not exceeded state or federal standards in the past 3 years.

TABLE 5.1-6
**Background $SO_2$ Concentrations (µg/m$^3$)**

| Station | Averaging Time | CAAQS/NAAQS | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Southwest Coastal Los Angeles County (LAX) | 1-hour (max) | 655/— | 52.4 | 52.4 | 67.8 |
| | 1-hour (99th percentile) | —/196 | 39.3 | 31.4 | 41.9 |
| | 3-hour* | —/1,300 | 32.2 | 34.8 | 38.7 |
| | 24-hour | 105/— | 13.1 | 15.7 | 9.2 |
| South Coastal LA County 1 (Long Beach) | 1-hour (max) | 655/— | 236 | 52.4 | 78.5 |
| | 1-hour (99th percentile) | —/196 | 78.5 | 31.4 | 31.4 |
| | 3-hour* | —/1,300 | 98.4 | 29.6 | 48.3 |
| | 24-hour | 105/— | 31.4 | 13.1 | 15.7 |

*EPA Secondary Standard

Source: SCAQMD, 2012a; ARB, 2012c; and EPA, 2012

### 5.1.5.4 Carbon Monoxide

CO is a colorless, odorless gas formed by incomplete combustion of fossil fuels. Exposure to CO near the levels of the AAQS can lead to fatigue, headaches, confusion, and dizziness (ARB, 2012b). The South Coast Air Basin is designated as attainment for the CO standards by both the EPA and ARB.

As shown in Table 5.1-7, CO concentrations measured at the LAX, Compton, and Long Beach monitoring stations have not exceeded either the state or federal standards in the past 3 years.

TABLE 5.1-7
**Background CO Concentrations (µg/m$^3$)**

| Station | Averaging Time | CAAQS/NAAQS | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Southwest Coastal Los Angeles County (LAX) | 1-hour | 23,000/40,000 | 4,581 | 2,290 | 3,436 |
| | 8-hour | 10,000/10,000 | 2,863 | 2,176 | 2,519 |
| South Central Los Angeles County (Compton) | 1-hour | 23,000/40,000 | 6,871 | 8,016 | 6,871 |
| | 8-hour | 10,000/10,000 | 4,924 | 5,268 | 4,123 |
| South Coastal LA County 1 (Long Beach) | 1-hour | 23,000/40,000 | 3,436 | 3,436 | 3,436 |
| | 8-hour | 10,000/10,000 | 2,978 | 2,519 | 2,405 |

Source: SCAQMD, 2012a; ARB, 2012c; and EPA, 2012

### 5.1.5.5 Fine Particulates ($PM_{10}$ and $PM_{2.5}$)

Fine particulate matter ($PM_{10}$ and $PM_{2.5}$) includes a wide range of solid or liquid particles, including smoke, dust, aerosols, and metallic oxides. Extensive research indicates that exposures to ambient $PM_{10}$ and $PM_{2.5}$ concentrations that exceed current air quality standards are associated with increased risk of hospitalization for lung- and heart-related respiratory illness, including emergency room visits for asthma. PM exposure is also associated with increased risk of premature death, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between PM exposure and reduced lung function and increased respiratory symptoms and illnesses (ARB, 2012b). The South Coast Air Basin is designated as non-attainment by EPA and ARB for $PM_{10}$ and $PM_{2.5}$ standards.

As shown in Table 5.1-8, $PM_{10}$ concentrations measured at the LAX, Long Beach, and South Long Beach monitoring stations did not exceed the 24-hour $PM_{10}$ NAAQS. The 24-hour CAAQS $PM_{10}$ standards have been exceeded each year during the past 3 years, with the exception of the concentration being met at the LAX monitoring station in 2008, and below the standard at the LAX and Long Beach monitoring stations in 2010. The annual $PM_{10}$ CAAQS concentrations have been exceeded each year in the past 3 years.

TABLE 5.1-8
**Background $PM_{10}$ Concentrations (µg/m$^3$)**

| Station | Averaging Time | CAAQS/NAAQS | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Southwest Coastal Los Angeles County (LAX) | 24-hour | 50/150 | 50 | 52 | 37 |
| | Annual* | 20/— | 25.6 | 25.4 | 20.6 |
| South Coastal LA County 1 (Long Beach) | 24-hour | 50/150 | 62 | 62 | 44 |
| | Annual* | 20/— | 29.1 | 30.5 | 22.0 |
| South Coastal LA county 2 (South Long Beach) | 24-hour | 50/150 | 81 | 83 | 76 |
| | Annual* | 20/— | 35.8 | 33.2 | 27.3 |

*Annual Arithmetic Mean

Source: SCAQMD, 2012a; ARB, 2012c; and EPA, 2012

As shown in Table 5.1-9, the 24-hour $PM_{2.5}$ concentrations measured at the Compton, Long Beach, and South Long Beach monitoring stations have exceeded the 24-hour NAAQS in 2008; and the 24-hour $PM_{2.5}$ concentrations measured at the Compton monitoring station have exceeded the 24-hour NAAQS in 2009. The 24-hour $PM_{2.5}$

NAAQS were met in 2010 at all three stations. The annual $PM_{2.5}$ concentrations measured at the Long Beach and South Long Beach monitoring stations did not exceed the annual NAAQS; however, the concentrations exceeded the state standards except in 2010. The annual $PM_{2.5}$ concentrations measured at the Compton monitoring station exceeded the state standards in all 3 years, and the concentrations exceeded the federal standards in 2008.

TABLE 5.1-9
**Background $PM_{2.5}$ Concentrations (µg/m$^3$)**

| Station | Averaging Time | CAAQS/NAAQS | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| South Central Los Angeles County (Compton) | 24-hour (98th percentile) | —/35 | 36.5 | 37.7 | 31.8 |
| | Annual* | 12/15 | 15.5 | 14.7 | 12.5 |
| South Coastal LA County 1 (Long Beach) | 24-hour (98th percentile) | —/35 | 38.9 | 34.2 | 28.3 |
| | Annual* | 12/15 | 14.2 | 13.0 | 10.5 |
| South Coastal LA county 2 (South Long Beach) | 24-hour (98th percentile) | —/35 | 36.4 | 30.5 | 26.5 |
| | Annual* | 12/15 | 13.7 | 12.5 | 10.4 |

*Annual Arithmetic Mean
Source: SCAQMD, 2012a; ARB, 2012c; and EPA, 2012

### 5.1.5.6 Greenhouse Gases

ARB has promulgated new laws to address the potential effects of increasing atmospheric concentrations of carbon dioxide and other greenhouse gases (GHG). On September 20, 2006, California signed into law the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32, codified at Section 1, Division 25.5, Section 38500 et seq. of the California Health & Safety Code). This law requires ARB to design and implement emission limits, regulations, and other measures, such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020 (representing a 25 percent reduction), and are further reduced by 2050 (an 80 percent reduction over 1990 levels).

AB 32 does not directly amend other environmental laws, such as the California Environmental Quality Act (CEQA). Instead, it provides for creation of a GHG emissions program that will involve identification of sources, prioritization of sources for regulation based on significance of source contribution to GHG emissions, and eventual regulation of those sources.

GHGs include the following pollutants:

- Carbon dioxide ($CO_2$) is a naturally occurring gas, as well as a by-product of burning fossil fuels and biomass, land-use changes, and other industrial processes. It is the principal anthropogenic GHG that affects the Earth's radiative balance.
- Methane ($CH_4$) is a GHG with a global warming potential (GWP) most recently estimated at 21 times that of $CO_2$. GWP is a measure of how much a given mass of GHG is estimated to contribute to global warming and is a relative scale that compares the mass of one GHG to that same mass of carbon dioxide. $CH_4$ is produced through anaerobic (without oxygen [$O_2$]) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.
- Nitrous oxide ($N_2O$) is a GHG with a GWP of 310 times that of $CO_2$. Major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.
- Hydrofluorocarbons (HFC) are compounds containing only hydrogen, fluorine, chlorine, and carbon. HFCs have been introduced as a replacement for the chlorofluorocarbons identified as ozone-depleting substances.
- Perfluorocarbons (PFC) are compounds containing only fluorine and carbon. Similar to HFCs, PFCs have been introduced as a replacement for chlorofluorocarbons. PFCs are also used in manufacturing and are emitted as by-products of industrial processes. PFCs are powerful GHGs.

- Sulfur hexafluoride ($SF_6$) is a colorless gas soluble in alcohol and ether, and is slightly soluble in water. It is a very powerful GHG used primarily in electrical transmission and distribution systems, as well as dielectrics in electronics.

Although RBEP will use the existing transmission infrastructure to the extent possible, some modifications to the interconnection of the RBEP into these systems will require the replacement of existing $SF_6$-containing equipment. However, it is assumed that the overall $SF_6$ levels will be consistent with the existing quantities. Therefore, an increase in emissions of HFCs, PFCs, or $SF_6$ is not expected to be significant for the project. That is why the project impact assessment focused on the impacts from emissions of $CO_2$, $CH_4$, and $N_2O$.

## 5.1.6 Environmental Analysis

This section describes the analysis conducted to assess the ambient air quality impacts from RBEP and to demonstrate compliance with the local, state, and federal air quality requirements for criteria pollutants. Emission estimates are presented for demolition and construction; commissioning; and operation. Dispersion model selection and setup are also described (emissions scenarios and release parameters, building wake effects, meteorological data, and receptor locations). Results are presented for the dispersion modeling analysis and are compared to the applicable local, state, and federal air quality regulations.

### 5.1.6.1 Criteria Pollutant and Greenhouse Gas Emission Estimates

Criteria pollutant emission rates were calculated for three components of the project: demolition of existing structures and construction of the new electrical generating components, commissioning activities, and operation. Hourly, daily, and annual criteria pollutant emissions were calculated based on a 60-month construction schedule and 5,900 hours of base load operation without duct burner firing per turbine per year, 470 hours of base load operation with duct burner firing per turbine per year, and with 624 startups and shutdowns per turbine per year. The criteria pollutants evaluated include $NO_x$, $SO_2$, VOCs, CO, $PM_{10}$, and $PM_{2.5}$.

#### 5.1.6.1.1 Construction and Demolition Emissions

Onsite construction activities will consist of the installation of three new combined-cycle gas turbines, an air-cooled condenser, and various auxiliary equipment. A power block enclosure, multiple sound walls, and administrative structures will also be constructed. RBEP construction is anticipated to take approximately 36 months. RBEP will reuse existing onsite potable water, natural gas, stormwater, process wastewater, sanitary pipelines, and electrical transmission facilities to the maximum extent possible; however, some modification and interconnection of the RBEP facility into these systems will require construction activity.

The demolition of the non-operational Redondo Beach Generating Station Units 1-4 will occur prior to the construction of the new generating units. Demolition of Units 1-4 is anticipated to take approximately 12 months, starting in first quarter 2016. The demolition of the Redondo Beach Generating Station Units 5–8 and auxiliary boiler No. 17 will begin in first quarter 2019, and will continue for approximately 24 months. In 2019 there will be overlap of both construction and demolition activities. Demolition of all existing units will include an organized, top-down dismantling of the existing boiler units, generators, and stacks. The existing foundations will remain largely intact at the conclusion of the demolition activities, and most of the demolition debris will be transported to an offsite location for recycling. All project-related construction/demolition activities are expected to be complete by December 2020.

All laydown and construction parking areas will be located within the existing 50-acre Redondo Beach Generating Station fenceline. A total of approximately 17 acres of the Redondo Beach Generating Station site will be used for construction laydown and parking. All construction equipment and supplies will be trucked directly to the site.

Onsite and offsite project emissions from construction and demolition have been divided into three categories: (1) vehicle and construction equipment exhaust; (2) fugitive dust from vehicle and construction equipment, including grading and bulldozing during construction; and (3) fugitive dust from demolition activities such as the top-down removal of the boiler stack and loading waste haul trucks with the generated debris.

The following criteria pollutant emissions have been calculated: $NO_x$, $SO_2$, VOC, CO, $PM_{10}$, and $PM_{2.5}$. Fugitive dust and construction equipment exhaust emissions have been estimated using methodology and emission factors consistent with the California Emissions Estimator Model (CalEEMod; version 2011.1.1), which incorporates OFFROAD2007 and portions of the EPA's AP-42 (ENVIRON, 2011; EPA, 2006; SCAQMD et al., 2011). Vehicle exhaust emissions for both paved and unpaved roads will be estimated using EMFAC2007 (version 2.3) emission factors, as consistent with the CalEEMod methodology.[2] It is not expected that large stockpiles of earthen materials would be present during project construction; therefore, wind-blown fugitive dust emissions from earthen stockpiles were assumed to be negligible. The Project Owner will also comply with all requirements outlined in SCAQMD Rule 1403, which requires the notification and special handling of asbestos-containing materials during demolition activities.

Maximum daily and annual emissions were estimated based on the number and type of construction equipment, the number of heavy-duty trucks, and the workforce projected for each month of construction and demolition. It was conservatively assumed that the construction and demolition activities would occur 10 hours per day, 23 days per month. The maximum daily emissions occur during month 40 for all pollutants with the exception of the combined total emissions of $PM_{10}$ and $PM_{2.5}$ from exhaust and fugitive dust, which occur during months 19 and 17, respectively. The maximum annual construction emissions occur between months 37 and 48 with the exception of the combined $PM_{10}$ and $PM_{2.5}$ emissions from exhaust and fugitive dust, which occur between months 15 and 26.

The maximum daily and annual emissions from the combined onsite and offsite construction and demolition activities are presented in Table 5.1-10. The detailed emission calculations for construction and demolition are provided in Appendix 5.1A.

TABLE 5.1-10
**Maximum Daily and Annual Emissions from Construction and Demolition**

| Construction Emissions | $NO_x$ | CO | VOC | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| Maximum Daily Emissions (lb/day) | 84.2 | 81.7 | 12.2 | 0.24 | 74.8 | 19.0 |
| Maximum Annual Emissions (tons/yr) | 10.9 | 10.6 | 1.6 | 0.03 | 7.8 | 2.0 |

Note: Maximum daily and annual emissions include contributions from onsite construction equipment, onsite vehicles, and offsite vehicles. The $PM_{10}$ and $PM_{2.5}$ emissions include exhaust and fugitive dust emissions. The maximum daily and annual emissions occur during the overlap of construction and demolition of Units 5–8 for all pollutants, except for total $PM_{10}$ and total $PM_{2.5}$ (combined emissions from exhaust and fugitive dust), which occur during construction.

Notes:

lb/day = pound(s) per day

tons/yr = ton(s) per year

The maximum annual greenhouse gases (GHG) from construction and demolition activities are presented in Table 5.1-11. Construction and demolition equipment GHG emissions have been estimated using emission factors from The Climate Registry (TCR) General Reporting Protocol (GRP, version 1.1), as updated in the 2012 Climate Registry Default Emission Factors (TCR, 2008), and fuel consumption rates from OFFROAD2007. Vehicle emissions (from vehicles used in commuting and from trucks) have been estimated using emission factors from TCR GRP (version 1.1) (TCR, 2008) and using fuel economy values from EMFAC2007 (version 2.3). No significant emissions of HFCs, PFCs, or $SF_6$ are expected during construction and demolition.

SCAQMD staff has recommended a GHG significance threshold that would apply to stationary source/industrial projects and would include direct and indirect emissions during construction and operation. Following the Tier 3 screening level approach, construction emissions would be amortized over the life of the project (defined as

[2] CalEEMod is a statewide computer model created by ENVIRON and SCAQMD to quantify criteria pollutant and greenhouse gas (GHG) emissions associated with the construction activities from a variety of land use projects (ENVIRON, 2011). Developed in cooperation with air districts throughout the state, CalEEMod is intended to standardize air quality analyses while allowing air districts to provide specific defaults reflecting regional conditions, regulations, and policies (SCAQMD et al., 2011). CalEEMod is generally viewed as an improvement and replacement of URBEMIS2007 by providing updated factors, methodologies, and defaults that are robustly documented.

30 years) and would be added to the operational emissions for comparison to the significance threshold of 10,000 metric tons (MT) of carbon dioxide equivalent ($CO_2e$).[3] Because the GHG potential to emit (PTE) emissions from the operation of the project are expected to exceed 1,000,000 MT of $CO_2e$, the project would exceed the 10,000 MT of $CO_2e$ limit. However, RBEP has been designed to incorporate energy-efficient technologies for reducing GHG PTE emissions from the power generation equipment based on meeting the project objectives, and SCAQMD will define the best available control technology (BACT) for reducing GHG emissions as part of the Prevention of Significant Deterioration (PSD) permitting process. Therefore, for purposes of evaluating the potential GHG impacts associated with RBEP construction and demolition activities, the construction GHG emissions in Table 5.1-11 were compared to the 10,000 MT of $CO_2e$ threshold. Based on this comparison, the annual GHG emissions from construction and demolition activities before amortization would be significantly less than 10,000 MT of $CO_2e$/yr. As a result, it is concluded that the mobile source GHG emissions from construction and demolition activities are less than significant.

The Council on Environmental Quality (CEQ) has also provided draft guidance suggesting that quantities of direct GHG emissions equal to or greater than 25,000 metric tons of $CO_2e$ on an annual basis are meaningful and should be quantified and disclosed for project evaluations within the National Environmental Policy Act (NEPA) framework (CEQ, 2010). While this is not a NEPA evaluation, this threshold can be used as a guide for assessing whether GHG emissions from construction and demolition activities and mobile source emissions during operation may be meaningful. As presented in Table 5.1-11, the quantities of direct GHG emissions are less than 25,000 MT of $CO_2e$ on an annual basis. Therefore, based on the draft CEQ guidance, the GHG emissions from construction and demolition activities would not be meaningful.

Estimated total fuel use during construction and demolition would be 882,490 gallons of diesel and 162,500 gallons of gasoline. Construction and demolition equipment fuel consumption rates were obtained from the OFFROAD2007 model. Vehicle fuel economies were estimated based on EMFAC2007 fuel economy values. Detailed GHG emission and fuel use calculations are included in Appendix 5.1A.

TABLE 5.1-11
**Maximum Annual Greenhouse Gas Emissions Estimates for RBEP Construction and Demolition Activities**

| Greenhouse Gas Emissions | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2$ Equivalent |
|---|---|---|---|---|
| Total (metric tons/yr) | 2,838 | 0.14 | 0.06 | 2,860 |

Note:
$CO_2$ equivalent total assumes a global warming potential of 21 for $CH_4$ and 310 for $N_2O$ (IPCC, 1996).

#### 5.1.6.1.2 Commissioning Emissions

During commissioning, each turbine will be initially operated at various load rates without the benefit of the emission control systems to ensure proper operation of the equipment. The total duration of the commissioning period is expected to be up to 180 days. During the commissioning period, each turbine will be operated for up to 491 hours without, or with partial, emission control systems in operation. The Project Owner will ensure that emissions are reduced to the extent feasible by limiting equipment operation consistent with the equipment manufacturer's recommended intervals. However, several possible scenarios during commissioning are expected to result in $NO_x$, VOC, and CO emissions that are greater than during normal operations. During commissioning, $PM_{10/2.5}$ and $SO_2$ emissions are expected to be no greater than full load operations.

Short-term $NO_2$, VOC, and CO emissions during the commissioning were estimated based on correspondence with the turbine vendor. The emission estimates are based on the estimated duration of each commissioning event, emission control efficiencies expected for each event, and turbine operating rates. The maximum hourly and event commissioning emission rates are presented in Table 5.1-12. The annual impacts for commissioning were not evaluated because the commissioning is expected to be completed within 180 days and the combined commissioning and operation emissions for a rolling 12-month period are not expected to exceed the maximum

[3] Information on thresholds available at http://www.aqmd.gov/hb/2008/December/081231a.htm

permitted annual emissions evaluated in Section 5.1.6.1. As previously stated, maximum hourly emission rates for $SO_2$, $PM_{10}$, and $PM_{2.5}$ are expected to be equal to or lower than normal operating rates due to reduced loads during commissioning. The detailed emission calculations for commissioning are provided in Appendix 5.1B.

TABLE 5.1-12
**RBEP Turbine Commissioning Emission Rate**

| Commissioning Emissions | $NO_X$ | CO | VOC | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| Maximum Hourly, lb/hr (per turbine)[a] | 109.7 | 3,169 | 383.8 | 2.63 | 9.5 | 9.5 |
| Total Commissioning Period, tons[b] | 12.4 | 169 | 21.2 | 1.59 | 4.4 | 4.4 |

[a] $SO_2$ and PM emissions not emitted in amounts greater than normal operating rates (includes duct burner firing).
[b] Total commissioning period $SO_2$ and PM emissions are based on the maximum unfired emission rates at 33°F with the exception of "Emissions Tuning at 100% load," "Commissioning Duct Burners," "Refire Unit with Duct Burners," half of the "Source Testing" hours, "Performance Testing," and "CALISO Certification." For those activities, the maximum fired emission rates at 33°F were used (see Appendix 5.1B).

lb/hr = pound(s) per hour

#### 5.1.6.1.3 Turbine Emissions—Operations

Operational emission estimates were prepared for the turbine startup and shutdown modes and the steady-state operating mode. Emission estimates for these operating modes are based on vendor data and engineering estimates. Natural gas will be the only fuel burned in the turbines. The turbines will use dry low $NO_x$ combustors, combined with SCR, to limit emissions of $NO_x$ to 2.0 ppmv , corrected to 15 percent $O_2$ (ppmvdc). Best combustion practices, combined with the use of an oxidation catalyst, will be used to limit CO and VOC emissions to 2.0 and 1.0 ppmvdc, respectively. $PM_{10}$ and $SO_2$ emissions will be kept to a minimum through the exclusive use of natural gas, inlet air filtration (for particulate matter control), and the oxidation catalyst system.

***Startup and Shutdown Emissions.*** During the startup and shutdown operating modes, the emission control systems are not fully functional, which may result in higher air emission rates relative to the steady-state operating mode. The MPSA 501DA is equipped with fast start technology and has the ability to reach full power within 10 minutes of initiating a startup. However, the inclusion of the steam generation system (HRSG, STG, and condenser) requires an extended startup period to allow for the gradual heating of the HRSG and steam turbine components.

Three startup scenarios have been developed for RBEP. For a cold start event, the combustion turbine and the steam generation system are all at ambient temperature at the time of the startup, which would typically occur if more than 49 hours elapse between a shutdown event and a system startup event. For the cold start event, the time from fuel initiation until reaching the baseload operating rate is expected to take up to 90 minutes. Although the exhaust emissions are expected to reach BACT levels in less than 90 minutes, a 90-minute startup period provides a conservative estimate of time for the SCR and oxidation catalyst systems to equilibrate and to achieve allowable BACT emission levels. A warm start event would typically be between 9 and 49 hours from a shutdown event. A hot start event would typically be within 9 hours of a shutdown event. For the warm and hot start events, the time from fuel initiation until reaching the baseload operating rate is expected to take up to 32.5 minutes. Although the exhaust emissions are expected to reach BACT levels in less than 32.5 minutes, a 32.5-minute startup period provides a conservative estimate of time for the SCR and oxidation catalyst systems to equilibrate and to achieve allowable BACT emission levels.

The duration of a MPSA 501DA shutdown event is approximately 10 minutes. As with the startup events, the emission controls are operational, but may not be achieving the proposed BACT levels for $NO_x$, CO, and VOC.

The maximum facility startup and shutdown emission rates are presented in Table 5.1-13, on a pound-per-event (lb/event) and a lb/hr basis. The maximum startup and shutdown event data are based on manufacturer data and engineering estimates. The maximum hourly startup and shutdown emission rates include the balance of steady-state operating emissions at 33°F, with the exception of the cold startup event. Because the duration for cold startup event is greater than 60 minutes, it was conservatively assumed that the system would reach BACT emission levels within 60 minutes, which estimates that approximately 90 percent of the cold start event emissions would

occur within the first 60 minutes. The detailed estimates of the facility startup and shutdown emissions are provided in Appendix 5.1B.

TABLE 5.1-13
**Facility Startup/Shutdown Emission Rates[a]**

| | $NO_x$ | CO | VOC | $SO_2$[b] | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| **Cold Start[c]** | | | | | | |
| Startup (lb/event/turbine) | 28.7 | 115.9 | 27.9 | — | — | — |
| Startup (lb/hr/turbine) | 25.4 | 113.9 | 27.3 | < 1.96 | < 4.5 | < 4.5 |
| **Warm Start[d]** | | | | | | |
| Startup (lb/event/turbine) | 16.6 | 46.0 | 21.0 | — | — | — |
| Startup (lb/hr/turbine) | 23.1 | 50.0 | 22.1 | < 2.63 | < 9.5 | < 9.5 |
| **Hot Start[d]** | | | | | | |
| Startup (lb/event/turbine) | 16.6 | 33.6 | 20.4 | — | — | — |
| Startup (lb/hr/turbine) | 23.1 | 37.6 | 21.5 | < 2.63 | < 9.5 | < 9.5 |
| **Shutdown[d]** | | | | | | |
| Shutdown (lb/event/turbine) | 9.0 | 45.3 | 31.0 | — | — | — |
| Shutdown (lb/hr/turbine) | 17.8 | 50.7 | 32.5 | < 1.96 | < 4.5 | < 4.5 |

[a] See Appendix 5.1B.
[b] Maximum $SO_2$ hourly emission rate based on the 0.75 grain of sulfur per 100 dry standard cubic feet (dscf) of natural gas.
[c] The hourly $NO_x$, CO, and VOC emission rates for a cold start are estimated assuming the SCR and catalyst are functional within 60 minutes. Therefore, the hourly emission rate is conservatively calculated by subtracting the lowest hourly emissions for the 70 percent load, without duct burner firing, at 106°F.
[d] The $NO_x$, CO, and VOC emissions for the balance of the hour for a warm and hot start event were based on the hourly emission rate for 100 percent load, with duct burner firing, at 33°F. The balance of the hour for shutdown is based on 100 percent load, without duct burner firing, at 33°F.

***Steady-state Operating Emissions.*** The turbine operational emission rates for steady-state operations without and with duct burner firing have been estimated based on vendor data and the combined maximum heat input rating and conservative estimates of annual operation. The $SO_2$ emission rate was estimated based on a fuel sulfur concentration of 0.75 grain of sulfur per 100 dscf of natural gas. The emission rates for the MPSA 501DA combustion turbines are shown in Table 5.1-14. Emission estimates are provided in Appendix 5.1B.

TABLE 5.1-14
**Maximum Pollutant Emission Rates for the MPSA 501DA Turbine[a]**

| | Without Duct Burner | | With Duct Burner | |
|---|---|---|---|---|
| **Pollutant** | **ppmvd @ 15% $O_2$** | **Emission Rate (lb/hr)** | **ppmvd @ 15% $O_2$** | **Emission Rate (lb/hr)** |
| $NO_x$ | 2.0 (1-hour) | 10.6 | 2.0 (1-hour) | 14.3 |
| CO | 2.0 (1-hour) | 6.4 | 2.0 (1-hour) | 8.7 |
| VOC | 1.0 (1-hour) | 1.8 | 1.0 (3-hour) | 2.5 |
| $SO_2$[d] | NA[c] | 1.96 | NA[c] | 2.63 |
| $PM_{10}/PM_{2.5}$[b] | NA[c] | 4.5 | NA[c] | 9.5 |
| Ammonia | 5 | 9.8 | 5 | 13.2 |

[a] Maximum values are for each turbine at an ambient temperature of 33°F and excludes startups and shutdowns.
[b] 100 percent of particulate matter emissions assumed to be emitted as $PM_{10}$ and $PM_{2.5}$.
[c] Not applicable.
[d] Estimated using a maximum of 0.75 grain of sulfur per 100 dscf of natural gas.
ppmvd = part(s) per million by volume, dry basis

#### 5.1.6.1.4 Facility Emissions

Emission sources at RBEP would include the three natural gas MPSA 501DA turbines and the fired HRSG. Natural gas will be the only fuel used during plant operation. The typical natural gas composition is shown in Table 5.1-15. Natural gas combustion results in the formation of $NO_x$, CO, unburned hydrocarbons (VOCs), $SO_2$, $PM_{10}$, and $PM_{2.5}$. Because natural gas is a clean-burning fuel, there will be minimal formation of combustion $PM_{10}$, $PM_{2.5}$, and $SO_2$.

TABLE 5.1-15
**Typical Natural Gas Specifications**

| Component Analysis | | Chemical Analysis | |
|---|---|---|---|
| **Component** | **Average Concentration, Volume** | **Molecular Weight** | **Weighted Average** |
| $CH_4$ | 96.19 | 16.04 | 15.43 |
| $C_2H_6$ | 1.67 | 30.07 | 0.50 |
| $C_3H_8$ | 0.27 | 44.00 | 0.12 |
| $C_4H_{10}$ | 0.098 | 58.12 | 0.057 |
| $C_5H_{12}$ | 0.0072 | 72.15 | 0.0052 |
| $C_6H_{14}$ | 0.022 | 86.18 | 0.019 |
| $N_2$ | 0.41 | 28.01 | 0.11 |
| $CO_2$ | 1.34 | 44.01 | 0.59 |
| | | **Average** | **16.83** |

Table 5.1-16 presents the maximum fuel use expected for each of the turbines, each of the duct burners, and the facility total. The estimated maximum hourly and daily fuel use was based on the maximum heat input for the turbine and duct burner at an ambient temperature of 33°F. The annual fuel use was estimated based on an average heat input at 63.3°F, 5,900 hours of base load operation without duct burner firing per turbine, 470 hours of base load operation with duct burner firing, and 624 startups and shutdowns per turbine.

TABLE 5.1-16
**Estimated Facility Fuel Use (MMBtu)[a,b]**

| Period | Gas Turbine (each) | Duct Burner (each) | Total Fuel Use (all units) |
|---|---|---|---|
| Per hour | 1,492 | 507 | 5,996 |
| Per day | 35,797 | 12,168 | 143,895 |
| Per year | 9,551,981 | 238,290 | 29,370,813 |

[a] The maximum hourly and daily fuel use was based on the maximum heat input for the turbine and duct burner at an ambient temperature of 33°F. The annual fuel use was estimated based on an average heat input at 63.3°F, 5,900 hours of base load operation without duct burner firing per turbine, 470 hours of base load operation with duct burner firing, and 624 startups and shutdowns per turbine.
[b] See Appendix 5.1B

Note:
MMBtu = million Btu

Maximum hourly turbine $NO_x$, as well as CO emissions, are based on a cold startup event. Maximum hourly turbine VOC emissions are based on a shutdown event. Because particulate matter and $SO_2$ emissions are based on fuel consumption, the maximum hourly $PM_{10}$, $PM_{2.5}$, and $SO_2$ emissions are based on each turbine operating at full load with duct burners at the minimum ambient temperature.

Monthly emissions are based on the following proposed operating profile (daily emissions represent the maximum monthly total divided by 30 days):

- Five cold starts per turbine
- 25 warm starts per turbine
- 60 hot starts per turbine

- 90 shutdowns per turbine
- 489.5 hours of operation per turbine at 100 percent load and 63.3°F, without duct burner firing
- 186 hours of operation per turbine at 100 percent load at 63.3°F with duct burner firing

The annual natural gas sulfur content is expected to average 0.25 grain per 100 dscf. However, on rare occasions, the natural gas fuel sulfur content can deviate and approach up to 0.75 grain of sulfur per 100 dscf. Therefore, hourly, daily, and monthly $SO_2$ emissions have been estimated assuming a natural gas sulfur content of 0.75 grain per 100 dscf.

Annual emissions are based on the following:

- 5,900 hours of base load operation without duct burner firing per turbine per year
- 470 hours of base load operation with duct burner firing per turbine per year
- 624 startups and shutdowns per turbine per year

Annual $SO_2$ emissions are based on an expected annual fuel sulfur level of 0.25 grain per 100 dscf of natural gas. Emission estimates are provided in Appendix 5.1B.

The existing Redondo Beach Generating Station currently has four operating generating units (Units 5–8) and one auxiliary boiler (No. 17). The operating units, the retired units 1–4, auxiliary boiler No. 17, and the main administrative building will be demolished as part of the project. Because the existing Redondo Beach Generating Station units will be retired and removed as part of the project, the current potential to emit for the existing Redondo Beach Generating Station Units 5–8 and Unit 17 and the maximum 2-year historical past actual emissions from the existing Redondo Beach Generating Station Units 5–8 and Unit 17 have been subtracted from the annual RBEP PTE to establish the overall net increase. The potential to emit values for the existing Redondo Beach Generating Station Units 5–8 and Unit 17 were based on permitted emission limits where applicable, SCAQMD Rule limits, and/or emission factors when a permitted limit did not exist. The detailed calculations are included in Appendix 5.1B. The maximum past actual values have been developed based on operations between calendar years 2007 and 2011 (Appendix 5.1B). This timeframe represents normal operations for these five existing units. A summary of the past actual emissions is presented in Table 5.1-17.

Criteria pollutant emissions from worker commutes and material deliveries were also calculated. The emissions are presented in Table 5.1-18. Emissions were estimated using emission factors from EMFAC2007 (version 2.3). Detailed calculations are included in Appendix 5.1B.

TABLE 5.1-17
**RBEP Facility Emissions**

| | $NO_x$ | $SO_2$ | VOC | CO | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| Maximum Hourly Emissions (per turbine)[a], lb/hr | 25.4 | 2.63 | 32.5 | 113.9 | 9.5 | 9.5 |
| Average Daily Facility Emissions[b], lb/day | 1,018 | 158.5 | 604 | 1,258 | 428 | 428 |
| Maximum Monthly Facility Emissions[c], lb/month | 30,541 | 4,755 | 18,113 | 37,740 | 12,834 | 12,834 |
| Average Annual Facility Emissions (tpy)[d] | | | | | | |
| RBEP (PTE) | 121.5 | 6.4 | 65.4 | 138.7 | 49.7 | 49.7 |
| Redondo Beach Generating Station Units 5-8 and 17 (PTE)[e] | 1,037 | 121 | 312 | 84,238 | 209.0 | 209.0 |
| Redondo Beach Generating Station Units 5-8 and 17 (Past Actual)[e] | 19.2 | 1.6 | 14.9 | 487 | 4.2 | 3.3 |
| Net PTE Increase (RBEP PTE - RBGS PTE) | (915) | (115) | (246) | (84,100) | (159) | (159) |
| **Net Increase (RBEP PTE – RBGS Past Actual)** | **102.3** | **4.8** | **50.5** | **(348.3)** | **45.5** | **46.3** |

TABLE 5.1-17
**RBEP Facility Emissions**

| | $NO_x$ | $SO_2$ | VOC | CO | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|

[a] Maximum hourly $NO_x$, and CO emissions were based on a turbine cold startup. Maximum hourly VOC emissions were based on a turbine shutdown event. The maximum hourly $PM_{10}$, $PM_{2.5}$, and $SO_2$ emissions are based on each turbine operating at full load with duct burners firing at the minimum ambient temperature.

[b] Average daily emissions represent the maximum monthly total divided by 30 days.

[c] Maximum monthly emissions are based on 5 cold starts, 25 warm starts, 60 hot starts, 90 shutdowns, and 489.5 hours of operation at 100 percent load, 63.3°F, without duct burner firing and 186 hours of operation at 100 percent load, 63.3°F with duct burner firing for each turbine.

[d] Average annual emissions are based on 5,900 hours of base load operation without duct burner firing per turbine per year, 470 hours of base load operation with duct burner firing per turbine per year, and 624 startups and shutdowns per turbine per year. Annual sulfuric acid emissions are less than 1 tpy.

[e] Redondo Beach Generating Station Units 5–8 and 17 will be retired and removed as part of the project; the current potential to emit for the existing Redondo Beach Generating Station Units 5–8 and Unit 17 and the maximum 2-year historical past actual emissions from these two units between calendar years 2007 and 2011 were subtracted from the RBEP PTE (see Appendix 5.1B).

Note:
tpy = ton(s) per year

TABLE 5.1-18
**Criteria Pollutant Emissions from Worker Commute and Deliveries During Operation**

| Emission Source | VOC | CO | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| Worker Commute (lb/yr) | 6.0 | 369 | 33.5 | 1.04 | 10.5 | 5.9 |
| Material Deliveries (lb/yr) | 3.03 | 14.8 | 39.5 | 0.14 | 1.95 | 1.5 |
| **Total (lb/yr)** | **9.05** | **384** | **73** | **1.2** | **12.5** | **7.3** |

### 5.1.6.2 Greenhouse Gas Emission Estimates

Combustion of natural gas in the gas turbines would result in emissions of $CO_2$, $CH_4$, and $N_2O$. GHG emissions for normal facility operations were calculated based on the maximum fuel use predicted for RBEP and emission factors contained in the TCR General Reporting Protocol (TCR, 2008). The emission factors used to estimate the GHG emissions are summarized in Appendix 5.1B. Similar to the criteria pollutant calculations, the current PTE for the existing Redondo Beach Generating Station Units 5–8 and Unit 17 and the maximum 2-year historical past actual emissions from the existing Huntington Beach Generating Station Units 5–8 and Unit 17 were subtracted from the RBEP PTE because the existing units will be retired as part of the project (see Appendix 5.1B). Emissions of $CO_2$, $N_2O$, and $CH_4$ resulting from RBEP operation are presented in Table 5.1-19.

TABLE 5.1-19
**Estimated Annual Greenhouse Gas Emissions from RBEP**

| | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|
| RBEP (PTE), MT/year | 1,554,010 | 112 | 26.4 | 1,564,548 |
| Redondo Beach Generating Station Units 5, 6, 7, 8, and 17 (PTE)*, metric tons/year | 6,298,174 | 107 | 107.1 | 6,333,635 |
| Redondo Beach Generating Station Units 5, 6, 7, 8, and 17 (Past Actual)*, MT/year | 322,224 | 5.4 | 0.6 | 322,524 |
| Net PTE Increase (RBEP PTE - RBGS PTE) | (4,744,164) | 5 | (81) | (4,769,087) |
| **NET Increase (RBEP PTE – RBGS Past Actual)** | **1,231,786** | **106** | **26** | **1,242,024** |

* Redondo Beach Generating Station Units 5, 6, 7, 8, and 17 will be retired and removed as part of the project. Therefore, the current potential to emit for the existing Redondo Beach Generating Station Units 5–8 and Unit 17 and the maximum 2-year historical past actual emissions from these two units between calendar years 2007 and 2011 (see Appendix 5.1B) were subtracted from the RBEP PTE.

GHG emissions from worker commutes and material deliveries were also calculated as part of the analysis. The GHG emissions are presented in Table 5.1-20. Emissions were estimated using emission factors from TCR GRP (version 1.1) (TCR, 2008) and fuel economy values from EMFAC2007 (version 2.3). Detailed calculations are included in Appendix 5.1B.

TABLE 5.1-20
**Greenhouse Gas Emissions from Worker Commute and Deliveries During Operation**

| | Greenhouse Gas Emissions (MT/year) | | | |
|---|---|---|---|---|
| **Emission Source** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2$ Equivalent** |
| Worker Commute, MT/year | 46.6 | 0.000092 | 0.000019 | 46.57 |
| Material Deliveries, MT/year | 6.9 | 0.000003 | 0.000003 | 6.85 |
| **Total** | **53.4** | **0.000095** | **0.000022** | **53.4** |

### 5.1.6.3 Air Quality Impact Analysis

An ambient air quality impact analysis was conducted to compare worst-case ground-level impacts resulting from the RBEP with established state and federal AAQS and applicable SCAQMD significance criteria. The analysis was conducted in accordance with the air quality impact analysis guidelines presented in the EPA's 40 Code of Federal Regulations (CFR) Part 51, Appendix W: *Guideline on Air Quality Models* (EPA, 2005) and SCAQMD's *AQMD Modeling Guidance for AERMOD* (SCAQMD, 2012b).

The analysis includes an evaluation of the possible effects of simple, intermediate, and complex terrain, and aerodynamic effects (downwash) due to nearby building(s) and structures on plume dispersion and ground-level concentrations. A numerical Gaussian plume model was used in this analysis. The model assumes that the concentrations of emissions within a plume can be characterized by a Gaussian distribution of gaseous concentrations about the plume centerline. Gaussian dispersion models are approved by EPA and SCAQMD for regulatory use and are based on conservative assumptions (that is, the models tend to overpredict actual impacts by assuming steady-state conditions, no pollutant loss through conservation of mass, no chemical reactions, etc.).

The subsections below present the following information:

- Modeling methodology for evaluating the impacts on ambient air quality
- Modeling scenarios and source data used to evaluate the impacts on ambient air quality
- Modeling results compared to the AAQS

#### 5.1.6.3.1 Modeling Methodology for Evaluating Impacts on Ambient Air Quality

The air dispersion modeling was conducted based on guidance presented in the *Guideline on Air Quality Models* (EPA, 2005) and the EPA-approved dispersion model, AERMOD (version 12060).

***Model Selection.*** The AERMOD model is a steady-state, multiple-source, dispersion model that incorporates hourly meteorological data inputs and local surface characteristics. The AERMOD model is well suited for this assessment based on the ability of the model to handle the various physical characteristics of project emission sources, including point, area, and volume source types. The required emission source data inputs to AERMOD include source locations, source elevations, stack heights, stack diameters, stack exit temperatures, stack exit velocities, and pollutant emission rates. The source locations are specified for a Cartesian (x,y) coordinate system where x and y are distances east and north in meters, respectively. The Cartesian coordinate system used for these analyses is the Universal Transverse Mercator Projection (UTM), 1983 North American Datum (NAD 83).

Where noted, the $NO_2$ 1-hour modeling was refined using the AERMOD Plume Volume Molar Ratio Method (PVMRM) model option. PVMRM offers a more realistic method of calculating concentrations of $NO_2$ by assuming that during the combustion of natural gas, approximately 50 percent of the stack emissions are emitted as $NO_2$. The remaining stack gas is released as nitrogen oxide. In the atmosphere, nitrogen oxide chemically reacts with ambient

concentrations of ozone to form $NO_2$. The PVMRM model calculates $NO_2$ concentrations based on the ambient ozone concentrations using this principle. The hourly ozone data used for the RBEP PVMRM was collected at the LAX monitoring station between 2005 and 2009 and was preprocessed for use with AERMOD by the SCAQMD.

***Model Options.*** The technical options selected for the AERMOD model include:

- Regulatory default control options
- Urban dispersion mode because land use within 3 km of the RBEP is primarily classified as urban based on the Auer Method. A population of 9,862,049 was also used in AERMOD, as recommended by the SCAQMD for projects in Orange County (SCAQMD, 2012b)
- Receptor elevations and controlling hill heights obtained from AERMAP (Version 11103) output

The model output is included on the attached modeling file compact disc.

***Meteorological Data.*** The CEC requires a minimum of 1 year of meteorological data approved by ARB or the local air pollution control district to be used in the air dispersion modeling analysis. SCAQMD model guidance recommends use of the nearest station to the project site. According to EPA's Guideline on Air Quality Models (EPA, 2005), representativeness of meteorological data used in dispersion modeling depends on (1) the proximity of the meteorological monitoring site to the area under consideration; (2) the complexity of the terrain; (3) the exposure of the meteorological monitoring site; and (4) the period of time during which data are collected.

Three SCAQMD meteorological data collection sites were identified in proximity to the proposed project: LAX, Compton, and Long Beach. Of the three locations, the LAX site was selected as the most representative based on the following factors:

- The monitoring site is the closest of the three to the proposed project (approximately 7.2 miles to the north-northwest of the RBEP site).
- The proximity to the ocean and the orientation of the coastline is similar for both locations.
- There are no complex terrain features between the two locations.
- The land uses surrounding the monitoring site and the RBEP site are similar (both are categorized as medium density residential with open water to the west).

Therefore, the monitoring station is considered representative of the RBEP site, and the meteorological data collected at the LAX monitoring station will be used to model the ambient air quality impacts. The meteorological data used for this analysis have been compiled by SCAQMD specifically for use in dispersion modeling analyses and include the period of January 1, 2005, through December 31, 2009. The surface data have also been coupled with the National Climatic Data Center soundings from the San Diego Miramar National Weather Service station (Station #03190). The final AERMET data files for 2005 through 2009 were downloaded directly from the SCAQMD website.

The annual and quarterly wind rose plots for the LAX meteorological station are presented in Appendix 5.1C.

***Background Data.*** As outlined in 40 CFR 51, Appendix W, Section 9.2, the background data used to evaluate the potential air quality impacts need not be collected on a project site, as long as the data are representative of the air quality in the subject area. The following three criteria were used for determining whether the background data are representative of: (1) location, (2) data quality, and (3) data currentness. These criteria are defined and applied to the project as follows:

- **Location:** The measured data must be representative of the areas where the maximum concentration occurs for the proposed stationary source, existing sources, and a combination of the proposed and existing sources.

  The nearest monitoring station relative to the project site is the LAX monitoring station. This site is located approximately 7.2 miles north-northwest of the project site, and the surrounding land use and proximity to the ocean are similar at both locations. No significant terrain features are in the vicinity of either the plant site or monitoring site that would significantly affect the representativeness of the winds or monitored

background concentrations. In addition, the LAX monitoring site measures each of the pollutants required in the air quality impact analysis, with the exception of $PM_{2.5}$. A meteorological data set has also been collected at the LAX monitoring station, and although the wind rose at LAX indicates that the site may not be directly downwind for all meteorological conditions, the meteorological data set is considered representative of the project site. Based on the information above, the ambient data collected at LAX is reasonably expected to be indicative of near-field background conditions at the project site, and these data are proposed for this analysis. However, since $PM_{2.5}$ is not currently monitored at the LAX site, the data collected at the next closest monitoring station (Compton) will be used. The Compton site is considered acceptable because the site is relatively close to the RBEP site, is located in an urban area downwind of the project site, and has values comparable to the other background monitoring station options located in Long Beach.

- **Data quality:** Data must be collected and equipment must be operated in accordance with the requirements of 40 CFR Part 58, Appendices A and B, and PSD monitoring guidance.

  The SCAQMD, ARB, and EPA ambient air quality data summaries were used as the primary sources of data. Therefore, the data at each of the monitoring stations listed in Table 5.1-3 will meet the data quality requirements of 40 CFR Part 58, Appendices A and B, and PSD monitoring guidance.

- **Data currentness:** The data are current if they have been collected within the preceding 3 years and are representative of existing conditions.

  The maximum ambient background concentrations from the period 2008 through 2010 were combined with the modeled concentrations and used for comparison to the ambient air quality standards. Therefore, the data at each of the monitoring stations listed in Table 5.1-3, with the exception of the recently established site in Long Beach (EPA Long Beach AQS ID:06-037-4006), represent the three most recent years of data available.

Based on the criteria presented above, the three most recent years of background $NO_2$, CO, $SO_2$, and $PM_{10}$ from the LAX monitoring station will be used. For $PM_{2.5}$, the monitoring data from the Compton monitoring station will be used because it is the nearest $PM_{2.5}$ monitor to the site, is downwind of the RBEP site, and represents a comparable estimate of the background $PM_{2.5}$ concentrations compared to the other monitoring locations in the vicinity of the project. A summary of the background concentrations for 2008 through 2010 is presented in Table 5.1-21.

TABLE 5.1-21
**Background Air Concentrations (2008-2010)[a]**

| | | 2008 | | 2009 | | 2010 | | Maximum |
|---|---|---|---|---|---|---|---|---|
| **Pollutant** | **Averaging Time** | **ppm** | **µg/m³** | **ppm** | **µg/m³** | **ppm** | **µg/m³** | **µg/m³** |
| $NO_2$ [d] | 1-hour (max) | 0.09 | 169 | 0.08 | 150.5 | 0.076 | 142.6 | 169 |
| | 1-hour (98th percentile) | 0.076 | 143 | 0.07 | 132 | 0.061 | 115 | 143 |
| | Annual[b] | 0.0143 | 26.9 | 0.0159 | 29.9 | 0.0121 | 22.8 | 29.9 |
| $SO_2$ [d] | 1-hour (max) | 0.02 | 52.4 | 0.02 | 52.4 | 0.0259 | 67.8 | 67.8 |
| | 1-hour (99th percentile) | 0.015 | 39.3 | 0.012 | 31.4 | 0.016 | 41.9 | 41.9 |
| | 3-hour[c] | 0.0123 | 32.2 | 0.0133 | 34.8 | 0.0148 | 38.7 | 38.7 |
| | 24-hour | 0.005 | 13.1 | 0.006 | 15.7 | 0.0035 | 9.2 | 15.7 |
| CO [d] | 1-hour | 4 | 4,581 | 2 | 2,290 | 3 | 3,436 | 4,581 |
| | 8-hour | 2.5 | 2,863 | 1.9 | 2,176 | 2.2 | 2,519 | 2,863 |
| $PM_{10}$ [d] | 24-hour | - | 50 | - | 52 | - | 37 | 52 |
| | Annual | - | 25.6 | - | 25.4 | - | 20.6 | 25.6 |
| $PM_{2.5}$ [e] | 24-hour (98th percentile) | -- | 36.5 | -- | 37.7 | - | 31.8 | 37.7 |
| | Annual | - | 15.5 | - | 14.7 | - | 12.5 | 15.5 |

[a] The SCAQMD, ARB, and EPA ambient air quality data summaries were used as reference.
[b] Annual Arithmetic Mean
[c] EPA Secondary Standard
[d] Data from the LAX monitoring station
[e] Data from the Compton monitoring station

***Receptor Grid Spacing.*** The base modeling receptor grid for the AERMOD modeling consists of receptors that are placed at the ambient air boundary and Cartesian-grid receptors that are placed beyond the project's site boundary at spacing that increases with distance from the origin. Property boundary receptors were placed at 30-meter intervals. Beyond the project's property boundary, receptor spacing was as follows:

- 50-meter spacing from property boundary to 500 meters from the origin
- 100-meter spacing from beyond 500 meters to 3 km from the origin
- 500-meter spacing from beyond 3 km to 10 km from the origin
- 1,000-meter spacing from beyond 10 km to 25 km from the origin
- 5,000-meter spacing from beyond 25 km to 50 km from the origin

All receptors and source locations were expressed in UTM NAD83, Zone 11 coordinate system. AERMAP (Version 11103) was used to calculate the receptor elevations and the controlling hill heights. Terrain in the vicinity of the project was accounted for by assigning base elevations to each receptor. National Elevation Dataset (NED) files from the United States Geological Survey (USGS) were obtained in one-third arc-second resolution for the 50-km grid. The AERMAP domain was large enough to encompass the 10 percent slope factor required for calculating the controlling hill height. Based on the outcome of the dispersion modeling analysis using the grid spacing above, the maximum predicted concentrations for the construction, commissioning, and operational stages of the project were located within the 50-meter spacing receptor grid. As a result, a supplemental refined receptor grid was not required.

A plot of the receptor grids is presented in Appendix 5.1C.

***Building Downwash and Good Engineering Practice Assessment.*** For the analysis of the potential turbine impacts during operation, EPA's BPIP-Prime (Building Profile Input Program – Plume Rise Model Enhancement, Version 04274) was used to calculate the projected building dimensions required for AERMOD evaluation of impacts from building downwash.

Good engineering practice (GEP) as used in the modeling analyses is the maximum allowed stack height to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles. In addition, the GEP modeling restriction ensures that any required regulatory control measure is not compromised by the effect of that portion of the stack that exceeds the GEP.

EPA's guidance for determining GEP stack height ($H_g$) (EPA, 1985) is based on the height of a nearby structure(s) measured from the ground-level elevation at the base of the stack (H) and the lesser dimension, height, or projected width, of the nearby structure(s) (L) as follows:

$$H_g = H + 1.5L$$

The GEP modeling restriction is the greater of the calculated GEP stack height or 65 meters. Therefore, based on the onsite and offsite building dimensions as input into BPIP-Prime, the calculated GEP height for the facility stack is the greater of 65 meters or the calculated height of 67.8 meters. The proposed turbine stack height of 42.7 meters (140 feet) does not exceed GEP stack height.

#### 5.1.6.3.2 Modeling Scenarios and Source Data Used to Evaluate Impacts on Ambient Air Quality

In evaluating the potential impacts of RBEP on ambient air quality, modeling of the worst-case ambient impacts for the project was compared to the state AAQS, federal AAQS, and the applicable SCAQMD new source review and PSD thresholds.

***Construction Impacts Analysis.*** As previously discussed, the construction and demolition activities for RBEP will occur for approximately 60 months. To evaluate the overall potential air quality impacts from the overlap of construction and demolition activities, the schedules for each activity were aligned and the maximum daily, monthly, and annual rolling 12-month emissions were developed. The maximum emissions of CO, $PM_{10}$ and $PM_{2.5}$ occur during construction of the power block while maximum emissions of NOx and $SO_2$ occur during the

overlapping period of power block construction and demolition of existing Units 5 and 6 and Units 7 and 8. A complete summary of the combined maximum daily, monthly, and annual emissions is provided in Appendix 5.1A.

The SCAQMD CEQA guidelines include daily CEQA significance thresholds for construction. Therefore, the maximum daily emissions from the construction and demolition activities have been compared to the SCAQMD CEQA significance thresholds in Table 5.1-22. As shown in Table 5.1-22, the maximum daily emissions are less than the significance thresholds for all pollutants. Therefore, the daily emissions associated with construction and demolition activities are expected to be less than significant.

TABLE 5.1-22
**Maximum Daily Construction and Demolition Emissions**

| Construction Emission Source | $NO_x$ | CO | VOC | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| Maximum Daily Emissions (lb/day) | 84.2 | 81.7 | 12.2 | 0.24 | 74.8 | 19.0 |
| SCAQMD CEQA Significance Threshold (lb/day) | 100 | 550 | 75 | 150 | 150 | 55 |
| Exceed Threshold? (yes or no) | No | No | No | No | No | No |

Note: Maximum daily emissions include contributions from onsite construction equipment, onsite vehicles, and offsite vehicles. The $PM_{10}$ and $PM_{2.5}$ emissions include exhaust and fugitive dust emissions.

In addition to the SCAQMD significance thresholds, the CEC requires an assessment of the potential ambient air quality impacts for construction and demolition activities. However, only the inclusion of the maximum hourly, daily, monthly, and annual rolling 12-month emissions from onsite activities are required. Therefore, the modeled concentrations of $NO_x$, CO, $PM_{10}$, $PM_{2.5}$, and $SO_2$ from onsite construction and demolition activities were combined with the ambient background concentrations and compared to the AAQS. The exhaust emissions were modeled as volume sources with a plume centerline height of 4.6 meters (15 feet), and the fugitive dust emissions were modeled as an area source assuming an average release height of 1 meter. The maximum 1-hour $NO_2$ concentrations were derived from the predicted 1-hour $NO_x$ concentrations at each receptor and the $NO_2$ to $NO_x$ ratios as a function of downwind distance, as discussed in the SCAQMD Localized Significance Threshold Methodology (LST) (SCAQMD, 2003). The results of the construction and demolition modeling analysis are presented in the following section. A detailed summary of the assumptions and emission factors used to estimate the emission rates is presented in Appendix 5.1A. A summary of the dispersion modeling input files is presented in Appendix 5.1C.

***Commissioning Impacts Analysis.*** During the RBEP commissioning period, each turbine will be initially operated at various load rates without the benefit of the emission control systems to ensure proper operation of the equipment. For the dispersion modeling analysis, it was assumed that the maximum impact would occur if all three turbines were simultaneously undergoing commissioning activities with the highest unabated emissions (e.g., initial full-speed, no-load CTG testing, steam blows, HRSG, and steam safety valve settings). As a result, the AERMOD dispersion analysis was conducted using the parameters and emission rates presented in Table 5.1-23.

The short-term concentrations of $NO_2$ and CO (the 1-hour and 8-hour impacts) from the commissioning of the project were combined with the ambient background concentrations and compared to the short-term AAQSs. Emission rates of $PM_{10}$, $PM_{2.5}$, and $SO_2$ are expected to be equal to or lower than normal operating rates due to reduced loads during commissioning. Because the commissioning activities are expected to be completed within 180 calendar days and the combined commissioning and operation emissions for a rolling 12-month period are not expected to exceed the maximum permitted annual emissions evaluated in Section 5.1.6.1, the annual impacts were not evaluated for the commissioning of the project. Additional details used to determine the maximum commissioning emission details are presented in Appendix 5.1B. A summary of the dispersion modeling input files is presented in Appendix 5.1C. The results of the commissioning modeling analysis are presented in the following section.

TABLE 5.1-23
**RBEP Commissioning Dispersion Modeling Scenarios**

| Scenarios | No. of Turbines/ Modeling Load | Exit Velocity (m/s) | Exhaust Temperature (K) | Emission Rates[a] (lb/hr) | | |
|---|---|---|---|---|---|---|
| | | | | 1-Hr $NO_x$ | 1-Hr CO | 8-Hr CO |
| CTG testing (full speed no load) | Three/5% | 10.06 | 499.8 | 48.53 | 1,709 | 1,709 |
| Steam blows[b] | Three/50% | 9.90 | 465.9 | 109.7 | 3,169 | 3,169 |
| Set unit HRSG and steam safety valves | Three/100% | 22.73 | 471.7 | 41.95 | 28.4 | 28.4 |
| Restart CTGs and run HRSG in bypass mode. STG bypass valve tuning. HRSG blow down and drum tuning | Three/40% | 9.95 | 473.2 | 25.97 | 1,373 | 1,373 |

[a] Emission rate given per turbine.
[b] The steam blows of the first CTG are expected to last up to 40 hours at 50 percent load. It is expected that steam blows on the remaining two CTGs will only last up to 20 hours (each) at 50 percent load.

Notes:
m/s = meter(s) per second
K = degrees Kelvin

***Operation Impacts Analysis.*** Turbine emissions and stack parameters, such as flow rate and exit temperature, would exhibit some variation with ambient temperature and operating load. Therefore, to evaluate the worst-case air quality impacts, a screening level dispersion modeling analysis was conducted at 70, 80, 90, and 100 percent load with and without duct burners at 33°F, 63.3°F, and 106°F. Exhaust parameters for the MPSA 501DA exhaust stacks were based on information provided by the vendor. Because all three RBEP units are identical, a unit emission factor (1 gram per second (g/s)) was used to predict the initial screening level downwind concentrations for each of the fifteen operating scenarios, and the resulting concentrations were scaled to reflect the emission rates for each operating scenario. A summary of the source parameters and the UTM locations of each source is included in Appendix 5.1C.

The hourly emission rates used to estimate the maximum 1-hour predicted impacts from the operation of RBEP were based on the conservative assumption that all three MPSA 501DA units would be in cold startup mode within the same hour. The 1-, 3-, and 24-hour $SO_2$ emission rates were estimated based on a fuel sulfur concentration of 0.75 grain of sulfur per 100 dscf of natural gas. The hourly emission rate for the 8-hour CO averaging period was based on the conservative assumption that all three MPSA 501DA units would complete one cold startup, two warm startup events, and three shutdowns, and would operate at 70 percent load for the remaining hours. The hourly 24-hour $PM_{10}$ and $PM_{2.5}$ emission rates were 9.5 lb/hour for the three duct burner modeling scenarios and 4.5 lb/hour for the remaining modeling scenarios. The annualized hourly $NO_x$, $PM_{10}$, and $PM_{2.5}$ emission rates for the annual impact assessment were based on the following:

- 5,900 hours of turbine operation without duct burner firing at 100, 90, 80, and 70 percent load
- 470 hours of turbine operation with duct burner firing at 100 percent load
- 24 cold startups
- 150 warm startups
- 450 hot startups
- 624 shutdowns

The emission rates and operating scenario resulting in the maximum predicted concentration are presented in Table 5.1-24. Because the maximum hourly, daily, and annual screening ground level impacts occurred within the 50-meter receptor grid, a supplemental 50-meter dispersion modeling grid at the point of maximum ground level impact was not necessary. The results of the modeling analysis are presented in the following section and in Appendix 5.1C.

TABLE 5.1-24
**Emission Rates and Operating Scenarios Corresponding to the Highest Predicted AERMOD Impacts**

| | Operating Scenario | Ambient Temperature (°F) | Operating Load (%) | Exhaust Velocity (m/s) | Exhaust Temperature (°F) | Turbine Emission Rate (lb/hr) |
|---|---|---|---|---|---|---|
| **$NO_2$** | | | | | | |
| 1-Hour | 15 | 106 | 70 | 49.5 | 374 | 25.4 |
| Annual | 10 | 63.3 | 70 | 52.4 | 373 | 9.23 |
| **CO** | | | | | | |
| 1-Hour | 15 | 106 | 70 | 49.5 | 374 | 114 |
| 8-Hour | 15 | 106 | 70 | 49.5 | 374 | 45.4 |
| **$SO_2$** | | | | | | |
| 1-hour | 1 | 33 | 100 w/DB | 79.0 | 398 | 2.63 |
| 3-hour | 6 | 63.3 | 100 w/DB | 74.8 | 396 | 2.51 |
| 24-hour | 10 | 63.3 | 70 | 52.4 | 373 | 1.35 |
| **$PM_{10}$** | | | | | | |
| 24-hour | 15 | 106 | 70 | 49.5 | 374 | 4.5 |
| Annual | 10 | 63.3 | 70 | 52.4 | 373 | 3.78 |
| **$PM_{2.5}$** | | | | | | |
| 24-hour | 15 | 106 | 70 | 49.5 | 374 | 4.5 |
| Annual | 10 | 63.3 | 70 | 52.4 | 373 | 3.78 |

Note: Emission rates are based on the following assumptions:

- The maximum 1-hour $NO_x$ and CO turbine emission rates are based on 60 minutes of a cold startup event.
- The 1-, 3-, and 24-hour $SO_2$ emission rate is based on the worst-case fuel sulfur content of 0.75 grain per 100 dscf of natural gas.
- The 8-hour CO emission rate estimate is based on one cold startup event, two warm startup events, and three shutdown events, and operating at 70 percent load for the remaining hours.
- The annual emission rates for $NO_x$, $PM_{10}$, and $PM_{2.5}$ were based on 5,900 hours of turbine operation without duct burner firing at 100 percent load; 470 hours of turbine operation with duct burner firing at 100 percent load; 24 cold startup events; 150 warm startup events; 450 hot startup events; and 624 shutdown events.

**Rule 1303 and Rule 1304.** SCAQMD Rule 1303 requires an ambient air quality analysis for each new emission source to demonstrate that a proposed project will not cause a violation or make significantly worse an existing violation of the CAAQS or NAAQS. However, under Rule 1304(a)(2), RBEP is not required to perform a dispersion modeling analysis. Therefore, a comparison of potential impacts to the significant change in air quality thresholds presented in SCAQMD Rule 1303, Appendix A-2 is not required as part of this air quality impacts analysis.

**Rule 2005.** SCAQMD Rule 2005 sets forth pre-construction review requirements for new facilities subject to the requirements of the RECLAIM program, for modifications to RECLAIM facilities, and for facilities that increase their allocation to a level greater than their starting allocation plus non-tradable credits. The existing Redondo Beach Generating Station is currently subject to the RECLAIM requirements, and RBEP will also exceed the major $NO_2$ modification threshold of 1 lb/day. Therefore, Rule 2005 requires an ambient air quality analysis to demonstrate that RBEP will not cause a significant increase in the air quality concentration of $NO_2$ as specified in Rule 2005, Appendix A.

**Regulation XVII (PSD).** SCAQMD Regulation XVII sets forth pre-construction review requirements for stationary sources to ensure that air quality in clean air areas does not significantly deteriorate, while maintaining a margin

for future industrial growth, and shall apply to pre-construction review of new or modified stationary sources that emit more than 100 tpy of federal attainment air contaminants. Based on the emission estimates and attainment designations, $NO_x$ is the only attainment pollutant from RBEP that will exceed the significant emissions increase threshold for which dispersion modeling is applicable and will be subject to dispersion modeling requirements.

The dispersion modeling approach and settings used to evaluate the project $NO_2$ impacts for comparison to the NAAQS and CAAQS were also used to determine the PSD near field (Class II) impacts. Table 5.1-25 summarizes the Class II significance impact levels (SIL), Class II PSD increments, and the significant monitoring concentration levels.

TABLE 5.1-25
**PSD Air Quality Impact Standards Applicable to the Project**

| Averaging Period/ Pollutant | Significance Impact Level* ($\mu g/m^3$) | PSD Increment ($\mu g/m^3$) | Significant Monitoring Concentrations ($\mu g/m^3$) |
|---|---|---|---|
| $NO_2$ (1-hour) | 7.52 | NS | NS |
| $NO_2$ (Annual) | 1 | 25 | 14 |

*Interim SIL for 1-hour $NO_2$ recommended in "Guidance Concerning the Implementation of the 1-hour $NO_2$ NAAQS for the Prevention of Significant Deterioration Program" (EPA, 2010).

Note:
NS = no standard

In addition to addressing RBEP's impacts within the near field, a Class I impact analysis was conducted to demonstrate that the RBEP will not cause or contribute to an exceedance of the Class I SIL or Increment Standards and will not adversely affect air quality-related values (AQRVs). To evaluate the potential impacts on Class I areas near the RBEP site, all Class I areas within 300 km of RBEP were identified. Based on this survey, the San Gabriel Wilderness, which is approximately 53 km from the RBEP site, was identified as the nearest Class I area. To address the PSD Class I Increment thresholds, AERMOD was used with a receptor ring at 50 km from the facility. The ring was spaced in 5-degree increments centered on the RBEP site location.

Table 5.1-26 summarizes the Class I SIL and allowable PSD increment consumption. If modeled impacts are below the SILs, then the project would be considered to have negligible impact at the more distant Class I areas.

TABLE 5.1-26
**Class I SIL and Increment Standards Applicable to the Project**

| Averaging Period/ Pollutant | Significance Impact Level ($\mu g/m^3$) | PSD Increment ($\mu g/m^3$) |
|---|---|---|
| $NO_2$ (Annual) | 0.1 | 2.5 |

To evaluate the potential impacts on visibility and deposition at the nearest Class I area, the Federal Class I area air quality guidance (FLAG, 2010) allows an emissions/distance (Q/D) factor of 10 to be used as a screening criteria for sources located more than 50 km from a Class I area. This screening criterion includes all AQRVs. Emissions are calculated as the total $SO_2$, $NO_x$, $PM_{10}$, and sulfuric acid ($H_2SO_4$) annual emissions (in tpy, based on 24-hour maximum allowable emissions multiplied by 365 days) unless an emission source is limited to time periods shorter than 1 year.

The combined RBEP annual emissions of $NO_x$, $SO_2$, $H_2SO_4$, and $PM_{10}$ based on the 24-hour maximum allowable emissions will be approximately 340 tpy. Therefore, the maximum Q/D for the project will be approximately 6.5 ton/km-year. Because the factor is less than the Federal Class I area air quality screening criteria of 10, visibility and deposition modeling is not required for any of the Class I areas because the potential impacts are expected to be less than significant.

#### 5.1.6.3.3 Modeling Results Compared to the Ambient Air Quality Standards

***Construction and Demolition Impacts Analysis.*** The results presented in Table 5.1-27 indicate that the maximum predicted $NO_2$, CO, and $SO_2$ construction impacts combined with the background concentrations will be below the AAQS for each averaging period. For particulate, the annual and 24-hour $PM_{10}$ background concentrations currently exceed the state AAQS without adding the modeled concentrations, and the current $PM_{2.5}$ concentrations exceed the AAQS. As a result, the predicted impacts combined with the background concentrations would also be greater than the AAQS.

Although the maximum modeled $PM_{10}$ concentrations associated with the project exceed the 24-hour state AAQS, the modeled concentrations of $PM_{10}$ and $PM_{2.5}$ decrease rapidly with distance from the project. As a result, the modeled concentrations are below the AAQS at the receptors beyond the property boundary. Based on the modeling analysis, fugitive dust is also a significant contribution to the predicted concentrations. Therefore, additional watering during periods of site grading, demolition, and high wind events, as well as implementation of the construction mitigation measures presented in Section 5.1.8.1, is expected to further reduce the offsite construction air quality impacts associated with construction and demolition activities to the extent possible.

TABLE 5.1-27
**Maximum Modeled Impacts from Construction and the Ambient Air Quality Standards**

| Pollutant | Averaging Period | Maximum Modeled Concentration ($\mu g/m^3$) | Background Concentration[a] ($\mu g/m^3$) | Total Predicted Concentration ($\mu g/m^3$) | State Standard ($\mu g/m^3$) | Federal Standard ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| $NO_2$[b] | 1-hour | 40.8 | 169 | 210 | 339 | — |
| | Federal 1-hour[c] | 40.8 | 130 | 171 | — | 188 |
| | Annual | 9.60 | 29.9 | 39.5 | 57 | 100 |
| $SO_2$ | 1-hour | 0.35 | 67.8 | 68.1 | 655 | — |
| | Federal 1-hour[d] | 0.35 | 37.5 | 37.9 | — | 196 |
| | 3-hour | 0.32 | 38.7 | 39.0 | — | 1,300 |
| | 24-hour | 0.063 | 15.7 | 15.8 | 105 | 365 |
| CO | 1-hour | 207 | 4,581 | 4,788 | 23,000 | 40,000 |
| | 8-hour | 113 | 2,863 | 2,976 | 10,000 | 10,000 |
| $PM_{10}$ | 24-hour | 78.5 | 52 | 131 | 50 | 150 |
| | Annual | 18.7 | 25.6 | 44.3 | 20 | — |
| $PM_{2.5}$ | 24-hour (98th percentile) | 17.8 | 35.3 | 53.2 | — | 35 |
| | Annual | 4.48 | 15.5 | 20.0 | 12 | 15 |

[a] Background concentrations were the highest concentrations monitored during 2008 through 2010.
[b] The maximum 1-hour $NO_2$ concentration is based on LST output, and the maximum annual $NO_2$ concentration includes an $NO_2$ to $NO_X$ equilibrium ratio of 0.75.
[c] Total predicted concentrations for the federal 1-hour $NO_2$ standard and 24-hour $PM_{2.5}$ standard are the respective maximum modeled concentrations combined with the 3-year average of 98th percentile background concentrations.
[d] Total predicted concentrations for the federal 1-hour $SO_2$ standard are the maximum modeled concentrations combined with the 3-year average of 99th percentile background concentrations.

***Commissioning Impacts Analysis.*** The potential impacts on ambient air quality associated with the RBEP commissioning activities were assessed based on engineering estimates of schedule and emissions. As previously discussed, it was assumed that the maximum impact would occur if all three turbines were simultaneously undergoing commissioning activities with the highest unabated emissions (for example, initial full-speed, no-load CTG testing, steam blows, HRSG, and steam safety valve settings).

Table 5.1-28 presents a comparison of the maximum modeled project commissioning impacts to the AAQS. The duct burners are not expected to be fired during the initial unabated commissioning activities. Therefore, the maximum impacts for $SO_2$, $PM_{10}$, and $PM_{2.5}$ are expected to be equal to or lower than normal operating rates with duct firing. As a result, the $SO_2$, $PM_{10}$, and $PM_{2.5}$ impacts from normal operation of all three turbines with duct firing (Table 5.1-29) are included for comparison to the AAQS. The analysis excluded a comparison to the annual

averaging period standards or thresholds because (1) commissioning will only occur once during the project lifetime, and it is expected to be completed within 180 calendar days; and (2) the combined commissioning and operation emissions for a rolling 12-month period are not expected to exceed the maximum permitted annual emissions. The analysis also excluded a comparison to the federal 1-hour $NO_2$ and $SO_2$ standards because the maximum hourly unabated emission rates that result in the highest predicted concentrations are only expected to occur once during the life of the project, and that one time would be less than 40 hours per turbine.[4] The 1-hour standards are also based on a 98th and 99th percentile statistical standard. Therefore, it is unlikely that simultaneous one-time unabated emissions for all three turbines would occur on the days with the highest background $NO_2$ and ozone concentrations.

TABLE 5.1-28
**Turbine Commissioning Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards**

| Pollutant | Averaging Time | Maximum Modeled Concentration (μg/m³) | Background Concentration (μg/m³)[a] | Total Predicted Concentration (μg/m³) | State Standard (μg/m³) | Federal Standard (μg/m³) |
|---|---|---|---|---|---|---|
| $NO_2$[b, c] | 1-hour | 118 | 169 | 287 | 339 | — |
| CO[c] | 1-hour | 6,439 | 4,581 | 11,020 | 23,000 | 40,000 |
| | 8-hour | 2,944 | 2,863 | 5,807 | 10,000 | 10,000 |
| $SO_2$[d] | 1-hour | 3.41 | 67.8 | 71.2 | 655 | — |
| | 3-hour | 1.51 | 38.7 | 40.2 | — | 1,300 |
| | 24-hour | 0.51 | 15.7 | 16.2 | 105 | 365 |
| $PM_{10}$[d] | 24-hour | 1.84 | 52 | 53.8 | 50 | 150 |
| $PM_{2.5}$[d] | 24-hour[e] | 1.84 | 35.3 | 37.1 | — | 35 |

[a] Background concentrations were the highest concentrations monitored during 2008–2010.
[b] The maximum 1-hour $NO_2$ concentration is based on AERMOD PVMRM output.
[c] The maximum $NO_2$ and CO impacts occurred during the 50 percent load scenario.
[d] The $SO_2$, $PM_{10}$, and $PM_{2.5}$ impacts from Table 5.1-29 have been included for comparison to the AAQS.
[e] Total predicted concentrations for the 24-hour $PM_{2.5}$ standard are the respective maximum modeled concentrations combined with the three-year average of 98th percentile background concentrations.

The maximum facility $NO_2$, CO, $SO_2$, $PM_{10}$, and $PM_{2.5}$ impacts combined with the background concentration are less than the AAQS, with the exception of the state $PM_{10}$ AAQS and the federal $PM_{2.5}$ AAQS. The 24-hour background $PM_{10}$ and $PM_{2.5}$ concentrations exceed the state and federal AAQS, respectively, without adding the modeled concentrations. As a result, the predicted impacts would also be greater than the AAQS. However, the commissioning activity would be finite, and the Project Owner will limit the hours of operation required to complete the commissioning activities. As discussed in Section 5.1.8.2, RBEP emissions will also be fully offset consistent with SCAQMD Rules 1303 and 1304 through the SCAQMD internal offset bank. Therefore, impacts from commissioning will be less than significant.

***Operation Impacts Analysis.*** The highest modeled concentrations were used to demonstrate compliance with the AAQS. Table 5.1-29 presents a comparison of the maximum RBEP operational impacts to the AAQS. The $NO_2$, CO, and $SO_2$ concentrations combined with the background concentrations do not exceed the AAQS. Therefore, RBEP will not cause or contribute to the violation of a standard, and the $NO_2$, CO, and $SO_2$ impacts from operation will be less than significant.

For $PM_{10}$ and $PM_{2.5}$, the background concentrations exceed the AAQS without the proposed project. As a result, the predicted project impact plus background also exceeds the AAQS, and the operation of the proposed project would further contribute to an existing violation of the AAQS absent mitigation. As discussed in Section 5.1.8.2, RBEP emissions will be fully offset consistent with SCAQMD Rules 1303 and 1304 through the permanent shutdown of the

[4] The steam blows of the first CTG are expected to last up to 40 hours at 50 percent load, and the remaining two CTGs would only last up to 20 hours (each) at 50 percent load.

existing AES-owned in-basin steam generating units and through the use of the SCAQMD internal offset bank (see Subsection 5.1.8.2.2). Therefore, the $PM_{10}$ impacts from operation will be less than significant.

A complete list of offsite impacts for the multiple turbine operating scenarios is presented in Appendix 5.1C.

TABLE 5.1-29
**RBEP Operation Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards**

| Pollutant | Averaging Time | Maximum Modeled Concentration (μg/m³) | Background Concentration (μg/m³)[a] | Total Predicted Concentration (μg/m³) | State Standard (μg/m³) | Federal Standard (μg/m³) |
|---|---|---|---|---|---|---|
| $NO_2$[b] | 1-hour | 40.0 | 169 | 209 | 339 | — |
| | Federal 1-hour[c] | 40.0 | 130 | 170 | — | 188 |
| | annual | 0.321 | 29.9 | 30.2 | 57 | 100 |
| $SO_2$ | 1-hour | 3.41 | 67.8 | 71.2 | 655 | — |
| | Federal 1-hour[d] | 3.41 | 37.5 | 40.9 | — | 196 |
| | 3-hour | 1.51 | 38.7 | 40.2 | — | 1,300 |
| | 24-hour | 0.51 | 15.7 | 16.2 | 105 | 365 |
| CO | 1-hour | 179 | 4,581 | 4,760 | 23,000 | 40,000 |
| | 8-hour | 40.4 | 2,863 | 2,903 | 10,000 | 10,000 |
| $PM_{10}$ | 24-hour | 1.84 | 52 | 53.8 | 50 | 150 |
| | Annual | 0.22 | 25.6 | 25.8 | 20 | — |
| $PM_{2.5}$ | 24-hour[c] | 1.84 | 35.3 | 37.1 | — | 35 |
| | Annual | 0.22 | 15.5 | 15.7 | 12 | 15 |

[a] Background concentrations were the highest concentrations monitored during 2008–2010.
[b] The hourly $NO_2$ concentration conservatively assumes a complete conversion of $NO_x$ to $NO_2$. The annual $NO_2$ concentration assumes an $NO_2$ to $NO_X$ equilibrium ratio of 0.75.
[c] Total predicted concentrations for the federal 1-hour $NO_2$ standard and 24-hour $PM_{2.5}$ standard are the respective maximum modeled concentrations combined with the 3-year average of 98th percentile background concentrations.
[d] Total predicted concentrations for the federal 1-hour $SO_2$ standard is the maximum modeled concentrations combined with the 3-year average of 99th percentile background concentrations.

**Rule 2005.** The maximum modeled $NO_2$ concentrations from the refined dispersion modeling analysis for each turbine are presented in Table 5.1-30 and are compared to the Rule 2005 significance threshold. The maximum modeled $NO_2$ concentrations were also added to representative background concentrations, and the results are compared to the state and federal ambient air quality standards for $NO_2$. The $NO_2$ concentrations per turbine are less than the Rule 2005 1-hour threshold and AAQS. Therefore, the predicted $NO_2$ impacts from operation will be less than significant compared to Rule 2005.

TABLE 5.1-30
**Rule 2005 Air Quality Thresholds and Standards Applicable to the Project (per emission unit)**

| Pollutant/ Averaging Period | Maximum Modeled Impact[a] (μg/m³) | Significant Threshold[b] (μg/m³) | Background Concentration (μg/m³)[c] | Total Predicted Concentration (μg/m³) | CAAQS/NAAQS (μg/m³) |
|---|---|---|---|---|---|
| $NO_2$ (1-hour) | 19.8 | 20 | 169 | 189 | 339/NA |
| $NO_2$ (federal 1-hour) | 19.8 | NA | 130 | 150 | NA/188[d] |
| $NO_2$ (annual) | 0.114 | 1 | 24.8 | 24.9 | 57/100 |

[a] The hourly $NO_2$ concentration conservatively assumes a complete conversion of $NO_x$ to $NO_2$. The annual $NO_2$ concentration assumes an $NO_2$ to $NO_X$ equilibrium ratio of 0.75
[b] Allowable change in air quality concentration per emission unit per Rule 2005, Appendix A.
[b] Background concentrations were the highest concentrations monitored during 2008 through 2010, unless otherwise noted.
[c] National 1-hour standard represents the 3-year average of the 98th percentile of the daily maximum 1-hour average.

**Regulation XVII (PSD).** Table 5.1-31 presents a summary of the predicted hourly and annual $NO_2$ impacts and a comparison to the Class II modeling SILs, Class II PSD increments, and the significant monitoring concentration levels. The predicted annual $NO_x$ impacts are less than the significance levels listed in Table 5.1-31. Therefore, the

annual $NO_x$ impacts are less than significant, and no further analysis is required. However, the maximum 1-hour $NO_2$ concentration exceeds the significance impact level. The radius of impact with predicted concentrations greater than 7.52 μg/m$^3$ is 1.1 km. Based on a survey of the area within 1.1 km, it is expected that the significant $NO_x$ sources within this distance are represented in the existing background data and the results presented in Table 5.1-29 indicate that RBEP will not cause or contribute to a violation of the AAQS. Furthermore, the $NO_2$ impacts from the existing Redondo Beach Generating Station Units 5, 6, 7, 8, and 17 are also included in the background concentrations and would no longer be operating at the completion of the RBEP. Therefore, the combined impacts from the existing $NO_2$ sources within 1.1 km of the existing Redondo Beach Generating Station and the predicted impacts from RBEP are not expected to cause or contribute to a violation of the NAAQS or CAAQS.

TABLE 5.1-31
**RBEP Predicted Impacts Compared to the PSD Air Quality Impact Standards**

| Averaging Period/ Pollutant | Maximum Predicted Impact (μg/m$^3$) | Significance Impact Level (μg/m$^3$) | PSD Increment (μg/m$^3$) | Significant Monitoring Concentrations (μg/m$^3$) |
|---|---|---|---|---|
| $NO_2$ (1-hour) | 32.0 | 7.52 | NS | NS |
| $NO_2$ (annual) | 0.32 | 1 | 25 | 14 |

Note: The maximum 1-hour $NO_2$ concentration is based on AERMOD PVMRM output and the maximum annual $NO_2$ concentration assumes an $NO_2$ to $NO_X$ equilibrium ratio of 0.75.

Note:
NS = no standard

Table 5.1-32 presents a summary of the predicted annual $NO_2$ impacts and a comparison to the Class I Increment thresholds. The predicted impacts from the operation of the RBEP are below the SILs. Therefore, the project would have a negligible impact at the more distant Class I areas.

TABLE 5.1-32
**RBEP Predicted Impacts Compared to the Class I SIL and Increment Standards**

| Averaging Period/ Pollutant | Maximum Predicted Impact at 50 km (μg/m$^3$) | Significance Impact Level (μg/m$^3$) | PSD Increment (μg/m$^3$) |
|---|---|---|---|
| $NO_2$ (annual) | 0.012 | 0.1 | 2.5 |

The annual $NO_2$ concentration conservatively assumes a complete conversion of $NO_x$ to $NO_2$.

***Fumigation Impacts Analysis.*** A meteorological condition that can produce high concentrations of ground-level pollutants is referred to as shoreline or inversion breakup fumigation. Inversion breakup fumigation occurs when a plume is emitted into a stable layer of air and that layer is then mixed to the ground in a short period of time through convective heating and microscale turbulence. Shoreline fumigation occurs when a plume is emitted into a stable layer of air and is then mixed to the surface as a result of advection of the air mass to less stable surroundings. Under both conditions, an exhaust plume may be drawn to the ground with little diffusion, causing high ground-level pollutant concentrations, although typically for periods less than 1 hour. Therefore, only comparisons to the 1-hour standards were included.

In some cases, the fumigation impacts can be greater than impacts predicted with the AERMOD model. To verify that fumigation impacts do not result in higher ambient air quality impacts, fumigation modeling was conducted. The effects of fumigation on the maximum modeled impacts were evaluated using the EPA SCREEN3 model (Version 96043) (EPA, 1992). The results of the fumigation modeling were based on the respective load and operating scenario which was identified in the operational ambient air quality impact analysis as the worst-case turbine impact scenario for each combination of pollutant and averaging time. Regulatory default mixing heights were selected.

The maximum inversion breakup fumigation concentration predicted by SCREEN3 occurs over 19 km downwind of the combustion turbine locations, while the maximum shoreline fumigation occurs at over 1.4 km downwind of

the combustion turbine locations. Table 5.1-33 presents a comparison of the potential RBEP operational fumigation impacts to the AAQS. The $NO_2$, $SO_2$, and CO concentrations combined with the background concentrations do not exceed the state AAQS. Therefore, fumigation impacts of $NO_2$, $SO_2$, and CO would be less than significant.

TABLE 5.1-33
**RBEP Operation Impacts Analysis—Fumigation Impacts Analysis Results Compared to the Ambient Air Quality Standards**

| Pollutant | Averaging Time | SCREEN3 Fumigation Result (μg/m$^3$) | Background Concentration[a] (μg/m$^3$) | Total Predicted Concentration (μg/m$^3$) | State Standard (μg/m$^3$) | Federal Standard (μg/m$^3$) |
|---|---|---|---|---|---|---|
| $NO_2$ | 1-hour | 60.7[b] | 169 | 230 | 339 | — |
| $SO_2$ | 1-hour | 6.98 | 67.8 | 74.8 | 655 | — |
| CO | 1-hour | 306 | 4,581 | 4,887 | 23,000 | 40,000 |

[a] Background concentrations were the highest concentrations monitored during 2008–2010.
[b] 1-hr $NO_2$ results include a $NO_2$ to $NO_X$ equilibrium ratio of 0.9 (i.e., in-stack ratio of 0.5 and an out-of-stack equilibrium of 0.8, or 0.5 + (0.8*0.5) = 0.9).

## 5.1.7 Cumulative Effects

The Project Owner requested a list of projects that are within a 6-mile radius of RBEP and are either currently in the permitting process, undergoing CEQA review, or recently received a Permit to Construct (PTC) from the SCAQMD. Once the source list is received, the sources will be provided to the CEC for review and comment on the appropriateness of excluding specific sources (sources with negligible emissions, administrative permit amendments with no increase in air emissions, and VOC sources), and a cumulative air quality impact analysis will be prepared using the methodology presented in the Air Dispersion Modeling Protocol within 60 days of receipt of the necessary data from the air district. This cumulative impact analysis will also be used to demonstrate RBEP's compliance with the 1-hour federal $NO_2$ standard consistent with PSD program requirements.

## 5.1.8 Mitigation Measures

### 5.1.8.1 Construction and Demolition Mitigation

SCAQMD Rule 403 requires the implementation of best mitigation practices to control fugitive dust[5]. Construction impacts will be further reduced with the implementation of a construction fugitive dust and diesel-fueled engine control plan. This plan will focus on reducing construction air quality impacts and will include the following construction mitigation measures:

- Watering unpaved roads and disturbed areas
- Limiting onsite vehicle speeds to 10 mph and posting the speed limit
- Frequent watering during periods of high winds when excavation/grading is occurring
- Sweeping onsite paved roads and entrance roads on an as-needed basis
- Replacing ground cover in disturbed areas as soon as practical
- Covering truck loads when hauling material that could be entrained during transit
- Applying dust suppressants or covers to soil stockpiles and disturbed areas when inactive for more than 2 weeks
- Use of Tier III construction equipment where feasible
- Maintaining all diesel-fueled equipment per manufacturer's recommendations to reduce tailpipe emissions
- Limiting diesel heavy equipment idling to less than 5 minutes, to the extent practical
- Using electric motors for construction equipment to the extent feasible

### 5.1.8.2 Operational Mitigation

During operations, the appropriate mitigation measure is to reduce potential air emissions before they are emitted. This is accomplished by the careful design of the project, including the installation of BACT to minimize

[5] Best Available Control Measures means fugitive dust control actions that are set forth in Table 1 of Rule 403.

air emissions. Air quality impacts will be further mitigated by providing emission offsets in the quantity expected to be emitted. The remainder of this section describes the BACT analysis and the emission offset mitigation.

#### 5.1.8.2.1 BACT Analysis

Based on the SCAQMD's BACT definition and major source thresholds (SCAQMD Rule 1302 and 1303), a BACT analysis is required for the uncontrolled emissions of $NO_x$, VOCs, CO, $SO_2$, $PM_{10}$, and $PM_{2.5}$. The EPA also requires a BACT analysis for the emissions of GHGs as part of the PSD permit application required under the EPA Tailoring Rule.

RBEP relies on the response characteristics of the MPSA 501DA combustion turbines and duct burning firing to provide a wide range of efficient, operationally flexible, fast-start, fast-ramping capacity to allow for the efficient integration of renewable energy sources into the California electrical grid. However, the Project Owner does not anticipate that duct burning will be required every hour that the turbines are operating to meet the variable electric generation demands. Therefore, the Project Owner has proposed two separate permit levels to allow the flexibility of operating the turbines with and without duct burning. The proposed RBEP emission limits are presented in Table 5.1-34.

TABLE 5.1-34
**Proposed BACT Emission Limits for RBEP**

| | Emission Limit (at 15% $O_2$) | |
|---|---|---|
| **Pollutant** | **Without Duct Burning** | **With Duct Burning** |
| $NO_x$ | 2.0 ppm (averaged over 1 hour) | 2.0 ppm (averaged over 1 hour) |
| CO | 2.0 ppm (averaged over 1 hour) | 2.0 ppm (averaged over 1 hour) |
| VOC | 1.0 ppm (averaged over 1 hour) | 1.0 ppm (averaged over 3 hours) |
| $PM_{10}$ | 4.5 lb/hr | 9.5 lb/hr |
| $PM_{2.5}$ | 4.5 lb/hr | 9.5 lb/hr |
| $SO_2$ | 0.75 grain of sulfur/100 scf of natural gas | 0.75 grain of sulfur/100 scf of natural gas |

The proposed BACT for $NO_x$ emissions is the use of dry low $NO_x$ combustors with SCR to control $NO_x$ emissions to 2.0 ppmvd (1-hour average) with and without duct burning. The BACT for CO emissions is best combustion design and the installation of an oxidation catalyst system to control CO emissions to 2.0 ppmvd (1-hour) with and without duct burning. The BACT for VOC emissions is best combustion design and the installation of an oxidation catalyst system to control VOC emissions to 1.0 ppmvd (1-hour) without duct burning and 1.0 ppmvd (3-hour) with duct burning. The BACT for $PM_{10}$/$PM_{2.5}$ emissions is best combustion practice, use of pipeline-quality natural gas, and use of inlet air filtration to control $PM_{10}$/$PM_{2.5}$ emissions to 4.5 lb/hr without duct burning and 9.5 lb/hr with duct burning. The BACT for $SO_2$ is the exclusive use of low sulfur pipeline-quality natural gas with a maximum fuel sulfur content of 0.75 grain per 100 scf. A complete summary of the top-down BACT assessment for criteria pollutants is included in Appendix 5.1D.

GHG pollutants are emitted during the combustion process when fossil fuels are burned. One of the possible ways to reduce GHG emissions from fossil fuel combustion is to use inherently lower GHG-emitting fuels and to minimize the use of fuel, which in this case is achieved by using thermally efficient gas turbines, with well designed HRSGs and STGs to generate additional power from the heat of the gas turbine exhaust.

As discussed in Appendix 5.1D, the MPSA 501DA CTGs operating in a combined-cycle operating configuration as a multistage generator compares favorably with other comparable simple-cycle turbines operating in a peaking capacity. The RBEP turbines and duct burners will combust natural gas to generate electricity from both the CTG and STG units. Therefore, the thermal efficiency for the project is best measured in terms of pounds of $CO_2$e/megawatt hour (MWh).

The performance of all CTGs degrades over time. Typically, turbine degradation at the time of recommended routine maintenance is up to 10 percent. Additionally, thermal efficiency can vary significantly with combustion turbine turndown and steam turbine/duct firing combinations. Finally, annual metrics for output-based limits on GHG emissions are affected by startup and shutdown periods because fuel is combusted before useful output of energy or steam. Therefore, the annual average thermal efficiency performance of any turbine will be greater than the optimal efficiency of a new turbine operating continuously at peak load over the lifetime of the turbine.

Based on the top-down GHG BACT analysis included in Appendix 5.1D, the only feasible and cost-effective option is the "Thermal Efficiency" option, which therefore was selected as the BACT. The GHG BACT calculation for the RBEP was determined in pounds of $CO_2e$/MWh of energy output (on a gross basis) and includes the inherent degradation in turbine performance over the life of the RBEP. RBEP has concluded that the BACT for GHG emissions is an emission rate of 1,082 pounds $CO_2$/MWhr of gross energy output, and a facility-wide annual $CO_2e$ emission limit of 1,564,548 MT/yr. Degradation over time and turndowns, startup, and shutdown are incorporated into these limits.

#### 5.1.8.2.2 Emission Offsets

The project would be required to provide emission offsets for $PM_{10}$, $SO_2$, and VOC emissions and RECLAIM trading credits (RTC) for $NO_x$ emissions under SCAQMD Rules 1303 and 2005. Under the Rule 1304(a)(2), RBEP is not required to provide Rule 1303 offsets because RBEP is a replacement for the existing electric utility steam boilers with no increase in energy output rating. The requirement to provide offsets is still applicable; however, it is the responsibility of the SCAQMD to surrender offsets consistent with Rule 1303. AES-SLD plans to enable 530 MW[6] of new generation under Rule 1304(b)(2) by permanently retiring AES-SLD's Redondo Beach Generating Station Unit 7 (480 MW) and using 50 MW from the retirement of Redondo Beach Generating Station Units 6 and 8 and Huntington Beach Generating Station Units 1 and 2.[7] The surplus 96 MW (146 MW minus 50 MW) will be applied to repowering projects at other AES-owned facilities in the future.

The Rule 1304 offset exemption does not extend to Regulation XX RTC, and the Project Owner will secure the required $NO_x$ RTCs for the first year and subsequent years of operation as outlined in Table 5.1-35. The first year includes the emissions from commissioning period, the annual operation emissions from RBEP, and emissions from the startup and shutdown events:

- Year 1 includes the NOx emissions from the commissioning, operations, and startup and shutdown events.
- Year 2 includes the NOx emissions from the operation and startup and shutdown events.

TABLE 5.1-35
**SCAQMD $NO_x$ RECLAIM Requirements**

| Pollutant | Offsets Required[a] |
|---|---|
| $NO_x$ | 267,804 lb $NO_x$ RTCs (first year – Commissioning Plus Operation)<br>242,957 lb $NO_x$ RTCs (second year – Operation Only) |

[a]The first -year RTC calculation includes the commissioning activities, plus 624 startups and shutdowns per year, 470 hours of turbine operation at 100 percent load, 63.3°F and duct burner firing, and 5,900 hours of turbine operation at 100 percent load, 63.3°F. The second year normal operation RTC calculation includes 624 startups and shutdowns per year, 470 hours of turbine operation at 100 percent load, 63.3°F and duct burner firing, and 5,900 hours of turbine operation at 100 percent load, 63.3°F.

[6] Maximum net output based on the 30 year, one hour duration, Site Minimum Winter Ambient Temperature (SMWAT) of 32 °F (Dry Bulb) and 30.75 °F (Wet Bulb) and relative humidity (RH) of 87.6%).

[7] The Huntington Beach Energy Project (12-AFC-02) AFC noted the retirement of 1,085 MW of generating capacity from Redondo Beach Generating Station Units 6 and 8 and HBGS Units 1 and 2 to mitigate the Huntington Beach Energy Project's 939 MW of new generation. This results in 146 MW of generating capacity not needed at Huntington Beach Energy Project.

## 5.1.9 Laws, Ordinances, Regulations, and Standards

The CAA, implemented by EPA, requires major new and modified stationary sources of air pollution to obtain a construction permit prior to commencing construction through a program known as the federal New Source Review (NSR) program. The requirements of the NSR program are dependent on whether the air quality in the area where the new source (or modified source) is being located attains the NAAQS. The program that applies in areas that are in attainment of the NAAQS is the PSD. The program that applies to areas where the air does not meet the NAAQS (termed non-attainment areas) is the non-attainment NSR.

EPA implements the NSR program through regional offices. Arizona, California, Hawaii, Nevada, and specific Pacific trust territories are administrated out of the EPA Region IX office in San Francisco. EPA typically delegates its NSR, Title V, and Title IV authority to local air quality agencies that have sufficient regulatory structure to implement these programs consistent with requirements of the CAA and implementing regulations. SCAQMD has been delegated several of these programs, including the authority to administer the PSD program.

ARB was established by the state legislature in 1967 with the purpose of attaining and maintaining healthy air quality, conducting research into causes and solutions to air pollution, and addressing the impacts that motor vehicles have on air quality. To this end, ARB implements the following programs:

- Establish and enforce motor vehicle emission standards, including fuel standards.
- Monitor, evaluate, and set health-based air quality standards.
- Conduct research to solve air pollution problems.
- Establish TAC control measures.
- Oversee and assist local air quality districts.

Air pollution control districts were established based on meteorological and topographical factors. The districts were established to enforce air pollution regulations for the purpose of attaining and maintaining all state and federal AAQS. The districts regulate air emissions by issuing air permits to stationary sources of air pollution in compliance with approved regulatory programs. Each district promulgates rules and regulations specific to air quality issues within its jurisdiction. The air emissions sources regulated by each district vary. The types of air pollution sources that might be regulated include manufacturers, power plants, refineries, gasoline service stations, and auto body shops.

The applicable LORS and compliance with these requirements are discussed in more detail in the following sections. Applicable PTC forms have been prepared in conjunction with this AFC and are included in Appendix 5.1E.

### 5.1.9.1 Federal LORS

EPA promulgates and enforces federal air quality regulations, with Region IX administering the federal air programs in California. The federal CAA provides the legal authority to regulate air pollution from stationary sources. The applicable federal regulations are summarized in Table 5.1-36, along with the agency responsible for administration of the regulation.

TABLE 5.1-36
**Applicable Federal Laws, Ordinances, Regulations, and Standards for Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Strategy |
|---|---|---|---|
| Title 40 CFR Part 50 | Establishes AAQS for criteria pollutants. | EPA Region IX | The Project Owner conducted a dispersion modeling analysis to determine if the project would exceed the state or federal AAQS. Dispersion modeling indicates that the project will not exceed the state or federal AAQS for the attainment pollutants during normal operations. Non-attainment pollutant emissions will be mitigated consistent with the SCAQMD's State Implementation Plan-Approved NSR program. |
| Title 40 CFR Parts 51, NSR (SCAQMD Reg XIII) | Requires pre-construction review and permitting of new or modified stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of AAQS. | SCAQMD with EPA Region IX | Requires NSR facility permitting for construction or modification of specified stationary sources. NSR applies to pollutants for which ambient concentration levels are higher than NAAQS. The NSR requirements are implemented at the local level with EPA oversight (SCAQMD Reg XIII).<br>A PTC and PTO application will be obtained from SCAQMD prior to construction of the project. As a result, the compliance requirements of 40 CFR, Part 51 will be met. |
| Title 40 CFR Parts 52, PSD | The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified in areas classified as attainment, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I Areas (e.g., national parks and wilderness areas). | SCAQMD with EPA Region IX | The PSD requirements apply on a pollutant-specific basis to any project that is a new major stationary source or a major modification to an existing major stationary source. SCAQMD classifies an unlisted source (which is not in the specified 28 source categories) that emits or has the potential to emit 250 tpy of any pollutant regulated by the Act as a major stationary source. For listed sources, the threshold is 100 tpy. $NO_x$, VOC, or $SO_2$ emissions from a modified major source are subject to PSD if the cumulative emission increases for either pollutant exceeds 40 tpy. In addition, a modification at a non-major source is subject to PSD if the modification itself would be considered a major source.<br>In May 2010, EPA issued the GHG permitting rule officially known as the "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule" (GHG Tailoring Rule), in which EPA defined six GHG pollutants (collectively combined and measured as $CO_2e$) as NSR-regulated pollutants and therefore subject to PSD permitting when new projects emit GHG pollutants above certain threshold levels. Under the GHG Tailoring Rule, beginning July 1, 2011, new sources with a GHG PTE equal to or greater than 100,000 tpy of $CO_2e$ will be considered a major source and will be required to undergo PSD permitting, including preparation of a BACT analysis for GHG emissions. Modifications to existing major sources ($CO_2e$ PTE of 100,000 tpy or greater) that result in an increase of $CO_2e$ greater than 75,000 tpy are similarly required to obtain a PSD permit, which includes a GHG BACT analysis.<br>RBEP is a combined-cycle project and would be considered one of the 28 source categories. Therefore, the emission rates were compared to the 100 tpy threshold. As shown in Table 5.1-17, the net emission increase in $NO_x$ would exceed the 100 tpy per pollutant. Therefore, RBEP would be subject to PSD analysis requirements for $NO_x$. The project also results in a GHG emissions increase above the new source PSD thresholds for $CO_2e$. Therefore, the project is subject to the GHG Tailoring Rule, and is required to obtain a PSD permit for GHGs.<br>A PSD application will be submitted to the SCAQMD and EPA as part of the authority to construct permit application. |

TABLE 5.1-36
**Applicable Federal Laws, Ordinances, Regulations, and Standards for Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Strategy |
|---|---|---|---|
| Title 40 CFR, Part 60 (SCAQMD Rule IX) | Establishes national standards of performance for new or modified facilities in specific source categories. | SCAQMD with EPA Region IX oversight | Proposed 40 CFR, Part 60 Subpart KKKK – $NO_x$ Emission Limits for New Stationary Combustion Turbines would apply to all new combustion turbines that commence construction, modification, or reconstruction after February 18, 2005. The rule requires natural gas-fired turbines greater than or equal to 30 MW to meet a $NO_x$ emission limit of 50 ng/J (0.39 lb/MW-hr), and an $SO_2$ limit of 73 ng/J (0.58 lb/MW-hr). Alternatively, a fuel sulfur limit of 500 ppmw could be met. Stationary combustion turbines regulated under this subpart would be exempt from the requirements of Subpart GG.<br><br>The proposed turbine will utilize dry low $NO_x$ combustors along with an SCR system and pipeline-quality natural gas, and will comply with both the $NO_x$ and $SO_2$ limits. The $NO_x$ and $SO_2$ emissions from the turbines will be 0.12 lb/MW-hr and 0.021 lb/MW-hr, respectively. The certified $NO_x$ CEMS will ensure compliance with the standard. Records of natural gas use and fuel sulfur content will ensure compliance with the $SO_2$ limit. |
| Title 40 CFR, Part 63 | Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific categories. | SCAQMD with EPA Region IX oversight | Title 40 CFR, Part 63—National Emission Standards for Hazardous Air Pollutants for Source Categories, establishes emission standards to limit emissions of hazardous air pollutants from specific source categories for Major HAP sources. Sources subject to Part 63 requirements must either use the MACT, be exempted under Part 63, or comply with published emission limitations. The potential NESHAP applicable to the project are Subpart YYYY, which sets a formaldehyde emission limit or an operational limit of 91 ppbv for turbines.<br><br>Projects would be subject to the Title 40 CFR, Part 63 requirements if the HAP PTE is greater or equal to 25 tpy for combined HAPs and 10 tpy for individual HAPs.<br><br>As shown in Section 5.9 (Public Health), RBEP has proposed an emission limit of 120 ppbv, and as a result, the project would not exceed the major source thresholds for HAPs (10 tpy for any one pollutant or 25 tpy for all HAPs combined). Therefore, RBEP would be less than the 40 CFR, Part 63 applicability threshold. |
| Title 40 CFR, Part 64 (CAM Rule) | Establishes onsite monitoring requirements for emission control systems. | SCAQMD with EPA Region IX oversight | Title 40 CFR, Part 64—Compliance Assurance Monitoring (CAM), requires facilities to monitor the operation and maintenance of emissions control systems and report any control system malfunctions to the appropriate regulatory agency. If an emission control system is not working properly, the CAM rule also requires a facility to take action to correct the control system malfunction. The CAM rule applies to emissions units with uncontrolled potential to emit levels greater than applicable major source thresholds. Emission control systems governed by Title V operating permits requiring continuous compliance determination methods are generally compliant with the CAM rule.<br><br>RBEP will have an emission control system for $NO_x$ and CO (SCR and oxidation catalyst). However, emissions of $NO_x$ and CO would be directly measured by a continuous monitoring system. Therefore, RBEP is exempt from the CAM provisions based on the exemption in Title 40 CFR, Part 64.2(b)(vi) and SCAQMD Reg XX for $NO_x$. |

TABLE 5.1-36
**Applicable Federal Laws, Ordinances, Regulations, and Standards for Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Strategy |
|---|---|---|---|
| Title 40 CFR, Part 70 (SCAQMD Reg XXX) | CAA Title V Operating Permit Program | SCAQMD with EPA Region IX oversight | Title 40 CFR, Part 70—Operating Permits Program, requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. The requirements of 40 CFR, Part 70 apply to facilities that are subject to NSPS requirements and are implemented at the local level through SCAQMD Reg XXX. According to Reg XXX, Rule 3001, a facility would be required to submit a Title V application if the facility had a potential to emit greater than 10 tpy $NO_x$ or VOC, 100 tpy of $SO_2$, 50 tpy of CO, or 70 tpy of $PM_{10}$, if the HAP PTE is greater or equal to 25 tpy for combined HAPs and 10 tpy for individual HAPs, or if the facility has the potential to emit greater than 100,000 tpy $CO_2e$.<br><br>RBEP will exceed the Title V thresholds listed in Rule 3001. As a result, RBEP will submit an application to modify the existing Title V permit as part of the permitting process. |
| Title 40 CFR, Part 72 (SCAQMD Reg XXXI) | CAA Acid Rain Program | SCAQMD with EPA Region IX oversight | Title 40 CFR, Part 72—Acid Rain Program, establishes emission standards for $SO_2$ and $NO_x$ emissions from electric generating units through the use of market incentives, requires sources to monitor and report acid gas emissions, and requires the acquisition of $SO_2$ allowances sufficient to offset $SO_2$ emissions on an annual basis.<br><br>An acid rain facility, such as RBEP, must also obtain an acid rain permit as mandated by Title IV of the CAA. A permit application must be submitted to SCAQMD at least 24 months before operation of the new units commences. The application must present all relevant sources at the facility, a compliance plan for each unit, applicable standards, and estimated commencement date of operation.<br><br>The necessary Title IV applications will be submitted as part of the permitting process. |

Notes:
CEMS = Continuous Emission Monitoring System
lb/MW-hr = pound(s) per megawatt hour
MACT = maximum achievable control technology
NESHAP = National Emissions Standards for Hazardous Air Pollutants
ng/J = nanograms per Joule
NSPS = New Source Performance Standards
ppbv = part(s) per billion by volume
ppmw = part(s) per million by weight
PTO = Permit to Operate

### 5.1.9.2 State LORS

ARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update, as necessary, the state's AAQS; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the State Implementation Plan for achievement of the federal AAQS.

The California Health and Safety Code, Section 41700 prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public; that endanger the comfort, repose, health, or safety of the public; or that damage business or property.

The state has promulgated numerous laws and regulations at the state level (Toxic Air Contaminants and Air Toxic Hot Spots) which are effectuated at the local level by the air districts. A discussion of these state and local LORS is presented in Tables 5.1-37 and 5.1-38, respectively. A discussion of the public health risks posed by emissions of TACs, including ammonia, is presented in Section 5.9, Public Health.

TABLE 5.1-37
**Applicable State Laws, Ordinances, Regulations, and Standards for the Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Strategy |
|---|---|---|---|
| California Code of Regulations, Section 41700 | Prohibits emissions in quantities that adversely affect public health, other businesses, or property. | SCAQMD with ARB oversight | The CEC conditions of exemption and the air quality management district PTC processes are developed to ensure that no adverse public health effects or public nuisances result from operation of the project. |
| California Assembly Bill 32 – Global Warming Solutions Act of 2006 (AB32) | The purpose is to reduce carbon emissions within the state by approximately 25 percent by the year 2020. | SCAQMD with ARB oversight | Requires the ARB to develop regulations to limit and reduce GHG emissions. |
| California Air Resources Board California Code of Regulations, Title 17, Article 5 | Establishes GHG limitations, reporting requirements, and a Cap and Trade offsetting program. | | The ARB has promulgated a Cap and Trade regulation that limits or caps GHG emissions and requires subject facilities to acquire GHG allowances. RBEP GHG emissions have been estimated, and the Project Owner will report emissions and acquire allowances consistent with these regulations. |
| California Senate Bill 1368 – Emissions Performance Standards (SB 1368) | The law limits long-term investments in baseload generation by the state's utilities to power plants that meet an emissions performance standard (EPS) jointly established by the CEC and the CPUC. | CEC with ARB oversight | The CEC has designed regulations that establish a standard for baseload generation owned by, or under long-term contract to, publicly owned utilities of 1,100 lbs $CO_2$/MWh. RBEP will emit 1,082 lbs $CO_2$/MWh. |

Note:

CPUC = California Public Utilities Commission

In August 2006, the California legislature passed AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires California resource agencies to establish a comprehensive program of regulatory and market mechanisms to achieve reductions in GHG emissions (ARB, 2006). RBEP will be subject to AB 32, and will be required to comply with all final rules, regulations, emissions limitations, emission reduction measures, or market-based compliance mechanisms adopted under AB 32. The ARB promulgated a Cap and Trade regulation to limit GHG emissions and to develop a market-based compliance mechanism for the creation, sale, and use of GHG allowances.

In addition to AB 32, Senate Bill 1368 (Perata, Chapter 598, Statutes of 2006) was signed into law on September 29, 2006. The law limits long-term investments in baseload generation by the state's utilities to power plants that meet an EPS jointly established by the CEC and the CPUC. In response, the CEC has designed regulations that establish a standard for baseload generation owned by, or under long-term contract to publicly owned utilities, of 1,100 lbs $CO_2$/MWh. A baseload generation is defined as electricity generation from a powerplant that is designed and intended to provide electricity at an annualized plant capacity factor of at least 60 percent. The permitted capacity factor for RBEP will be approximately 70 percent. Therefore, the GHG emissions from the operation of the combined-cycle combustion turbines are also compared to the 1,100 lbs $CO_2$/MWh threshold.

#### 5.1.9.3 Local Laws, Ordinances, Regulations, and Standards

When the state’s air pollution statutes were reorganized in the mid-1960s, local districts were required to be established in each county of the state. The three different types of districts are county, regional, and unified. In addition, special air quality management districts, with more comprehensive authority over non-vehicular sources as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California, including SCAQMD. Air quality management districts have principal responsibility for developing plans for meeting the NAAQS and CAAQS; for developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards; for implementing permit programs established for the construction, modification, and operation of sources of air pollution; and for enforcing air pollution statutes and regulations governing non-vehicular sources.

The SCAQMD plans define the proposed strategies, including stationary source control measures and NSR rules, whose implementation will attain the state AAQS. The relevant stationary source control measures and NSR requirements are presented in Table 5.1-38.

### 5.1.10 Agencies and Agency Contacts

Each level of government has adopted specific regulations that limit emissions from stationary combustion sources, several of which are applicable to RBEP. The agencies having permitting authority for RBEP, and their contact information, are shown in Table 5.1-39.

### 5.1.11 Permits and Permit Schedule

A PTC application has been submitted to SCAQMD as part of the CEC licensing process. The PTC included permitting forms for the Title IV and Title V permitting programs. SCAQMD is responsible for issuing the required construction permits related to air quality. Consistent with the CEC siting regulations, SCAQMD must issue a preliminary determination of compliance within 180 days after issuing the application completeness determination letter. If all requirements of the SCAQMD rules are met, SCAQMD will issue a determination of compliance to the CEC within 240 days after the acceptance of the application as complete. Upon approval of the project by the CEC, a determination of compliance serves as the SCAQMD PTC. A PTO will be issued by SCAQMD after construction and demonstration of compliance with the PTC. Title IV and Title V permits are also issued by SCAQMD after the final Commission Decision.

TABLE 5.1-38
**Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Assessment |
|---|---|---|---|
| SCAQMD Rule 201 | Rule 201 (Permit to Construct) establishes an orderly procedure for the review of new and modified sources of air pollution through the issuance of permits. | SCAQMD | Rule 201 specifies that any facility installing nonexempt equipment that causes or controls the emission of air pollutants must first obtain a PTC from the SCAQMD. SCAQMD has three separate preconstruction review programs for new or modified sources of criteria pollutant emissions: Reg XIII (New Source Review), Reg XVII (Prevention of Significant Deterioration), and Rule 2005 (NSR for RECLAIM).<br>The air quality analysis includes an assessment of the air quality impacts in accordance with Reg XIII, Reg XVII, and Rule 2005. The completed SCAQMD PTC application forms have also been included in Appendix 5.1E. |
| SCAQMD Rule 201.1 | Rule 201.1 incorporates the permit conditions in federally issued permits to construct. | SCAQMD | A person constructing and/or operating equipment or an agricultural permit unit, pursuant to a PTC issued by the EPA, shall construct the equipment or agricultural permit unit in accordance with the conditions set forth in that permit, and shall operate the equipment or agricultural permit unit at all times in accordance with such conditions.<br>A federal PSD permit will be obtained for the RBEP. The Project Owner will comply with the permit conditions established in the PSD permit. |
| SCAQMD Rule 212 | The purpose of this rule is to establish standards for approving permits and issuing public notice. | SCAQMD | Rule 212 requires public notification if:<br>a. Any new or modified permit unit, source under Regulation XX, or equipment under Regulation XXX that may emit air contaminants is located within 1,000 feet from the outer boundary of a school.<br>b. Any new or modified facility has onsite emission increases exceeding any of the daily maximums specified in subdivision (g) of this rule;<br>c. Any new or modified permit unit, source under Regulation XX, or equipment under Regulation XXX with increases in emissions of toxic air contaminants, for which the Executive Officer has made a determination that a person may be exposed to an MICR is greater than 1 in 1 million ($1 \times 10^{-6}$), due to a project's proposed construction, modification, or relocation for facilities with more than one permitted equipment unless the applicant can show that the total facility-wide MICR is below 10 in 1 million ($10 \times 10^{-6}$).<br>The predicted total facility-wide MICR is less than 1 in 1 million. However, RBEP will be within 1,000 feet from the outer boundary of a school, and the onsite emissions will exceed the daily maximums listed in subdivision (g) of this rule. Therefore, a public notice consistent with the requirements outlined in Rule 212 will be issued. The process for public notification and comment will include all of the applicable provisions of 40 CFR, Part 51, Section 51.161(b), and 40 CFR, Part 124, Section 124.10 |
| SCAQMD Rule 218 | Establishes requirements for a CEMS | SCAQMD | The owner or operator of any equipment subject to this Rule shall provide, properly install, operate, and maintain in calibration and good working order a certified CEMS to measure the concentration and/or emission rates, as applicable, of air contaminants and diluent gases, flow rates, and other required parameters.<br>Each gas turbine will be equipped with a CEMS. These units will comply with all applicable requirements of Rule 218, Rule 212 ($NO_x$ RECLAIM), and Title IV (Acid Rain – 40 CFR75). |
| SCAQMD Rule 401 | Establishes limits for visible emissions from stationary sources. | SCAQMD | Rule 401 prohibits visible emissions as dark as or darker than Ringlemann No. 1 for periods greater than 3 minutes in any hour.<br>Natural gas will be the only fuel fired in the natural gas turbines. Therefore, the project will not create visible emissions as dark as or darker than Ringlemann No. 1. |
| SCAQMD Rule 402 | Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or that damage business or property. | SCAQMD | A person shall not discharge from any source whatsoever such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or which endanger the comfort, repose, health or safety of any such persons or the public; or which cause, or have a natural tendency to cause, injury or damage to business or property.<br>The CEC conditions of exemption and the SCAQMD PTC process are designed to ensure that the operation of the project will not cause a public nuisance. |
| SCAQMD Rule 403 | Establishes requirements to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources. | SCAQMD | Rule 403 requires the implementation of best available control measures to minimize fugitive dust emissions and prohibits visible dust emissions beyond the property line, a 50 $\mu g/m^3$ incremental increase in $PM_{10}$ concentrations across a facility as measured by upwind and downwind concentrations, and track-out of bulk material onto public, paved roadways.<br>The project will implement best available control measures as part of the SWPPP to minimize fugitive dust emissions during construction and operation. |
| SCAQMD Rule 404 | Establishes limits for particulate matter emission concentrations. | SCAQMD | A person shall not discharge into the atmosphere from any source, particulate matter in excess of the concentration at standard conditions listed in Rule 404. However, per Rule 404.c, this rule does not apply to emissions resulting from the combustion of liquid or gaseous fuels in steam generators or gas turbines.<br>Because RBEP will combust natural gas only, Rule 404 is not applicable and will not be addressed further. |
| SCAQMD Rule 405 | Establishes limits for particulate matter mass emission rates. | SCAQMD | Emission rate limits are based upon the process weight (fuel burned) per hour.<br>Natural gas will be the only fuel fired in the natural gas turbines. Therefore, the project is expected to comply with the Rule 405 particulate emission limits. |
| SCAQMD Rule 407 | Establishes limits for CO and $SO_x$ emissions from stationary sources. | SCAQMD | Rule 407 prohibits CO and $SO_x$ emissions in excess of 2,000 and 500 ppm, respectively, from any source.<br>The CO emissions from the MPSA 501DA turbines will be less than 2 ppm. Therefore, the project meets the CO limit. In addition, equipment that complies with the requirements of Rule 431.1 is exempt from the $SO_x$ limit. Because the facility will comply with Rule 431.1, the $SO_x$ provisions of Rule 407 will not be addressed further. |

TABLE 5.1-38
**Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Assessment |
|---|---|---|---|
| SCAQMD Rule 409 | Establishes limits for particulate emissions from fuel combustion sources. | SCAQMD | Rule 409 prohibits particulate emissions in excess of 0.1 grain per cubic foot of gas at 12 percent $CO_2$ at standard conditions.<br>Natural gas will be the only fuel fired in the natural gas turbines. Therefore, the project is expected to comply with the Rule 409 particulate emission limits. |
| SCAQMD Rule 431.1 | Establishes limits for the sulfur content of gaseous fuels to reduce $SO_x$ emissions from stationary combustion sources. | SCAQMD | Rule 431.1 limits the sulfur content of natural gas calculated as $H_2S$ to be less than 16 ppmv.<br>The sulfur content of the natural gas will be less than 0.75 grain of sulfur per 100 dscf of natural gas or 12.6 ppmv. Therefore, the project is expected to comply with the Rule 431.1 requirement. |
| SCAQMD Rule 474 | Establishes limits for emissions of $NO_x$ from stationary combustion sources. | SCAQMD | Per Rule 2001, $NO_x$ RECLAIM facilities are exempt from the provisions of Rule 474. Because the project will be a $NO_x$ RECLAIM facility, Rule 474 is not applicable and will not be addressed further. |
| SCAQMD Rule 475 | Establishes limits for combustion contaminant (PM) emissions from subject equipment. | SCAQMD | Rule 475 prohibits PM emissions that exceed both 11 lbs/hr (per emission unit) and 0.01 gr/dscf at 3 percent $O_2$.<br>The MPSA 501DA turbines PM emission rate will be 9.5 lb/hr and less than 0.01 gr/dscf. |
| SCAQMD Rule 476 | Establishes limits for $NO_x$ and PM emissions from steam generating equipment with a maximum heat input rating exceeding 50 MMBtu/hr. | SCAQMD | Per Rule 2001, $NO_x$ RECLAIM facilities are exempt from the $NO_x$ requirements for this rule. Therefore, only the PM provisions of this rule will apply.<br>The MPSA 501DA turbines PM emission rate will be 9.5 lb/hr and less than 0.01 gr/dscf. |
| SCAQMD Rule 53 | Established limits for emissions of sulfur compounds ($SO_x$) from stationary sources in Orange County. | SCAQMD | A person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge 500 ppmv calculated as $SO_2$.<br>The use of low sulfur natural gas will result in $SO_2$ concentrations significantly less than 500 pppmv. |
| SCAQMD Regulation IX (Permits – 40 CFR, Part 60) | Establishes national standards of performance for new or modified facilities in specific source categories. | SCAQMD with EPA Region IX oversight | See Federal, Title 40 CFR, Part 60 (Table 5.1-36) to review applicability and the compliance assessment. |
| SCAQMD Regulation X (Permits – 40 CFR, Part 63) | Establishes national emission standards to limit emissions of HAPs (or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific categories. | SCAQMD with EPA Region IX oversight | See Federal, Title 40 CFR, Part 63 (Table 5.1-36) to review applicability and the compliance assessment. |
| SCAQMD Rule 1134 | Establishes limits for emissions of $NO_x$ from the stationary gas turbines. | SCAQMD | Per Rule 2001, $NO_x$ RECLAIM facilities are exempt from the provisions of Rule 1134. Therefore, Rule 1134 is not applicable to the project and will not be addressed further. |
| SCAQMD Rule 1135 | Establishes limits for emissions of $NO_x$ from the electricity generating systems. | SCAQMD | Per Rule 2001, $NO_x$ RECLAIM facilities are exempt from the provisions of Rule 1135. Therefore, Rule 1135 is not applicable to the project and will not be addressed further. |
| SCAQMD Rule 1146 | Establishes limits for emissions of $NO_x$ from industrial, institutional, and commercial boilers, steam generators, and process heaters. | SCAQMD | Per Rule 2001, $NO_x$ RECLAIM facilities are exempt from the provisions of Rule 1146. Therefore, Rule 1146 is not applicable to the project and will not be addressed further. |

TABLE 5.1-38
**Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Assessment |
|---|---|---|---|
| SCAQMD Rule XIII (Permits – NSR) | The purpose of this rule is to provide for the review of new and modified sources and provide mechanisms, including the use of BACT and emission offsets, by which authorities to construct such sources may be granted for non-RECLAIM pollutants. | SCAQMD | Rule 1303(a) – BACT: BACT shall be applied to any new or modified source which results in an emission increase of any nonattainment air contaminant, any ozone-depleting compound, or ammonia.<br>The BACT requirements of Rule 1303 apply regardless of any modeling or offset exemption in Rule 1304. Therefore, a complete top-down BACT analysis was conducted for emissions of CO, VOC, $SO_x$, $PM_{10}$, $PM_{2.5}$, and GHG. The proposed BACT emission limits are presented in Section 5.1.8.2 (See Appendix 5.1D). A BACT analysis for $NO_x$ was conducted as part of compliance with Rule 2005.<br>Rule 1303(b)(1) – Modeling: As part of the NSR permit approval process, an air quality dispersion analysis must be conducted using a mass emissions-based analysis contained in the rule or an approved dispersion model to evaluate impacts of increased criteria pollutant emissions from any new or modified facility on ambient air quality.<br>The RBEP is exempt from modeling requirements per Rule 1304(a)(2) for those pollutants subject to Regulation XIII, but not Regulation XX.<br>Rule 1303(b)(2) – Offsets: Unless exempt from offsets requirements pursuant to Rule 1304, emission increases shall be offset by either Emission Reduction Credits approved pursuant to Rule 1309, or by allocations from the Priority Reserve in accordance with the provisions of Rule 1309.1, or allocations from the Offset Budget in accordance with the provisions of Rule 1309.2. Offset ratios shall be 1.2-to-1.0 for Emission Reduction Credits and 1.0-to-1.0 for allocations from the Priority Reserve, except for facilities not located in the South Coast Air Basin (SOCAB), where the offset ratio for Emission Reduction Credits only shall be 1.2-to-1.0 for VOC, $NO_x$, $SO_2$, and $PM_{10}$, and 1.0-to-1.0 for CO.<br>The RBEP is exempt from offset requirements per Rule 1304(a)(2) with the exception of Regulation XX pollutants.<br>Rule 1303(b)(3) – Sensitive Zone Requirements: Unless credits are obtained from the Priority Reserve, facilities located in the South Coast Air Basin are subject to the Sensitive Zone requirements specified in Health and Safety Code Section 40410.5.<br>The RBEP is exempt from offset requirements per Rule 1304(a)(2) with the exception of Regulation XX pollutants.<br>Rule 1303(b)(4) – Facility-wide Compliance: The project will comply with all applicable rules and regulations of the District.<br>Rule 1303(b)(5)(A) – Alternative Analysis: Conduct an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed source and demonstrate that the benefits of the proposed project outweigh the environmental and social costs associated with that project.<br>The Project Owner has conducted a comparative evaluation of alternative sites as part of the AFC process and has concluded that the benefits of providing grid reliability and increased employment in the surrounding area will outweigh the environmental and social costs incurred in the construction and operation of the proposed facility.<br>Rule 1303(b)(5)(B) – Statewide Compliance: Demonstrate prior to the issuance of a Permit to Construct that all major stationary sources, as defined in the jurisdiction where the facilities are located, that are owned or operated by such person (or by any entity controlling, controlled by, or under common control with such person) in the State of California are subject to emission limitations and are in compliance or on a schedule for compliance with all applicable emission limitations and standards under the Clean Air Act.<br>The Project Owner has certified in the 400-A form that all major sources under its ownership or control in the State of California are in compliance with all federal, state, and local air quality rules and regulations.<br>Rule 1303(b)(5)(C) –Protection of Visibility: Conduct a modeling analysis for plume visibility in accordance with the procedures specified in Appendix B if the net emission increase from the new or modified source exceeds 15 tons/year of $PM_{10}$ or 40 tons/year of $NO_x$; and the location of the source, relative to the closest boundary of a specified Federal Class I area, is within 28 kilometers.<br>Emissions of $PM_{10}$ and $NO_x$ will exceed the emissions thresholds; however, the distance to the nearest Class I area is approximately 53 km. Therefore, a visibility analysis is not required.<br>Rule 1303(b)(5)(D) – Compliance through CEQA: Because the CEC certification process is similar to the CEQA process, the applicable CEQA requirements have been addressed in this AFC. |
| SCAQMD Rule 1325 – (Permits - Federal $PM_{2.5}$ New Source Review) | The purpose of this rule is to provide for the review of new and modified sources and to provide mechanisms, including the use of LAER and emission offsets, by which authorities to construct such sources may be granted for $PM_{2.5}$. | SCAQMD | The Executive Officer shall deny the Permit for a new major polluting facility; or major modification to a major polluting facility; or any modification to an existing facility that would constitute a major polluting facility in and of itself (i.e., the potential to emit 100 tons or more per year of $PM_{2.5}$ or its precursors), unless each of the following requirements is met:<br>(A) LAER is employed for the new or relocated source or for the actual modification to an existing source; and<br>(B) Emission increases shall be offset at a ratio of 1.1:1 for $PM_{2.5}$ and at the ratio required in Regulation XIII or Rule 2005 for $NO_x$ and $SO_2$ as applicable; and<br>(C) Certification is provided by the owner/operator that all major sources, as defined in the jurisdiction where the facilities are located, that are owned or operated by such person (or by any entity controlling, controlled by, or under common control with such person) in the State of California are subject to emission limitations and are in compliance or on a schedule for compliance with all applicable emission limitations and standards under the CAA; and<br>(D) An analysis is conducted of alternative sites, sizes, production processes, and environmental control techniques for such proposed source and demonstration made that the benefits of the proposed project outweigh the environmental and social costs associated with that project.<br>RBEP will not exceed the 100 tpy threshold for $PM_{2.5}$ (or $PM_{2.5}$ precursors on a per-pollutant basis). Therefore, Rule 1325 is not applicable to RBEP. |

TABLE 5.1-38
**Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Assessment |
|---|---|---|---|
| SCAQMD Rule 1401 (Permits – Toxics New Source Review) | The purpose of this rule is to provide for the review of new and modified sources of TAC emissions to evaluate potential public exposure and health risk, to mitigate potentially significant health risks resulting from these exposures, and to provide net health risk benefits by improving the level of control when existing sources are modified or replaced. | SCAQMD | T-BACT shall be applied to any new or modified source of TACs where the source risk is a cancer risk greater than 1 in 1 million ($10^{-6}$), a chronic hazard index greater than 1.0, or an acute hazard index greater than 1.0.<br>The predicted MICR at the MEIR and MEIW cancer risks for the project are 0.20 and 0.038 in 1 million, respectively. The maximum predicted chronic and acute hazard indices are 0.0079 and 0.056, respectively. The values are less than the individual source thresholds of 1 in 1 million ($10^{-6}$). The levels are also below the PTC or PTO facility thresholds for cancer risk of 10 in 1 million and the chronic and acute hazard index of 1.0. Nevertheless, the project will employ emission controls considered to be T-BACT. |
| SCAQMD Rule 1403 (Permits – Asbestos Removal) | The purpose of this rule is to specify work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials. | SCAQMD | The Project Owner will comply with the requirements outlined in Rule 1403 prior to and during the removal of asbestos-containing materials. |
| SCAQMD Reg XVII (Permits – PSD) | The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified in areas classified as attainment, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas). | SCAQMD with EPA Oversight | See Federal, Title 40 CFR, Part 52 (Table 5.1-36) to review applicability and the compliance assessment. |
| SCAQMD Reg XX (Permits – $NO_x$ RECLAIM) | The purpose of this rule is to provide for the review of new and modified sources and to provide mechanisms, including the use of BACT and emission offsets, by which authorities to construct such sources may be granted for RECLAIM pollutants. | SCAQMD | Rule 2005(b)(1)(A) – BACT: BACT shall be applied to any new or modified source which results in an emission increase of any nonattainment air contaminant, any ozone-depleting compound, or ammonia.<br>A complete top-down BACT analysis was conducted for emissions of $NO_x$. The proposed BACT emission limits are presented in Section 5.1.8.2 (See Appendix 5.1D). A BACT analysis for CO, VOC, $SO_2$, $PM_{10}$, $PM_{2.5}$, and GHG was conducted as part of compliance with Rule 1303.<br>Rule 2005(b)(1)(B) – Modeling: As part of the NSR permit approval process, an air quality dispersion analysis must be conducted for $NO_x$ using a mass emissions-based analysis contained in the rule or an approved dispersion model, to evaluate impacts of increased $NO_x$ emissions from any new or modified facility on ambient air quality.<br>An air quality dispersion analysis was conducted for $NO_x$ using the AERMOD dispersion model.<br>Rule 2005(b)(2) – Offsets: $NO_x$ emission increases shall be offset using RECLAIM trading credits at a ratio of 1.0-to-1.0.<br>The RBEP project will participate in the $NO_x$ RECLAIM program and will secure the necessary offsets as outlined in Section 5.1.8.<br>Rule 2005(e) – Trading Zone Requirements: Any increase in an annual Allocation to a level greater than the facility's starting plus non-tradable Allocations, and all emissions from a new or relocated facility, must be fully offset by obtaining RTCs originated in one of the two trading zones. A facility in Zone 1 may only obtain RTCs from Zone 1. A facility in Zone 2 may obtain RTCs from either Zone 1 or 2, or both.<br>The RBEP is located in Zone 1. Therefore, the Project Owner will obtain RTCs from Zone 1 only.<br>Rule 2005(g)(1) – Statewide Compliance: Demonstrate prior to the issuance of a Permit to Construct, that all major stationary sources, as defined in the jurisdiction where the facilities are located, that are owned or operated by such person (or by any entity controlling, controlled by, or under common control with such person) in the State of California are subject to emission limitations and are in compliance or on a schedule for compliance with all applicable emission limitations and standards under the Clean Air Act.<br>The Project Owner has certified in the 400-A form that all major sources under its ownership or control in the State of California are in compliance with all federal, state, and local air quality rules and regulations.<br>Rule 2005(g)(2) – Alternative Analysis: Conduct an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed source and demonstrate that the benefits of the proposed project outweigh the environmental and social costs associated with that project.<br>The Project Owner has conducted a comparative evaluation of alternative sites as part of the AFC process and has concluded that the benefits of providing grid reliability and increased employment in the surrounding area will outweigh the environmental and social costs incurred in the construction and operation of the proposed facility.<br>Rule 2005(g)(3) – Compliance through CEQA: Because the CEC certification process is similar to the CEQA process, the applicable CEQA requirements have been addressed in this Application for Certification.<br>Rule 2005(g)(4) – Protection of Visibility: Conduct a modeling analysis for plume visibility in accordance with the procedures specified in Appendix B if the net emission increase from the new or modified source exceeds 40 tons/year of $NO_x$; and the location of the source, relative to the closest boundary of a specified Federal Class I area, is within 28 kilometers.<br>Emissions of $NO_x$ will exceed the emissions thresholds; however, the distance to the nearest Class I area is approximately 53 km. Therefore, a visibility analysis is not required.<br>Rule 2005(h) – Public Notice: The applicant shall provide public notice, if required, pursuant to Rule 212.<br>The Project Owner will comply with the requirements for Public Notice outlined in Rule 212.<br>Rule 2005(i) – Rule 1401 Compliance: All new or modified sources shall comply with the requirements of Rule 1401.<br>The Project Owner will comply with the requirements of 1401 as demonstrated in Section 5.9, Public Health.<br>Rule 2005(j) – Compliance with State and Federal NSR: The project will comply with all applicable rules and regulations of the District. |

TABLE 5.1-38
**Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality**

| LORS | Purpose | Regulating Agency | Applicability/Compliance Assessment |
|---|---|---|---|
| SCAQMD Reg XXX (Permits – Title V) | The purpose of this rule is to implement the operating permit requirements of Title V of the CAA as amended in 1990. | SCAQMD with EPA Oversight | See Federal, Title 40 CFR, Part 70 (Table 5.1-36) to review applicability and the compliance assessment. |
| SCAQMD Reg XXXI (Permits – Acid Rain) | The purpose of this rule is to incorporate by reference the provisions of 40 CFR, Part 72 for purposes of implementing an acid rain program that meets the requirements of Title IV of the CAA. | SCAQMD with EPA Oversight | See Federal, Title 40 CFR, Part 72 (Table 5.1-36) to review applicability and the compliance assessment. |

Notes:
gr/dscf = grain(s) per dry standard cubic foot
$H_2S$ = hydrogen sulfide
LAER = lowest achievable emission rate
MEIR = maximum exposed individual resident
MEIW = maximum exposed individual worker
MICR = maximum individual cancer risk
PM = particulate matter
$SO_x$ = oxides of sulfur
SWPPP = stormwater pollution prevention program
T-BACT = best available control technology for toxics

TABLE 5.1-39
**Agency Contacts for Air Quality**

| Issue | Agency | Agencies Contacted |
|---|---|---|
| Regulatory oversight | EPA Region IX | Gerardo Rios<br>EPA Region IX<br>75 Hawthorne Street<br>San Francisco, CA 94105<br>(415) 947-3974 |
| Regulatory oversight | ARB | Michael Tollstrup<br>Project Assessment Branch<br>California Air Resources Board<br>2020 L Street<br>Sacramento, CA 95814<br>(916) 322-6026 |
| Permit issuance, enforcement | SCAQMD | Andrew Lee<br>South Coast Air Quality Management District<br>21865 Copley Drive<br>Diamond Bar, CA 91765<br>(909) 396-2643 |

## 5.1.12 References

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