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5.2 AIR QUALITY

5.2.1 Introduction

This section presents the methodology and results of an analysis performed to assess potential effects of airborne emissions from the construction and routine operation of the Watson Cogeneration Steam and Electric Reliability Project (Project). Section 5.2.1 presents the introduction, applicant information, and the basic South Coast Air Quality Management District (SCAQMD) rules applicable to the Project. Section 5.2.2 presents the Project description, both current and proposed. Section 5.2.3 presents data on the emissions of criteria and air toxic pollutants from the Project. Section 5.2.4 discusses the Best Available Control Technology (BACT) evaluation for the Project. Section 5.2.5 presents the air quality effect analysis for the Project. Section 5.2.6 presents applicable laws, ordinances, regulations, and standards (LORS). Section 5.2.6 presents agency contacts, and Section 5.2.6 presents permit requirements and schedules. Section 5.2.7 contains references cited or consulted in preparing this section.

Watson Cogeneration Company (Applicant) is proposing to construct and operate one new General Electric (GE) 7EA combustion turbine generator (CTG) with one duct fired heat recovery steam generator (HRSG) and two additional cells added to the existing cooling tower. The Project's primary objective is to provide additional process steam in response to the process steam demand at the BP Carson Refinery. The original design of the Watson facility allocated plot space for a new unit at a later date and included provisions to accommodate it. The additional unit is sized and designed to provide reliable base load operations with supplemental duct firing in the HRSG.

The Project will operate as a base loaded cogeneration unit and is proposed to be permitted for 8,760 hours of operation per year, with an expected facility capacity factor of greater than 95 percent. The expansion Project will consist of the following:

- Installation of a nominal 85 megawatt (MW) GE 7EA Dry Low NO_x (DLN) combustion turbine with inlet fogging.
- Installation of the HRSG producing up to approximately (~) 659 Klbs steam/hr and equipped with a duct burner with up to 447.9 MMBtu/hr (high heating value [HHV]) heat input at 36^oF.
- Installation of two additional cells to the existing seven cell wet cooling tower to provide cooling and heat rejection from the new power block process.
- Installation of all required auxiliary support systems.

The Project design will incorporate the air pollution emission controls designed to meet SCAQMD BACT determinations. These controls will include DLN combustors in the CTG to limit nitrogen oxide (NO_x) production, Selective Catalytic Reduction (SCR) with anhydrous ammonia for additional NO_x reduction in the HRSG, an oxidation catalyst to control carbon monoxide (CO) and volatile organic compounds (VOC) emissions. Fuels to be used will be pipeline specification natural gas, refinery gas, or a mix of pipeline specification natural gas and refinery gas**.** Low NO_x burners will be incorporated into the HRSG.

5.2.1.1 Regulatory Items Affecting Modification

Although a regulatory compliance analysis (LORS) is presented in Section 5.2.6, there are several SCAQMD regulations that directly affect the permitting and review process, such as the Determination of Compliance for the modification as follows:

- New Source Review (NSR) Regulation XIII Rule 1303(a) requires that BACT be applied to all new or modified sources which result in an emissions increase of any nonattainment air contaminant, any ozone depleting compound, or ammonia.
- Per Regulation XIII Rule 1303(b), provide all required emissions mitigations prior to the issuance of the permit to construct for the project.
- Provide an effect analysis per Regulation XIII Rule 1303(b).
- Per Regulation XIII Rule 1303(b), demonstrate prior to the issuance of the Permit to Construct (PTC) that all major stationary sources owned or operated by the Applicant, which are subject to emissions limitations, are either in compliance or on a schedule for compliance with all applicable emissions limitations under the Clean Air Act (CAA).
- The Applicant is proposing to accept a "capped" emissions rate for sub 10-micron particulate matter (PM_{10}) / sub 2.5-micron particulate matter ($PM_{2.5}$) on the existing four turbines/HRSGs plus the new turbine/HRSG, i.e., the final $PM_{10}/PM_{2.5}$ emissions rate for all five units subsequent to construction, will not exceed the current allowed emissions rate for the existing four units.

5.2.2 Project Description

5.2.2.1 Current Site and Facilities

The Project Site is a 2.5-acre brown field site located within the boundary of the existing Watson Cogeneration Facility, which is a 21.7-acre area within the 428-acre parcel further described as Assessors Parcel Number (APN) 7315-006-003, 1801 Sepulveda Boulevard, Carson, California, 90745 and is integral to BP's existing Carson Refinery (BP Refinery). The street address of the Project Site is located within the boundary of the existing Watson Cogeneration Facility at 22850 South Wilmington Avenue, Carson, California. Figure 3-1, Regional Map, depicts the Project Site and surrounding area. An existing warehouse/maintenance shop on a portion of the site will be removed as part of the Project. The Project Site is located approximately 0.7 mile south of the 405 Freeway, roughly bounded by Wilmington Avenue to the west, East Sepulveda Boulevard to the south, and South Alameda Street to the east. The site Universal Transverse Mercator (UTM) coordinates are as follows: 384725.7mE, 3742300mN, Zone 11 (NAD27).

The Project Site elevation is approximately 32 feet above mean sea level (MSL). Because the site is located within the existing refinery property boundary, the Project Site and surrounding areas are highly developed, and have been subject to disturbance for many years.

The Project's primary objective is to provide additional process steam in response to the refinery's process steam demand. The Project complements the existing cogeneration facility located within the confines of the refinery. The existing facility has four GE 7EA CTGs, four

HRSGs, and two steam turbine generators. The Project consists of adding a fifth CTG/HRSG to the existing configuration and is referred to as the "fifth train."

The Construction Laydown and Parking Area is a paved 25-acre parcel located approximately 1 mile southeast of the Project Site, at the northeast corner of East Sepulveda Boulevard and South Alameda Street. The area is owned by BP and is currently used as a truck parking and staging area.

No off-site improvements associated with the Project, such as water supply, natural gas or wastewater pipelines, are currently planned for the Project. The Project will connect to the existing supply pipelines currently located at the facility. Additionally, the Project will tie in to the existing Watson Cogeneration ammonia distribution system for use in the air pollution control system.

5.2.2.2 Project Equipment Specifications

The facility addition will consist of the following equipment.

- A single 85 MW GE 7EA combustion turbine.
- A single HRSG with duct burners capable of up to 447.9 MMBtu/hr HHV heat input.
- Two new cooling tower cells added to the existing seven-cell cooling tower.

The existing cooling tower cells as well as the new cells will be installed with drift eliminators in the 0.001 percent range. Thus, there will be a net reduction of emissions of 1.1 tons per year of particulate matter (PM).

All power from the facility that is not consumed by the refinery will be sold to the California power grid under the control of the California Independent System Operator (CAISO).

The equipment specifications for the new emissions sources are summarized in Table 5.2-1, Combustion Equipment Specification, as follows:

Table 5.2-1
Combustion Equipment Specifications

Parameter	Unfired	59 F/60 Percent RH Minimum Fired	Maximum Fired
Steam Production, lbs/hr	339,143	375,670	659,293
Net Facility Output, MW*	85.770	85.712	85.263
CTG Heat Input, mmbtu/hr (LHV)	925.9	925.9	925.9
Duct Burner Heat Input, mmBtu/hr (LHV)	0	41.0	383.6
Project Total Heat Input, mmBtu/hr (LHV)	925.9	966.9	1,309.5
Net Facility Heat Rate, Btu/kWh (LHV)	10,795	11,280	15,358

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
lbs/hr = pounds per hour
LHV = lower heating value
mmBtu = million British thermal units
MW = megawatt
RH = relative humidity
* Turbine output will vary from 74 MW (summer) to 94 MW (winter)

Specifically, the combustion turbine-HRSG/emission source will have the following characteristics.

Combustion Turbine

- Manufacturer: GE
- Model: 7EA
- Fuel: Primary-natural gas; Secondary-natural gas/refinery gas blend
- Heat Input: 1,062.1 mmbtu/hr (HHV) at 36^{o}F
- Fuel consumption: up to ~1,030,238 standard cubic feet per hour
- Exhaust flow: ~872,656 actual cubic feet per minute at Independent System Operator (ISO) Conditions
- Exhaust temperature: ~385 degrees Fahrenheit (°F) at the HRSG stack top exit

Heat Recovery Steam Generator

- Manufacturer: Not Selected
- Model: N/A
- Fuel: Primary-refinery gas; Secondary-natural gas
- Duct Burner Heat Input : up to 447.9 mmbtu/hr (HHV) at 36^{o}F
- Steam Production Rating: 659 Klbs/hr (maximum)
- Duct Burner Manufacturer: John Zink or equivalent

Cooling Tower Cells (additional cells on existing seven-cell tower)

- Manufacturer: Marley or equivalent
- Number of Cells: 2
- Number of Fans: 2 (~945,000 actual cubic feet per minute each)
- Water circulation rate: 9,300 gallons per minute per cell
- Drift rate: 0.001 percent (0.00001 fraction)
- Expected total dissolved solids (TDS): ~3,575 parts per million by weight (ppmw)

The fuel used on this project is similar to the fuels used on the existing cogeneration facility. Specifically, the fuel in the CTG will initially be based on firing pipeline quality natural gas or a blend of pipeline quality natural gas and low sulfur (approximately 40 parts per million by volume [ppmv]) total sulfur refinery gas. It is anticipated that the blending of refinery gas in the CTG will not exceed 35 by weight percent of the total mixed flow into the CTG, due to hydrogen limitations in the fuel requirements as specified by GE. The HRSG will be fueled with either 100 percent natural gas or 100 percent refinery gas with the refinery fuel not exceeding 40 ppmv

total sulfur. There are no proposed fuel mixture limitations on the HRSG. For the emission calculations presented in the application, the HRSG emissions were based upon a worst-case assumption of 100 percent refinery gas in order to maximize the total emissions while the combustion turbine emissions were based on the 35 by weight percent blend of refinery gas in the total mixed gas stream. The natural gas will meet the Public Utility Commission (PUC) grade specifications. The refinery gas sulfur will be limited to 40 ppm in order to meet the SCAQMD BACT limits. Table 5.2-2, Estimated Fuel Use Summary for the Project, presents a fuel use summary for the facility. Fuel use values are based on the maximum heat rating of each system, fuel specifications, and maximum operational scenario. Fuel analysis data for both natural gas and refinery gas is presented in Appendix I, Air Quality Data.

Table 5.2-2
Estimated Fuel Use Summary for the Project

System	Fuel	Per Hour, mmscf	Per Day, mmscf	Per Year, mmscf
Combustion Turbine	Natural gas	1.030238	24.777	9,043.65
Combustion Turbine	Natural gas and refinery gas	1.03995	24.959	9,109.96
HRSG-Duct Burner	Refinery gas	0.4475	10.739	3,919.83

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
Mmscf = million standard cubic feet
Scf = standard cubic feet
Based on 24 hours per day and 365 days per year
Turbine natural gas HHV = 1,028.05 btu/scf
Turbine refinery gas HHV = 998.95 btu/scf
Turbine blend gas HHV = 1,018.54 btu/scf (65% natural gas, 35% refinery gas by weight)
HRSG duct burner refinery gas HHV = 998.95 btu/scf
Turbine heat input HHV = 1,062.05 mmbtu/hr
HRSG heat input HHV = 447.94 mmbtu/hr
See Appendix I, Air Quality Data, for specific information.

5.2.2.3 Climate and Meteorology

The climate of the South Coast Air Basin (basin) is strongly influenced by the local terrain and geography. The basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean on the west, and relatively high mountains forming the north, south, and east perimeters. The climate is mild, tempered by cool sea breezes and is dominated by the semi-permanent high pressure of the eastern Pacific.

Across the 6,600-square-mile basin, there is little variation in the annual average temperature of 62°F. However, the eastern portion of the basin (generally described as the Inland Empire area), experiences greater variability in annual minimum and maximum temperatures as this area is farther from the coast and the moderating affect on climate from the ocean is weaker. All portions of the basin have recorded temperatures well above 100°F. January is usually the coldest month, while the months of July and August are usually the hottest.

The majority of the rainfall in the basin falls during the period from November through April. Annual rainfall values range from approximately 9 inches per year in Riverside, to 14 inches per year in downtown Los Angeles. Monthly and annual rainfall totals can vary considerably from

year to year. Cloud cover, in the form of fog or low stratus, is often caused by persistent low inversions and the cool coastal ocean water. Downtown Los Angeles experiences sunshine approximately 73 percent of the time during daylight hours, while the inland areas experience a slightly higher amount of sunshine, and the coastal areas a slightly lower value.

Although the basin is characterized by a semi-arid climate, the air near the surface can often have high relative humidity due to the presence of a shallow marine layer on most days. Except for infrequent periods of off-shore winds, the marine layer strongly influences the local climate. Periods of heavy fog are common, with "high fog" (low stratus clouds) a frequent and characteristic occurrence. The annual average relative humidity ranges from approximately 70 percent in the coastal areas to 57 percent in the inland parts of the basin.

The basin is characterized by light average wind speeds and poor ventilation. Wind speeds in the downtown Los Angeles area average 5.7 miles per hour (mph), with little seasonal variation. Coastal wind speeds typically average about 2 mph faster than the downtown wind speeds, with the inland areas showing wind speeds slightly slower than the downtown Los Angeles values. Summer wind speeds are typically higher than winter wind speeds. The re-circulating sea-breeze is the dominant wind pattern in the basin, characterized by a daytime on-shore flow and a nighttime land breeze. This pattern is broken by the occasional winter storm, or the strong northeasterly flows from the mountains and deserts north of the basin known as "Santa Ana winds." Annual and quarterly wind roses are presented in Appendix I, Air Quality Data.

Along the southern California coast, surface air temperatures are relatively cool. Coupled with warm, dry subsiding air from aloft, the potential for early morning inversions is high, i.e., approximately 87 percent of all days. The basin-wide average occurrence of inversions at ground level (surface) is 11 days per month, and varies from 2 days per month in June to 22 days per month in December. Upper air inversions, with bases at less than 2,500 feet above MSL occur approximately 22 days each month, while higher based inversions, up to 3,500 feet above MSL occur approximately 191 days per year.

Representative climatic data for the Project Area was derived from the Long Beach WSCMO Station (#045085, Period of Record 4-1-58 to present) located to the south of the Project Site. A summary of data from this site indicates the following:

- Average maximum daily temperature 74.2°F
- Average minimum daily temperature 54.8°F
- Highest mean maximum annual temperature 90.5°F
- Lowest mean minimum annual temperature 41.8°F
- Mean annual precipitation 12.94 inches

Air quality is determined primarily by the type and amount of pollutants emitted into the atmosphere, the nature of the emitting source, the topography of the air basin, and the local meteorological conditions. In the Project Area, inversions and light winds can result in conditions for pollutants to accumulate in the region.

Meteorological data supplied by the National Climatic Data Center (NCDC) for Long Beach Airport as representative of the site is presented in Appendix I, Air Quality Data. This data was

derived from the Automated Surface Observing System (ASOS) for the years 2002 through 2006.

5.2.3 Emissions Evaluation

5.2.3.1 Current Facility Emissions and Permit Limitations

The site currently accommodates the BP-Carson Refinery operations and the existing Watson facility. The Watson facility presently consists of four GE 7EA combustion turbines and four duct-fired HRSGs operating in combined cycle cogeneration mode. A seven cell mechanical draft cooling tower is operated in conjunction with the present steam turbines' operations. The Watson facility currently produces approximately 393 MW, as well as process steam to support the refinery process operations. Watson currently holds permits to operate (Facility Permit) issued by the SCAQMD. The refinery and cogeneration operations are designated as facility ID#131003 by the SCAQMD.

5.2.3.2 Facility Emissions

Installation and operation of the Project will result in a change in the emissions signature for the site and will be considered a major modification under the SCAQMD rules, but will not trigger the major modification thresholds for Prevention of Significant Deterioration. The Project is proposing a no net increase for PM. Criteria pollutant emissions from the new combustion turbine/HRSG and cooling tower cells are delineated in the following sections, while emissions of hazardous air pollutants are delineated in Section 5.16. Backup data for both the criteria and hazardous air pollutant emission calculations are provided in Appendix I, Air Quality Data.

The emissions calculations presented in the application represent the highest potential emissions based on either pipeline quality natural gas or refinery gas. For emissions of criteria pollutants, the mass emissions from the CTG are based on the higher of either firing a blend of natural gas and refinery gas with the amounts of refinery gas not exceeding 35 percent or 100 percent natural gas. The CTG Hazardous Air Pollutant (HAP) emission factors were based on the higher of a calculated weighted volumetric average of natural gas/refinery gas or 100 percent natural gas. For the HRSG, the criteria pollutant and HAP emissions are based on the higher of 100 percent refinery gas or 100 percent natural gas in the duct burners.

5.2.3.3 Normal Operations

Operation of the proposed process and equipment systems will result in emissions to the atmosphere of both criteria and toxic air pollutants. Criteria pollutant emissions will consist primarily of NO_x, CO, VOCs, sulfur oxides (SO_x), total suspended particulates (TSP), PM_{10}, and $PM_{2.5.}$ Air toxic pollutants will consist of a combination of toxic gases and toxic PM species. Table 5.2-3, Criteria and Toxic Pollutants Potentially Emitted from the Project, lists the pollutants that may potentially be emitted from the Project.

Table 5.2-3
Criteria and Toxic Pollutants Potentially Emitted from the Project

Criteria Pollutants	Toxic Pollutants (cont'd)
NO_x	Hexane (n-Hexane)
CO	Naphthalene Propylene
VOCs	Propylene Oxide
SO_x	Toluene
TSP	Xylene
$PM_{10}/PM_{2.5}$	Arsenic
Lead	Aluminum
	Cadmium
Toxic Pollutants	Chromium VI
Ammonia	Copper
PAHs	Iron
Acetaldehyde	Mercury
Acrolein	Manganese
Benzene	Nickel
1-3 Butadiene	Silver
Ethylbenzene	Zinc
Formaldehyde	

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2008.
Notes:
CO = carbon monoxide
NO_x = nitrogen oxide
PAH = polycyclic aromatic hydrocarbon
$PM_{2.5}$ = sub 2.5-micron particulate matter
PM_{10} = sub 10-micron particulate matter
SO_x = sulfur oxide
TSP = total suspended particulate
VOC = volatile organic compound

5.2.3.4 Criteria Pollutant Emissions

Tables 5.2-4, 5.2-5, 5.2-6, and 5.2-7 present data on the criteria pollutant emissions expected from the facility equipment and systems under normal operating scenarios. The maximum hourly emissions are based on either Case E-3 (36°F day with maximum duct firing) or are based on cold start maximum hourly emission rate. A cold start is defined as a three hour event with the turbine in BACT compliance during hour three. The worst case day is defined at two cold starts (initial cold start failure then a restart for a total of six hours) plus 18 hours of full load operation (Case E-3). The worst-case day for VOC, SO_2, and $PM_{10/2.5}$ is based on 24-hours of full load operation (Case E-3).

Table 5.2-4
Combustion Turbine/HRSG Emissions for the Project
(Steady State Operation-Controlled)

Pollutant	Emission Factor and Units	Max Hour Emissions (lbs)	Max Daily Emissions (lbs)	Max Annual Emissions (tons)
NO_x	2.0 ppmvd	11.94	286.6	39.9
CO	4.0 ppmvd	14.54	349.0	64.8
VOC	2.0 ppmvd	4.16	99.8	18.2
SOx	<=0.00285 lbs/mmBtu	6.84	164.2	29.9
$PM_{10/2.5}$	<=0.00661 lbs/mmBtu	10.0[1]	240.0	43.8
NH_3	5.0 ppmvd	11.05	265.2	48.4

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
CO = carbon monoxide
CTG = combustion turbine generator
lbs/hr = pounds per hour
lbs/mmBtu = pounds per million British thermal units
NH_3 = ammonia
NO_x = nitrogen oxide
$PM_{2.5}$ = sub 2.5-micron particulate matter
PM_{10} = sub 10-micron particulate matter
ppmvd = parts per million, volumetric dry (each of the values in this table has been corrected to 15% O_2)
SO_x = sulfur oxide
VOC = volatile organic compound
Case E-3, 36 ^oF/36% RH, maximum firing CTG and DB.
Non-startup or shutdown emissions for hourly and daily emissions. Annual emissions include startup/shutdown.
Cooling Tower PM_{10} equals 0.33 lb/hr, 7.92 lbs/day, and 1.45 tons per
Annual NH_3 emissions based on 11.05 lbs/hr.
[1] Net Project increase of particulate matter (TSP, $PM_{10/2.5}$) is zero and will be capped under existing limit of 1,244 lbs/day

Table 5.2-5
Combustion Turbine Startup and Shutdown Emissions

Parameter/Mode	Cold Startup	Warm Startup	Shutdown
NO_x, lbs/event	211.24	21.32	12.85
CO, lbs/event	300.65	58.72	57.60
VOC, lbs/event	9.95	2.61	4.11
PM_{10}, lbs/event	30.0	7.16	9.34
SO_x, lbs/event	20.52	3.18	5.95
Event Time, minutes (hours)	180 minutes (3 hours)	60 minutes (1 hour)	60 minutes (1 hour)
Number of Events/Year	4	12	16

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
CO = carbon monoxide
lbs = pounds
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
SO_x = sulfur dioxide
VOC = volatile organic compound
Turbine startups on natural gas only. During the three-hour cold start, BACT level emissions are expected during the transition from hour two to hour three. DLN combustors operational at 50 percent turbine load. Warm start event assumes 26 minutes at full load with maximum duct burner operation. Shutdown event assumes that turbine is operating at full load with maximum duct burner for 52 minutes prior to shutdown.

Table 5.2-6
Combustion Turbine/HRSG Emissions for the Project (Including Base Load, Cold and Warm Startup and Shutdown, Whichever is Greater)

Pollutant	Emission Factor	Max Hour Emissions (pounds)	Max Daily Emissions (pounds)	Max Annual Emissions (tons)
NO_x	N/A	175.0	637.40	39.9
CO	N/A	210.0	863.02	64.8
VOCs	N/A	4.20	99.84	18.2
SOx	N/A	6.84	164.16	29.95
$PM_{10/2.5}$	N/A	10.0[1]	240[1]	43.8[1]

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
CO = carbon monoxide
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
SO_x = sulfur oxide
VOCs = volatile organic compounds
See Appendix I, Air Quality Data, for detailed emissions and operational data.
Annual emissions assume 8,720 hours with duct firing plus four cold starts (12 hours), 12 warm starts (12 hour), and 16 shutdowns (16 hours) per year.
[1] Net Project increase of PM (TSP, $PM_{10/2.5}$) is zero and will be capped under existing limit of 1,244 lbs/day

Table 5.2-7
Cooling Tower Emissions for the Project (Two Cells)

Pollutant	TDS, mg/L	Max Hour Emissions (pounds)	Max Daily Emissions (pounds)	Max Annual Emissions (tons)
$PM_{10/2.5}$	3,575*	0.33	7.92	1.45

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2008.
Notes:
*The TDS presented in the Air Section is greater than the TDS presented in the Water Section in order to be conservative
Drift fraction = 0.001 percent
mg/L = milligrams per Liter
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
The existing cooling tower emissions (seven cells) will be reduced from 1.745 lb/hr down to 1.163 lb/hr through the introduction of 0.001 percent drift eliminators.
Emissions are from the new cooling tower cells only, assuming operational time of 24 hr/day and 8760 hr/year.

Table 5.2-8, Summary of Facility Emissions for the Project, presents a summary of the total proposed facility operational emissions.

Table 5.2-8
Summary of Facility Emissions for the Project

Pollutant	pounds/hour	pounds/day	tons/year
NO_x	11.94	637.40	39.9
CO	14.54	863.02	64.8
VOCs	4.16	99.84	18.2
SO_x	6.84	164.16	29.95
TSP	5.0[1]	120.0[1]	21.9[1]
$PM_{10}/_{2.5}$	10.0[1]	240.0[1]	43.8[1]
NH_3	11.05	265.2	48.4

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
CO = carbon monoxide
NH_3 = ammonia
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
SO_x = sulfur oxide
TSP = total suspended particulate
VOCs = volatile organic compounds
Including startup and shutdown emissions, and cooling tower PM_{10}.
* TSP filterable portion as referenced in appendix S of 40 CFR Part 51.
[1] Net project increase of PM (TSP, $PM_{10/2.5}$) is zero and will be capped under existing limit of 1,244 lbs/day.

Table 5.2-9, Emissions Comparison of the Current Facility to the Project (Tons/Year), compares the proposed potential to emit for the new Project to the inventoried actual emissions for the current facility.

Table 5.2-9
Emissions Comparison of the Current Facility to the Project (Tons/Year)

Pollutant	Refinery Site[1] Actuals	Project Increase, PTE	Total*
NO_x	713.4	39.9	753.3
CO	432.1	64.8	496.9
VOCs	580.1	18.2	598.3.00
SO_x	1221.3	29.95	1,2451.3
PM_{10}	308	45.2[2]	353.2
$PM_{2.5}$	289.9	45.2[2]	753.3

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009. CARB Emissions Inventory Database, 8/2008, Facility Detail Risk Selection, 2005 data.
Notes:
*Calculated emissions increases and decreases.
CO = carbon monoxide
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
SO_x = sulfur oxide
VOCs = volatile organic compounds
[1] Source: CARB Emissions Inventory Database, 8/2008, Facility Detail Risk Selection-2005 data.
[2] Actual $PM_{10/2.5}$ emissions will be capped under existing SCAQMD daily permit limit of 1,244 lbs/day. See Section 5.2.1.1.

A VOC service component listing for the natural gas and refinery gas fuel systems is presented in Appendix I-A. These components are similar to those listed in the current facility permit (#131003) as subject to Condition H23.3, which requires compliance with Rule 1173 and 40 CFR 60, subpart GGG. Fugitive VOC emissions from the refinery gas portions of the listing are insignificant.

Greenhouse Gas Emissions

Operational emissions of greenhouse gases (GHG) will be primarily from the combustion of fuels in the turbine/HRSG. Appendix I, Air Quality Data, contains the support data for the GHG emissions evaluation. Estimated carbon dioxide (CO_{2e}) emissions for the new portion of the Project are as follows:

- CO_{2e} = 629,000 – 682,000 tons/year (depending upon fuel firing options)

NSR/PSD Facility Status

Currently, the SCAQMD air basin is attainment/unclassified for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and CO, and is non-attainment for $PM_{10/2.5}$, and ozone. Based on the values in Tables 5.2-6, Combustion Turbine/HRSG Emissions for the Project (Including Base Load, Cold and Warm Startup and Shutdown, Whichever is Greater), and 5.2-7, Cooling Tower Emissions for the Project (two Cells), the new facility will be a major modification to an existing major stationary source per SCAQMD New Source Review (NSR) Regulation XIII for any criteria pollutant. Detailed emissions data on the facility are presented in Appendix I, Air Quality Data. Based upon the annual emission presented in Table 5.2-8, Summary of Facility Emissions for the Project, the facility will not trigger the Prevention of Significant Deterioration (PSD) program requirements for any attainment pollutant, including TSP. Therefore neither a PSD increment analysis protocol, nor a Class I effect assessment will be required (see Appendix I, Air Quality Data). The facility will be required to obtain offsets pursuant to the SCAQMD regulations. The proposed criteria pollutant mitigation strategy for the Project is discussed in Appendix I, Air Quality Data, and is summarized below.

- NO_x and SO_x mitigation, in the form of Regional Clean Air Initiatives Market (RECLAIM Trading Credits [RTCs]**)** will be achieved via the RECLAIM program.
- VOC mitigation will be achieved by obtaining sufficient purchased Emission Reduction Credits (ERCs) to fully satisfy the Regulation XIII offset requirements.
- $PM_{10}/PM_{2.5}$ mitigation will be achieved by accepting a cap on $PM_{10}/PM_{2.5}$ emissions for all five units equivalent to the present daily $PM_{10}/PM_{2.5}$ limits on the existing four units. The existing PM_{10} emissions limit is 1,244 lbs/day. The actual daily emissions of PM_{10} for all four existing units have been substantially under the daily permit limit of 1,244 lbs/day. Based on 2008 PM source test data, the daily emissions were 562 lbs/day. Thus, the potential addition of 240 lbs/day of $PM_{10/2.5}$ will still be well under the 1,244 lbs/day limit. Therefore, the Project is proposing a no net increase for TSP/ $PM_{10}/PM_{2.5}$.
- CO offsets are not required since the air basin is in attainment.

5.2.3.5 Hazardous Air Pollutants

See Section 5.16, Public Health, for a detailed discussion and quantification of HAP emissions from the Project and the results of the health risk assessment. See Appendix O, Public Health, for the public health analysis health risk assessment (HRA) support materials. Section 5.16, Public Health, also discusses the need for Risk Management Plans pursuant to 40 CFR 68 and the California Accidental Release Program regulations.

5.2.3.6 Construction

Construction-related emissions are based on the following:

- The Applicant leases the current Project Site. Construction of the new combustion turbine/HRSG facility and addition of the cooling tower cells is expected to result in the temporary disturbance of approximately 2.5 acres. A 25 acre Construction Laydown and Parking Area will also be used for materials storage and craft labor parking.
- Moderate site preparation will be required prior to construction of the turbine/HRSG, and cooling tower cells, building foundations, support structures, etc.
- Construction activity is expected to last for a total of 20 months (not including startup and commissioning).

Construction-related issues and emissions at the Project Site are consistent with issues and emissions encountered at any construction site. Compliance with the provisions of the following permits will generally result in minimal site emissions: (1) grading permit, (2) Stormwater Pollution Prevention Plan (SWPPP) requirements (construction site provisions), (3) use permit, (4) building permits, and (5) the SCAQMD Permit to Construct (PTC), which will require compliance with the provisions of all applicable fugitive dust rules that pertain to the site construction phase. An analysis of construction site emissions is presented in Appendix I, Air Quality Data. This analysis incorporates the following mitigation measures or control strategies:

- The Applicant will have an on-site construction mitigation manager who will be responsible for the implementation and compliance of the construction mitigation program. The documentation of the ongoing implementation and compliance with the proposed construction mitigations will be provided on a periodic basis.
- All unpaved roads and disturbed areas in the Project and Construction Laydown and Parking Area will be watered as frequently as necessary to control fugitive dust. The frequency of watering will be on a minimum schedule of every two hours during the daily construction activity period. Watering may be reduced or eliminated during periods of precipitation.
- On-site vehicle speeds will be limited to 5 mph on unpaved areas within the Project construction site.
- The construction site entrance will be posted with visible speed limit signs.
- All construction equipment vehicle tires will be inspected and cleaned as necessary to be free of dirt prior to leaving the construction site via paved roadways.
- Gravel ramps will be provided at the tire cleaning area.

- All unpaved exits from the construction site will be graveled or treated to reduce track-out to public roadways.
- All construction vehicles will enter the construction site through the treated entrance roadways, unless an alternative route has been provided.
- Construction areas adjacent to any paved roadway will be provided with sandbags or other similar measures as specified in the construction SWPPP to prevent runoff to roadways.
- All paved roads within the construction site will be cleaned on a periodic basis (or less during periods of precipitation), to prevent the accumulation of dirt and debris.
- The first 500 feet of any public roadway exiting the construction site will be cleaned on a periodic basis (or less during periods of precipitation), using wet sweepers or air-filtered dry vacuum sweepers, when construction activity occurs or on any day when dirt or runoff from the construction site is visible on the public roadways.
- Any soil storage piles and/or disturbed areas that remain inactive for longer than 10 days will be covered, or shall be treated with appropriate dust suppressant compounds.
- All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions will be covered, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to minimize fugitive dust emissions. A minimum freeboard height of 2 feet will be required on all bulk materials transport.
- Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) will be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition will remain in place until the soil is stabilized or permanently covered with vegetation.
- Disturbed areas, which are presently vegetated, will be re-vegetated as soon as practical.

To mitigate exhaust emissions from construction equipment, the Applicant is proposing the following:

- The Applicant will work with the general contractor to utilize to the extent feasible, Environmental Protection Agency (EPA)/Air Resources Board Tier II/Tier III engine compliant equipment for equipment over 100 horsepower.
- Ensure periodic maintenance and inspections per the manufacturers specifications.
- Reduce idling time through equipment and construction scheduling.
- Use California low sulfur diesel fuels (<=15 ppmw Sulfur).

Based on the temporary nature and the time frame for construction, the Applicant believes that these measures will reduce construction emissions and effects to levels that are less than significant. Use of these mitigation measures and control strategies will ensure that the site does not cause any violations of existing air quality standards as a result of construction-related activities. Appendix I, Air Quality Data, presents the evaluation of construction related emissions as well as data on the construction related ambient air quality effects.

Table 5.2-10, SCAQMD CEQA Significance Thresholds, presents data on the regional air quality significance thresholds currently being implemented by the SCAQMD. The specific

construction and operational thresholds were derived from the SCAQMD California Environmental Quality Act (CEQA) guidance.

Table 5.2-10
SCAQMD CEQA Significance Thresholds

Pollutant	Construction Thresholds	Operations Thresholds
NO_x	100 lbs/day	55 lbs/day
CO	550 lbs/day	550 lbs/day
VOCs	75 lbs/day	55 lbs/day
SO_x	150 lbs/day	150 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day

Source: SCAQMD CEQA Manual, LST Methodology, Attachment D, June 2003.
Notes:
CO = carbon monoxide
lbs = pounds
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
SO_x = sulfur oxide
VOC = volatile organic compound
Other Significance Thresholds:
NO_2 – Project is significant if it contributes to an exceedance of the 1 hour attainment standard of 0.25 ppm, or the annual standard of 0.053 ppm.
CO – Project is significant if it contributes to an exceedance of the 1 hour attainment standard of 20 ppm, or the 8 hour standard of 9 ppm.
Sulfate – 24 hour average – 1 ug/m3.
PM_{10} – 24 hour average for construction – 10.4 ug/m3
PM_{10} – 24 hour average for operation – 2.5 ug/m3 (source by source application)
PM_{10} – annual geo average – 1 ug/m3
PM_{10} – annual arithmetic mean – 20 ug/m3
TACs – MICR >= 10 in 1 million, HI >= 1 (Project incremental increase), HI >=3 (facility wide)

In addition to the local and regional significance criteria, the following general conformity analysis thresholds are as follows in accordance with Code of Federal Regulations (40 CFR Parts 6 and 51):

- NO_x – 25 tons per year
- VOCs – 25 tons per year
- CO – 100 tons per year
- SO_x – 100 tons per year
- PM_{10} – 70 tons per year
- $PM_{2.5}$ – no value available (use 100 tpy based on PM_{10} moderate NA area value)

Emissions from the construction phase are not estimated to exceed the conformity levels noted above. Emissions from the operational phase are subject to the SCAQMD NSR permitting provisions, and as such, are exempt from a conformity determination or analysis.

5.2.4 Best Available Control Technology Evaluation

5.2.4.1 Current Facility Control Technologies

Table 5.2-11, BACT Values for Combustion Turbine/HRSG, summarizes the control technologies currently proposed for use on the combustion turbine/HRSG.

Table 5.2-11
BACT Values for Combustion Turbine/HRSG

Pollutant	BACT Emissions Range[1]	Proposed BACT
NO_x	2.0 – 2.5 ppmvd	2.0 ppmvd
CO	4.0 – 6.0 ppmvd	4.0 ppmvd
VOCs	2.0 ppmvd	2.0 ppmvd
SO_x Natural Gas	1.0 gr S/100 scf (short term) 0.33 gr S/100 scf (long term)	0.75 gr S/100 scf (short term) 0.33 gr S/100 scf (long term)
SO_x Refinery Gas	<= 40 ppmvd S	40 ppmvd S
TSP, $PM_{10}/PM_{2.5}$	0.003 – 0.009 lbs/mmbtu	<= 0.0066 lbs/mmbtu

Source: CARB, SCAQMD, SDAPCD, SJVUAPCD, and BAAQMD BACT Guidelines. Watson Cogeneration Steam and Electric Reliability Project Team, 2009.

Notes:

CO = carbon monoxide
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
ppmvd = parts per million, volumetric dry
SO_x = sulfur oxide
TSP = total suspended particulates
VOCs = volatile organic compounds

[1] Data derived from CARB, SCAQMD, SDAPCD, SJVUAPCD, and BAAQMD.

5.2.4.2 Proposed Best Available Control Technology

Table 5.2-12, Proposed BACT for the Combustion Turbine/HRSG, presents the proposed BACT for the new combustion turbine/HRSG. The new combustion turbine/HRSG SCR will utilize the existing ammonia distribution system in place at the Watson Cogeneration Facility. No new ammonia tanks are proposed.

Table 5.2-12
Proposed BACT for the Combustion Turbine/HRSG

Pollutant	Proposed BACT Emissions Level	Proposed BACT System(s)	Meets Current BACT Requirements
NO_x	2.0 ppmvd	DLN (turbine) and low NOx burners (HRSG) with SCR	Yes
CO	4.0 ppmvd	Oxidation Catalyst for both turbine and HRSG	Yes
VOCs	2.0 ppmvd	Oxidation Catalyst for both turbine and HRSG	Yes
SO_x	0.75 gr S/100 scf (short term) 0.29 gr S/100 scf (long term)	Natural Gas	Yes
SO_x	40 ppmvd S	Refinery Gas	Yes
TSP, PM_{10}/ $PM_{2.5}$	<= 10.0 lbs/hr	Gaseous Fuels	Yes
NH_3	5.0 ppmvd	Reagent for SCR System	Yes

Source: CARB, SCAQMD, SDAPCD, SJVUAPCD, and BAAQMD BACT Guidelines. Watson Cogeneration Steam and Electric Reliability Project Team, 2008.

Notes:

CO = carbon monoxide
DLN = dry low NO_x
NH_3 = ammonia
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
ppm = parts per million
ppmvd = parts per million, volumetric dry
scf = standard cubic feet
SCR = selective catalytic reduction
SO_x = sulfur oxide
TSP = total suspended particulate
VOCs = volatile organic compounds

Cooling Tower BACT

SCAQMD Rule 219 exempts the cooling tower from the permit process and is therefore not subject to the BACT requirements of Regulation 13. BACT is referenced here for the CEC. BACT for the new cooling tower cells will be high efficiency drift eliminators rated at 0.00001 drift fraction (0.001 percent). Currently, there are no drift eliminators with 0.0005 percent penetration for use with nitrified water. Thus, this level of BACT is based on the use of nitrified water in the cooling tower which results in a BACT level which is slightly less stringent than typically applied to such towers, i.e., 0.0005 percent.

Based on the above data, the proposed emissions levels for the new combustion turbine/HRSG satisfy the BACT requirements of the SCAQMD under Regulation 13. The proposed emission levels for the cooling tower cells are expected to meet the BACT requirements of the CEC.

5.2.5 Air Quality Impact Analysis

This section describes the results, in both magnitude and spatial extent of ground level concentrations resulting from emissions from the Project. The maximum modeled concentrations were added to the maximum background concentrations to calculate a total effect.

Potential air quality effects were evaluated based on air quality dispersion modeling, as described herein and presented in a modeling protocol previously submitted and approved by the SCAQMD and the CEC. A copy of the modeling protocol is included in Appendix I, Air Quality Data. All input and output modeling files are contained on a CD-ROM disk provided to the SCAQMD and CEC Staff under separate cover. All modeling analyses were performed using the techniques and methods as discussed with the SCAQMD and CEC through development of a modeling protocol.

5.2.5.1 Dispersion Modeling

For modeling the potential effect of the Project in terrain that is both below and above stack top (defined as simple terrain when the terrain is below stack top and complex terrain when it is above stack top) the United States Environmental Protection Agency (USEPA) guideline model AERMOD (version 07026) was used as well as the latest versions of the AERMOD preprocessors to determine surface characteristics (AERSURFACE version 08009), to process meteorological data (AERMET version 06341), and to determine receptor slope factors (AERMAP version 06341). The purpose of the AERMOD modeling analysis was to evaluate compliance with the California and federal air quality standards.

The nearest representative National Weather Bureau Army Navy sites (WBAN) in the general area of the Project is the Long Beach Daugherty Field site. This WBAN site has used an ASOS since September 1996 to measure surface meteorological data that can be readily converted to a site dispersion database that is directly used by atmospheric dispersion models. The ASOS data were downloaded from the NCDC website in CD-3505 format, and then converted to SAMSON format using the Russ Lee freeware program NCDC_CNV. The most recent five years of meteorological data (2001-2006) collected from this ASOS site, which is located approximately 9 kilometers east of the Project, and which satisfies the definition of on-site data was used in the analysis. The data was pre-processed for direct use by the AERMET (version 06341) preprocessor model. Upper air data for the same time period was taken from the closest representative National Weather Service radiosonde station that, when combined with the proposed surface dataset, met the USEPA required data recovery rates of 90 percent. This radiosonde station is Miramar Naval Air Station north of San Diego. As part of the AERMET input requirements, Albedo, Bowen Ratio, and Surface Roughness must be classified by season. These values were determined with the AERSURFACE using the latest USEPA guidance (i.e., *AERMOD Implementation Guide*, revised January 9, 2008, and the *AERSURFACE User's Guide* [EPA-454/B-08-001]) as described later.

Any missing data was substituted as per USEPA recommended procedures, as discussed in the USEPA memorandum (Lee and Atkinson 1992). Periods with more than one consecutive

missing hour of wind speed or wind direction were set to calm/missing to ensure that worst case predicted effects were resulting from actual rather than interpolated meteorological conditions.

AERMOD input data options are listed below. Use of these options follows the USEPA's modeling guidance. Default model option[1] for temperature gradients, wind profile exponents, and calm processing, which includes final plume rise, stack-tip downwash, and elevated receptor terrain heights option, and all sources were modeled as urban sources.

5.2.5.2 Model Selection

Several other USEPA models and programs were used to quantify pollutant effects on the surrounding environment based on the emission sources operating parameters and their locations. The models used were Building Profile Input Program for PRIME (BPIP-PRIME, current version 04274), the HARP On-Ramp preprocessor, and the SCREEN3 (version 96043) dispersion model for fumigation effects. These models, along with options for their use and how they are used, are discussed below.

- Comparison of effects to significant effect levels.
- Compliance with state and federal ambient air quality standards (AAQS).
- Calculation of health risk effects through the use of the HARP On-Ramp program.

5.2.5.3 Good Engineering Practice Stack Height Analysis

Good engineering practice (GEP) stack height was calculated at 125 feet based on existing on-site and off-site structure dimensions. The design stack height of 100 feet does not exceed GEP stack height, thus downwash effects were included in the modeling analysis.

BPIP-PRIME was used to generate the wind-direction-specific building dimensions for input into AERMOD. All on-site and the nearby refinery structures were included for analysis with BPIP-PRIME. The building location plan, located in Appendix I, Air Quality Data, shows the buildings included in the downwash analysis.

5.2.5.4 Receptor Grid Selection and Coverage

Receptor and source base elevations were determined from the U.S. Geological Survey (USGS) Digital Elevation Model (DEM) data using 10-meter spacing between grid nodes. All coordinates were referenced to UTM North American Datum 1927 (NAD27), Zone 11. The receptor locations and elevations from the DEM files will be placed exactly on the DEM nodes. Every effort was made to maintain receptor spacing across DEM file boundaries.

Cartesian coordinate receptor grids are used to provide adequate spatial coverage surrounding the Project Area for assessing ground-level pollution concentrations, to identify the extent of significant effects, and to identify maximum effects locations. The receptor grids used in this analysis are listed below.

[1]To reduce run times for the area source modeled for fugitive dust and the large number of point sources modeled for mobile combustion source equipment, the TOXICS keyword was used for modeling construction effects.

- 10-meter resolution from the Project fenceline and extending outwards in all directions 500-meters. This is called the downwash grid. In addition, receptors were placed at 10-meter intervals or less along the Project fenceline.
- 50-meter resolution that extends outwards from the edge of the downwash grid to 2 kilometers in all directions. This is referred to as the intermediate grid.
- 200-meter resolution that extends outwards from the edge of the intermediate grid to 10 kilometers in all directions in receptor areas inside the contiguous United States (receptor elevations are not available in USGS datasets for areas inside Mexico, which are 6 kilometers or more from the Project Site). This is referred to as the coarse grid.
- 10-meter resolution around any location on the coarse and intermediate grids where a maximum effect is modeled that is above the concentrations on the downwash grid. In the modeling analyses, all overall maximum effects occurred in the downwash receptor grid, so no refined receptor grids were required.
- For the HARP On-Ramp program, the minimum receptor spacing was changed to 100 meter resolution due to the limitation of the number of receptors the On-Ramp program can use.

Concentrations within the facility fence-line will not be calculated. The coarse and fine receptor grid figure, located in Appendix I, Air Quality Data, displays the receptors grids used in the modeling assessment. A facility boundary figure is also presented in Appendix I, Air Quality Data.

5.2.5.5 Meteorological Data Selection

The use of the five years of recent ASOS meteorological data collected at the Long Beach Airport (Daugherty Field) location is believed to satisfy the definition of on-site data. USEPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant effect on air quality. Specifically, the meteorological data requirement originates from the CAA in Section 165(e)(1), which requires an analysis "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility." This requirement and USEPA's guidance on the use of on-site monitoring data are also outlined in the On-Site Meteorological Program Guidance for Regulatory Modeling Applications (US EPA, 1987). The representativeness of meteorological data is dependent upon: (a) the proximity of the meteorological monitoring site to the area under consideration; (b) the complexity of the topography of the area; (c) the exposure of the meteorological sensors; and (d) the period of time during which the data are collected.

First, the meteorological monitoring site and Project location are in close proximity, at approximately the same elevation, and with roughly the same topography. The meteorological monitoring data are measured by ASOS equipment about 9 kilometers to the east of the Project Site. Second, the meteorological monitoring site and Project location are located roughly about the same distance and in the same orientation to significant terrain features that might influence wind flow patterns. In addition, there are no nearby (localized) significant terrain features between or surrounding the Project Site and the meteorological monitoring site that would limit the use of the meteorological monitoring data for the Project. Third, surface characteristics such

as surface roughness, Bowen ratio, and albedo are relatively consistent throughout the area. Fourth and finally, five years of recent meteorological data will be used in the modeling analyses that will be representative of conditions at the start of the Project operations.

Representativeness is defined in the document "Workshop on the Representativeness of Meteorological Observations" (Nappo et. al. 1982) as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application." Judgments of representativeness should be made only when sites are climatologically similar, as is the case with the meteorological monitoring site and the Project location. The following considerations were addressed in determining the representativeness of the meteorological data set for use in the dispersion models at the Project Site.

- The aspect ratio of significant terrain feature, (which is the ratio of height to width of hill at base) are similar for the meteorological dataset and the Project location since both are located at about the same elevation and at about the same orientation to the same major terrain features.
- The slope of terrain is roughly the same for the Project Site and the meteorological dataset (i.e., the distance to and height and length scales of large-scale terrain features that play a large role in the affect on the horizontal and vertical wind patterns are about the same for both locations).
- The ratio of terrain height to stack/plume height at the final plume height would be consistent at the two locations (i.e., the effects of terrain on the plume would disperse pollutants in an identical manner to the dispersion conditions monitored by the meteorological dataset).
- The correlation of terrain features to prevailing meteorological conditions, as discussed earlier, would be nearly identical to both locations since the orientation and aspect of terrain at the Project location correlates well with the prevailing wind fields as measured by and contained in the meteorological dataset. In other words, the same meso-scale and localized geographic and topographic features that influence wind flow patterns at the meteorological monitoring site also influence the wind flow patterns at the Project Site.

For these reasons and also as discussed above, the meteorological data selected for the Project are expected to satisfy the definition of representative meteorological data. Thus, it is our assessment that the meteorological data collected at the Long Beach Airport are identical to the dispersion conditions at the Project Site and to the regional area. A graphical wind rose for a recent five-year period is attached. Five-year quarterly wind roses for the modeling data set will be provided in the application.

Surface Characteristics: As part of the AERMET input requirements, Albedo, Bowen Ratio, and Surface Roughness must be classified for the area around the meteorological monitoring site (as noted above, these surface characteristics are relatively consistent throughout the area, including the locations of the meteorological monitoring site and Project Site). The AERSURFACE program (version 08009) was used to generate the surface characteristics for use in AERMET as specified in EPA's January 2008 AERMOD Guidance Document and AERSURFACE User's Guide using default settings where appropriate. AERSURFACE was executed for four sectors, as shown on an attached figure, to define surface roughness four areas

around the Long Beach ASOS meteorological station. Other AERSURFACE inputs/outputs are listed below in Table 5.2-13, AERSURFACE Inputs/Outputs for Use in AERMET.

Table 5.2-13
AERSURFACE Inputs/Outputs for Use in AERMET

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Seasonal Assumptions[1] for Surface Roughness (meters) and Albedo:												
Season	Fall	Fall	Fall	Spring	Spring	Spring	Summer	Summer	Summer	Fall	Fall	Fall
Arid	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Airport	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Surface Roughness (meters) for Sectors 1 (15º-60º) / 2 (60º-135º) / 3 (135º-280º) / 4 (280º-15º):												
Sector 1	0.132	0.132	0.132	0.124	0.124	0.124	0.133	0.133	0.133	0.132	0.132	0.132
Sector 2	0.122	0.122	0.122	0.107	0.107	0.107	0.125	0.125	0.125	0.122	0.122	0.122
Sector 3	0.164	0.164	0.164	0.144	0.144	0.144	0.164	0.164	0.164	0.164	0.164	0.164
Sector 4	0.127	0.127	0.127	0.110	0.110	0.110	0.127	0.127	0.127	0.127	0.127	0.127
Albedo	0.18	0.18	0.18	0.17	0.17	0.17	0.18	0.18	0.18	0.18	0.18	0.18
Bowen Ratio based on the following surface moisture contents:[2]												
2002	Dry	Dry	Dry	Avg	Avg	Avg	Avg	Avg	Avg	Dry	Avg	Avg
2003	Dry	Avg	Avg	Avg	Wet	Wet	Wet	Avg	Avg	Avg	Avg	Avg
2004	Dry	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Wet	Avg	Wet
2005	Wet	Wet	Avg	Wet	Avg	Avg	Avg	Avg	Wet	Wet	Dry	Avg
2006	Dry	Avg	Avg	Wet	Wet	Avg	Wet	Wet	Avg	Avg	Dry	Avg
Bowen Ratio by Year/Month:												
2002	2.94	2.94	2.94	1.09	1.09	1.09	1.14	1.14	1.14	2.94	1.36	1.36
2003	2.94	1.36	1.36	1.09	0.70	0.70	0.74	1.14	1.14	1.36	1.36	1.36
2004	2.94	1.36	1.36	1.09	1.09	1.09	1.14	1.14	1.14	0.79	1.36	0.79
2005	0.79	0.79	1.36	0.70	1.09	1.09	1.14	1.14	0.74	0.79	2.94	1.36
2006	2.94	1.36	1.36	0.70	0.70	1.09	0.74	0.74	1.14	1.36	2.94	1.36

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2008.

Notes:

[1]Assignment of seasons for each month based on USEPA modeling analyses for the Los Angeles area in the 2008 Draft Criteria Document for NO_2 (*"Risk and Exposure Assessment to Support the Review of the NO_2 Primary National Ambient Air Quality Standard: First Draft,"* EPA-452/P-08-001, April 2008).

[2]Dry/Average/Wet designate total monthly rainfall amounts for the year and month shown that fall into the lower 30th percentiles / middle 40th percentiles / upper 30th percentiles for a standardized 30-year climatological period (in this case, 1971-2000) for the Long Beach Airport.

The area surrounding the Project Site, within 3 kilometers, can be characterized as urban in accordance with the Auer land use classification methodology (USEPA's "*Guideline on Air Quality Models*"), with mostly commercial/industrial and compact residential areas surrounding the Project Site. Therefore, in the modeling analyses supporting the permitting of the facility, all emissions were modeled as urban sources with the ARMOD urban option set to a population of 200,000, based upon the affected geographic area.

5.2.5.6 Background Air Quality

In 1970, the United States Congress instructed the USEPA to establish standards for air pollutants, which were of nationwide concern. This directive resulted from the concern of the effects of air pollutants on the health and welfare of the public. The resulting Clean Air Act (CAA) set forth air quality standards to protect the health and welfare of the public. Two levels of standards were promulgated—primary standards and secondary standards. Primary national ambient air quality standards (NAAQS) are "those which, in the judgment of the administrator [of the USEPA], based on air quality criteria and allowing an adequate margin of safety, are requisite to protect the public health (state of general health of community or population)." The secondary NAAQS are "those which in the judgment of the administrator [of the USEPA], based on air quality criteria, are requisite to protect the public welfare and ecosystems associated with the presence of air pollutants in the ambient air." To date, NAAQS have been established for seven criteria pollutants as follows: SO_2, CO, ozone, NO_2, PM_{10}, $PM_{2.5}$, and lead.

The criteria pollutants are those that have been demonstrated historically to be widespread and have a potential to cause adverse health effects. USEPA developed comprehensive documents detailing the basis of, or criteria for, the standards that limit the ambient concentrations of these pollutants. The State of California has also established AAQS that further limit the allowable concentrations of certain criteria pollutants. Review of the established air quality standards is undertaken by both USEPA and the State of California on a periodic basis. As a result of the periodic reviews, the standards have been updated and amended over the years following adoption.

Each federal or state AAQS is comprised of two basic elements: (1) a numerical limit expressed as an allowable concentration, and (2) an averaging time which specifies the period over which the concentration value is to be measured. Table 5.2-14, State and Federal Ambient Air Quality Standards, presents the current federal and state AAQS.

Table 5.2-14
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards Concentration	National Standards Concentration
Ozone	1-hour	0.09 ppm (180 µg/m^3)	-
	8-hour	0.07 ppm (137 µg/m^3)	0.075 ppm (157 µg/m^3) (3-year average of annual 4th-highest daily maximum)
Carbon Monoxide	8-hour	9.0 ppm (10,000 µg/m^3)	9 ppm (10,000 µg/m^3)
	1-hour	20 ppm (23,000 µg/m^3)	35 ppm (40,000 µg/m^3)
Nitrogen dioxide	Annual Average	0.03 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
	1-hour	0.18 ppm (339 µg/m^3)	-
Sulfur dioxide	Annual Average	-	0.03 ppm (80 µg/m^3)
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
	3-hour	-	0.5 ppm (1,300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	-
Respirable particulate matter (10 micron)	24-hour	50 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	-
Fine particulate matter	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3 (3-year average)

Table 5.2-14
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards Concentration	National Standards Concentration
(2.5 micron)	24-hour	-	35 µg/m^3 (3-year average of 98th percentiles)
Sulfates	24-hour	25 µg/m^3	-
Lead	30-day	1.5 µg/m^3	-
	3 Month Rolling Average	-	0.15 µg/m^3

Source: CARB website, table updated 2/22/07

Notes:
µg/m^3 = micrograms per cubic meter
ppm = parts per million

Brief descriptions of health effects for the main criteria pollutants are as follows.

Ozone—Ozone is a reactive pollutant that is not emitted directly into the atmosphere, but rather is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving precursor organic compounds (POC) and NO_x. POC and NO_x are therefore known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of POC and NO_x under the influence of wind and sunlight. Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. In addition to causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide—CO is a non-reactive pollutant that is a product of incomplete combustion. Ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic and are also influenced by meteorological factors such as wind speed and atmospheric mixing. Under inversion conditions, CO concentrations may be distributed more uniformly over an area out to some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses.

Particulate Matter (PM_{10} and $PM_{2.5}$)—PM_{10} consists of particulate matter that is 10 microns or less in diameter (a micron is 1 millionth of a meter), and fine particulate matter, $PM_{2.5}$, consists of particulate matter 2.5 microns or less in diameter. Both PM_{10} and $PM_{2.5}$ represent fractions of particulate matter, which can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, contribute to increases in local PM_{10} concentrations, while others, such as vehicular traffic, affect regional PM_{10} concentrations.

Several studies that the USEPA relied on for its staff report have shown an association between exposure to particulate matter, both PM_{10} and $PM_{2.5}$, and respiratory ailments or cardiovascular

disease. Other studies have related particulate matter to increases in asthma attacks. In general, these studies have shown that short-term and long-term exposure to particulate matter can cause acute and chronic health effects. $PM_{2.5}$, which can penetrate deep into the lungs, causes more serious respiratory ailments. These studies, along with information provided by the USEPA in the 1996 staff report, were used as the basis for evaluating the effects of the facility emissions of PM_{10} and $PM_{2.5}$ on public health.

Nitrogen Dioxide and Sulfur Dioxide—NO_2 and SO_2 are two gaseous compounds within a larger group of compounds, NO_x and SO_x, respectively, which are products of the combustion of fuel. NO_x and SO_x emission sources can elevate local NO_2 and SO_2 concentrations, and both are regional precursor compounds to particulate matter. As described above, NO_x is also an ozone precursor compound and can affect regional visibility. (NO_2 is the "whiskey brown-colored" gas readily visible during periods of heavy air pollution.) Elevated concentrations of these compounds are associated with increased risk of acute and chronic respiratory disease.

SO_2 and NO_2 emissions can be oxidized in the atmosphere to eventually form sulfates and nitrates, which contribute to acid rain. Large power facilities with high emissions of these substances from the use of coal or oil are subject to emissions reductions under the Phase I Acid Rain Program of Title IV of the 1990 CAA Amendments. Power facilities, with individual equipment capacity of 25 MW or greater that use natural gas or other fuels with low sulfur content, are subject to the Phase II Program of Title IV. The Phase II program requires facilities to install Continuous Emission Monitoring Systems (CEMS) in accordance with 40 CFR Part 75 and report annual emissions of SO_x and NO_x. Currently, the acid rain program provisions do not apply to the existing facility but will apply to the Project. The Project will participate in the Acid Rain allowance program through the purchase of SO_2 allowances. Sufficient quantities of SO_2 allowances are available for use on this Project.

Lead—Gasoline-powered automobile engines used to be the major source of airborne lead in urban areas. Excessive exposure to lead concentrations can result in gastrointestinal disturbances, anemia, and kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. The use of lead additives in motor vehicle fuel has been eliminated in California and lead concentrations have declined substantially as a result.

The nearest criteria pollutant air quality monitoring sites to the Project Site would be the stations located at North Long Beach, South Long Beach, and Lynwood. Ambient monitoring data for these sites for the most recent three-year period is summarized in Table 5.2-16, Summary of Air Quality Monitoring Data for the Most Recent 3 Year Period. Data from these sites is estimated to present a reasonable representation of background air quality for the Project Site and effect area.

Table 5.2-15, SCAQMD Attainment Status Table, presents the SCAQMD attainment status.

Table 5.2-15
SCAQMD Attainment Status

Pollutant	Averaging Time	Federal Status	State Status
Ozone	8-hr	Severe NA	Extreme NA
NO_2	All	UNC/ATT	UNC/ATT
CO	All	ATT	ATT
SO_2	All	ATT	ATT
PM_{10}	All	Serious NA	NA
$PM_{2.5}$	All	NA	NA

Source: SCAQMD Website, 2008.
Notes:
ATT = attainment
CO = carbon monoxide
NA = non-attainment
NO_2 = nitrogen dioxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
SO_2 = sulfur dioxide
UNC = unclassified

Table 5.2-16
Summary of Air Quality Monitoring Data for Most Recent 3 Year Period

Pollutant	Site	Avg. Time	2005	2006	2007
Ozone, ppm	N. Long Beach	1 Hr Max	.091	.081	.099
	Lynwood		.111	.088	.102
	N. Long Beach	8 Hr Max	.068	.058	.073
	Lynwood		.081	.066	.077
PM_{10}, ug/m^3	N. Long Beach	24 Hr Max	66	78	75
	S. Long Beach		131	117	123
	N. Long Beach	Annual AM	29.6	31.1	30.2
	S. Long Beach		43.4	45.0	41.7
$PM_{2.5}$, ug/m^3	N. Long Beach	24 Hr 98^{th} Percentile	41.4	34.9	40.8
	S. Long Beach		37.8	35.3	33.7
	Lynwood		48.5	44.5	46.1
	N. Long Beach	Annual AM	16.0	14.2	14.6
	S. Long Beach		14.7	14.5	13.7
	Lynwood		17.5	16.7	15.9
CO, ppm	N. Long Beach	1 Hr Max	4.2	4.2	3.3
	Lynwood		7.4	8.4	7.8
	N. Long Beach	8 Hr Max	3.5	3.4	2.6
	Lynwood		5.9	6.4	5.1
NO_2, ppm	N. Long Beach	1 Hr Max	.14	.10	.11
	Lynwood		.11	.14	.10
	N. Long Beach	Annual AM	.0241	.0215	.0207
	Lynwood		.0312	.0306	.0291

Table 5.2-16
Summary of Air Quality Monitoring Data for Most Recent 3 Year Period

Pollutant	Site	Avg. Time	2005	2006	2007
SO_2, ppm	N. Long Beach	1 Hr Max	.041	.027	.037
	N. Long Beach	3 Hr Max	.033	.023	.028
	N. Long Beach	24 Hr Max	.010	.010	.011
	N. Long Beach	Annual AM	.002	.0012	.0027
Sulfate, ug/m^3	N. Long Beach	24 Hr Max	16.8	17.8	11.1
	S. Long Beach		ND	18.8	11.7
	Lynwood		17.3	24.1	12.5

Source: SCAQMD website, Air Quality Monitoring Summaries for 2005, 2006, 2007. EPA AIRS Data System, EPA Website, 2008.

Note:

CO = carbon monoxide
NO_2 = nitrogen dioxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
ppm = parts per million
SO_2 = sulfur dioxide

Background values are taken primarily from the SCAQMD Annual Air Quality Data Tables accessible from http://www.aqmd.gov/smog/historicaldata.htm except 1-hr SO_2, 3-hr SO_2, and 2005 annual SO_2 and additional significant digits for 1-hr CO and 2006 1-hr ozone taken from USEPA at http://www.epa.gov/air/data/reports.html

Table 5.2-17, Background Air Quality Values, shows the background air quality values based upon the data presented in Table 5.2-16, Summary of Air Quality Monitoring Data for the Most Recent 3 Year Period. The background values represent the highest values reported for any site during any single year of the most recent three-year period. Appendix I, Air Quality Data, presents the background air quality data summaries.

Table 5.2-17
Background Air Quality Values

Pollutant and Averaging Time	Background Value, µg/m^3
Ozone – 1-hr	217
Ozone – 8-hr	159
PM_{10} – 24-hr	131
PM_{10} – Annual	45.0
$PM_{2.5}$ – 24-hr	48.5
$PM_{2.5}$ – Annual	17.5
CO – 1-hr	9600
CO – 8-hr	7315
NO_2 – 1-hr	264
NO_2 – Annual	58.9
SO_2 – 1-hr	107
SO_2 – 3-hr	86
SO_2 – 24-hr	28.6

Table 5.2-17
Background Air Quality Values

Pollutant and Averaging Time	Background Value, µg/m^3
SO_2 – Annual	7.0
Sulfate, 24 -hr	24.1

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2008.
Notes:
µg/m^3 = micrograms per cubic meter
CO = carbon monoxide
NO_2 = nitrogen dioxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
SO_2 = sulfur dioxide
Conversion factors used for conversion from ppm units for gaseous pollutants in the previous table were based on the AAQSs as follows:
Ozone: 1958 ug/m^3 per ppm (235 ug/m^3 / 0.12 ppm)
CO: 1143 ug/m^3 per ppm (40,000 ug/m^3 / 35 ppm)
NO_2: 1887 ug/m^3 per ppm (100 ug/m^3 / 0.053 ppm)
SO_2: 2600 ug/m^3 per ppm (1300 ug/m^3 / 0.5 ppm)

Effects on Class II Areas

Operational characteristics of the combustion turbine, such as emission rate, exit velocity, and exit temperature vary by operating load and ambient temperature. The Project will be operated over a variety of these temperature ranges. Thus, the air quality analysis considered the range of operational characteristics over a variety of ambient temperatures. The screening modeling analysis, using AERMOD and five years of hourly meteorology (year 2002-2006) was performed for the load conditions with no duct firing, minimal duct firing, and maximum duct firing in the HRSG in order to determine the combustion turbine operating condition that will result in the highest modeled concentrations for averaging periods of 24 hours or less. These conditions were considered for four ambient temperature conditions: 36°F (a cold day), 59°F (ISO conditions), 85°F (average hot day) and 102°F (maximum high temperature day). The 63°F condition was assumed to represent annual average conditions. As such, no screening analyses were performed for annual average concentrations, which were modeled for the 63°F case at 100 percent load (with maximum duct firing), which is the typical operating scenario.

The results of the load screening analysis are listed in Appendix I, Air Quality Data. The screening analysis shows that the worst-case load and ambient temperature condition is 100 percent load with the maximum duct firing at 36°F for all short-term effects except for 24-hour PM_{10} where the worst-case effect occurred under 85°F with minimum duct firing.

5.2.5.7 Refined Analysis

Facility sources, including the nine-cell cooling tower, were modeled in the analysis for comparisons with Significant Impact Levels (SILs) and California Ambient Air Quality Standards (CAAQS)/National Ambient Air Quality Standards (NAAQS), as necessary. However, for comparisons with the SCAQMD significance levels, the cooling tower was not included with the combustion turbine's effects for comparisons with the PM_{10} significance levels.

For the new combustion turbine, start-up and shutdown emissions were also accounted for in the refined analysis for all short-term (24-hours or less) and long-term (annual) averages in the air quality modeling. The highest one-hour emissions during the start-up of the combustion turbine (cold start) was used for determining one-hour NO_x and CO effects. For the eight-hour CO modeling, the highest one-hour cold startup emission rate was assumed to occur for eight hours and was used to simulate the worst-case day of two cold starts. Annual emission estimates already include emissions from start-up, shutdown, and maintenance activities. Because the startup time for the combustion turbine will be one hour or less, and no duct burning in the HRSG is expected to occur, the worst-case stack modeling was identified by performing a screening analysis. The worst-case stack for the one-hour NO_x and CO stack emissions occur at the 85°F unfired case. Detailed emission calculations for all averaging periods are included in Appendix I, Air Quality Data.

The worst-case modeling input information for each pollutant and averaging period are shown in Table 5.2-18, Stack Parameters and Emission Rates for the Modeled Sources, for normal operating conditions and combustion turbine startup/shutdown conditions. As discussed above, the combustion turbine stack parameters used in modeling the effects for each pollutant and averaging period reflected the worst-case operating condition for that pollutant and averaging period identified in the load screening analysis. Stack parameters associated with operation at 100 percent load with the duct burner on at the average temperature of 63°F were used in modeling annual average effects.

Table 5.2-18
Stack Parameters and Emission Rates for Each of the Modeled Sources

					Emission Rates (g/s)			
	Stack Height (m)	**Stack Diameter (m)**	**Stack Temp. (deg K)**	**Exhaust Velocity (m/s)**	**NO_x**	**SO_2**	**CO**	**$PM_{10/2.5}$**
Averaging Period: 1-hour for Normal Operating Conditions								
New Turbine/HRSG	30.48	4.72	469.93	24.6	1.504	0.862	1.832	--
Existing Turbines/HRSGs	30.48	4.72	437.59	22.82	1.751	0.329	0.533	--
Averaging Period: 3-hours for Normal Operating Conditions								
New Turbine/HRSG	30.48	4.72	469.93	24.6	--	0.862	--	--
Existing Turbines/HRSGs	30.48	4.72	437.59	22.82	--	0.329	--	--
Averaging Period: 8-hours for Normal Operating Conditions								
New Turbine/HRSG	30.48	4.72	469.93	24.6	--	--	1.832	--
Existing Turbines/HRSGs	30.48	4.72	437.59	22.82	--	--	0.533	--
Averaging Period: 24-hours for Normal Operating Conditions								
New Turbine/HRSG	30.48	4.72	467.04	22.1	--	0.862	--	1.26
Existing Turbines/HRSGs	30.48	4.72	437.59	22.82	--	0.329	--	0. 692
Each New Cooling Tower Cells	15.04	9.64	292.32	6.05	--	--	--	0.0209
Each Existing Cooling Tower Cell	15.55	9.29	292.32	6.26	--	--	--	0.0209

Table 5.2-18
Stack Parameters and Emission Rates for Each of the Modeled Sources

	Stack Height (m)	Stack Diameter (m)	Stack Temp. (deg K)	Exhaust Velocity (m/s)	Emission Rates (g/s) NO_x	SO_2	CO	$PM_{10/2.5}$
Averaging Period: Annual for Normal Operating Conditions								
New Turbine/HRSG	30.48	4.72	468.96	23.5	1.1507	0.862	--	1.26
Existing Turbines/HRSGs	30.48	4.72	437.59	22.82	1.471	0.329	0.4388	0.692
Each New Cooling Tower Cells	15.04	9.64	298.79	6.11	--	--	--	0.0209
Each Existing Cooling Tower Cell	15.55	9.29	298.96	6.32	--	--	--	0.0209

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
CO = carbon monoxide
g/s = grams per second
HRSG = heat recovery steam generator
m = meter
m/s = meters per second
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5 micron particulate matter
SO_2 = sulfur dioxide

5.2.5.8 Normal Operations Impact Analysis

In order to determine the magnitude and location of the maximum effects for each pollutant and averaging period, the AERMOD model was used. Table 5.2-19, Air Quality Impact Results for Refined Modeling Analysis of Project, summarizes maximum modeled concentrations for each criteria pollutant and associated averaging periods. The 24-hour $PM_{2.5}$ concentration represents the 98th percentile modeled impact. In order to assess the significance of the modeled concentrations, the maximum concentrations were modeled and compared to the Class II PSD and SCAQMD SILs. All modeled facility pollutant concentrations are less than the SILs for those pollutants.

The maximum effects for NO_2 (one-hour and annual averages), CO (one-hour and eight-hour averages), SO_2 (one-hour, three-hour, 24-hour, and annual averages), and $PM_{10}/PM_{2.5}$ (24-hour and annual averages) occurred in the immediate vicinity of the facility either on the fenceline or within the downwash grid in the 10-meter-spaced receptor areas. Therefore, no additional 10-meter-spaced receptor grids in the coarse or intermediate receptor grid areas were required.

Because the maximum modeled effects for CO are less than the significance levels, the Project would not significantly affect the SCAQMD attainment area. As noted above, all modeled effects are less than the Class II and SCAQMD significance levels.

Table 5.2-19
Air Quality Impact Results
for Refined Modeling Analysis of Project

Pollutant	Avg. Period	Maximum Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	($\mu g/m^3$)
Normal Operating Conditions							
NO_2	1-hour	1.585	264	265.59	-	339	-
	Annual	0.086	58.9	58.98	1	56	100
CO	1-hour	1.930	9,600	9,601.93	2,000	23,000	40,000
	8-hour	1.370	7,315	7,316.37	500	10,000	10,000
SO_2	1-hour	0.908	107	107.91	-	655	-
	3-hour	0.720	86	86.72	25	-	1,300
	24-hour	0.227	28.6	28.83	5	105	365
	Annual	0.062	7	7.06	1	-	80
PM_{10}	24-hour	3.859	131	134.86	5	50	150
	Annual	0.193	45	45.19	1	20	-
PM_{10} Turbines Only	24-hour	0.363			2.5	SCAQMD SILs	
	Annual	0.093			1.0		
$PM_{2.5}$	24-hour	1.252	48.5	49.75	5	-	35
	Annual	0.193	17.5	17.69	1	12	15
Start-up/Shutdown Periods							
NO_2	1-hour	23.944	264	287.94	-	338	-
CO	1-hour	28.733	9,600	9,628.73	2,000	23,000	40,000
	8-hour	21.605	7,315	7,336.61	500	10,000	10,000
Commissioning Activities							
NO_2	1-hour	28.870	264	292.87	-	338	-
CO	1-hour	34.890	9,600	9,634..89	2,000	23,000	40,000
	8-hour	26.007	7,315	7,341.01	500	10,000	10,000
PM_{10}	24-hour	0.432	131	131.43	5	50	150
$PM_{2.5}$	24-hour	0.432	45	45.43	5	-	35

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.

Notes:

CAAQS = California Ambient Air Quality Standards
CO = carbon monoxide
NAAQS = National Ambient Air Quality Standards
NO_2 = nitrogen dioxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
SCAQMD = South Coast Air Quality Management District
SO_2 = sulfur dioxide
$\mu g/m^3$ = micrograms per cubic meter

Table 5.2-20, Air Quality Impact Results for Refined Modeling Analysis of Entire Facility, summarizes maximum-modeled concentrations for each criteria pollutant and associated averaging periods for normal operations, which include start-up/shutdown periods, and for initial commissioning activities for the entire facility (i.e., all five combustion turbines and the nine cell cooling towers). The current permit limits that only one combustion turbine can be started during any one day. Thus, the effects presented below assume one combustion turbine in startup with the other four combustion turbines at maximum load. The existing combustion turbine emissions data was obtained from the 2007 source test (10/11/2007) where the tested maximum emission rate for each turbine was used. This data is included in Appendix I, Air Quality Data. Again, combined effects (maximum facility effects plus maximum background concentrations) are only greater than the AAQS for those pollutants and averaging times where the background concentrations are already greater than the AAQS. This includes modeled effects for normal operations, start-up/shutdown periods, and commissioning activities. Again, since Project effects are less than SILs, emissions from the Project will not significantly affect the ambient air quality of the area.

Table 5.2-20
Air Quality Cumulative Impact Results
for Refined Modeling Analysis of Project

Pollutant	Avg. Period	Maximum Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	
Normal Operating Conditions							
NO_2	1-hour	9.049	264	273.04	-	339	-
	Annual	0.596	58.9	59.49	1	56	100
CO	1-hour	4.040	9,600	9,604.04	2,000	23,000	40,000
	8-hour	2.997	7,315	7317.99	500	10,000	10,000
SO_2	1-hour	2.206	107	109.21	-	655	-
	3-hour	1.828	86	87.83	25	-	1,300
	24-hour	0.578	28.6	29.19	5	105	365
	Annual	0.155	7	7.16	1	-	80
PM_{10}	24-hour	3.919	131	134.91	5	50	150
	Annual	0.340	45	45.34	1	20	-
$PM_{2.5}$	24-hour	1.472	48.5	49.97	5	-	35
	Annual	0.340	17.5	17.84	1	12	15
Start-up/Shutdown Periods							
NO_2	1-hour	28.98	264	292.98	-	338	-
CO	1-hour	31.09	9,600	9,631.09	2,000	23,000	40,000
	8-hour	23.35	7,315	7,338.35	500	10,000	10,000
Commissioning Activities							
NO_2	1-hour	36.63	264	300.63	-	338	-
CO	1-hour	37.25	9,600	9,637.25	2,000	23,000	40,000
	8-hour	27.75	7,315	7,342.75	500	10,000	10,000

Table 5.2-20
Air Quality Cumulative Impact Results
for Refined Modeling Analysis of Project

						Ambient Air Quality CAAQS/NAAQS	
PM_{10}	24-hour	3.992	131	134.92	5	50	150
$PM_{2.5}$	24-hour	1.522	45	46.52	5	-	35

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
Modeling includes all five turbines/HRSGs and the nine cell cooling tower
CAAQS = California Ambient Air Quality Standards
CO = carbon monoxide
NAAQS = National Ambient Air Quality Standards
NO_2 = nitrogen dioxide
PM_{10} = sub 10-micron particulate matter
$PM_{2.5}$ = sub 2.5-micron particulate matter
SO_2 = sulfur dioxide
$\mu g/m^3$ = micrograms per cubic meter

There are several scenarios that are possible during commissioning, which are expected to result in NO_x, CO, VOC, and $PM_{10}/_{2.5}$ emissions that are greater than during normal operations. (During commissioning, SO_2 emissions are expected to be no greater than full load operations.) Typically, these commissioning activities occur prior to the installation of the abatement equipment, e.g., SCR and oxidation catalyst, while the combustion turbines are being tuned to achieve optimum performance. During combustion turbine tuning, NO_x and CO emission control systems would not be functioning.

For the purposes of air quality modeling, NO_2, CO, and $PM_{10}/_{25}$ effects could be higher during commissioning than under other operating conditions already evaluated. The commissioning activities for the combustion turbine are expected to consist of several phases. Though precise emission values during the phases of commissioning cannot be provided, given the consideration for contingencies during shakedown, the worst case short-term emissions profile during expected commissioning-period operating loads are summarized in Table 5.2-21, Estimated Maximum Hourly Emissions Rates.

Table 5.2-21
Estimated Maximum Hourly Emissions Rates During Commissioning

		NO_X	CO	VOC	PM_{10}	SO_x
Emission Rate	lb/hr	211	255	5	12	4

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2008.
Note:
CO = carbon monoxide
lb/hr = pounds per hour
NO_x = nitrogen oxide
PM_{10} = sub 10-micron particulate matter
SO_x = sulfur oxide
VOC = volatile organic compounds

The new combustion turbine's commissioning period (prior to SCR and CO catalyst loading), with an estimated duration of 550 operating hours total, is expected to consist of the following processes and time periods as delineated in Table 5.2-22, Commissioning Schedule.

Table 5.2-22
Commissioning Schedule

Stage	Activities	Emissions Controls	Duration (time, hours)
1	1) Combustion turbine first fire 2) Combustion turbine no load testing 3) HRSG boil out	DLN: None SCR/CO: None/None	100 hours
2	1) Steam blow 2) Combustion turbine no load operation	DLN: None SCR/CO: None/None	50 hours
3	1) Combustion turbine generator load testing 2) HRSG steam production	DLN: None SCR/CO: None/None	100 hours
4	1) Combustion turbine DLN combustor tuning 2) Combustion turbine control system tuning	DLN: Partial SCR/CO: None/None	150 hours
5	1) SCR catalyst installation 2) Ammonia Injection/SCR tuning 3) CO catalyst installation	DLN: Full SCR/CO: Partial/Partial	100 hours
6	1) Emissions control final tuning 2) Peak testing 3) Duct Burner testing	DLN: Full SCR/CO: Full/Full	50 hours

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2008.
Note:
CO = carbon monoxide
DLN = Dry Low NO_x
HRSG = heat recovery steam generator
SCR = Selective Catalytic Reduction

The emissions during the 550 hours of commissioning activities are expected to be as follows:

- NO_x - 20.0 tons
- CO - 23.6 tons
- VOC - 1.4 tons
- TSP, $PM_{10/2.5}$ - 1.6 tons
- SO_x - 0.6 tons

Appendix I, Air Quality Data, lists the specific emissions during each phase of the commissioning activity.

During the commissioning period, the existing combustion turbines and the cooling tower will be operational. The modeling presented in Table 5.2-20, Air Quality Impact Results for Refined Modeling Analysis of Project, summarizes the results of the commissioning assessment.

Fumigation analyses with the USEPA Model SCREEN3 (version 96043) were conducted for inversion breakup conditions based on USEPA guidance given in *"Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised"* (EPA-454/R-92-019). Stack

parameters for the worst-case source configuration determined in the AERMOD screening analysis were modeled (maximum firing at 100 percent load with an ambient temperature of 36.0°F). Shoreline fumigation effects were not assessed since the nearest distance to the shoreline of the Pacific Ocean (or other large bodies of water) is greater than 3 kilometers.

An inversion breakup fumigation effect of 0.9825 micrograms/cubic meter ($\mu g/m^3$) for a unitized emission rate (1 gram/second, [g/s]) was predicted to occur at 19,205 meters from the turbine. This result is predicted to occur by SCREEN3 for rural conditions of F stability and 2.5 m/s wind speeds at the stack release height. Since the site vicinity is urban in nature, maximum SCREEN3 effects were calculated in both rural and urban modes for the turbine stack at the inversion breakup distance of 19,205 meters for all SCREEN3 meteorological conditions. At this distance, the maximum urban effect was 2.349 times higher than the maximum rural effect (i.e., 0.8545 $\mu g/m^3$ vs. 0.3637 $\mu g/m^3$ for 1 g/s emissions). Thus, the inversion breakup fumigation effect was adjusted to 2.308 $\mu g/m^3$ for a unitized emission rate to account for urban dispersion conditions (i.e., 2.349 x 0.9825 $\mu g/m^3$).

These unitized effects were used to calculate one-hour inversion breakup effects for all pollutants by multiplying the unitized effects by the pollutant emission rates (in g/s).

Table 5.2-23
Fumigation Impact Summary

Pollutant /Average Time	Fumigation Impacts for Turbine at Inversion Breakup Location	Maximum Turbine Impacts from SCREEN3
NO_x 1-hour	3.471 $\mu g/m^3$	6.905 $\mu g/m^3$
SO_2 1-hour	1.985 $\mu g/m^3$	3.948 $\mu g/m^3$
CO 1-hour	4.22 $\mu g/m^3$	8.402 $\mu g/m^3$

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2009.
Notes:
CO = carbon monoxide
$\mu g/m^3$ = micrograms per cubic meter
NO_x = nitrogen oxide
SO_2 = sulfur dioxide

As shown above in Table 5.2-23, Fumigation Impact Study Summary, the fumigation effects are less than the maximum facility SCREEN3 effects predicted to occur in the general area of the Project Site under normal operating conditions. Since one-hour fumigation effects are less than the maximum overall SCREEN3 one-hour effects, no further analysis of additional short-term averaging times (three-hours, eight-hours, or 24-hours) is required as described in Section 4.5.3 of *"Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised"* (EPA-454/R-92-019).

SCAQMD Rule 1303 requires a coherent plume analysis if the project will emit NO_x and PM_{10} at levels above 40 and 15 tons per year, respectively. The Project has the potential to emit over 15 tons per year of PM_{10} but will be under 40 tons per year of NO_x. SCAQMD Rule 1303 also states that the analysis must be completed only if the Class I areas are within the distances listed in Table 5.2-24, Class I Location Data. The six Class I areas governed under Rule 1030 are: Agua Tibia, Cucamonga, Joshua Tree, San Gabriel, San Gorgonio, and San Jacinto. Based on the distances listed in Table 5.2-24, Class I Location Data, none of the Class I areas are within

the prescribed distances for modeling. Thus, the Project emissions are not expected to affect the listed Class I areas.

Table 5.2-24
Class I Location Data

Class I Area	Distance For Modeling (km)	Minimum Distance (km)	Maximum Distance (km)
San Gabriel	29	52.86	69.77
Cucamonga	28	70.23	80.77
Agua Tibia	28	117.69	129.47
San Gorgonio	32	121.95	143.47
San Jacinto	28	135.18	149.77
Joshua Tree	29	165.31	273.76

Source: SCAQMD Regulation XIII, Rule 1303. Watson Cogeneration Steam and Electric Reliability Project Team, 2008.
Notes:
km = kilometers

5.2.5.9 Effects on Soils, Vegetation, and Sensitive Species

Effects on soils, vegetation, and sensitive species were determined to be "insignificant" for the following reasons:

- No soils, vegetation, or sensitive species were identified in the Project Area, which are recognized to have any known sensitivity to the types or amounts of air pollutants expected to be emitted by the facility.
- The facility emissions are expected to be in compliance with all applicable air quality rules and regulations.
- The facility effects are not predicted to result in violations of existing air quality standards, nor will the emissions cause an exacerbation of an existing violation of any quality standard.
- The Project is beyond the minimum distances to the Agua Tibia, Cucamonga, Joshua Tree, San Gabriel, San Gorgonio, and San Jacinto Class I areas required by the SCAQMD Rule 1303 for a Class I visibility assessments.

5.2.6 Laws, Ordnances, Regulations, and Statutes (LORS)

Table 5.2-25, Summary LORS - Air Quality, presents a summary of local, state, and federal air quality LORS deemed applicable to the Project. Specific LORS are discussed in greater detail in Section 5.2.6.1.

Table 5.2-25
Summary of LORS - Air Quality

LORS	Applicability	Conformance (AFC Section)
Federal Regulations		
CAAA of 1990, 40 CFR 50	Project operations will not cause violations of state or federal AAQS.	5.2.5.8
40 CFR 52.21 (PSD)	Impact analysis shows compliance with NAAQS, expansion Project is not subject to PSD.	5.2.5.1 through 5.2.5.9, 5.2.3.4, Appendix I-C
40 CFR 72-75 (Acid Rain)	Project will submit all required applications for inclusion to the Acid Rain program and allowance system, CEMS will be installed as required. The Project is subject to Title IV.	5.2.6.1, 5.2.6.2
40 CFR 60 (NSPS)	Project will determine subpart applicability and comply with all emissions, monitoring, and reporting requirements. 40 CFR 60, Subpart KKKK will apply to the turbine and HRSG duct burners. Subpart KKKK applicability exempts HRSG from Subpart Db applicability. Subpart Ja applies to the turbine and HRSG due to the firing of refinery gas and the units are considered part of the refinery operation. Subpart GGGa applies to equipment leaks at petroleum refineries, and would apply to the refinery gas equipment proposed for use on the turbine and HRSG as part of the refinery operation. Subpart QQQ applies to process wastewater, specifically to storm water and process wastewater containing any amount of VOCs. Applicable to the Project since the proposed turbine and HRSG are considered part of the refinery operation.	5.2.6, 5.2.6.1
40 CFR 70 (Title V)	Title V application will be submitted as part of the AQMD PTC package within 10 working days of the AFC submittal.	5.2.6.1, 5.2.6.2
40 CFR 68 (RMP)	Project will evaluate substances and amounts stored, determine applicability, and comply with all program level requirements. The existing RMP and OCA will be evaluated for necessary revisions.	5.15, 5.16.1.6
40 CFR 64 (CAM Rule)	Facility will be exempt from CAM Rule provisions.	5.2.6, 5.2.6.1
40 CFR 63 (HAPs, MACT)	Project will determine subpart applicability and comply with all emissions, monitoring, and reporting requirements. Subpart CC-MACT for Petroleum Refineries, refinery fuel gas equipment leaks, applies due to the Project being an integral part of the existing refinery operations. Proposed project has no refinery gas process vents, storage tanks, or transfer racks. Subpart FF applies to the benzene waste operation at any refinery which generates > 10 Mg/yr of benzene waste. Presently the refinery storm water and process wastewater is exempt from control due to the benzene content of such wastes is < 10 ppmw. Subpart YYYY applies to stationary combustion turbines constructed after 1-14-03 located at a major HAPs source. Emissions limits in the rule are currently stayed.	5.2.6.1, 5.2.6.2

Table 5.2-25
Summary of LORS - Air Quality

LORS	Applicability	Conformance (AFC Section)
State Regulations (CARB)		
CHSC 44300 et seq.	Project will determine applicability, and prepare inventory plans and reports as required.	5.2.6, 5.2.6.1
CHSC 41700	SCAQMD Permit to Construct (PTC) will ensure that no public nuisance results from operation of facility.	5.2.6.1, 5.2.6.2
Gov. Code 65920 et seq.	Pursuant to the Permit Streamlining Act, the Applicant believes the Project is a "development project" as defined, and is seeking approvals as applicable under the Act.	n/a
Local Regulations (South Coast AQMD)		
Rule 53A	Limits SO_x and PM emissions from stationary sources. BACT will insure compliance with these provisions.	5.2.6, Appendix I-E
Rule 201	Permitting procedures defined. Project will comply with all required permitting application requirements.	5.2.6.1, 5.2.6.2
Rule 401	Limits visible emissions. Project will comply with all limits per BACT and clean fuel use.	5.2.6, 5.2.6.1, Appendix I-E
Rule 402	Prohibits public nuisances. Project is not expected to cause or create any type of public nuisance.	5.2.4
Rule 403	Fugitive dust limits and mitigation measures. Project will comply with all rule provisions during construction and operation. See Appendix I, Air Quality Data, for construction data and mitigation criteria.	5.2.3.6, 5.2.6.1 Appendix I-D
Rule 407	Limits CO and SO_x emissions from stationary sources. Also covered in Rule 431.1. BACT and clean fuel use will insure compliance.	5.2.6, 5.2.6.1, Appendix I-A and I-E
Rule 409	Limits PM emissions from fuel combustion. BACT and clean fuel use will insure compliance.	5.2.6, 5.2.6.1, Appendix I-A and I-E
Rule 474	Limits NO_x emissions from fuel combustion. BACT and clean fuel use will insure compliance.	5.2.6, 5.2.6.1, Appendix I-A and I-E
Rule 475	Limits PM emissions from fuel combustion. BACT and clean fuel use will insure compliance.	5.2.6, 5.2.6.1, Appendix I-A and I-E
Rule 476	Limits NO_x and combustion contaminant emissions from fuel combustion. BACT and clean fuel use will insure compliance.	5.2.6, 5.2.6.1, Appendix I-A and I-E
Rule 431.1	Limits fuel sulfur content of gaseous fuels. Use of PUC grade natural gas and BACT compliant refinery gas insures compliance.	5.2.4, 5.2.6.1 Appendix I-A and I-E
Rule 1109	Limits NOx and CO from Boilers and Heaters. NOx pre-empted by Regulation XX, Rule 2012. CO BACT will insure compliance with Rule 1109 CO limits.	5.2.6, Appendix I-A
Rule 1134	Limits NO_x emissions from stationary combustion turbines. Pre-empted by Rule XX. CO limits per Rule 1134 will be complied with via CO BACT (use of CO Catalyst).	5.2.6, 5.2.6.1, Appendix I-A and I-E

Table 5.2-25
Summary of LORS - Air Quality

LORS	Applicability	Conformance (AFC Section)
Rule 1173	Limits fugitive VOC emissions from VOC service components, for VOCs as defined in AQMD Rule 102.	5.2.6, 5.2.6.1, Appendix I-A
Rule XIII (1301-1313)	NSR provisions. Project will meet all NSR rule requirements (BACT, offsets, AQ impact analysis, etc.)	Section 5.2, Appendix I
Rule XIV (1401 and 1470)	NSR for Toxics (Project will comply with all provisions of Rule 1401-New Sources) See Appendix O, Public Health, and Section 5.16 Public Health for analysis and compliance data.	Section 5.16, 5.2.6.1, Appendix O
Rule XVII (PSD)	Project expansion project is not expected to trigger PSD program requirements.	5.2.3.4, Appendix I-C
Rule XX (RECLAIM)	Project will be subject to RECLAIM for NO_x and SO_x.	5.2.3.4, 5.2.6.1
Rule XXX (Title V)	Project will submit the required Title V application as an integral part of the SCAQMD PTC application within 10 days of AFC submittal.	5.2.6.1, 5.2.6.2
Rule XXXI (Acid Rain)	Project will comply with all provisions of the acid rain program as adopted by the SCAQMD (monitoring, reporting, recordkeeping, testing, allowance use and tracking, notifications, etc.) The Project is subject to Title IV.	5.2.6.2

Source: Watson Cogeneration Steam and Electric Reliability Project Team, 2008.

Notes:

AFC = Application for Certification
BACT = Best Available Control Technology
CAAA = Clean Air Act Amendments
CAAQS = California Ambient Air Quality Standards
CAM = Compliance Assurance Monitoring
CARB = California Air Resources Board
CEMS = Continuous Emissions Monitoring System]
CFR = Code of Federal Regulations
CO = carbon monoxide
HRSG = heat recovery steam generator
LORS = laws, ordinances, regulations, and standards
NAAQS = National Ambient Air Quality Standards
NO_x = nitrogen oxides
NSR = New Source Review
OCA = Offsite Consequences Analysis
PM = particulate matter
PSD = Prevention of Significant Deterioration
PTC = Permit to Construct
PUC = Public Utility Commission
RECLAIM = Regional Clean Air Incentives Market
RMP = Risk Management Plan
SCAQMD = South Coast Air Quality Management District
SO_x = sulfur oxides

5.2.6.1 Specific LORS Discussion

Federal LORS

The federal EPA implements and enforces the requirements of many of the federal air quality laws. EPA has adopted the following stationary source regulatory programs in its effort to implement the requirements of the CAA:

- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- Prevention of Significant Deterioration (PSD)
- New Source Review (NSR)
- Title IV: Acid Rain/Deposition Program
- Title V: Operating Permits Program
- CAM Rule

National Standards of Performance for New Stationary Sources - 40 CFR Part 60, Subpart KKKK

The NSPS program provisions limit the emission of criteria pollutants from new or modified facilities in specific source categories. The applicability of these regulations depends on the equipment size or rating; material or fuel process rate; and/or the date of construction, or modification. Reconstructed sources can be affected by NSPS as well. Applicability of Subpart KKKK to the proposed new turbine/HRSG supersedes applicability of Subpart GG and Db. Compliance with BACT will insure compliance with the emissions limits of Subpart KKKK.

National Emission Standards for Hazardous Air Pollutants - 40 CFR Part 63

The NESHAPs program provisions limits hazardous air pollutant emissions from existing major sources of HAP emissions in specific source categories. The NESHAPs program also requires the application of maximum achievable control technology (MACT) to any new or reconstructed major source of HAP emissions to minimize those emissions. Subpart YYYY will apply to the proposed turbine/HRSG. The emissions provisions of Subpart YYYY are currently subject to "stay" by EPA. Notwithstanding the foregoing, the proposed turbine/HRSG is expected to comply with the emissions provisions.

Prevention of Significant Deterioration Program - 40 CFR Parts 51 and 52

The PSD program requires the review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies only to pollutants for which ambient concentrations do not exceed the corresponding NAAQS. The PSD program allows new sources of air pollution to be constructed, and existing sources to be modified, while maintaining the existing ambient air quality levels in the Project region and protecting Class I areas from air quality degradation. The AFC air quality analysis complies with all applicable PSD provisions.

New Source Review - 40 CFR Parts 51 and 52

The NSR program requires the review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment of AAQS. NSR applies to pollutants for which ambient concentrations exceed the corresponding NAAQS. The AFC air quality analysis complies with all applicable NSR provisions.

Title IV - Acid Rain Program - 40 CFR Parts 72-75

The Title IV program requires the monitoring and reduction of emissions of acid rain compounds and their precursors. The primary source of these compounds is the combustion of fossil fuels. Title IV establishes national standards to limit SO_x and NO_x emissions from electrical power generating facilities. The proposed new turbine/HRSG will be subject to Title IV, and will submit the appropriate applications to the air District as part of the PTC application process. The Project will participate in the Acid Rain allowance program through the purchase of SO_2 allowances. Sufficient quantities of SO2 allowances are available for use on this Project.

Title V - Operating Permits Program - 40 CFR Part 70

The Title V program requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit. The existing cogeneration facility, as part of the refinery is presently subject to Title V. Title V application forms applicable to the proposed new turbine/HRSG will be included in the SCAQMD PTC application.

CAM Rule - 40 CFR Part 64

The CAM rules require facilities to monitor the operation and maintenance of emissions control systems and report malfunctions of any control system to the appropriate regulatory agency. The CAM rule applies to emissions units with uncontrolled potential to emit levels greater than applicable major source thresholds. However, emission control systems governed by Title V operating permits requiring continuous compliance determination methods are exempt from the CAM rule. Since the project will be issued a Title V permit requiring the installation and operation of continuous emissions monitoring systems, the project will qualify for this exemption from the requirements of the CAM rule.

Toxic Release Inventory Program (TRI) - Emergency Planning and Community Right-to-Know Act

The TRI program as applied to electric utilities, affects only those facilities in Standard Industrial Classification (SIC) Codes 4911, 4931, and 4939 that combust coal and/or oil for the purpose of generating electricity for distribution in commerce must report under this regulation. The proposed project SIC Code is 4911. However, the proposed Project will not combust coal and/or oil for the purpose of generating electricity for distribution in commerce. Therefore, this program does not apply to the proposed Project.

State LORS

CARB's jurisdiction and responsibilities fall into the following five areas; (1) implement the state's motor vehicle pollution control program; (2) administer and coordinate the state's air

pollution research program; (3) adopt and update the state's AAQS; (4) review the operations of the local air pollution control districts (APCDs) to insure compliance with state laws; and, (5) to review and coordinate preparation of the State Implementation Plan (SIP).

Air Toxic "Hot Spots" Act – H&SC §44300-44384

The Air Toxics "Hot Spots" Information and Assessment Act requires the development of a statewide inventory of Toxic Air Contaminants (TAC) emissions from stationary sources. The program requires affected facilities to; (1) prepare an emissions inventory plan that identifies relevant TACs and sources of TAC emissions; (2) prepare an emissions inventory report quantifying TAC emissions; and (3) prepare an HRA, if necessary, to quantify the health risks to the exposed public. Facilities with significant health risks must notify the exposed population, and in some instances must implement risk management plans to reduce the associated health risks.

Public Nuisance – H&SC § 41700

Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or which endanger the comfort, repose, health, or safety of the public, or that damage business or property.

Local Air District LORS-South Coast AQMD

AQMD Regulation II - Permits

AQMD Regulation II establishes the basic framework for acquiring permits to construct and operate from the air district. The AFC will be the basis for the Districts Determination of Compliance. A separate PTC application will be submitted to the AQMD. The PTC application, for the purposes of maintaining consistency with the AFC, will be similar in scope and detail, and will contain the District permit application forms.

AQMD Preconstruction Review for Criteria Pollutants

The AQMD has several preconstruction review programs for new or modified sources of criteria pollutant emissions, as follows:

- Regulation XIII (New Source Review) – Regulation XIII provides for review of non-attainment pollutants and their precursors, and requires the following analyses to be conducted; (1) BACT, (2) mitigation analysis (offsets), (3) air quality impact analysis, (4) Class I Area impact analysis, (5) visibility, soils, and vegetation impact analysis, and (6) pre-construction monitoring. The AFC air quality analysis and the PTC application comply with the Regulation XIII requirements.
- Regulation XVII (Prevention of Significant Deterioration) - Regulation XVII provides for review of attainment pollutants, and requires the following analyses to be conducted; (1) BACT, (2) air quality impact analysis, (3) Class I Area impact analysis, (4) visibility, soils, and vegetation impact analysis, and (5) pre-construction monitoring. The AFC air quality analysis and the PTC application comply with the Regulation XVII requirements.
- Rule 2005 (New Source Review for RECLAIM) – Regulation XX, Rule 2005 provides for NSR review for sources subject to the District's RECLAIM program. The proposed new

turbine/HRSG will be subject to the RECLAIM program for both NO_x and SO_x. The refinery is currently subject to RECLAIM for both NO_x and SO_x, and as such is familiar with the monitoring, reporting, and recordkeeping requirements of the RECLAIM program. Compliance with all aspects of the RECLAIM program is anticipated.

AQMD Rule 1401 - New Source Review of Toxic Air Contaminants

Rule 1401 (NSR for Toxic Air Contaminants) establishes risk thresholds for new or modified sources of TAC emissions. Rule 1401 establishes limits for maximum individual cancer risk, cancer burden, and non-carcinogenic acute and chronic hazard indices for new or modified sources of TAC emissions. The public health analysis contained in Section 5.15 and Appendix O, Public Health, shows compliance with all Rule 1401 requirements.

AQMD Regulation XXX - Federal Operating Permit Program

Regulation XXX (Title V Permits) implements the federal operating permit program at the local District level. Regulation XXX requires major emitting facilities and acid rain facilities undergoing modifications to obtain an operating permit containing the federally enforceable requirements mandated by Title V of the CAA of 1990. The PTC application to be filed with the AQMD per Section 5.2.6.3 will contain all the required District Title V application forms.

AQMD Regulation XXXI - Acid Rain Program

Regulation XXXI (Title IV – Acid Rain Permit Program) establishes the issuance of acid rain permits in accordance with Title IV of the Clean Air Act of 1990. Regulation XXXI requires a facility subject to Title IV to obtain emissions allowances for SO_x, and to monitor SO_x, NO_x, and CO_2 emissions and exhaust gas flow rates. Acid rain facilities, such as the proposed Project, must also obtain an acid rain permit as mandated by Title IV of the CAA. A permit application must be submitted to the AQMD well in advance of operation of the new unit. The PTC application to be filed with the AQMD per Section 5.2.6.3 will contain all the required District Title IV application forms. Regulation XXXI applies only to the proposed new turbine/HRSG, as the existing cogeneration facility is currently exempt. The Project will participate in the Acid Rain allowance program through the purchase of SO_2 allowances. Sufficient quantities of SO_2 allowances are available for use on this Project.

AQMD Regulation IX- NSPS

Regulation IX (NSPS) incorporates by reference the provisions of 40 CFR 60, Chapter 1. See Table 5.2-25 and the Federal LORS discussion above.

AQMD Prohibitory or Source Specific Rules

Relevant AQMD prohibitory or source specific rules include the following:

- Rule 401 - Visible Emissions: Establishes limits for visible emissions from stationary sources. Rule 401 prohibits visible emissions as dark or darker than Ringelmann No. 1 for periods greater than three minutes in any hour. Use of gaseous fuels is expected to insure compliance with Rule 401.
- Rule 402 - Nuisance: 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. Proper operation of the new unit and support systems is not expected to cause a nuisance.

- Rule 403 - Fugitive Dust: Implements requirements to reduce the amount of fugitive PM emitted into the ambient air as a result of man-made fugitive dust sources. Rule 403 requires the implementation of best available control measures (BACMs) to minimize fugitive dust emissions and prohibits visible dust emissions beyond the property line. Use of BACMs to control dust during construction and operation is expected to insure compliance with Rule 403. See Appendix I-D.
- Rule 407 - Liquid and Gaseous Air Contaminants: Rule 407 prohibits CO and SO_x emissions in excess of 2,000 ppm and 500 ppm, respectively, from any source. Stationary internal combustion reciprocating engines are exempt from this rule. In addition, equipment that complies with the requirements of Rule 431.1 is exempt from the SO_x limit. The existing facility and the new turbine/HRSG will comply with Rule 431.1.
- Rule 409 - Combustion Contaminants: Rule 409 prohibits particulate emissions in excess of 0.1 grains per cubic foot of gas at 12 percent CO_2 at standard conditions. The provisions of this rule do not apply to stationary internal combustion reciprocating engines. Use of clean fuels will insure compliance with this rule.
- Rule 431.1 - Sulfur Content of Gaseous Fuels: Establishes limits for the sulfur content of gaseous fuels to reduce SO_x emissions from stationary combustion sources. Rule 431.1 limits the sulfur content of natural gas to 16 ppmv. Gas supplied by SoCal Gas has sulfur contents well below this rule value.
- Rule 431.2 - Sulfur Content of Liquid Fuels: Establishes limits for the sulfur content of liquid fuels to reduce SO_x emissions from stationary combustion sources. Rule 431.2 limits the sulfur content of Diesel fuel to 0.05 percent by weight. Liquid fuels are not proposed for use in the turbine/HRSG.
- Rule 474 - Fuel Burning Equipment - Oxides of Nitrogen: Implements limits on emissions of NO_x from stationary combustion sources. NO_x RECLAIM sources/facilities are exempt from the provisions of Rule 474. Since the proposed Project is also a NO_x RECLAIM facility, Rule 474 is not applicable to the Project.
- Rule 475 - Electric Power Generating Equipment: Implements limits for combustion contaminant (particulate matter) emissions from affected equipment. Rule 475 prohibits PM emissions in excess of 11 lbs/hr (per emission unit) or 0.01 grains per dry standard cubic foot (gr/dscf) at 3 percent O_2. Use of clean fuels will insure compliance.
- Rule 476 - Steam Generating Equipment: Implements limits for emissions of NO_x and combustion contaminants (PM) from affected equipment. However, NO_x RECLAIM facilities are exempt from the NO_x provisions of Rule 476. The PM provisions of Rule 476 are superseded by those of Rule 475. Rule 476 is therefore not applicable to the proposed Project.
- Rule 53A - Specific Contaminants: Implements limits for emissions of sulfur compounds (oxides of sulfur) and combustion contaminants (PM) from stationary sources. Rule 53A prohibits SO_x and PM emissions in excess of 500 ppm and 0.1 gr/dscf at 12 percent CO_2, respectively. Use of clean fuels will insure compliance.
- Rule 1110.2 - Emissions from Stationary Internal Combustion Engines: Implements limits for emissions of NO_x, VOC, and CO from the stationary internal combustion reciprocating

engines. Emergency standby engines that operate less than 200 hours per year are exempt from this regulation. No such engines are proposed as part of the Project. Rule 1110.2 is therefore not applicable to the proposed Project.

- Rule 1134 - Emissions of Oxides of Nitrogen from Stationary Gas Turbines: Implements limits for emissions of NO_x from the stationary gas turbines. NO_x RECLAIM sources/facilities are exempt from the provisions of Rule 1134. Rule 1134 is therefore not applicable to the proposed Project. The CO provisions of the rule will be complied with via the BACT requirements for CO, i.e., the use of a CO catalyst.
- Rule 1135 - Emissions of Oxides of Nitrogen from Electric Power Generating Systems: Implements limits for emissions of NO_x from the electricity generating systems. NO_x RECLAIM sources/facilities are exempt from the provisions of Rule 1135. Rule 1135 is therefore not applicable to the proposed Project.
- Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters: Implements limits for emissions of NO_x and CO from industrial, institutional, and commercial steam generating units. Boilers, such as the proposed HRSG, used to generate electricity are exempt from the regulation. Rule 1146 is therefore not applicable to the proposed Project.
- Rule 1173 - Limits fugitive VOC emissions from VOC service components, for VOCs as defined in AQMD Rule 102. Compliance is achieved through a continuous program of inspection, maintenance, repair, sampling, and analysis of VOC service components. The existing refinery 1173 program will be implemented on the components installed and operated on the new proposed unit.

5.2.6.2 Agency Jurisdiction and Contacts

Table 5.2-26, Agencies, Contacts, Jurisdictional Involvement, Required Permits for Air Quality, presents data on the following: (1) air quality agencies that may or will exercise jurisdiction over air quality issues resulting from the power facility, (2) the most appropriate agency contact for the Project, (3) contact address and phone information, and (4) the agency involvement in required permits or approvals.

Table 5.2-26
Agencies, Contacts, Jurisdictional Involvement, Required Permits For Air Quality

Agency	Contact	Jurisdictional Area	Permit Status
California Energy Commission (CEC)	Assigned Project Manager 1516 Ninth St. Sacramento, CA 95814	Primary reviewing and certification agency.	Will certify the facility under the energy siting regulations and CEQA. Certification will contain a variety of conditions pertaining to emissions and operation.

Table 5.2-26
Agencies, Contacts, Jurisdictional Involvement, Required Permits For Air Quality

Agency	Contact	Jurisdictional Area	Permit Status
South Coast AQMD	Mohsen Nazemi Dep. EO Permitting/Compliance 21865 E. Copley Dr. Diamond Bar, CA 91765 909-396-2662	Prepares Determination of Compliance (DOC) for CEC, Issues SDAQMD Permit to Construct (PTC) and Permit to Operate (PTO), Primary air regulatory and enforcement agency.	DOC will be prepared subsequent to AFC submittal. PTC application to be submitted to AQMD within 10 days of AFC submittal.
California Air Resources Board (CARB)	Mike Tollstrup Chief, Project Assessment Branch 1001 I St., 6th Floor Sacramento, CA 95814 (916) 322-6026	Oversight of AQMD stationary source permitting and enforcement program	CARB staff will provide comments on applicable AFC sections affecting air quality and public health. CARB staff will also have opportunity to comment on draft PTC.
Environmental Protection Agency, Region IX	Gerardo Rios Chief, Permits Section USEPA-Region 9 75 Hawthorne St. San Francisco, CA 94105 (415) 947-3974	Oversight of all AQMD programs, including permitting and enforcement programs	USEPA Region 9 staff will receive a copy of the DOC. USEPA Region 9 staff will have opportunity to comment on draft PTC

Notes:
AQMD = Air Quality Management District
CARB = California Air Resources Board
DOC = Determination of Compliance
EO = Executive Officer
PTC = Permit to Construct
SDAQMD = South Coast Air Quality Management District
USEPA = United States Environmental Protection Agency

5.2.6.3 Permit Requirements and Schedules

A PTC application is required in accordance with the SCAQMD rules. A complete application for a PTC, including the required Title V application forms, will be submitted within 10 working days of the AFC submittal.

5.2.7 References

CARB (California Air Resources Board). 1999. Guidance for Power Plant Siting and Best Available Control Technology, PAB-SSD. July.

CARB (California Air Resources Board). 2008. Best Available Control Technology Clearinghouse Program, http://www.arb.ca.gov/bact/bact.htm. August.

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SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 5.2 (all pages)		
Appendix B (g) (8) (A)	The information necessary for the air pollution control district where the project is located to complete a Determination of Compliance.	Section 5.2, Section 5.16, Appendices I and O (all pages)		
Appendix B (g) (8) (B)	The heating value and chemical characteristics of the proposed fuels, the stack height and diameter, the exhaust velocity and temperature, the heat rate and the expected capacity factor of the proposed facility.	Section 5.2.1, page 5.2-1; Section 5.2.2.2, pages 5.2-3 through 5.2-5; Section 5.2.5.3, page 5.2-19; Appendices I-A, I-B		
Appendix B (g) (8) (C)	A description of the control technologies proposed to limit the emission of criteria pollutants.	Section 5.2.4, pages 5.2-16 through 5.2-18; Appendix I-E		
Appendix B (g) (8) (D)	A description of the cooling system, the estimated cooling tower drift rate, the rate of water flow through the cooling tower, and the maximum concentrations of total dissolved solids.	Section 5.2, 5.2.2.2, pages 5.2-3 through 5.2-4; Appendix I-A		
Appendix B (g) (8) (E)	The emission rates of criteria pollutants and greenhouse gases (CO_2, CH_4, N_2O, and SF6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all on-site secondary emission sources.	Section 5.2.3, pages 5.2-7 through 5.2-12, Appendix I-A		

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SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (8) (F)(i)	A description of typical operational modes, and start-up and shutdown modes for the proposed project, including the estimated frequency of occurrence and duration of each mode, and estimated emission rate for each criteria pollutant during each mode.	Section 5.2.3, pages 5.2-7 through 5.2-16; Section 5.2.5.8, pages 5.2-30 through 5.2-36		
Appendix B (g) (8) (F)(ii)	A description of the project's planned initial commissioning phase, which is the phase between the first firing of emissions sources and the commercial operations date, including the types and durations of equipment tests, criteria pollutant emissions, and monitoring techniques to be used during such tests.	Section 5.2.5.8, pages 5.2-30 through 5.2-34		
Appendix B (g) (8) (G)	The ambient concentrations of all criteria pollutants for the previous three years as measured at the three Air Resources Board certified monitoring stations located closest to the project site, and an analysis of whether this data is representative of conditions at the project site. The applicant may substitute an explanation as to why information from one, two, or all stations is either not available or unnecessary.	Section 5.2.5.6, pages 5.2-23 through 5.2-28		
Appendix B (g) (8) (H)	One year of meteorological data collected from either the Federal Aviation Administration Class 1 station nearest to the project or from the project site, or meteorological data approved by the California Air Resources Board or the local air pollution control district.	Section 5.2.5.1, pages 5.2-18 through 5.2-19; Section 5.2.5.5, pages 5.2-20 through 5.2-22		

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Appendix B (g) (8) (H) (i)	If the data is collected from the project site, the applicant shall demonstrate compliance with the requirements of the U.S. Environmental Protection Agency document entitled "On-Site Meteorological Program Guidance for Regulatory Modeling Applications" (EPA - 450/4-87-013 (August 1995)), which is incorporated by reference in its entirety.	Section 5.2.5.5, pages 5.2-20 through 5.2-22		
Appendix B (g) (8) (H) (ii)	The data shall include quarterly wind tables and wind roses, ambient temperatures, relative humidity, stability and mixing heights, upper atmospheric air data, and an analysis of whether this data is representative of conditions at the project site.	Section 5.2.5.5, pages 5.2-20 through 5.2-22; Appendix I-B (Figures I-B-6 through I-B-10)		
Appendix B (g) (8) (I)	An evaluation of the project's direct and cumulative air quality impacts, consisting of the following:	Section 5.2.3.6, pages 5.2-13 through 5.2-16; Section 5.2.5, pages 5.2-18 through 5.2-36; Appendix I-B, Appendix I-G		
Appendix B (g) (8) (I) (i)	A screening level air quality modeling analysis, or a more detailed modeling analysis if so desired by the applicant, of the direct criteria pollutant impacts of project construction activities on ambient air quality conditions, including fugitive dust (PM_{10}) emissions from grading, excavation and site disturbance, as well as the combustion emissions [nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$)] from construction-related equipment;	Section 5.2.3.6, pages 5.2-13 through 5.2-16; Appendix I-B and Appendix I-D		

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Appendix B (g) (8) (I) (ii)	A screening level air quality modeling analysis, or a more detailed modeling analysis if so desired by the applicant, of the direct criteria pollutant (NO_x, SO_2, CO, $PM_{10,}$ and $PM_{2.5}$) impacts on ambient air quality conditions of the project during typical (normal) operation, and during shutdown and startup modes of operation. Identify and include in the modeling of each operating mode the estimated maximum emissions rates and the assumed meteorological conditions;	Section 5.2.5, pages 5.2-18 through 5.2-36; Appendix I-B		
Appendix B (g) (8) (I) (iii)	A protocol for a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary emissions sources within a six mile radius which have received construction permits but are not yet operational, or are in the permitting process. The cumulative inert pollutant impact analysis should assess whether estimated emissions concentrations will cause or contribute to a violation of any ambient air quality standard; and	Appendix I-G		
Appendix B (g) (8) (I) (iv)	An air dispersion modeling analysis of the impacts of the initial commissioning phase emissions on state and federal ambient air quality standards for $NO_{X,}$ SO_2, CO, PM_{10}, and $PM_{2.5}$.	Section 5.2.5, pages 5.2-18 through 5.2-36; Appendix I-B		
Appendix B (g) (8) (J)	If an emission offset strategy is proposed to mitigate the project's impacts under subsection (g)(1), provide the following information:	Appendix I-F		

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Appendix B (g) (8) (J) (i)	The quantity of offsets or emission reductions that are needed to satisfy air permitting requirements of local permitting agencies (such as the air district), state and federal oversight air agencies, and the California Energy Commission. Identify by criteria air pollutant, and if appropriate, greenhouse gas; and	Appendix I-F; and 5.2.3.4, page 5.2-12		
Appendix B (g) (8) (J) (ii)	Potential offset sources, including location, and quantity of emission reductions;	Appendix I-F; and 5.2.3.4, page 5.2-12		
Appendix B (g) (8) (K)	A detailed description of the mitigation, if any, which an applicant may propose, for all projects impacts from criteria pollutants that currently exceed state or federal ambient air quality standards, but are not subject to offset requirements under the district's new source review rule.	Appendix I-F; and 5.2.3.4, page 5.2-12		
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Section 5.2.6, pages 5.2-36 through 5.2-39		

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Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 5.2.6.2, pages 5.2-45 to 5.2-46		
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 5.2.6.2, pages 5.2-45 to 5.2-46		
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 5.2.6.3, page 5.2-46		