DOCKETED

Docket Number:	13-AFC-01
Project Title:	Alamitos Energy Center
TN #:	201620-11
Document Title:	AEC AFC 5.1 Air Quality
Description:	Previously TN# 201495-10
Filer:	Tiffani Winter
Organization:	CH2M Hill
Submitter Role:	Applicant Consultant
Submission Date:	2/3/2014 12:47:11 PM
Docketed Date:	2/3/2014

5.1 Air Quality

This section describes and evaluates the potential air quality effects of the Alamitos Energy Center (AEC). Section 5.1.1 describes the project setting, and Section 5.1.2 provides an overview of the project related to air quality. Section 5.1.3 provides an overview of the existing air quality settings. Section 5.1.4 provides an overview of air quality standards. Section 5.1.5 presents information on the existing air quality in the region and in the general area of the project. Section 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 AEC. Section 5.1.7 evaluates potential cumulative effects to air quality, and Section 5.1.8 addresses proposed mitigation measures that would avoid or minimize any adverse impacts. Section 5.1.9 describes the laws, ordinances, regulations, and standards (LORS) that apply to the project, and Section 5.1.10 presents agencies and agencies' contacts. Section 5.1.11 identifies the permits and permit schedule related to air quality, and Section 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

AES Southland Development, LLC (AES-SLD) proposes to construct, own, and operate the AEC—a natural-gas-fired, air-cooled, combined-cycle, electrical generating facility in Long Beach, Los Angeles County, California. The proposed AEC will have a net generating capacity of 1,936 megawatts (MW) and gross generating capacity of 1,995 MW.[1] The AEC will replace and be constructed on the site of the existing Alamitos Generating Station.

The AEC will consist of four 3-on-1 combined-cycle gas turbine power blocks with twelve natural-gas-fired combustion turbine generators, twelve heat recovery steam generators, four steam turbine generators, four air-cooled condensers, and related ancillary equipment. The AEC will use air-cooled condensers for cooling, completely eliminating the existing ocean water once-through-cooling system. The AEC will use potable water provided by the City of Long Beach Water Department (LBWD) for construction, operational process, and sanitary uses but at substantially lower volumes than the existing Alamitos Generating Station has historically used. This water will be supplied through existing onsite potable water lines.

The AEC will interconnect to the existing Southern California Edison (SCE) 230-kilovolt switchyard adjacent to the north side of the property. Natural gas will be supplied to the AEC via the existing offsite 30-inch-diameter pipeline owned and operated by Southern California Gas Company that currently serves the Alamitos Generating Station. Existing water treatment facilities, emergency services, and administration and maintenance buildings will be reused for the AEC. The AEC will require relocation of the natural gas metering facilities and construction of a new natural gas compressor building within the existing Alamitos Generating Station site footprint. Stormwater will be discharged to two retention basins and then ultimately to the San Gabriel River via existing stormwater outfalls.

The AEC will include a new 1,000-foot process/sanitary wastewater pipeline to the first point of interconnection with the existing LBWD sewer system and will eliminate the current practice of treatment and discharge of process/sanitary wastewater to the San Gabriel River. The project may also require upgrading approximately 4,000 feet of the existing offsite LBWD sewer line downstream of the first point of interconnection, therefore, this possible offsite improvement to the LBWD system is also analyzed in this AFC. The total length of the new pipeline (1,000 feet) and the upgraded pipeline (4,000 feet) is approximately 5,000 feet.

[1] Referenced to site ambient average temperature conditions of 65.3 degrees Fahrenheit (°F) dry bulb and 62.7°F wet bulb temperature without evaporative cooler operation.

To provide fast-starting and stopping, flexible generating resources, the AEC will be configured and deployed as a multi-stage generating (MSG) facility. The MSG configuration will allow the AEC to generate power across a wide and flexible operating range. The AEC can serve both peak and intermediate loads with the added capabilities of rapid startup, significant turndown capability (ability to turn down to a low load), and fast ramp rates (30 percent per minute when operating above minimum gas turbine turndown capacity). As California’s intermittent renewable energy portfolio continues to grow, operating in either load following or partial shutdown mode will become necessary to maintain electrical grid reliability, thus placing an increased importance upon the rapid startup, high turndown, steep ramp rate, and superior heat rate of the MSG configuration employed at the AEC.

By using proven combined-cycle technology, the AEC can also run as a baseload facility, if needed, providing greater reliability to meet resource adequacy needs for the southern California electrical system. As an in-basin generating asset, the AEC will provide local generating capacity, voltage support, and reactive power that are essential for transmission system reliability. The AEC will be able to provide system stability by providing reactive power, voltage support, frequency stability, and rotating mass in the heart of the critical Western Los Angeles local reliability area. By being in the load center, the AEC also helps to avoid potential transmission line overloads and can provide reliable local energy supplies when electricity from more distant generating resources is unavailable.

The AEC’s combustion turbines and associated equipment will include the use of best available control technology to limit emissions of criteria pollutants and hazardous air pollutants. By being able to deliver flexible operating characteristics across a wide range of generating capacity, at a relatively consistent and superior heat rate, the AEC will help lower the overall greenhouse gas emissions resulting from electrical generation in southern California and allow for smoother integration of intermittent renewable resources.

Existing Alamitos Generating Station Units 1–6 are currently in operation. All six operating units and retired Unit 7 will be demolished as part of the proposed project. Construction and demolition activities at the project site are anticipated to last 139 months, from first quarter 2016 until third quarter 2027. The project will commence with the demolition of retired Unit 7 and other ancillary structures to make room for the construction of AEC Blocks 1 and 2. The demolition of Unit 7 will commence in the first quarter of 2016. The construction of Block 1 is scheduled to commence in the third quarter of 2016 and construction of Block 2 is scheduled to commence in the fourth quarter of 2016. The demolition of existing Units 5 and 6 will make space for the construction of AEC Block 3. AEC Block 3 construction is scheduled to commence in the first quarter of 2020 and will be completed in the second quarter of 2022. The demolition of existing Units 3 and 4 will make space for the construction of AEC Block 4. AEC Block 4 construction is scheduled to commence in the second quarter of 2023 and will be completed in the fourth quarter of 2025. The demolition of remaining existing units is scheduled to commence in the third quarter of 2025.

Construction of the AEC will require the use of onsite laydown areas (approximately 8 acres dispersed throughout the existing site) and an approximately 10-acre laydown area located adjacent to the existing site. The adjacent 10-acre laydown area will be shared with another project being developed by the Applicant (Huntington Beach Energy Project [HBEP] 12-AFC-02). Due to the timing for commencement of construction for these two projects, the adjacent laydown area will already be in use for equipment storage before AEC construction begins.

5.1.2 Project Overview as it Relates to Air Quality

Each of the AEC’s four 3-on-1 natural-gas-fired combined-cycle power blocks will consist of three Mitsubishi Power Systems Americas (MPSA) 501DA CTGs, one STG, and an air-cooled condenser. Each CTG will be equipped with an HRSG. The CTGs 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 SCE 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 or health analyses for the AEC.

The project's air quality and other related objectives and its ability to realize the project's benefits is also contingent on the use of the offset provisions contained in South Coast Air Quality Management District's (SCAQMD) Rule 1304(a)(2). Rules 1304 and 1304.1 allow 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 to or less than the megawatts produced from the electric utility steam boilers).

5.1.3 Existing Site Conditions

The AEC will be constructed entirely within the 63-acre site of the existing Alamitos Generating Station, an operating power plant in Long Beach, California. The project site is located at 690 N. Studebaker Road.

5.1.3.1 Geography and Topography

The existing Alamitos Generating Station is located on a gently sloping coastal terrace above the Alamitos Bay marina, and the topography of the site ranges from approximately 7 to 20 feet above mean sea level. The nearest complex terrain (terrain exceeding stack height) in relation to the AEC is located in the city of Signal Hill, approximately 3.5 miles northwest of the AEC site. Although Signal Hill is the highest area within 6 miles of the AEC site, it is not a significant terrain feature, with gradual rising terrain less than 0.5 mile in width. The nearest Class I area is the San Gabriel Wilderness, which is approximately 33 miles (approximately 53 kilometers [km]) northeast of the AEC 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 South Coast Air 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 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 South Coast Air Basin, averaging 62°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 South Coast Air 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 South Coast Air Basin, the frequency of such days being higher near the coast. Except for infrequent periods when dry, continental air is brought into the South Coast Air 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 South Coast Air Basin (SCAQMD, 1993).

Long-term average temperature and precipitation data have been collected from the Long Beach WSCMO surface climatological station near the AEC site. The data indicate that the normal daily maximum temperatures are relatively consistent throughout the year, with average daily maximum temperatures ranging from 67.0 to 83.9°F, and normal daily minimum temperatures ranging from 45.3 to 64.9°F (Western Regional Climatic Center [WRCC], 2013). The Long Beach location receives an average of 12 inches of rain annually (WRCC, 2013).

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 South Coast Air 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 South Coast Air 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 South Coast Air 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 South Coast Air 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 (H_2S), 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 ambient 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 8 hour	0.09 ppm (180 μg/m³) 0.070 ppm (137 μg/m³)	— 0.075 ppm (147 μg/m³)
CO	1-hour 8-hour	20 ppm (23 mg/m³) 9.0 ppm (10 mg/m³)	35 ppm (40 mg/m³) 9 ppm (10 mg/m³)
NO_2	1-hour Annual Arithmetic Mean	0.18 ppm (339 μg/m³) 0.030 ppm (57 μg/m³)	100 ppb (188 μg/m³) [a] 0.053 ppm (100 μg/m³)
SO_2 [b]	1-hour 3-hour (Secondary Standard) 24-hour	0.25 ppm (655 μg/m³) — 0.04 ppm (105 μg/m³)	75 ppb (196 μg/m³) 0.5 ppm (1,300 μg/m³) —
PM_{10}	24-hour Annual Arithmetic Mean	50 μg/m³ 20 μg/m³	150 μg/m³ —
$PM_{2.5}$	24-hour Annual Arithmetic Mean	— 12 μg/m³	35 μg/m³ [c] 12 μg/m³ [d]
Sulfates	24-hour	25 μg/m³	—
Lead	30-day Average Calendar Quarter	1.5 μg/m³ —	— 1.5 μg/m³
H_2S	1-hour	0.03 ppm (42 μg/m³)	—
Vinyl Chloride	24-hour	0.01 ppm (26 μg/m³)	—
Visibility-reducing Particles	8-hour (10 a.m. to 6 p.m. PST)	In sufficient amount to produce an extinction coefficient of 0.23 per 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 1-hour daily maximum concentrations 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/m³ = milligram(s) per cubic meter
μg/m³ = microgram(s) per cubic meter
ppb = part(s) per billion
ppm = part(s) per million
PST = Pacific Standard Time

Source: ARB, 2013a

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 NAAQS. In addition, ARB makes area designations within California for CAAQS. 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 (South Coast Air Basin), California

Pollutant	State Designation	Federal Designation
Ozone	1-hour: Non-attainment (Extreme) 8-hour: Non-attainment	1-hour: N/A 8-hour: Non-attainment (Extreme)
CO	1-hour: Attainment 8-hour: Attainment	1-hour: Attainment 8-hour: Attainment
NO_2	1-hour: Non-attainment Annual: Non-attainment	1-hour: Attainment Annual: Attainment
SO_2	1-hour: Attainment 24-hour: Attainment	1-hour: Attainment 24-hour: N/A
PM_{10}	24-hour: Non-attainment Annual: Non-attainment	24-hour: Attainment* Annual: N/A
$PM_{2.5}$	24-hour: N/A Annual: Non-attainment	24-hour: Non-attainment Annual: Non-attainment
Lead	Non-attainment	Non-attainment
H_2S, Sulfates	Unclassified, Attainment	N/A, N/A

*Effective July 26, 2013, Los Angeles County was reclassified by the EPA from non-attainment to attainment for PM_{10} (78 Federal Register 38223; EPA-R09-OAR-2013-0007-0021).

N/A = Not applicable (i.e., no standard)

Sources: ARB, 2013b; EPA, 2013a

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. Table 5.1-3 lists the pollutants monitored at each of the monitoring stations used for the AEC's air quality analyses. A discussion of the representativeness of each station is included in Section 5.1.6.3.

Several monitoring stations are located near the AEC site, including monitoring stations in the cities of Long Beach, Anaheim, and Compton. The four closest ARB-certified monitoring stations relative to the AEC site with three or more years of data available are located approximately 4.6 miles northwest of the project site in South Long Beach (South Coastal Los Angeles County 2), 6.4 miles northwest of the project site in North Long Beach (South Coastal Los Angeles County 1), 7.2 miles to the northwest of the project site in Long Beach (South Coastal Los Angeles County 3, EPA ID 06-037-4006), and 10.1 miles to the east-northeast of the project site in Anaheim (Central Orange County). One other ARB-certified monitoring station was identified near the project site: the South Central Los Angeles County monitoring station in Compton. However, this monitoring station was relocated from the Lynwood location in 2008 and is approximately 10.9 miles to the north-northwest of the project site, which is farther from the project site than the other monitoring stations identified.

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 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 NAAQS and CAAQS.

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 (North Long Beach)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South Coastal Los Angeles County 2 (South Long Beach)	N/A	N/A	N/A	N/A	Yes	Yes	Yes
Central Orange County (Anaheim)	Yes	Yes	Yes	N/A	Yes	Yes	N/A
South Central Los Angeles County (Compton) [a]	Yes	Yes	Yes	N/A	N/A	Yes	Yes
South Coastal Los Angeles County 3, EPA ID 06-037-4006 (Long Beach) [b]	Yes	Yes	Yes	Yes	N/A	N/A	N/A

[a] Station is near the project site, but not one of the three closet stations. The station has been presented for informational purposes.

[b] Station, referred to as the Hudson site by the SCAQMD, was commissioned in 2010 and, at the request of the SCAQMD, is used to represent NO_2 background because EPA Region 9 believes that it captures the large NO_X sources in the Ports area that are upwind of the project site.

Yes = Pollutant was monitored at this location
N/A = Not Applicable (i.e., 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 with oxygen 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, 2013c). 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, the 1-hour (max and 98th percentile) and annual NO_2 concentrations measured at the North Long Beach, Anaheim, Compton, and Long Beach stations have not exceeded either the state or federal standards for the three most recent years of data.

TABLE 5.1-4

Background NO_2 Concentrations ($\mu g/m^3$)

Station	Averaging Time	CAAQS/NAAQS	2010	2011	2012
South Coastal Los Angeles County 1 (North Long Beach)	1-hour (Max)	339/—	175	200	145
	1-hour (98th Percentile)	—/188	132	127	118
	Annual*	57/100	37.3	33.3	39.1
Central Orange County (Anaheim)	1-hour (Max)	339/—	138	139	127
	1-hour (98th Percentile)	—/188	115	114	101
	Annual*	57/100	32.9	31.6	27.5
South Central Los Angeles County (Compton)	1-hour (Max)	339/—	145	142	149
	1-hour (98th Percentile)	—/188	129	123	119
	Annual*	57/100	33.7	35.0	32.4
South Coastal Los Angeles County 3, EPA ID 06-037-4006 (Long Beach)	1-hour (Max)	339/—	222	169	170
	1-hour (98th Percentile)	—/188	134	139	146
	Annual*	57/100	41.4	39.5	N/A

*Annual Arithmetic Mean
N/A = Not Applicable (i.e., data were collected in 2012, but did not meet the completeness criteria for an annual averaging time)

Sources: SCAQMD, 2013; ARB, 2013d; and EPA, 2013b

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 standards 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, 2013c). 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 in 2010 except at the Compton monitoring station. Similarly, the measured 8-hour ozone concentrations exceeded the federal and state standards at all stations in 2010 except at the Compton monitoring station. The measured 8-hour ozone concentrations were below the NAAQS at all stations in 2011 and 2012 and below the CAAQS at all stations except the Anaheim monitoring station in 2011 and the Compton monitoring station in 2012.

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

Station	Averaging Time	CAAQS/NAAQS	2010	2011	2012
Central Orange County (Anaheim)	1-hour	180/—	204	173	155
	8-hour	137/147	173	141	132
South Central Los Angeles County (Compton)	1-hour	180/—	159	161	169
	8-hour	137/147	122	128	137
South Coastal Los Angeles County 1	1-hour	180/—	198	143	165
(North Long Beach)	8-hour	137/147	165	120	132
South Coastal Los Angeles County 3,	1-hour	180/—	194	145	157
EPA ID 06-037-4006 (Long Beach)	8-hour	137/147	165	124	130

Sources: SCAQMD, 2013; ARB, 2013d; and EPA, 2013b

5.1.5.3 Sulfur Dioxide

SO_2 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, 2013c). 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 (max and 99th percentile), 3-hour, and 24-hour SO_2 concentrations measured at the North Long Beach and Long Beach monitoring stations have not exceeded state or federal standards in the three most recent years of data. The 3-hour 2011 and 2012 data were unavailable; therefore, 2008 and 2009 data were used, if available, to maintain the three most recent years of data.

TABLE 5.1-6
Background SO_2 Concentrations (µg/m³)

Station	Averaging Time	CAAQS/NAAQS	2008	2009	2010	2011	2012
South Coastal Los Angeles County 1 (North Long Beach)	1-hour (Max)	655/—	—	—	105	38.7	58.1
	1-hour (99th Percentile)	—/196	—	—	41.9	28.0	37.4
	3-hour*	—/1,300	98.4	29.6	64.4	N/A	N/A
	24-hour	105/—	—	—	15.7	10.5	7.9
South Coastal Los Angeles County 3, EPA ID 06-037-4006 (Long Beach)	1-hour (Max)	655/—	—	—	94.2	113	59.4
	1-hour (99th Percentile)	—/196	—	—	41.9	64.7	55.8
	3-hour*	—/1,300	NM	NM	42.1	N/A	N/A
	24-hour	105/—	—	—	10.5	31.4	10.5

*EPA Secondary Standard
N/A = Not Applicable (i.e., insufficient data available to make a determination)
NM = Pollutant was not measured at this station during this year

Sources: SCAQMD, 2013; ARB, 2013d; and EPA, 2013b

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 NAAQS and CAAQS can lead to fatigue, headaches, confusion, and dizziness (ARB, 2013c). 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, the 1-hour and 8-hour CO concentrations measured at the North Long Beach, Anaheim, 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/m³)

Station	Averaging Time	CAAQS/NAAQS	2010	2011	2012
South Coastal Los Angeles County 1 (North Long Beach)	1-hour	23,000/40,000	3,436	3,665	2,978
	8-hour	10,000/10,000	2,405	2,978	2,519
Central Orange County (Anaheim)	1-hour	23,000/40,000	3,436	3,092	3,436
	8-hour	10,000/10,000	2,290	2,405	2,634
South Central Los Angeles County (Compton)	1-hour	23,000/40,000	6,871	6,871	5,955
	8-hour	10,000/10,000	4,123	5,382	4,581
South Coastal Los Angeles County 3, EPA ID 06-037-4006 (Long Beach)	1-hour	23,000/40,000	4,695	4,237	4,810
	8-hour	10,000/10,000	2,978	3,779	2,978

Sources: SCAQMD, 2013; ARB, 2013d; and EPA, 2013b

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. Particulate matter (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, 2013c). The South Coast Air Basin is designated as attainment and non-attainment by EPA for PM_{10} and $PM_{2.5}$ standards, respectively, and non-attainment by ARB for PM_{10} and $PM_{2.5}$ standards.

As shown in Table 5.1-8, PM_{10} concentrations measured at the North Long Beach, South Long Beach, and Anaheim monitoring stations did not exceed the 24-hour PM_{10} NAAQS in the past 3 years. The 24-hour PM_{10} CAAQS was not exceeded during the past 3 years at the North Long Beach monitoring station. However, it was exceeded in 2011 at the Anaheim monitoring station and in 2010 and 2012 at the South Long Beach monitoring station. The 24-hour PM_{10} CAAQS was met in 2011 at the South Long Beach monitoring station. The annual PM_{10} CAAQS has been exceeded each year at all three monitoring stations in the past 3 years.

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

Station	Averaging Time	CAAQS/NAAQS	2010	2011	2012
South Coastal Los Angeles County 1	24-hour	50/150	44.0	43.0	45.0
(North Long Beach)	Annual*	20/—	22.0	24.2	23.3
South Coastal Los Angeles County 2	24-hour	50/150	76.0	50.0	54.0
(South Long Beach)	Annual*	20/—	27.3	28.7	25.5
Central Orange County (Anaheim)	24-hour	50/150	43.0	53.0	48.0
	Annual*	20/—	22.4	24.8	22.4

*Annual Arithmetic Mean

Sources: SCAQMD, 2013; ARB, 2013d; and EPA, 2013b

As shown in Table 5.1-9, the 24-hour (98th percentile) and annual $PM_{2.5}$ concentrations measured at the North Long Beach, South Long Beach, Anaheim, and Compton monitoring stations have not exceeded either the state or federal standards in the past 3 years, except for the annual CAAQS and NAAQS in 2010 and 2011 at the Compton monitoring station.

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

Station	Averaging Time	CAAQS/NAAQS	2010	2011	2012
South Coastal Los Angeles County 1	24-hour (98th Percentile)	—/35	28.3	27.8	26.4
(North Long Beach)	Annual*	12/12	10.5	11.0	10.4
South Coastal Los Angeles County 2	24-hour (98th Percentile)	—/35	26.5	26.6	25.1
(South Long Beach)	Annual*	12/12	10.4	10.7	10.6
Central Orange County (Anaheim)	24-hour (98th Percentile)	—/35	25.2	28.1	24.9
	Annual*	12/12	10.2	11.0	10.8
South Central Los Angeles County	24-hour (98th Percentile)	—/35	31.8	31.5	30.3
(Compton)	Annual*	12/12	12.5	13.0	11.7

*Annual Arithmetic Mean

Sources: SCAQMD, 2013; ARB, 2013c; and EPA, 2013b

5.1.5.6 Greenhouse Gases

ARB has promulgated new laws to address the potential effects of increasing atmospheric concentrations of carbon dioxide (CO_2) 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 amend or preempt other environmental laws, such as the Warren-Alquist Act or the California Environmental Quality Act (CEQA). Instead, it provides for creation of a GHG emissions program that will involve identification of covered sources, prioritization of covered sources by sector for regulation based on significance of source contribution to GHG emissions, and, eventually, regulation of but a few *de minimis*, exempted sources. ARB has selected, created, and begun implementation of the California Cap-And-Trade Program to further the purposes of AB 32.

GHGs include the following pollutants:

- 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 CO_2. 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 most recently estimated at 310 times that of CO_2. Major sources of N_2O include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.
- Hydrofluorocarbons (HFCs) 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 (PFCs) 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.

Emissions of HFCs, PFCs, or SF_6 are not expected to be significant for the AEC relative to the other GHGs. Therefore, the project impact assessment is 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 the AEC 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 139-month construction schedule and 3,320 hours of full load operation per turbine per year with 495 startups and shutdowns per turbine per year. The criteria pollutants evaluated include NO_x, SO_2, VOC, 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 twelve new CTGs, twelve new HRSGs, four new STGs, four new air-cooled condensers, and various auxiliary equipment. AEC construction is anticipated to take approximately 139 months. The AEC will reuse existing onsite potable water, natural gas, and stormwater pipelines as well as electrical transmission facilities to the maximum extent possible; however, some modification and interconnection of the AEC facility into these systems will require construction activity. Additionally, the project will include construction of a new 1,000-foot offsite wastewater pipeline and the potential need to upgrade up to 4,000 feet of an existing offsite sanitary pipeline.

The project will commence in the first quarter of 2016 with demolition of the retired Alamitos Generating Station Unit 7, the Unit 7 fuel tank, and the northeast warehouse, which is anticipated to take approximately 8 months. Demolition of the retired Alamitos Generating Station Unit 7, the Unit 7 fuel tank, and the northeast warehouse will make space for construction of AEC Blocks 1 and 2. Construction of AEC Block 1 is scheduled to commence in the third quarter of 2016 and construction of AEC Block 2 is scheduled to commence in the fourth quarter of 2016; construction of Blocks 1 and 2 is anticipated to take approximately 33 months. Demolition of Alamitos Generating Station Units 5 and 6 will commence in the fourth quarter of 2018 and continue for approximately 24 months. Demolition of Units 5 and 6 will make space for construction of AEC Block 3, which is scheduled to commence in the first quarter of 2020 and continue for approximately 30 months. Demolition of Alamitos Generating Station Units 3 and 4 will commence in the first quarter of 2022 and continue for approximately 24 months. Demolition of Units 3 and 4 will make space for construction of AEC Block 4, which is scheduled to commence in the second quarter of 2023 and continue for approximately 30 months. Demolition of Alamitos Generating Station Units 1 and 2 is scheduled to commence in the third quarter of 2025 and continue for approximately 24 months. Demolition of the 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. In addition to the planned construction and demolition activities, construction of the new offsite wastewater pipeline and upgrades to the existing offsite sanitary pipeline will commence in the third quarter of 2016 and take approximately 4 months. All project-related construction/demolition activities are expected to be complete by the third quarter of 2027. Throughout this duration, there will be periods of up to 8 months of overlap between construction and demolition activities.

Construction of the AEC will require the use of onsite laydown areas (approximately 8 acres dispersed throughout the existing site) and an approximately 10-acre laydown area located adjacent to the existing site. At all times, more laydown space will be available due to the sequential nature of the project. The adjacent 10-acre laydown area will be shared with another project (Huntington Beach Energy Project [HBEP] – 12-AFC-02) being developed by the Applicant. Due to the timing for commencement of construction for these two projects, the 10-acre laydown area will already be in use for equipment storage before AEC construction begins. Because emissions associated with preparing this area for equipment storage will occur prior to commencement of AEC construction, and offsite truck travel associated with the use of this laydown area for HBEP were included in HBEP's Application for Certification (AFC; 12-AFC-02), air emissions attributed to the AEC project, unrelated to site preparation, will be minimal emissions from construction equipment used to move AEC items into and out of the laydown area for construction of AEC Block 3. Exhaust emissions associated with the use of the 10-acre laydown area are included in the Block 3 construction and demolition estimates. During AEC construction, all construction equipment and supplies will be trucked directly to the project site.

Onsite and offsite project emissions from construction and demolition have been divided into three categories: (1) vehicle and construction/demolition equipment exhaust; (2) fugitive dust from vehicle and construction/demolition equipment, including grading and bulldozing during AEC construction; and (3) fugitive dust from demolition activities such as the top-down removal of the boilers and stacks and loading of waste haul trucks with the recyclable materials and 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 2013.2.2 or newer), which incorporates portions of the EPA's *AP-42* (ENVIRON, 2013; EPA, 2006; SCAQMD, et. al., 2011). Vehicle exhaust emissions for both paved and unpaved roads were estimated using EMFAC2011 emission factors,[2] as consistent with the CalEEMod methodology.[3] As appropriate, fugitive dust emissions would be mitigated by watering; the control efficiency for each mitigation measure applied was determined per the SCAQMD *CEQA Handbook* (SCAQMD, 2007). 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 any asbestos-containing materials encountered 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 12 for NO_x, PM_{10}, and $PM_{2.5}$; during month 24 for CO and SO_2; and during month 17 for VOC. The maximum annual construction emissions vary for all pollutants, occurring between months 12 and 23 for VOC, PM_{10}, $PM_{2.5}$, and NO_x; between months 15 and 26 for CO; and between months 17 and 28 for SO_2.[4]

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)	154	101	15.5	0.25	36.6	14.1
Maximum Annual Emissions (tpy)	18.7	12.9	1.91	0.031	4.02	1.53

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

lb/day = pound(s) per day

tpy = ton(s) per year

The maximum annual GHG emissions 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 2.0) (TCR, 2013), and fuel

[2] The EMFAC2011-PL (project level assessment) module was used for vehicle emission factors. EMFAC2011 consists of three modules: EMFAC-LDV, which estimates passenger vehicle emissions; EMFAC-HD, which estimates emissions from diesel trucks and buses over 14,000 pound(s) (lb); and a third module called EMFAC-SG, which integrates the output of EMFAC-LDV and EMFAC-HD and the ability to conduct scenario assessments for air quality and transportation planning (ARB, 2013e). In order to aid in obtaining emission rates for project level assessments, ARB has released a new tool, EMFAC2011-PL, which can be used for most assessments using EMFAC default information to obtain standard emission rates for the desired vehicle category scheme (ARB, 2013e).

[3] CalEEMod is a statewide computer model created by ENVIRON and SCAQMD to quantify criteria pollutant and GHG emissions associated with the construction activities from a variety of land use projects (ENVIRON, 2013). 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).

[4] Demolition of the retired Alamitos Generating Station Unit 7, the Unit 7 fuel tank, and the northeast warehouse occurs during months 1 through 8. Construction of Blocks 1 and 2 occurs during months 9 through 41, with offsite construction activities from the new and upgraded sanitary pipeline also occurring in months 9 through 12. These activities contribute to the maximum daily and annual construction emissions.

consumption rates from OFFROAD2007. Vehicle emissions (from vehicles used in commuting and from trucks) have been estimated using emission factors from TCR GRP (Version 2.0) (TCR, 2013) and using fuel economy values from the EMFAC2011 Web Tool Database, based on EMFAC2007 vehicle categories.[5] 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 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).[6] 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, the AEC has been designed to incorporate energy-efficient technologies for reducing GHG PTE emissions from the power generation equipment; additionally, SCAQMD will define the 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 AEC 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. As a result, it is concluded that the GHG emissions from construction and demolition activities are less than significant.

Estimated total fuel use during construction and demolition would be 2,019,839 gallons of diesel and 674,241 gallons of gasoline. Construction and demolition equipment fuel consumption rates were obtained from the OFFROAD2007 model. Vehicle fuel economies were estimated using the EMFAC2011 Web Tool Database, based on EMFAC2007 vehicle categories. Detailed GHG emission and fuel use calculations are included in Appendix 5.1A.

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

GHG Emissions	CO_2	CH_4	N_2O	CO_2 Equivalent*
Total (MT/yr)	3,646	0.17	0.069	3,671

*CO_2e assumes a GWP of 21 for CH_4 and 310 for N_2O (IPCC, 2007).

MT/yr = metric ton(s) per year

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 while these systems are being commissioned and tested. The total duration of a power block commissioning period is expected to be up to 180 days. During the commissioning period, each turbine will be operated for up to 455 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. 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}, $PM_{2.5}$, and SO_2 emissions are expected to be no greater than full load operations.

Short-term NO_x, VOC, and CO emissions during commissioning were estimated based on correspondence with the turbine vendor. The emission estimates are based on the estimated duration of each

[5] The database is available online at http://www.arb.ca.gov/emfac/.

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

commissioning event, emission control efficiencies expected for each event, and turbine operating rates. 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 maximum hourly and event commissioning emission rates are presented in Table 5.1-12. Although commissioning is expected to be completed within 180 days, annual impacts for the combined commissioning of one power block and operation of four power blocks for a rolling 12-month period were also evaluated because annual emissions during the commissioning year could be higher than those during a non-commissioning year. The annual average emission rates associated with commissioning and operation are also presented in Table 5.1-12. The detailed emission calculations for commissioning are provided in Appendix 5.1B.

TABLE 5.1-12
AEC Turbine Commissioning Emission Rate

Commissioning Emissions	NO_x	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$
Short-Term Emission Rates						
Maximum Hourly, lb/hr (per turbine) [a]	110	3,169	384	3.09	4.50	4.50
Total Commissioning Period, tons (per 3 x 1 block) [b]	11.3	168	21.0	2.11	3.07	3.07
Annual Emission Rates						
Annual Average Hourly, lb/hr (per turbine) [c]	5.05	N/A	N/A	N/A	2.12	2.12
Total Commissioning/Operation Period, tons (per 3 x 1 block) [d]	66.4	N/A	N/A	N/A	28.0	28.0

[a]SO_2, PM_{10}, and $PM_{2.5}$ emissions are not emitted in amounts greater than normal operating rates.

[b]Total commissioning period SO_2, PM_{10}, and $PM_{2.5}$ emissions are based on the maximum emission rates at 28°F (see Appendix 5.1B).

[c]Annual average hourly emissions for evaluating annual impacts are based on the sum of annual commissioning and operation emissions per turbine, divided by 8,760.

[d]Total commissioning/operation period emissions are based on the total commissioning period emissions presented in Table 5.1-12 and the maximum operation emission rates at 65.3°F (see Appendix 5.1B).

N/A = Not applicable (i.e., no annual averaging period for these pollutants)
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 CTGs. The CTGs will use dry low NO_x combustors, combined with SCR, to limit emissions of NO_x to 2 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 and 1 ppmvdc, respectively. PM_{10}, $PM_{2.5}$, and SO_2 emissions will be kept to a minimum through the exclusive use of natural gas, inlet air filtration (for particulate matter [PM] 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 STG components.

Three startup scenarios have been developed for the AEC. For a cold start event, the CTG and the STG 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 base load 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 occur between 9 and 49 hours from a shutdown event. A hot start event would typically occur within 9 hours of a shutdown event. For the warm and hot start events, the time from fuel initiation until reaching the base load 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(s) per event (lb/event) and a pound(s) per hour (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 28°F, with the exception of the cold startup event. Because the duration for a 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	116	27.9	—	—	—
Startup (lb/hr/turbine)	25.5	114	27.3	< 3.09	< 4.50	< 4.50
Warm Start [d]						
Startup (lb/event/turbine)	16.6	46.0	21.0	—	—	—
Startup (lb/hr/turbine)	21.5	49.0	21.9	< 3.09	< 4.50	< 4.50
Hot Start [d]						
Startup (lb/event/turbine)	16.6	33.6	20.4	—	—	—
Startup (lb/hr/turbine)	21.5	36.6	21.3	< 3.09	< 4.50	< 4.50
Shutdown [d]						
Shutdown (lb/event/turbine)	9.00	45.3	31.0	—	—	—
Shutdown (lb/hr/turbine)	18.0	50.8	32.6	< 3.09	< 4.50	< 4.50

[a]See Appendix 5.1B.

[b]The maximum SO_2 hourly emission rate is based on a fuel sulfur concentration of 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 at 107°F.

[d]The NO_x, CO, and VOC emissions for the balance of the hour for a warm start, hot start, and shutdown event were based on the hourly emission rate for 100 percent load at 28°F.

Steady-State Operating Emissions. The CTG operational emission rates for steady-state operations 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 CTGs 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]

Pollutant	ppmvd @ 15% O_2	Emission Rate (lb/hr)
NO_x	2 (1-hour)	10.7
CO	2 (1-hour)	6.50
VOC	1 (1-hour)	1.86
SO_2 [b]	N/A [c]	3.09
PM_{10} /$PM_{2.5}$ [d]	N/A [c]	4.50
Ammonia	5	9.87

[a]Maximum values are for each turbine at an ambient temperature of 28°F and excludes startups and shutdowns.

[b]Estimated using a maximum fuel sulfur concentration of 0.75 grain of sulfur per 100 dscf of natural gas.

[c]Not applicable.

[d]100 percent of PM emissions assumed to be emitted as PM_{10} and $PM_{2.5}$.

5.1.6.1.4 Facility Emissions

Emission sources at the AEC would include the twelve natural gas MPSA 501DA CTGs and the associated emission control systems in the HRSGs. 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**

C_2H_6 = Ethane
C_3H_8 = Propane
C_4H_{10} = Butane
C_5H_{12} = Pentane
C_6H_{14} = Hexane
N_2 = Nitrogen

Table 5.1-16 presents the maximum fuel use expected for each of the CTGs, and the facility total. The estimated maximum hourly and daily fuel use was based on the maximum heat input for the CTG at an ambient temperature of 28°F. The annual fuel use was estimated based on an average heat input at 65.3°F, 3,320 hours of base load operation per turbine, and 495 startups and shutdowns per turbine.

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

Period	Gas Turbine (Each)	Total Fuel Use (All Units)
Per hour	1,509	18,103
Per day	36,207	434,480
Per year	5,074,335	60,892,017

[a]The maximum hourly and daily fuel use was based on the maximum heat input for the turbine at an ambient temperature of 28°F. The annual fuel use was estimated based on an average heat input at 65.3°F, 3,320 hours of base load operation per turbine, and 495 startups and shutdowns per turbine.

[b]See Appendix 5.1B.

MMBtu = million British thermal unit(s)

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 PM 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 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
- 676.2 hours of operation per turbine at 100 percent load and 28°F

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:

- 3,320 hours of base load operation per turbine per year
- 495 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 Alamitos Generating Station currently has six operating generating units (Units 1–6) and one retired generating unit (Unit 7). The operating units, the retired unit, the Unit 7 fuel tank, and the northeast warehouse will be demolished as part of the project. Because the existing Alamitos Generating Station units will be retired and removed as part of the project, the maximum 2-year historical past actual emissions from these units between calendar years 2008 and 2012 have been subtracted from the annual AEC PTE to establish the overall net increase. The maximum past actual values have been developed based on operations between calendar years 2008 and 2012, as presented in Appendix 5.1B. This timeframe represents normal operations for the existing Alamitos Generating Station Units 1–6. 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 EMFAC2011. Detailed calculations are included in Appendix 5.1B.

TABLE 5.1-17
AEC Facility Emissions

	NO_x	SO_2	VOC	CO	PM_{10}	$PM_{2.5}$
Maximum Hourly Emissions (per turbine) [a], lb/hr	25.5	3.09	32.6	114	4.50	4.50
Average Daily Facility Emissions [b], lb/day	3,835	920	2,375	4,888	1,339	1,339
Maximum Monthly Facility Emissions [c], lb/month	115,043	27,584	71,237	146,625	40,176	40,176
Average Annual Facility Emissions (tpy) [d]						
AEC (PTE)	272	20.8	188	372	99.5	99.5
Alamitos Generating Station Units 1-6 (Past Actual) [e]	65.8	6.84	25.7	1,180	16.3	16.3
Net Increase (AEC PTE – Alamitos Generating Station Past Actual)	**206**	**13.9**	**163**	**(808)**	**83.2**	**83.2**

[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 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 startups, 25 warm startups, 60 hot startups, 90 shutdowns, and 676.2 hours of operation at 100 percent load and 65.3°F for each turbine. Value includes VOC emissions associated with the 3 oil/water separator systems (see Appendix 5.1B, Table 5.1B.8).

[d]Average annual emissions are based on 3,320 hours of base load operation and 495 startups and shutdowns per turbine per year. Annual sulfuric acid (H_2SO_4) emissions are less than 1 tpy.

[e]Alamitos Generating Station Units 1–6 will be retired and removed as part of the project; the annualized maximum 2-year historical past actual emissions from these units between calendar years 2008 and 2012 were subtracted from the AEC PTE (see Appendix 5.1B).

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)	27.5	1,571	153	5.53	63.3	26.4
Material Deliveries (lb/yr)	2.71	12.6	55.6	0.19	1.91	1.13
Total (lb/yr)	**30.2**	**1,584**	**208**	**5.72**	**65.2**	**27.5**

5.1.6.2 Greenhouse Gas Emission Estimates

Combustion of natural gas in the CTGs 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 AEC and emission factors contained in the TCR GRP (TCR, 2013). The emission factors used to estimate the GHG emissions are summarized in Appendix 5.1B. Similar to the criteria pollutant calculations, the annualized maximum 2-year historical past actual emissions from the existing Alamitos Generating Station Units 1–6 were subtracted from the AEC PTE because the existing operational units will be retired as part of the project (see Appendix 5.1B). Emissions of CO_2, N_2O, and CH_4 resulting from AEC operation are presented in Table 5.1-19.

TABLE 5.1-19
Estimated Annual Greenhouse Gas Emissions from AEC

	CO_2	CH_4	N_2O	CO_2e
AEC (PTE), MT/yr	3,230,930	54.8	171	3,284,936
Alamitos Generating Station Units 1–6 (Past Actual)*, MT/yr	1,236,020	21.0	21.0	1,242,959
NET Increase (AEC PTE – Alamitos Generating Station Past Actual)	**1,994,911**	**33.8**	**150**	**2,041,976**

* Alamitos Generating Station Units 1–6 will be retired and removed as part of the project. Therefore, the annualized maximum 2-year historical past actual emissions from these units between calendar years 2008 and 2012 (see Appendix 5.1B) were subtracted from the AEC 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 2.0) (TCR, 2013) and fuel economy values from the EMFAC2011 Web Tool Database, based on EMFAC2007 vehicle categories. Detailed calculations are included in Appendix 5.1B.

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

	GHG Emissions (MT/yr)			
Emission Source	CO_2	CH_4	N_2O	CO_2e
Worker Commute, MT/yr	265	0.011	0.0022	266
Material Deliveries, MT/yr	9.68	0.000027	0.000025	9.69
Total (MT/yr)	**275**	**0.011**	**0.0023**	**276**

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 AEC with established state and federal ambient air quality standards and applicable SCAQMD significance criteria. The analysis was conducted in accordance with the air quality impact analysis guidelines presented in 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, 2012).

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 over-predict 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 CAAQS and NAAQS

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 12345 or most recent version).

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).

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 AEC site 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 Los Angeles County (SCAQMD, 2012)
- Receptor elevations and controlling hill heights obtained from AERMAP (Version 11103) output

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

Where noted, NO_2 concentrations were determined using a default ambient ratio of 0.75 NO_2/NO_x (i.e., 75 percent of NO_x emissions are converted to NO_2) for annual predicted impacts and 0.8 for 1-hour predicted impacts (EPA, 2010; EPA, 2011).

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.

Two SCAQMD meteorological data collection sites were identified in proximity to the proposed project: North Long Beach and Anaheim. Of the two locations, the North Long Beach site was selected as the most representative based on the following factors:

- The monitoring site is the closer of the two to the proposed project (approximately 6.4 miles to the northwest of the AEC site, versus 10.1 miles to the northeast for Anaheim monitoring station).
- There are no complex terrain features between the two locations.
- The land uses surrounding the monitoring site and the AEC site are similar (both are surrounded by a blend of low, medium, and high intensity land uses with open water less than 10 miles to the south-southwest).

Therefore, the North Long Beach monitoring station is representative of the AEC site, and the meteorological data collected at the North Long Beach monitoring station was 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, 2006, through

December 31, 2009, and January 1, 2011, through December 31, 2011.[7] The surface data have also been coupled with the National Climatic Data Center twice-daily soundings from the San Diego Miramar National Weather Service station (Station #03190). The final AERMET data files for 2006 through 2009 and 2011 were provided via e-mail by the SCAQMD.

The annual and quarterly wind rose plots for the North Long Beach 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 South Long Beach monitoring station (South Coastal Los Angeles County 2). This monitoring station is located approximately 4.6 miles northwest of the project site. The proximity to the ocean are similar at both locations and no significant terrain features are in the vicinity of either the project site or monitoring station that would significantly affect the representativeness of the winds or monitored background concentrations. For the reasons noted above, the South Long Beach monitoring station is considered the most representative location. However, because the South Long Beach monitoring station only measures PM_{10}, $PM_{2.5}$, and lead, the nearest representative location for the remaining pollutants was selected based on the surrounding features, as discussed below.

  The North Long Beach monitoring station (South Coastal Los Angeles County 1) is close to the AEC site (approximately 6.4 miles to the northwest), is located in an urban area near two large industrial sources (the Port of Long Beach and the Long Beach airport), and collects monitored background concentrations comparable to the other monitoring station options located in Long Beach. In addition, the North Long Beach monitoring station measures each of the pollutants required in the air quality impact analysis. The Anaheim monitoring station (Central Orange County) is directly downwind from the project site, but is farther away (approximately 10.1 miles to the east-northeast), farther inland than the project site, and collects monitored background concentrations lower than those collected at the North Long Beach monitoring station (i.e., the North Long Beach monitoring station represents a more conservative analysis).

  Based on the information above, the ambient data collected at the North Long Beach monitoring station are considered representative of the project site for the pollutants not monitored at the South Long Beach monitoring station, unless otherwise noted below. Additionally, a meteorological dataset has also been collected at the North Long Beach monitoring station and is considered representative of the project site using the criteria above.

  At the request of the SCAQMD, NO_2 data collected at the Long Beach monitoring station (South Coastal Los Angeles County 3, EPA ID 06-037-4006) are considered representative of the project site. This monitoring station is located approximately 7.2 miles to the northwest of the project site and is considered representative because it captures the large NO_x-emitting sources in the Ports area that are upwind of the proposed project.

[7] At the direction of the SCAQMD, 2010 meteorological data were not recommended for use because the data do not meet the 90 percent completeness requirements. Similarly, 2012 meteorological data were not recommended for use because the collected wind speeds are suspicious.

- **Data quality:** Data must be collected and equipment must be operated in accordance with the requirements of 40 CFR 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 meet the data quality requirements of 40 CFR 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 three most recent years 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 represent the three most recent years of data available.[8]

Based on the criteria presented above, the three most recent years of background hourly NO_2 data from the Long Beach monitoring station, the three most recent years of background CO, SO_2, ozone, and annual NO_2 data from the North Long Beach monitoring station, and the three most recent years of background PM_{10}, $PM_{2.5}$, and lead data from the South Long Beach monitoring station were combined with the modeled concentrations and used for comparison to the ambient air quality standards. A summary of the background concentrations for 2008 through 2012 is presented in Table 5.1-21. In a few instances, 2011 or 2012 data were unavailable so 2008 or 2009 data were used to maintain the three most recent years of data as noted in Table 5.1-21.

Receptor Grid Spacing. The base modeling receptor grid for the AERMOD modeling consists of receptors that are placed at the ambient air boundary (i.e., the project's property 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 NAD 83, 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 files from the United States Geological Survey 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 per standard modeling protocols.

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

[8] It should be noted that the recently established site in Long Beach (South Coastal Los Angeles County 3, EPA ID 06-037-4006) does not have three complete years of data available. In 2012, NO_2 was only monitored during peak conditions; therefore, the collected data do not meet the completeness criteria for an annual averaging time.

TABLE 5.1-21
Background Air Concentrations (2008–2012)

		2008 [a]		2009 [a]		2010		2011		2012		Maximum
Pollutant	**Averaging Time**	**ppm**	**μg/m³**	**ppm**	**μg/m³**	**ppm**	**μg/m³**	**ppm**	**μg/m³**	**ppm**	**μg/m³**	**μg/m³**
NO_2	1-hour (Max)	--	--	--	--	0.118	222	0.090	169	0.091	170	222
	1-hour (98th Percentile)	--	--	--	--	0.071	134	0.074	139	0.077	146	139 [d]
	Annual [b]	--	--	--	--	0.020	37.3	0.018	33.3	0.021	39.1	39.1
Ozone	1-hour (Max)	--	--	--	--	0.101	198	0.073	143	0.084	165	198
	8-hour (Max)	--	--	--	--	0.084	165	0.061	120	0.067	132	165
SO_2	1-hour (Max)	--	--	--	--	0.040	105	0.015	38.7	0.022	58.1	105
	1-hour (99th Percentile)	--	--	--	--	0.016	41.9	0.011	28.0	0.014	37.4	35.8 [d]
	3-hour [c]	0.038	98.4	0.011	29.6	0.025	64.4	N/A	N/A	N/A	N/A	98.4
	24-hour (Max)	--	--	--	--	0.006	15.7	0.004	10.5	0.003	7.85	15.7
CO	1-hour (Max)	--	--	--	--	3.00	3,436	3.20	3,665	2.60	2,978	3,665
	8-hour (Max)	--	--	--	--	2.10	2,405	2.60	2,978	2.20	2,519	2,978
PM_{10}	24-hour (Max)	--	--	--	--	--	76.0	--	50.0	--	54.0	76.0
	Annual [b]	--	--	--	--	--	27.3	--	28.7	--	25.5	28.7
$PM_{2.5}$	24-hour (98th Percentile)	--	--	--	--	--	26.5	--	26.6	--	25.1	26.1 [d]
	Annual [b]	--	--	--	--	--	10.4	--	10.7	--	10.6	10.7
Lead	Monthly (Max)	--	--	--	0.010	--	0.010	--	0.013	--	N/A	0.013
	Quarterly (Max)	--	--	--	0.010	--	0.010	--	0.009	--	N/A	0.010

[a] 2008 and 2009 data were used when 2011 and 2012 data were unavailable for certain pollutants.
[b] Annual Arithmetic Mean.
[c] EPA Secondary Standard.
[d] 3-year average rather than the maximum.

N/A = Not applicable (i.e., data not available from SCAQMD, ARB, or EPA sources)

Source: SCAQMD, 2013; ARB, 2013d; EPA, 2013b

Building Downwash and Good Engineering Practice Assessment. For the analysis of the potential turbine impacts during operation, EPA's Building Profile Input Program – Plume Rise Model Enhancement (BPIP-Prime, 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 maximum calculated height of 80.01 meters.[9] The proposed turbine stack height of 36.6 meters (120 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 the AEC on ambient air quality, modeling of the worst-case ambient impacts for the project was compared to the CAAQS, NAAQS, and the applicable SCAQMD new source review and PSD thresholds.

Construction Impacts Analysis. As previously discussed, the construction and demolition activities for AEC will occur for approximately 139 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 monthly maximum emissions of VOC, CO, and SO_2 occur during the construction of Blocks 1 and 2. The monthly maximum emissions of NO_x, PM_{10}, and $PM_{2.5}$ occur during the overlap of construction of the new and upgraded sanitary pipeline with construction of Blocks 1 and 2. A description of the maximum annual emissions was provided in Section 5.1.6.1.1 and a complete summary of the combined maximum daily, monthly, and annual emissions is provided in Appendix 5.1A.

The SCAQMD's CEQA Air Quality Handbook (1993)[10] includes daily CEQA significance thresholds for construction. Therefore, the maximum daily emissions from the construction and demolition activities have been compared to the SCAQMD CEQA Air Quality Handbook's 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 except NO_x. Therefore, the daily emissions associated with construction and demolition activities are expected to be less than significant with the exception of NO_x.

[9] Note that the calculated GEP height for the facility stacks ranges from 78.64 meters to 80.01 meters, dependent on power block.

[10] According to the SCAQMD website: "The CEQA Air Quality Handbook (SCAQMD, 1993) is still the currently available guidance document for preparing air quality analyses, but is in the process of being revised (and will be called the AQMD Air Quality Analysis Guidance Handbook). The 1993 CEQA Air Quality Handbook is still available, however, there are sections that are obsolete. A list of these obsolete sections can be found on the CEQA Air Quality Handbook (1993) webpage." (Information at: http://www.aqmd.gov/ceqa/faq.html#What is the Air Quality Analysis Guidance Handbook?)

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)	154	101	15.5	0.25	36.6	14.1
SCAQMD CEQA Significance Threshold (lb/day)	100	550	75	150	150	55
Exceed Threshold? (yes or no)	Yes	No	No	No	No	No

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

In addition to the SCAQMD CEQA Air Quality Handbook's 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 CAAQS and NAAQS.

To complete this comparison, the exhaust emissions were modeled as a set of point sources spaced approximately 25 meters apart over the construction areas with a horizontal stack release. The horizontal release type is an AERMOD beta option (i.e., non-regulatory default option), which negates mechanical plume rise. This conservative approach was used because it is unknown whether the construction equipment will have vertically oriented exhaust stacks. Stack release parameters consisted of a stack release temperature of 533 degrees Kelvin (K; 500°F), a stack diameter of 0.127 meters (5 inches), and a release height of 4.6 meters (15 feet) based on data for typical construction equipment. The wind-blown and fugitive dust emissions were modeled as area sources assuming a ground-level release height with an initial vertical dimension of one meter. The results of the construction and demolition modeling analysis are presented in the following section. A detailed summary of the modeling 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 AEC commissioning period, each CTG will be initially operated at various load rates without the benefit of the emission control systems to ensure proper operation of the equipment. To provide a conservative analysis (i.e., one that would overstate actual impacts using a worst-case scenario) for the dispersion modeling analysis, it was assumed that the maximum impact would occur if the nine turbines in Blocks 1–3 were in simultaneous cold-start mode while the three turbines in Block 4 were simultaneously undergoing commissioning activities with the highest unabated emissions (i.e., 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 commissioning parameters and emission rates presented in Table 5.1-23 for Block 4 and the cold-start mode parameters and emission rates presented in Table 5.1-24 for Blocks 1–3.

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 ambient air quality standards. 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. Although commissioning is expected to be completed within 180 days, annual impacts for the combined commissioning of one power block and operation of four power blocks for a rolling 12-month period were also evaluated because annual emissions during the commissioning year could be higher than those during a non-commissioning year. As a result, annual NO_2, PM_{10}, and $PM_{2.5}$ impacts from commissioning with operation, evaluated using the emission rates identified in Table 5.1-12, were combined with the ambient background concentrations and compared to the annual ambient air quality standards. Additional modeling assumptions used to determine the maximum commissioning emissions 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
AEC Commissioning Dispersion Modeling Scenarios

Scenarios	No. of Turbines/ Modeling Load	Exit Velocity (m/s)	Exhaust Temperature (K)	Emission Rates [a] (lb/hr)		
				1-hour NO_x	1-hour CO	8-hour 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%	23.05	485.4	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%	9.94	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.

m/s = meter(s) per second

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 dispersion modeling analysis was conducted at 70, 80, 90, and 100 percent load at 28°F, 65.3°F, and 107°F. Exhaust parameters for the MPSA 501DA exhaust stacks were based on information provided by the vendor. A summary of the source parameters and the source UTM locations for each modeled scenario is included in Appendix 5.1C.

The hourly emission rates used to estimate the maximum 1-hour predicted impacts from the operation of the AEC were based on the conservative assumption that all twelve 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 twelve MPSA 501DA units would complete one cold startup, two warm startup events, and three shutdowns, and would operate at base load for the remaining hours. The hourly 24-hour PM_{10} and $PM_{2.5}$ emission rates were 4.5 lb/hr for each modeling scenario. The annualized hourly NO_x, PM_{10}, and $PM_{2.5}$ emission rates for the annual impact assessment were based on the following:

- 3,320 hours of turbine operation at 100, 90, 80, and 70 percent load
- 20 cold startups
- 125 warm startups
- 350 hot startups
- 495 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 per standard modeling protocols. 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 (ft/s)	Exhaust Temperature (°F)	Turbine Emission Rate (lb/hr)*
NO_2						
1-hour	15	107	70	50.9	381	25.5
Annual	10	65.3	70	53.9	380	4.19
CO						
1-hour	15	107	70	50.9	381	114
8-hour	15	107	70	50.9	381	45.4
SO_2						
1-hour	5	28	70	56.9	382	2.26
3-hour	5	28	70	56.9	382	2.26
24-hour	5	28	70	56.9	382	2.26
PM_{10}						
24-hour	15	107	70	50.9	381	4.5
Annual	10	65.3	70	53.9	380	1.89
$PM_{2.5}$						
24-hour	15	107	70	50.9	381	4.5
Annual	10	65.3	70	53.9	380	1.89

*Emission rates are based on the following assumptions:

- The maximum 1-hour NO_x and CO emission rates are based on 60 minutes of a cold startup event.
- The 1-, 3-, and 24-hour SO_2 emission rates are based on the worst-case fuel sulfur content of 0.75 grain per 100 dscf of natural gas.
- The 8-hour CO emission rate 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 3,320 hours of turbine operation at 100 percent load, 20 cold startup events, 125 warm startup events, 350 hot startup events, and 495 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. Under SCAQMD Rule 1304(a)(2), there is an exemption from the dispersion modeling requirements of SCAQMD Rule 1303(b)(1) and the offset requirement of SCAQMD Rule 1303(b)(2) for projects like the AEC that are classified by SCAQMD's Rules as "Electric Utility Steam Boiler Replacement," defined in pertinent part as the replacement of electric utility steam boiler(s) with combined cycle gas turbine(s)". Therefore, SCAQMD Rule 1304(a)(2) expressly provides that a SCAQMD Rule 1303, Appendix A-2 review is not required as part of this air quality impacts analysis.

Per SCAQMD Rule 1303(b)(5)(C), a modeling analysis is required to evaluate impacts on plume visibility if the net emission increase from the new or modified source exceeds 15 tpy of PM_{10} or 40 tpy of NO_x; and the location of the source, relative to the closest boundary of a specified federal Class I area, is within 28 km. (There is no exemption from this modeling requirement for Electric Utility Steam Boiler Replacement projects.) Net emissions of PM_{10} and NO_x will exceed the emissions thresholds but the distance to the nearest Class I area is approximately 53 km. Therefore, a visibility analysis is not required for Class I areas under SCAQMD Rule 1303.

Although not required by its Rules, the SCAQMD requested an analysis of the project's impacts on visibility for nearby State Parks and National Wilderness Areas designated as Class II areas. As such, a visibility analysis for Class II areas was performed using the EPA-recommended VISCREEN model. The general procedures to determine visibility impacts followed the approach outlined in the *Workbook for Plume Visual Impact Screening and Analysis (Revised)* (EPA, 1992a), with clarification of particular inputs below:

- Background visual ranges for the Class II areas were determined using maps supplied by the Interagency Monitoring of Protected Visual Environments (IMPROVE). The average of the annual upper and lower bounds were used.
- When a Tier 1 approach exceeded the Class I criterion for color difference and contrast, a Tier II assessment was conducted. The Tier II assessment used the North Long Beach AERMET meteorological dataset, which was provided by SCAQMD staff for the years 2006 through 2009 and 2011. These data were pre-processed with the EPA Meteorological Processor for Regulatory Modeling Applications (MPRM, Version 99349) for the Industrial Source Complex (ISC) modeling system.[11]

Based on a survey of State Parks and National Wilderness Areas designated as Class II areas within 50 km of the AEC, the following Class II areas were included in the visibility assessment:

- Crystal Cove State Park
- Water Canyon National Park
- Chino Hills State Park
- Kenneth Hahn State Park

Rule 2005. SCAQMD Rule 2005 sets forth pre-construction review requirements for new facilities subject to the requirements of the Regional Clean Air Incentives Market (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 Alamitos Generating Station is currently subject to the RECLAIM requirements, and AEC will also exceed the major NO_2 modification threshold of 1 lb/day. Therefore, an ambient air quality analysis is required to demonstrate that AEC 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 applies to pre-construction review of new or modified stationary sources that emit more than 100 tpy of federal attainment air contaminants. Note that although the project is not expected to emit more than 100 tpy of PM_{10}, PM_{10} impacts were also evaluated against the significant emissions increase thresholds due to Los Angeles County's new designation as an attainment area for PM_{10}. Based on the emission estimates and attainment designations, NO_2 and PM_{10} are the only attainment pollutants from the AEC that will exceed the thresholds 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's NO_x and PM_{10} 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 Significant Impact Levels (SILs), Class II PSD increment Standards, and the significant monitoring concentration levels.

[11] ISC-ready data, pre-processed with MPRM, contain the wind speed, wind direction, and stability class for each hour of the year. These data are required to create the Joint Frequency Distribution tables used to calculate the Tier II wind speed and stability class for each area analyzed.

TABLE 5.1-25

PSD Air Quality Impact Standards Applicable to the Project

Averaging Period/ Pollutant	Significant Impact Level ($\mu g/m^3$)	PSD Class II Increment Standard ($\mu g/m^3$)	Significant Monitoring Concentrations ($\mu g/m^3$)
NO_2 (1-hour)	7.52*	N/A	N/A
NO_2 (Annual)	1.0	25	14
PM_{10} (24-hour)	5.0	30	10
PM_{10} (Annual)	1.0	17	N/A

*The SIL for 1-hour NO_2 is based on SCAQMD correspondence.

N/A = Not applicable (i.e., no standard)

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

Averaging Period/ Pollutant	Significant Impact Level ($\mu g/m^3$)	PSD Class I Increment Standard ($\mu g/m^3$)
NO_2 (Annual)	0.1	2.5
PM_{10} (24-hour)	0.3	2.0
PM_{10} (Annual)	0.2	1.0

To evaluate the potential impacts on visibility and deposition at the nearest Class I area, the federal Class I area air quality guidance (Federal Land Managers [FLM], 2010) allows an emissions/distance (Q/D) factor of 10 to be used as a screening criterion 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). These emissions are divided by the distance (in km) from the Class I area.

The combined AEC annual emissions of NO_x, SO_2, H_2SO_4, and PM_{10}, calculated using the 24-hour maximum allowable emissions, will be approximately 967 tpy. Therefore, the maximum Q/D for the project will be approximately 18.1 ton/km-year. Because the factor is greater than the federal Class I area air quality screening criterion of 10, visibility and deposition modeling is required for all Class I areas which exceed the screening criterion and any additional Class I areas requested by the FLM. Note that as part of the federal review process running in parallel with the CEC and SCAQMD processes, the results of the visibility and deposition modeling will be prepared as a separate document and submitted to the appropriate FLM for review and approval within 30 days of approval of the *Dispersion Modeling Protocol for Air Quality Related Values at Class I Areas Near the Alamitos Energy Center* (see Appendix 5.1F).

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 ambient air quality standards for each averaging period. For PM_{10}, the annual and 24-hour PM_{10} background concentrations currently exceed the CAAQS without adding the modeled concentrations. Similarly, the annual and 24-hour $PM_{2.5}$ background concentrations are equal to at least 75 percent of the ambient air quality standards. As a result, the predicted impacts combined with the background concentrations would be greater than the state and federal ambient air quality standards.

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

Pollutant	Averaging Period	Maximum Modeled Concentration (μg/m³)	Background Concentration [a] (μg/m³)	Total Predicted Concentration (μg/m³)	CAAQS (μg/m³)	NAAQS (μg/m³)
NO_2 [b]	1-hour	107	222	329	339	—
	Federal 1-hour [c]	—	—	190 [d]	—	188
	Annual	10.4	39.1	49.5	57	100
SO_2	1-hour	0.21	105	105	655	—
	Federal 1-hour [e]	0.21	35.8	36.0	—	196
	3-hour	0.17	98.4	98.6	—	1,300
	24-hour	0.057	15.7	15.8	105	365
CO	1-hour	108	3,665	3,773	23,000	40,000
	8-hour	64.4	2,978	3,042	10,000	10,000
PM_{10}	24-hour	31.5	76.0	108	50	150
	Annual	6.97	28.7	35.7	20	—
$PM_{2.5}$	24-hour (98th Percentile) [c]	8.10	26.1	34.2	—	35
	Annual	1.93	10.7	12.6	12	12

[a]Background concentrations were the highest concentrations monitored during 2010 through 2012, with the exception of 3-hour SO_2 concentrations, which were based on 2008 through 2010 monitored data.

[b]The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[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 concentration for the federal 1-hour NO_2 standard is the maximum modeled concentration paired with the 3-year average of 98th percentile seasonal hour-of-day background concentrations, as provided by the SCAQMD.

[e]Total predicted concentration for the federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99th percentile background concentrations.

Although the maximum modeled PM_{10} and $PM_{2.5}$ concentrations associated with the project exceed both the 24-hour and annual CAAQS and NAAQS, the modeled concentrations of PM_{10} and $PM_{2.5}$ decrease rapidly with distance from the project.[12] Additionally, the maximum impacts occur in areas that would not be accessible to the public. As a result, the modeled concentrations are below the ambient air quality standards at the receptors beyond the property boundary. Based on the modeling analysis, fugitive dust is also a significant contributor to the predicted concentrations. Therefore, implementation of the construction mitigation measures presented in Section 5.1.8.1 are expected to further reduce the offsite construction air quality impacts associated with construction and demolition activities to the extent possible.

[12] 24-hour PM_{10} impacts reduce to below half of the maximum impact within 50 meters of the fence line. Annual PM_{10} impacts reduce to one-third of the maximum within 50 meters of the fence line.

Commissioning Impacts Analysis. The potential impacts on ambient air quality associated with the AEC commissioning activities were assessed based on engineering estimates of schedule and emissions. As previously discussed, it was assumed that the maximum short-term impact would occur if the nine turbines in Blocks 1–3 were in simultaneous cold-start mode while the three turbines in Block 4 were simultaneously undergoing commissioning activities with the highest unabated emissions (i.e., initial full-speed, no-load CTG testing, steam blows, HRSG, and steam safety valve settings). The maximum annual impact would occur assuming normal operation of all four power blocks with the addition of Block 4 commissioning during a rolling 12-month period.

Table 5.1-28 presents a comparison of the maximum modeled project commissioning impacts to the CAAQS and NAAQS. The maximum short-term impacts for SO_2, PM_{10}, and $PM_{2.5}$ are expected to be equal to or lower than normal operating rates. As a result, the short-term SO_2, PM_{10}, and $PM_{2.5}$ impacts from normal operation of all twelve turbines (Table 5.1-29) are included for comparison to the CAAQS and NAAQS. As previously discussed, the analysis also includes a comparison to the annual averaging period standards and thresholds based on normal operation of twelve turbines and commissioning of three turbines for a rolling 12-month period.

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)	CAAQS (µg/m³)	NAAQS (µg/m³)
NO_2 [b, c]	1-hour [d]	—	—	294	339	—
	Annual	0.33	39.1	39.4	57	100
CO [c]	1-hour	7,213	3,665	10,878	23,000	40,000
	8-hour	2,326	2,978	5,304	10,000	10,000
SO_2 [e]	1-hour	4.32	105	109	655	—
	3-hour	3.35	98.4	102	—	1,300
	24-hour	1.20	15.7	16.9	105	365
PM_{10} [e]	24-hour	2.61	76.0	78.6	50	150
	Annual	0.16	28.7	28.9	20	—
$PM_{2.5}$ [e]	24-hour [f]	2.61	26.1	28.7	—	35
	Annual	0.16	10.7	10.9	12	12

[a] Background concentrations were the highest concentrations monitored during 2010 through 2012, with the exception of 3-hour SO_2 concentrations, which were based on 2008 through 2010 monitored data.

[b] The maximum 1-hour and annual NO_2 concentrations include an ambient NO_2 ratio of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively. The maximum 1-hour NO_2 concentrations are paired with the 3-year maximum seasonal background concentrations according to EPA Detailed Air Quality System Data for the Long Beach monitoring station (EPA, 2013c).

[c] The short-term NO_2 and CO impacts occurred during the 50 percent load scenario.

[d] The maximum 1-hour NO_2 concentration is based on commissioning of only one combustion turbine at the highest unabated emissions rate.

[e] The short-term SO_2, PM_{10}, and $PM_{2.5}$ impacts from Table 5.1-29 have been included for comparison to the ambient air quality standards.

[f] Total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the respective maximum modeled concentration combined with the 3-year average of 98th percentile background concentrations.

Note that the analysis 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.[13] The 1-hour NO_2 and SO_2 standards are also based on a 98th and 99th percentile statistical standard, respectively. Therefore, it is unlikely that simultaneous one-time unabated emissions for all twelve turbines would occur on the days with the highest background NO_2 and ozone concentrations.

The maximum facility NO_2, CO, SO_2, and $PM_{2.5}$ impacts combined with the background concentration are less than the ambient air quality standards. The background PM_{10} concentrations exceed the CAAQS without adding the modeled concentrations. As a result, the predicted impacts would also be greater than the CAAQS. 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, AEC 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.

Additionally, the Project Owner proposes to mitigate potential CO and NO_2 air quality impacts from the commissioning of the AEC gas turbines by accepting an enforceable limit or restriction on the commissioning activities that may occur at any point in time. The Project Owner proposes to limit commissioning events and the resulting emissions such that the operation of a gas turbine with zero percent emission controls will be limited to a single gas turbine at any one time. When a gas turbine has commissioned and employed dry low NO_x burners, CO catalyst, and SCR and is expected to achieve approximately 75 percent control of CO and NO_2 emissions, up to two gas turbines will be allowed continue to complete commissioning activities.

Operation Impacts Analysis. The highest modeled concentrations were used to demonstrate compliance with the CAAQS and NAAQS. Table 5.1-29 presents a comparison of the maximum AEC operational impacts to the CAAQS and NAAQS. The NO_2, CO, SO_2, and $PM_{2.5}$ concentrations combined with the background concentrations do not exceed the ambient air quality standards. Therefore, the AEC will not cause or contribute to the violation of a standard, and the NO_2, CO, SO_2, and $PM_{2.5}$ impacts from operation will be less than significant.

For PM_{10}, the background concentrations exceed the CAAQS without the proposed project. As a result, the predicted project impact plus background also exceeds the CAAQS, and the operation of the proposed project would further contribute to an existing violation of the CAAQS absent mitigation. As discussed in Section 5.1.8.2, AEC emissions will be fully offset consistent with SCAQMD Rules 1303 and 1304 through the permanent shutdown of the existing Alamitos Generating Station Units 1–6 and through the use of the SCAQMD internal offset bank (see Section 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.

[13] For each block, 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.

TABLE 5.1-29

AEC 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)	CAAQS (μg/m³)	NAAQS (μg/m³)
NO_2 [b]	1-hour	38.5	222	260	339	—
	Federal 1-hour [c]	38.5	139	177	—	188
	Annual	0.26	39.1	39.4	57	100
SO_2	1-hour	4.32	105	109	655	—
	Federal 1-hour [d]	4.32	35.8	40.1	—	196
	3-hour	3.35	98.4	102	—	1,300
	24-hour	1.20	15.7	16.9	105	365
CO	1-hour	215	3,665	3,880	23,000	40,000
	8-hour	65.2	2,978	3,043	10,000	10,000
PM_{10}	24-hour	2.61	76.0	78.6	50	150
	Annual	0.16	28.7	28.9	20	—
$PM_{2.5}$	24-hour [c]	2.61	26.1	28.7	—	35
	Annual	0.16	10.7	10.9	12	15

[a]Background concentrations were the highest concentrations monitored during 2010 through 2012, with the exception of 3-hour SO_2 concentrations, which were based on 2008 through 2010 monitored data.

[b]The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[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 concentration for the federal 1-hour SO_2 standard is the maximum modeled concentration 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. Although the NO_2 concentrations per turbine are greater than the Rule 2005 1-hour threshold, they are less than the ambient air quality standards and will be fully offset through the purchase of NO_x RECLAIM trading credits (RTC) (see Section 5.1.8.2.2). 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)	22.5	20	222	244	339/N/A
NO_2 (Federal 1-hour)	22.5	N/A	139	161	N/A/188 [d]
NO_2 (Annual)	0.021	1.0	39.1	39.1	57/100

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[b] Allowable change in air quality concentration per emission unit per SCAQMD Rule 2005, Appendix A.

[c] Background concentrations were the highest concentrations monitored during 2010 through 2012.

[d] National 1-hour standard represents the 3-year average of the 98th percentile of the daily maximum 1-hour average.

N/A = Not Applicable (i.e., no standard)

Regulation XVII (PSD). Table 5.1-31 presents a summary of the predicted hourly and annual NO_2 and 24-hour and annual PM_{10} impacts from AEC operation, as well as a comparison to the Class II SILs, Class II PSD Increment Standards, and the significant monitoring concentration levels. As shown, the maximum predicted annual NO_2, 24-hour PM_{10}, and annual PM_{10} impacts from AEC operation are below the Class II SILs, Class II PSD Increment Standards, and significant monitoring concentrations. Therefore, additional analysis of annual NO_2, 24-hour PM_{10}, and annual PM_{10} impacts is not required. However, the maximum predicted 1-hour NO_2 impacts from AEC operation exceed the Class II SIL, with a radius of impact with predicted concentrations greater than 7.52 $\mu g/m^3$ of 5.3 km. Therefore, the cumulative impacts of the AEC and competing sources were assessed, per the methodology described in *Dispersion Modeling Protocol for the Alamitos Energy Center* (see Appendix 5.1F), for all receptors where the AEC impacts alone exceeded the 1-hour NO_2 SIL.

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

Averaging Period/ Pollutant	Maximum Predicted Impact ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	PSD Class II Increment Standard ($\mu g/m^3$)	Significant Monitoring Concentrations ($\mu g/m^3$)
NO_2 (1-hour) [a]	38.5	7.52 [b]	N/A	N/A
NO_2 (Annual) [a]	0.26	1.0	25	14
PM_{10} (24-hour)	2.61	5.0	30	10
PM_{10} (Annual)	0.16	1.0	17	N/A

[a]The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[b]The SIL for 1-hour NO_2 is based on SCAQMD correspondence.

N/A = Not applicable (i.e., no standard)

SCAQMD identified two facilities within 10 km of the AEC for inclusion in the cumulative impact assessment:

- Los Angeles Department of Water and Power, Haynes Generating Station (Facility ID 800074): located in Long Beach, California with 10 emission sources
- Beta Offshore (Facility ID 166073): located in Huntington Beach, California with 13 emission sources

The stack locations, stack parameters, and 1-hour NO_2 emission rates for the emission sources at these two facilities were provided by SCAQMD. Per SCAQMD's request, the Beta Offshore emission sources were modeled as rural sources.

In addition to the above facilities, SCAQMD also requested that emissions from shipping lane activity off the California coast be included in the cumulative impact assessment. SCAQMD provided the relevant locations, source parameters, and 1-hour NO_2 emission rates for the shipping lane activity. Per SCAQMD's request, the shipping lane emission sources were modeled as rural sources.

The cumulative impacts of the AEC and competing sources were assessed for all receptors where the AEC impacts alone exceeded the 1-hour NO_2 SIL of 7.52 $\mu g/m^3$. Based on a comparison of these results to the 1-hour NO_2 NAAQS of 188 $\mu g/m^3$, it was determined that there were receptors where the contributions from the AEC combined with those from competing sources and representative background concentrations exceeded the 1-hour NO_2 NAAQS. Therefore, the following AERMOD-generated output files were post-processed to assess the impact from the AEC's emissions at each of the receptors where an exceedance of the 1-hour NO_2 NAAQS was modeled:

- The file titled AEC_PSD_Cumulative_YYYY_NO2_1_ALL.MAX (see the modeling files included with this submission on compact disc) shows the date, time, and location of each occurrence with a modeled, cumulative impact greater than the 1-hour NO_2 NAAQS of 188 $\mu g/m^3$.

- The file titled AEC_PSD_Cumulative_YYYY_NO2_1_AEC.MAX (see the modeling files included with this submission on compact disc) shows the date, time, and location of each occurrence with impacts from AEC operation alone that exceed the 1-hour NO_2 SIL of 7.52 µg/m^3.

The dates and times of these occurrences were cross-referenced to identify potential overlap. Based on this review, it was determined that the occurrences with NAAQS exceedances do not correspond to occurrences where the AEC contribution alone is greater than the SIL. Therefore, the AEC's contribution to each modeled exceedance is less than significant and would not cause or contribute to any modeled exceedance of the 1-hour NO_2 NAAQS.

A summary of the dispersion modeling input files for this analysis, as well as the modeling parameters used, are presented in Appendix 5.1C. The AERMOD input and output files are included with this submission on compact disc.

Table 5.1-32 presents a summary of the predicted annual NO_2, 24-hour PM_{10}, and annual PM_{10} impacts and a comparison to the PSD Class I Increment Standards. The predicted impacts from the operation of the AEC are below the SILs. Therefore, the project would have a negligible impact at the more distant Class I areas.

TABLE 5.1-32
AEC Predicted Impacts Compared to the Class I SIL and PSD Class I Increment Standards

Averaging Period/ Pollutant	Maximum Predicted Impact at 50 km (µg/m^3)	Significant Impact Level (µg/m^3)	PSD Class I Increment Standard (µg/m^3)
NO_2 (Annual)*	0.014	0.1	2.5
PM_{10} (24-hour)	0.10	0.3	2.0
PM_{10} (Annual)	0.0085	0.2	1.0

*The annual NO_2 concentration includes an ambient NO_2 ratio of 0.75 (EPA, 2005).

Class II Visibility Impacts Analysis. As requested, a visibility analysis for Class II areas within 50 km of the AEC was performed using the VISCREEN plume modeling program per the procedures outlined in the *Workbook for Plume Visual Impact Screening and Analysis* (EPA, 1992a), as further described in Appendix 5.1G. Please note that Tier I and II assessments were conducted using criterion for Class I areas, as no criteria exist for Class II areas. Therefore, the visibility assessment was conducted using overly conservative assumptions for Class II areas. However, even using the conservative approach, the modeled results from the visual assessment demonstrates that AEC would not adversely affect visibility at nearby Class II Areas.

Table 5.1-33 summarizes the VISCREEN Tier I modeled results for each Class II area evaluated.[14] The maximum modeled values for color difference and contrast are presented for inside the area analyzed, regardless of the VISCREEN modeled lines of sight for the observer.

[14] The Class II areas for evaluation were presented in the *Dispersion Modeling Protocol for the Alamitos Energy Center* (see Appendix 5.1F), submitted to SCAQMD on August 28, 2013 and revised in December 2013.

TABLE 5.1-33
AEC Tier I VISCREEN Results

Class II Area	Minimum Distance	Maximum Distance	Variable	Sky	Terrain	Criteria*
Crystal Cove State Park	30.3 km	35.5 km	Color Difference	1.732	**2.656**	2.0
			Contrast	-0.017	0.023	|0.05|
Water Canyon/Chino Hills State Park	29.6 km	42.2 km	Color Difference	**2.293**	**2.736**	2.0
			Contrast	-0.023	0.023	|0.05|
Kenneth Hahn State Park	34.6 km	37.3 km	Color Difference	1.409	**2.237**	2.0
			Contrast	-0.014	0.02	|0.05|

Bold values exceed the Class I significant impact criterion.
*Levels of concern for Class I areas were used because no specific requirements or criteria exist for assessing Class II visibility impacts (FLM, 2010).

As shown in Table 5.1-33, the Tier I assessment exceeded the criterion for color difference at each Class II area analyzed and, therefore, required a Tier II assessment. The Tier II assessment results are summarized in Table 5.1-34.

TABLE 5.1-34
AEC Tier II VISCREEN Results

Class II Area	Minimum Distance	Maximum Distance	Wind Speed [a]	Stability [a]	Variable	Sky	Terrain	Criteria [b]
Crystal Cove State Park	30.3 km	35.5 km	4	D	Color Difference	0.118	0.193	2.0
					Contrast	0.001	0.002	|0.05|
Water Canyon/ Chino Hills State Park	29.6 km	42.2 km	2	D	Color Difference	0.304	0.398	2.0
					Contrast	0.003	0.003	|0.05|
Kenneth Hahn State Park	34.6 km	37.3 km	4	D	Color Difference	0.095	0.157	2.0
					Contrast	0.001	0.001	|0.05|

[a]The Joint Frequency Distribution table used to calculate the wind speed and stability for the Tier II assessment is presented in Appendix 5.1G.

[b]Levels of concern for Class I areas were used because no specific requirements or criteria exist for assessing Class II visibility impacts (FLM, 2010).

The VISCREEN Tier II assessment for each Class II area did not exceed the criterion for color difference or contrast. The modeled results are below the conservative Class I area criterion for both color difference and contrast, therefore, the AEC would not adversely affect visibility at nearby Class II areas. The VISCREEN input and output files, as well as the meteorological data used in this analysis, have been separately prepared and are included on the attached modeling compact disc.

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. Accordingly, 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 13043) (EPA, 1992b). 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 for NO_2 and CO predicted by SCREEN3 occurs over 18 km downwind of the CTG locations, while the maximum inversion breakup fumigation concentration for SO_2 predicted by SCREEN3 occurs over 19 km downwind of the CTG locations. There are no shoreline fumigation impacts due to the inland location of the CTGs. Table 5.1-35 presents a comparison of the potential AEC operational fumigation impacts to the state and federal ambient air quality standards. The NO_2, SO_2, and CO concentrations combined with the background concentrations do not exceed the CAAQS. Therefore, fumigation impacts of NO_2, SO_2, and CO would be less than significant.

TABLE 5.1-35
AEC Operation Impacts Analysis—Fumigation Impacts Analysis Results Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	SCREEN3 Fumigation Result (µg/m³)	Background Concentration* (µg/m³)	Total Predicted Concentration (µg/m³)	CAAQS (µg/m³)	NAAQS (µg/m³)
NO_2	1-hour	39.9	222	262	339	—
SO_2	1-hour	3.28	105	108	655	—
CO	1-hour	179	3,665	3,844	23,000	40,000

*Background concentrations were the highest concentrations monitored during 2010 through 2012.

5.1.7 Cumulative Effects

The Project Owner requested a list of projects that are within a 6-mile radius of the AEC 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 *Dispersion Modeling Protocol for the Alamitos Energy Center* (see Appendix 5.1F) within 60 days of receipt of the necessary data from SCAQMD.

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.[15] 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 three times per day
- During construction, watering areas disturbed by grading and bulldozing activities every 3 hours
- During demolition, watering areas disturbed by dismemberment and debris loading activities every 4 hours

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

- Limiting onsite vehicle speeds to 10 miles per hour, or other speed as approved by the CEC's Compliance Project Manager based on site conditions, and posting the approved speed limit
- 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, to the extent 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 preferable mitigation measure is to avoid or minimize to the extent feasible potential air emissions before they are emitted. This is accomplished by the careful design of the project, including the installation of BACT to minimize 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 Rules 1302 and 1303), a BACT analysis is required for the uncontrolled emissions of NO_x, VOC, CO, SO_2, PM_{10}, and $PM_{2.5}$. EPA also requires a BACT analysis for the emissions of GHGs as part of the PSD permit application required under the EPA Tailoring Rule.

The AEC relies on the response characteristics of the MPSA 501DA CTGs 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. The proposed AEC emission limits are presented in Table 5.1-36.

TABLE 5.1-36
Proposed BACT Emission Limits for the AEC

Pollutant	Emission Limit (at 15 percent O_2)
NO_x	2 ppmvd (averaged over 1 hour)
CO	2 ppmvd (averaged over 1 hour)
VOC	1 ppmvd (averaged over 1 hour)
PM_{10}	4.5 lb/hr
$PM_{2.5}$	4.5 lb/hr
SO_2	<0.75 grain of sulfur per 100 dscf 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 ppmvd (1-hour average). The proposed BACT for CO emissions is best combustion design and the installation of an oxidation catalyst system to control CO emissions to 2 ppmvd (1-hour average). The proposed BACT for VOC emissions is best combustion design and the installation of an oxidation catalyst system to control VOC emissions to 1 ppmvd (1-hour average). The proposed 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. The proposed BACT for SO_2 is the exclusive use of pipeline-quality natural gas with a fuel sulfur content of less than 0.75 grain per 100 dscf. 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. These objectives are achieved in this case by using thermally efficient CTGs, with well-designed HRSGs and STGs to generate additional power from the heat of the CTG exhaust.

As discussed in Appendix 5.1D, the MPSA 501DA CTGs operating in a MSG combined-cycle operating configuration compare favorably with other comparable simple-cycle turbines operating in a peaking capacity. The AEC CTGs 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 pound(s) of CO_2e per megawatt hour (lb CO_2e/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 operational 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 AEC was determined in lb CO_2e/MWh of energy output (on a gross basis) and includes the inherent degradation in turbine performance over the lifetime of the AEC. AEC has concluded that the BACT for GHG emissions is an emission rate of 1,089 lb CO_2/MWh of gross energy output, and a facility-wide annual CO_2e emission limit of 3,284,950 MT/yr.[16] 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 RTCs for NO_x emissions under SCAQMD Rules 1303 and 2005. Under SCAQMD Rule 1304(a)(2), the AEC is not required to provide SCAQMD Rule 1303 offsets because it 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 SCAQMD Rule 1303. AES-SLD plans to enable 1,995 MW[17] of new generation under SCAQMD Rule 1304(b)(2) by permanently retiring Alamitos Generating Station Units 1 and 2 (175 MW each), Units 3 and 4 (320 MW each), and Units 5 and 6 (480 MW each) and using 45 MW from the retirement of Huntington Beach Generating Station Units 1 and 2.[18] The AEC is also subject to SCAQMD Rule 1304.1, which will require the payment of fees to generate air quality improvements within the project area consistent with the SCAQMD’s approved Air Quality Management Plan.

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[16] CO_2e emission limit includes approximately 14 MT/yr from operation of 16 generator circuit breakers and four 230-kilovolt transmission breakers (see Appendix 5.1B for calculation details).

[17] Referenced to site ambient average temperature conditions of 65.3 degrees Fahrenheit (°F) dry bulb and 62.7°F wet bulb temperature without evaporative cooler operation.

[18] The HBEP (12-AFC-02) AFC noted the retirement of 1,085 MW of generating capacity from Redondo Beach Generating Station Units 6 and 8 and Huntington Beach Generating Station Units 1 and 2 to mitigate the HBEP’s 939 MW of new generation. This results in 146 MW of generating capacity not needed at HBEP, 50 MW of which were applied toward the Redondo Beach Energy Project.

The SCAQMD Rule 1304 offset exemption does not extend to Regulation XX RTC, and the Project Owner will secure the required NO_x RTCs for the various years of operation and commissioning, as outlined in Table 5.1-37.

TABLE 5.1-37
SCAQMD NO_x RECLAIM Requirements

Operation Phase	NO_x Offsets Required
Blocks 1 and 2 Commissioning and Operation [a]	317,052 lb/yr NO_x RTCs
Blocks 1 and 2 Operation [b]	271,836 lb/yr NO_x RTCs
Block 3 Commissioning and Operation [c]	104,033 lb/yr NO_x RTCs
Blocks 1, 2, and 3 Operation [b]	407,754 lb/yr NO_x RTCs
Block 4 Commissioning [d]	22,608 lb/yr NO_x RTCs
Blocks 1, 2, 3, and 4 Operation [b]	543,672 lb/yr NO_x RTCs

[a]RTCs estimate includes commissioning activities plus 495 startups and shutdowns per year and 3,320 hours of turbine operation at 100 percent load, 65.3°F.

[b]RTCs estimate includes 495 startups and shutdowns per year and 3,320 hours of turbine operation at 100 percent load, 65.3°F.

[c]RTCs estimate includes commissioning activities plus 2,208 hours (i.e., 3 months) of turbine operation at 100 percent load, 65.3°F, and associated startups and shutdowns.

[d]RTCs estimate includes only commissioning activities.

5.1.9 Laws, Ordinances, Regulations, and Standards

The Clean Air Act (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 quality management districts and 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 ambient air quality standards. 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 5.1-38, along with the agency responsible for administration of the regulation.

TABLE 5.1-38
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 ambient air quality standards 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 ambient air quality standards. Dispersion modeling indicates that the project will not exceed the state or federal ambient air quality standards for the attainment pollutants during normal operations. Non-attainment pollutant emissions will be mitigated consistent with SCAQMD's State Implementation Plan-Approved NSR program.
Title 40 CFR Part 51, NSR (SCAQMD Regulation XIII)	Requires preconstruction review and permitting of new or modified stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of ambient air quality standards.	SCAQMD with EPA Region IX Oversight	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 Regulation XIII). A PTC and Permit to Operate (PTO) application will be obtained from SCAQMD prior to construction of the project. As a result, the compliance requirements of 40 CFR 51 will be met.

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

LORS	Purpose	Regulating Agency	Applicability/Compliance Strategy
Title 40 CFR Part 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 Oversight	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 CAA 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. 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. The AEC 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 threshold. Therefore, the AEC 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. A PSD application will be submitted to SCAQMD and EPA as part of the authority to construct permit application.

TABLE 5.1-38
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	40 CFR 60 Subpart KKKK—NO_x Emission Limits for New Stationary Combustion Turbines applies to all new combustion turbines that commence construction, modification, or reconstruction after February 18, 2005. The Rule requires natural-gas-fired turbines with a heat input greater than 850 MMBtu/hr to meet an NO_x emission limit of 15 ppm at 15 percent O_2, and an SO_2 limit of 0.060 lb/MMBtu. Alternatively, a fuel sulfur limit of 500 part(s) per million by weight (ppmw) could be met. Stationary combustion turbines regulated under this subpart would be exempt from the requirements of Subpart GG. The proposed turbines will use 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 2 ppmvd at 15 percent O_2 and 0.0013 lb/MMBtu, respectively. The certified NO_x Continuous Emission Monitoring System (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 (HAP) 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	40 CFR 63—National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories, establishes emission standards to limit emissions of HAPs from specific source categories for Major HAP sources. Sources subject to 40 CFR 63 requirements must either use the maximum achievable control technology (MACT), be exempted under 40 CFR 63, or comply with published emission limitations. The potential NESHAP applicable to the project is Subpart YYYY, which sets a formaldehyde emission limit or an operational limit of 91 parts per billion by volume (ppbv) for turbines. Projects would be subject to the 40 CFR 63 requirements if the HAP PTE is greater or equal to 25 tpy for combined HAPs and 10 tpy for individual HAPs. As shown in Section 5.9 (Public Health), the AEC has proposed a formaldehyde 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, the AEC would be less than the 40 CFR 63 applicability threshold.

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

LORS	Purpose	Regulating Agency	Applicability/Compliance Strategy
Title 40 CFR Part 64 (CAM Rule)	Establishes onsite monitoring requirements for emission control systems.	SCAQMD with EPA Region IX Oversight	40 CFR 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 PTE 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. The AEC 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 CEMS. Therefore, the AEC is exempt from the CAM provisions based on the exemption in 40 CFR 64.2(b)(vi) and SCAQMD Regulation XX for NO_x.
Title 40 CFR Part 70 (SCAQMD Regulation XXX)	CAA Title V Operating Permit Program	SCAQMD with EPA Region IX Oversight	40 CFR 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 70 apply to facilities that are subject to New Source Performance Standards (NSPS) requirements and are implemented at the local level through SCAQMD Regulation XXX. According to Regulation XXX, Rule 3001, a facility would be required to submit a Title V application if the facility has a PTE 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 a PTE greater than 100,000 tpy CO_2e. The AEC will exceed the Title V thresholds listed in SCAQMD Rule 3001. As a result, the AEC will submit an application to modify the existing Title V permit as part of the permitting process.
Title 40 CFR Part 72 (SCAQMD Regulation XXXI)	CAA Acid Rain Program	SCAQMD with EPA Region IX Oversight	40 CFR 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. An acid rain facility, such as the AEC, 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. The necessary Title IV applications will be submitted as part of the permitting process.

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 CAAQS; 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 NAAQS.

The California Health & 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 cause, or have a natural tendency to cause, injury or 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 5.1-39 and 5.1-40, respectively. A discussion of the public health risks posed by emissions of TACs, including ammonia, is presented in Section 5.9, Public Health.

TABLE 5.1-39
Applicable State Laws, Ordinances, Regulations, and Standards for the Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Strategy
California Health & Safety Code, Section 41700	Prohibits emissions in quantities that adversely affect public health, safety, businesses, or property.	SCAQMD with ARB Oversight	The CEC Conditions of Certification 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 ARB to develop regulations to limit and reduce GHG emissions.
California Code of Regulations, Title 17, Article 5	Establishes GHG limitations, reporting requirements, and a Cap and Trade offsetting program.	ARB	ARB has promulgated a Cap and Trade regulation that limits or caps GHG emissions and requires subject facilities to acquire GHG allowances. AEC GHG emissions have been estimated, and the Project Owner will report emissions and acquire allowances and offsets consistent with these regulations.
California Senate Bill 1368 – Emissions Performance Standards (SB 1368)	The law limits long-term investments in base load generation by the state's utilities to power plants that meet an emissions performance standard jointly established by the CEC and the California Public Utilities Commission (CPUC).	CEC with ARB Oversight	The CEC has designed regulations that establish a standard for base load generation owned by, or under long-term contract to, publicly owned utilities of 1,100 lb CO_2/MWh. The AEC satisfies this requirement, emitting 1,089 lb CO_2/MWh.

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). The AEC 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. 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 base load generation by the state's utilities to power plants that meet an emissions performance standard jointly established by the CEC and the CPUC. In response, the CEC has designed regulations that establish a standard for base load generation owned by, or under long-term contract to publicly owned utilities, of 1,100 lb CO_2/MWh. A base load generation is defined as electricity generation from a power plant that is designed and intended to provide electricity at an annualized plant capacity factor of at least 60 percent. The permitted capacity factor for the AEC will be approximately 42 percent. Therefore, as a non-baseload facility the AEC is not subject to the emissions performance standard; however, despite its inapplicability, the AEC's state of the art, efficient combined-cycle configuration nevertheless satisfies this requirement, emitting 1,089 lb CO_2/MWh.

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 ambient 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.

SCAQMD plans define the proposed strategies, including stationary source control measures and NSR rules, whose implementation will attain the CAAQS. The relevant stationary source control measures and NSR requirements are presented in Table 5.1-40 (because of its size, this table is provided at the end of this section).

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 the AEC. The agencies having permitting authority for the AEC, and their contact information, are shown in Table 5.1-41.

TABLE 5.1-41
Agency Contacts for Air Quality

Issue	Agency	Agencies Contacted
Regulatory oversight	EPA Region IX	Gerardo Rios EPA Region IX 75 Hawthorne Street San Francisco, CA 94105 (415) 947-3974
Regulatory oversight	ARB	Michael Tollstrup Project Assessment Branch California Air Resources Board 1001 "I" Street Sacramento, CA 95814 P.O. Box 2815 Sacramento, CA 95812 (916) 322-6026

TABLE 5.1-41
Agency Contacts for Air Quality

Issue	Agency	Agencies Contacted
Permit issuance, enforcement	SCAQMD	Mohsen Nazemi South Coast Air Quality Management District 21865 Copley Drive Diamond Bar, CA 91765 (909) 396-2662

5.1.11 Permits and Permit Schedule

A PTC application has been submitted to SCAQMD as part of the CEC licensing process. The PTC includes permitting forms for the federal 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 as a federal delegate under the CAA after the final Commission Decision.

5.1.12 References

California Air Resources Board (ARB). 2006. *AB 32 Fact Sheet*. September.

California Air Resources Board (ARB). 2013a. *Summary of Ambient Air Quality Standards*. Available online at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed June 2013.

California Air Resources Board (ARB). 2013b. *State Area Designations*. Available online at: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed June 2013.

California Air Resources Board (ARB). 2013c. *Overview of Nitrogen Dioxide, Ozone, Sulfur Dioxide, Carbon Monoxide, and Particulate Matter*. Available online at: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm. Accessed August 2013.

California Air Resources Board (ARB). 2013d. iADAM: Air Quality Data Statistics – Top 4 Summary. Available online at: http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed June 2013.

California Air Resources Board (ARB). 2013e. EMFAC2011-PL – Handbook for Project Level Assessment. Available online at: http://www.arb.ca.gov/msei/modeling.htm. Accessed August 2013.

ENVIRON. 2013. *CalEEMod User's Guide*. October.

Federal Land Managers (FLM). 2010. *Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report (Revised 2010)*. November.

Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007, The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Available online at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4_wg1_full_report.pdf. Accessed August 2013.

South Coast Air Quality Management District (SCAQMD). 1993. *CEQA Air Quality Handbook*. November.

South Coast Air Quality Management District (SCAQMD). 2007. *CEQA Handbook, Table XI-A Mitigation Measure Examples: Fugitive Dust from Construction & Demolition*. April.

South Coast Air Quality Management District (SCAQMD). 2012. *AQMD Modeling Guidance for AERMOD*. Available online at: http://www.aqmd.gov/smog/metdata/AERMOD_ModelingGuidance.html. Accessed July 2012.

South Coast Air Quality Management District (SCAQMD). 2013. Historical Air Quality Data Tables by Year. Available online at: http://www.aqmd.gov/smog/historicaldata.htm. Accessed June 2013.

South Coast Air Quality Management District, Bay Area Air Quality Management District, Sacramento Metropolitan Air Quality Management District, San Joaquin Valley Air Pollution Control District, Santa Barbara County Air Pollution Control District, San Luis Obispo Air Pollution Control District (SCAQMD, et. al.). 2011. *Technical Paper: Methodology Reasoning and Policy Development of the California Emission Estimator Model*. July.

The Climate Registry (TCR). 2013. *General Reporting Protocol.* March.

U.S. Environmental Protection Agency (EPA). 1985. *Guideline for Determination of Good Engineering Practice Stack Height*. EPA-450/4-80-023R. June.

U.S. Environmental Protection Agency (EPA). 1992a. *Workbook for Plume Visual Impact Screening and Analysis*. EPA-454/R-92-023. October.

U.S. Environmental Protection Agency (EPA). 1992b. *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised*. EPA-454/R-92-019. October.

U.S. Environmental Protection Agency (EPA). 2005. *Guideline on Air Quality Models*, 40 CFR 51, Appendix W. November.

U.S. Environmental Protection Agency (EPA). 2006. *AP-42, Compilation of Air Pollutant Emission Factors*. Chapter 13. Volume 1. Fifth Edition.

U.S. Environmental Protection Agency (EPA). 2010. *EPA Guidance Concerning the Implementation of the 1-Hour NO_2 NAAQS for the PSD Program*. EPA Office of Air Quality Planning and Standards. June 29.

U.S. Environmental Protection Agency (EPA). 2011. *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard*. EPA Office of Air Quality Planning and Standards. March 1.

U.S. Environmental Protection Agency (EPA). 2013a. *The Green Book Nonattainment Areas for Criteria Pollutants*. Available online at: http://www.epa.gov/air/oaqps/greenbk/index.html. Accessed June 2013.

U.S. Environmental Protection Agency (EPA). 2013b. *AirData – Monitor Values Reports*. Available online at: http://www.epa.gov/airdata/ad_rep_mon.html. Accessed June 2013.

U.S. Environmental Protection Agency (EPA). 2013c. *Download Detailed AQS Data*. Available online at: http://www.epa.gov/ttn/airs/airsaqs/detaildata/downloadaqsdata.htm. Accessed August 2013.

Western Regional Climatic Center (WRCC). 2013. Historical Climate Data Summaries for the Long Beach WSCMO Station. Available online at: http://www.wrcc.dri.edu/Climsum.html. Accessed July 2013.

TABLE 5.1-40
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: Regulation XIII (NSR), Regulation XVII (PSD), and Rule 2005 (NSR for RECLAIM). The air quality analysis includes an assessment of the air quality impacts in accordance with Regulation XIII, Regulation 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. A federal PSD permit will be obtained for the AEC. 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: 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; or b. Any new or modified facility has onsite emission increases exceeding any of the daily maximums specified in subdivision (g) of this rule; or c. Any new or modified permit unit, source under Regulation XX, or equipment under Regulation XXX with increases in emissions of TACs, for which the Executive Officer has made a determination that a person may be exposed to a maximum individual cancer risk (MICR) greater than 1 in 1-million (1×10^{-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 (10×10^{-6}). The predicted total facility-wide MICR is less than 10 in 1-million. However, the AEC will be located 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 51, Section 51.161(b), and 40 CFR 124, Section 124.10.

TABLE 5.1-40
Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Assessment
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. Each CTG 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 CFR 75).
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. 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. The CEC Conditions of Certification 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 PM 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. The project will implement best available control measures as part of the Stormwater Pollution Prevention Plan to minimize fugitive dust emissions during construction and operation.
SCAQMD Rule 404	Establishes limits for PM emission concentrations.	SCAQMD	A person shall not discharge into the atmosphere from any source PM 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. Because the AEC will combust natural gas only, Rule 404 is not applicable.
SCAQMD Rule 405	Establishes limits for PM mass emission rates.	SCAQMD	Emission rate limits are based upon the process weight (fuel burned) per hour. Natural gas will be the only fuel fired in the natural gas turbines. Therefore, the project will comply with the Rule 405 PM emission limits.

TABLE 5.1-40

Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Assessment
SCAQMD Rule 407	Establishes limits for CO and oxides of sulfur (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. The CO emissions from the MPSA 501DA CTGs 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.
SCAQMD Rule 409	Establishes limits for PM emissions from fuel combustion sources.	SCAQMD	Rule 409 prohibits PM emissions in excess of 0.1 grain per cubic foot of gas at 12 percent CO_2 at standard conditions. Natural gas will be the only fuel fired in the natural gas turbines. Therefore, the project is expected to comply with the Rule 409 PM 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. 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.
SCAQMD Rule 475	Establishes limits for combustion contaminant (PM) emissions from subject equipment.	SCAQMD	Rule 475 prohibits PM emissions that exceed both 11 lb/hr (per emission unit) and 0.01 grain per dscf at 3 percent O_2. The MPSA 501DA CTG PM emission rate will be 4.5 lb/hr and less than 0.01 grain per 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. The MPSA 501DA CTG PM emission rate will be 4.5 lb/hr and less than 0.01 grain per dscf.
SCAQMD Rule 53	Establishes limits for emissions of sulfur compounds (SO_x) from stationary sources in Los Angeles 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 0.2 percent by volume calculated as SO_2. The use of low sulfur natural gas will result in SO_2 concentrations significantly less than 0.2 percent by volume.
SCAQMD Regulation IX (Permits – 40 CFR 60)	Establishes national standards of performance for new or modified facilities in specific source categories.	SCAQMD with EPA Region IX Oversight	See 40 CFR 60 (Table 5.1-38) to review applicability and the compliance assessment.

TABLE 5.1-40

Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Assessment
SCAQMD Regulation X (Permits – 40 CFR 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 40 CFR 63 (Table 5.1-38) 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.
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.
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.
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. 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_2, PM_{10}, $PM_{2.5}$, and GHG. The proposed BACT emission limits are presented in Section 5.1.8.2.1 (see Appendix 5.1D). A BACT analysis for NO_x was conducted as part of compliance with Rule 2005. 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. The AEC is exempt from modeling requirements per Rule 1304(a)(2) for those pollutants subject to Regulation XIII, but not Regulation XX.

TABLE 5.1-40
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), Cont.			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, 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. The AEC is exempt from offset requirements per Rule 1304(a)(2) with the exception of Regulation XX pollutants. 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 California Health & Safety Code Section 40410.5. The AEC is exempt from offset requirements per Rule 1304(a)(2) with the exception of Regulation XX pollutants. Rule 1303(b)(4) – Facility-wide Compliance: The project will comply with all applicable rules and regulations of the SCAQMD. 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. As a matter of law, the AEC is not required to consider offsite alternatives. Public Resources Code Section 25540.6(b) states: "The commission may also accept an application for a non-cogeneration project at an existing industrial site without requiring a discussion of site alternatives if the commission finds that the project has a strong relationship to the existing industrial site and that it is therefore reasonable not to analyze alternative sites for the project." The AEC has a strong relationship to the existing industrial site, as a power plant has been located on this site for nearly 60 years. Therefore, in enacting Public Resources Code section 25540.6 the Legislature determined that it is reasonable not to analyze offsite alternatives for projects with such a strong relationship to an existing industrial site. Although the Applicant is not required to consider offsite alternatives, the Applicant did consider alternative technologies. Alternative equipment technologies were rejected because of their environmental effects or their inability to meet the project objectives. Rule 1303(b)(5)(B) – Statewide Compliance: Demonstrate prior to the issuance of a PTC 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 CAA.

TABLE 5.1-40
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), Cont.			The Project Owner has certified in SCAQMD Form 400-A 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. 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 tpy of PM_{10} or 40 tpy of NO_x; and the location of the source, relative to the closest boundary of a specified federal Class I area, is within 28 km. 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. 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. Rule 1304.1 – Require the payment of fees to generate air quality improvements within the project area consistent with the SCAQMD's approved Air Quality Management Plan.
SCAQMD Rule 1325 – (Permits - Federal $PM_{2.5}$ NSR)	The purpose of this Rule is to provide for the review of new and modified sources and to provide mechanisms, including the use of lowest achievable emissions rate (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 PTE 100 tpy or more of $PM_{2.5}$ or its precursors), unless each of the following requirements is met: (A) LAER is employed for the new or relocated source or for the actual modification to an existing source; and (B) Emission increases shall be offset at a ratio of 1.1-to-1.0 for $PM_{2.5}$ and at the ratio required in Regulation XIII or Rule 2005 for NO_x and SO_2, as applicable; and (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 (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. AEC 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 AEC.

TABLE 5.1-40

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 NSR)	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	Best Available Control Technology for Toxics (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 (1×10^{-6}), a chronic hazard index greater than 1.0, or an acute hazard index greater than 1.0. The predicted MICR at the maximum exposed individual resident (MEIR) and maximum exposed individual worker (MEIW) cancer risks for an individual unit are 0.32 and 0.064 in 1-million, respectively. The predicted MICR at the maximum exposed individual resident (MEIR) and maximum exposed individual worker (MEIW) cancer risks for the project are 3.1 and 0.60 in 1-million, respectively. The maximum predicted chronic and acute hazard indices for the project are 0.0040 and 0.078, respectively. The individual unit values are less than the individual source thresholds of 1 in 1-million (1×10^{-6}). The project values are 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 Region IX Oversight	See 40 CFR 52 (Table 5.1-38) to review applicability and the compliance assessment.

TABLE 5.1-40
Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/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. A complete top-down BACT analysis was conducted for emissions of NO_x. The proposed BACT emission limits are presented in Section 5.1.8.2.1 (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. 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. An air quality dispersion analysis was conducted for NO_x using the AERMOD dispersion model. Rule 2005(b)(2) – Offsets: NO_x emission increases shall be offset using RTCs at a ratio of 1.0-to-1.0. The AEC will participate in the NO_x RECLAIM program and will secure the necessary offsets as outlined in Section 5.1.8.2.2. 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. The AEC is located in Zone 1. Therefore, the Project Owner will obtain RTCs from Zone 1 only. Rule 2005(g)(1) – Statewide Compliance: Demonstrate, prior to the issuance of a PTC, 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 CAA. The Project Owner has certified in SCAQMD Form 400-A 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. 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.

TABLE 5.1-40
Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Assessment
SCAQMD Reg XX (Permits – NO_x RECLAIM), Cont.			As a matter of law, the AEC is not required to consider offsite alternatives. Public Resources Code Section 25540.6(b) states: "The commission may also accept an application for a non-cogeneration project at an existing industrial site without requiring a discussion of site alternatives if the commission finds that the project has a strong relationship to the existing industrial site and that it is therefore reasonable not to analyze alternative sites for the project." The AEC has a strong relationship to the existing industrial site, as a power plant has been located on this site for nearly 60 years. Therefore, in enacting Public Resources Code section 25540.6 the Legislature determined that it is reasonable not to analyze offsite alternatives for projects with such a strong relationship to an existing industrial site. Although the Applicant is not required to consider offsite alternatives, the Applicant did consider alternative technologies. Alternative equipment technologies were rejected because of their environmental effects or their inability to meet the project objectives. 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 AFC. 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 tpy of NO_x; and the location of the source, relative to the closest boundary of a specified federal Class I area, is within 28 km. 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. Rule 2005(h) – Public Notice: The applicant shall provide public notice, if required, pursuant to Rule 212. The Project Owner will comply with the requirements for Public Notice outlined in Rule 212. Rule 2005(i) – Rule 1401 Compliance: All new or modified sources shall comply with the requirements of Rule 1401. The Project Owner will comply with the requirements of Rule 1401 as demonstrated in Section 5.9, Public Health. Rule 2005(j) – Compliance with State and Federal NSR: The project will comply with all applicable rules and regulations of the SCAQMD.
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 Region IX Oversight	See 40 CFR 70 (Table 5.1-38) to review applicability and the compliance assessment.

TABLE 5.1-40
Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Assessment
SCAQMD Rule 3008 – Title V Permits (PTE Limitations)	The purpose of this Rule is to exempt low-emitting facilities with actual emissions below a specific threshold from federal Title V permit requirements by limiting the facility's PTE.	SCAQMD	This Rule shall apply to any facility that would, if it did not comply with the limitations set forth in either paragraphs (d)(1) or (d)(2) of Rule 3008, have the PTE air contaminants equal to or in excess of the thresholds specified in Table 2, subdivision (b) of Rule 3001 – Applicability, or, for GHGs, 100,000 or more tpy of CO_2e. AEC will exceed the Title V thresholds listed in Rule 3001. As a result, AEC will submit an application to modify the existing Title V permit as part of the permitting process.
SCAQMD Reg XXXI (Permits – Acid Rain)	The purpose of this Rule is to incorporate by reference the provisions of 40 CFR 72 for purposes of implementing an acid rain program that meets the requirements of Title IV of the CAA.	SCAQMD with EPA Region IX Oversight	See 40 CFR 72 (Table 5.1-38) to review applicability and the compliance assessment.