3.1 AIR QUALITY

This section presents an evaluation of the emissions and air quality impacts resulting from construction and operation of the Project. This analysis was prepared in accordance with the CEC power plant siting regulations, and the rules and regulations of the San Diego Air Pollution Control District (SDAPCD) for permitting requirements for the Determination of Compliance/Authority to Construct (DOC/ATC) process.

3.1.1 Environmental Baseline

3.1.1.1 Project

The Project includes the addition of one General Electric (GE) LM6000-PC Sprint® gas combustion turbine generator unit (CTG 3). In addition, a 600 kW natural-gas fired reciprocating engine will be installed to provide black start capabilities. The proposed CTG 3 is a nominal 47 megawatt (MW) natural gas-fired simple-cycle unit that will be located immediately east and adjacent to the existing Larkspur Energy Facility which currently contains two CTG units (CTG 1 and CTG 2). A plot plan illustrating the layout of the proposed equipment for the Project and the existing facility is provided as Figure 2-1.

It is expected that the annual emissions increase of all criteria pollutants due to the proposed CTG 3 will be below the significance thresholds specified by the EPA's Prevention of Significant Deterioration (PSD) regulations. Specifically, the increases in emissions will be less than: 250 tons per year of carbon monoxide (CO), reactive organic compounds (ROC), particulate matter less than 10 micrometers in diameter (PM_{10}), sulfur oxides (SO_x), and nitrogen oxides (NO_x), less than 0.6 ton per year of lead (Pb) and less than 7 tons per year of sulfuric acid mist. San Diego County is currently designated unclassified for federal PM_{10} standards, non-attainment with respect to the California and federal ambient air quality standards for ozone, and non-attainment for California PM_{10} standards.

3.1.1.2 Combustion Turbine

The specifications for the combustion turbine are as follows:

- Engine manufacturer: General Electric
- Engine model: LM6000-PC Sprint®
- Fuel: natural gas
- Nominal MW rating: 47 MW
- Nominal Fuel Consumption: 420.8 MMBtu/hr (ISO conditions, HHV)

The primary maximum operating scenario for the CTG is 24-hours per day, 7-days per week, for a total of 4,000-hours per year.

3.1.1.3 Black Start Engine

In addition to the new CTG 3, the Project includes a 600 kW natural gas-fired reciprocating engine to provide black start capabilities to start the CTG 3 during losses of grid power. Otherwise, the black start engine will only be operated for short periods to test its operability in the event of an emergency. The specifications for the black start engine are as follows:

- Engine manufacturer: Caterpillar, Detroit Diesel or equivalent
- Engine model: Caterpillar 3412, Detroit Diesel 12V149 or equivalent
- Engine rating: 600 kW
- Fuel: natural gas
- Nominal Fuel consumption: 5.71 MMBtu/hr
- Nominal Exhaust flow: 8,916 lbs/hr
- Nominal Exhaust temperature: 797ºF

3.1.1.4 Fuels

The only fuel to be combusted on site by proposed CTG 3 and the black start unit is California Public Utility Commission (CPUC)-grade natural gas supplied by the SDG&E gas system. The gas will have a higher heating value (HHV) of approximately 1,020 Btu/standard cubic feet (scf), and a sulfur content not to exceed 0.75 grain/dry standard cubic foot (dscf). Typical analyses of the proposed natural gas are presented in Appendix A-1, Calculation of Maximum Hourly, Daily, and Annual Emissions.

Total fuel combustion for the Project is presented in Table 3.1-1. Fuel use values are based on the maximum heat rating of each system, fuel specifications, and the maximum operational scenario.

TABLE 3.1-1
FUEL USE SUMMARY

System	Units	Per Hour	Maximum Per Day	Maximum Per Year
CTG 3	MMBtu	428.6	10,286.4	1,714,400
Black start Engine	MMBtu	5.71	5.7	136.8

3.1.1.5 Project Emissions

The operation of CTG 3 and the black start unit will result in emissions of both criteria pollutants and toxic air contaminants (TACs). Criteria pollutant emissions include CO, NO, volatile organic compounds (VOCs), SO, and particulate matter (PM_{10} and $PM_{2.5}$). TACs emitted by CTG 3 and black start unit consist of trace amounts of toxic gases and particulates that result from the combustion of fossil fuels. In addition, the operation of the combustion turbine and black start unit will result in emissions of

greenhouse gases, including carbon dioxide (CO_2), nitrous oxide (N_2O), and uncombusted methane (CH_4).

TAC emissions and the associated impacts are addressed in Public Health (Section 3.8).

3.1.1.6 Criteria Pollutant Emissions

Tables 3.1-2 and 3.1-3 present data on criteria pollutant emissions from the combustion turbine and black start engine. Emissions for the CTG 3 are based on an operational scenario that includes a maximum of six startups/shutdowns per day, 300 startups/shutdowns per year, and 4,000 operating hours per year at full rated capacity. The black start engine would be permitted to operate for periods of 30 minutes or less for testing (24-hours per year total), or during emergency conditions.

TABLE 3.1-2
MAXIMUM HOURLY AND ANNUAL CRITERIA POLLUTANT EMISSIONS - CTG 3

Pollutant	BACT limit	Normal Hourly Emissions, 100% Load (lbs/hr)	Maximum Hourly Emissions, including startups and shutdowns (lbs/hr)	Maximum Annual Emissions, including startups and shutdowns, (tons/year)
NOx	2.5 ppmvd @ 15% O_2	4.33	7.91	9.73
CO	6 ppmvd @ 15% O_2	6.34	8.99	13.60
VOCs	2 ppmvd @ 15% O_2	1.31	1.31	2.65
SOx	0.75 gr S/100 scf	0.90	0.90	1.83
$PM_{10}/PM_{2.5}$	4 lbs/hr	4.00	4.07	8.15
NH_3	5 ppmvd @ 15% O_2	3.21	3.21	6.42

TABLE 3.1-3
MAXIMUM HOURLY AND ANNUAL CRITERIA POLLUTANT EMISSIONS
BLACK START ENGINE[1]

Pollutant	BACT limit	Maximum Hourly Emissions, lbs/hr	Maximum Annual Emissions, lbs/year
NOx	0.5 g/bhp-hr	0.44	21.29
CO	2.5 g/bhp-hr	2.22	106.43
VOCs	5.4 g/bhp-hr	4.79	229.89
SOx	5.88E-04 lbs/MMBtu	0.002	0.08
$PM_{10}/PM_{2.5}$	4.83E-02 lbs/MMBtu	0.138	6.62

Notes:

[1]Engine would run for a maximum of 30 minutes per test for testing purposes, 24 hours annually.

Table 3.1-4 presents a summary of the total combined criteria pollutant emissions for the proposed Unit 3 turbine and the black start engine.

TABLE 3.1-4
SUMMARY OF PROJECT EMISSIONS

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tons/year)
NOx	8.35	9.74
CO	11.21	13.65
VOCs	6.10	2.76
SOx	0.900	1.83
$PM_{10}/PM_{2.5}$	4.208	8.15
NH_3	3.21	6.42

Table 3.1-5 presents data on startup and shutdown emissions for CTG 3. In this case, the pounds per hour (lbs/hr) values assume one startup or shutdown during a 1-hour period, with the turbine operating at 100 percent load for the remainder of the hour.

TABLE 3.1-5
STARTUP AND SHUTDOWN EMISSION RATES - CTG 3

Pollutant	Startup Emissions, (lbs/start)	Startup Emissions, (lbs/hr)	Shutdown Emissions, (lbs/shutdown)	Shutdown Emissions, (lbs/hr)
NOx	4.30	7.91	2.80	6.55
CO	3.70	8.99	2.40	7.90
VOCs	0.10	1.19	0.09	1.23
SOx	0.15	0.90	0.12	0.90
$PM_{10}/PM_{2.5}$	0.40	3.73	0.60	4.07

3.1.1.7 Greenhouse Gas Emissions

Emissions of greenhouse gases from CTG 3 were estimated based on data provided for the turbine by the Project engineers for CO_2, and using EPA AP-42 emission factors for N_2O and CH_4 for natural gas-fired turbines. Greenhouse gas emissions for the black start engine were estimated based on EPA AP-42 emission factors for CO_2 and CH_4 for natural gas-fired lean-burn internal combustion engines. Tables 3.1-6 and 3.1-7 present estimates of the greenhouse gas emissions from the combustion turbine and black start engine. The Project will be reporting greenhouse gas emissions to the California Climate Action Registry (CCAR).

TABLE 3.1-6
MAXIMUM HOURLY AND ANNUAL GREENHOUSE GAS EMISSIONS - CTG 3

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tons/year)
CO_2	56,982	110,081
N_2O	1.29	2.48
CH_4	3.69	7.12

TABLE 3.1-7
MAXIMUM HOURLY AND ANNUAL GREENHOUSE GAS EMISSIONS
BLACK START ENGINE[1]

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tons/year)
CO_2	314	7.54
CH_4	3.57	0.09

Notes:

[1] EPA does not provide emission factors for N_2O for natural gas engines.

Table 3.1-8 presents a summary of the total Project greenhouse gas emissions.

TABLE 3.1-8
SUMMARY OF PROJECT GREENHOUSE GAS EMISSIONS

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tons/year)
CO_2	57,296	110,089
N_2O	1.29	2.48
CH_4	7.26	7.21

3.1.1.8 Exhaust Stacks and Emission Points

Table 3.1-9 presents physical data on the combustion turbine and black start engine emission points. Exhaust gas flow rates and temperatures for the gas turbine vary as a function of operating load and ambient temperature.

TABLE 3.1-9
STACK PARAMETER DATA

Parameter	Combustion Turbine	Black Start Engine
Stack Height (feet)	60	8
Stack Diameter (feet)	12	0.667

TABLE 3.1-9
STACK PARAMETER DATA
(Continued)

Parameter	Combustion Turbine	Black Start Engine
Exhaust Gas Flow Rate (acfm)	421,762 – 616,508	4,716
Exhaust Gas Velocity (feet/sec)	62.00 – 90.85	224.95
Exhaust Gas Temperature (ºF)	714.8 - 857.8	797

3.1.1.9 Construction Emissions and Proposed Mitigation Measures

Construction emissions would arise due to combustion of fuel in heavy construction equipment and delivery trucks, construction worker commutes, and generation of fugitive dust during earthmoving and grading operations. Construction emissions would be temporary, as the total construction duration is anticipated to be 8 months.

Site disturbance will be minimal, as the combustion turbine and ancillary equipment will be installed on a 0.9-acre site next to the existing Larkspur Energy Facility. The site is currently flat and only limited grading would be required. Construction would be required to comply with best management practices for dust control, including watering, application of surfactants, control of vehicle speeds, paving of access areas, or other operational or technological measures to reduce dispersion of dust.

An analysis of construction emissions is presented in Appendix A-2, Construction Emissions and Impact Analysis. The analysis includes the following emissions control measures as part of the design assumptions:

- Construction equipment exhaust emissions will comply with all applicable EPA and California emission standards for off-road equipment.
- Construction equipment will use only California certified diesel or gasoline fuels.
- Construction equipment will be subject to a preventative maintenance program to ensure correct operation and minimize exhaust emissions.
- Equipment use scheduling will be used to minimize on-site operational time and idling times.
- Fugitive dust will be controlled during grading and site work using application of water – a minimum of 3 times daily or by adding chemical suppressants. Water or chemicals will be applied to all disturbed portions of the Project site including unpaved roads, and laydown area.
- Track-out of dirt will be minimized either by sweeping, or water flushing, as needed to remove track-out materials from all paved access roads.
- On-site vehicle speeds will be generally limited to 15 miles per hour.
- Disturbed areas will be re-vegetated as soon as practical.
- All trucks entering or leaving the site carrying loads of soils, sands, and other loose materials, will be covered or provide a minimum freeboard height of 2 feet.

Because of the limited size of the disturbed area, use of these mitigation measures and control strategies will typically ensure that construction activities at the site will not cause violations of existing air quality standards for particulate matter.

3.1.1.10 Project Location

As discussed in Section 2.0 (Project Description), the site is located in the City of San Diego in San Diego County. The site is situated just south of Old Otay Mesa Road, east of the 905 Freeway and south of the intersection of Harvest Road and Old Otay Mesa Road. The topography of the site and surrounding area is generally flat, with a mean elevation of approximately 538 feet above mean sea level. Topography of the site and the surrounding area is presented in Figure 3.1-1, Topography Within a 6- and 10- Mile Radius of Project Site. The Project site and immediate surrounding area to the north and northeast are undeveloped, vacant land. Immediately to the south lies the SDG&E substation. Land uses in the areas immediately to the west, south, and southeast are primarily commercial and industrial in nature.

3.1.1.11 Existing Air Quality

Each federal or state ambient air quality standard (AAQS) is comprised of two basic elements: (1) a numerical limit expressed as an allowable concentration that is not to be exceeded, and (2) an averaging time which specifies the period over which the concentration value is to be measured. Table 3.1-10 presents the current federal and state AAQSs.

TABLE 3.1-10
CURRENT FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Average Time	California Standards		National Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone	1 hour	0.09 ppm (137 μg/m^3)	Ultraviolet Photometry	--	--	Ethylene Chemiluminescence
	8 hour	0.07 ppm (137 μg/m^3)		0.08 ppm (157 μg/m^3)	0.08 ppm (157 μg/m^3)	
Carbon Monoxide	8 hours	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Spectroscopy (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Spectroscopy (NDIR)
	1 hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen Dioxide (NO_2)[a]	Annual Average	--	Gas Phase Chemiluminescence	0.053 ppm (100 μg/m^3)	0.053 ppm (100 μg/m^3)	Gas Phase Chemiluminescence
	1 hour	0.25 ppm (470 μg/m^3)		--	--	

TABLE 3.1-10
CURRENT FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS
(Continued)

Pollutant	Average Time	California Standards		National Standards		
		Concentration	Method	Primary	Secondary	Method
Sulfur Dioxide (SO_2)	Annual Average	--	Ultraviolet Fluorescence	0.03 ppm (80 μg/m^3)	--	Pararosaniline
	24 hours	0.04 ppm (105 μg/m^3)		0.14 ppm (365 μg/m^3)	--	
	3 hours	--		--	0.5 ppm (1300 μg/m^3)	
	1 hour	0.25 ppm (655 μg/m^3)		--	--	
Respirable Particulate Matter (PM_{10})	24 hours	50 μg/m^3	Gravimetric or Beta Attenuation	--	--	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m^3		50 μg/m^3	50 μg/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	15 μg/m^3	--	Inertial Separation and Gravimetric Analysis
	24 hours	--		35 μg/m^3	--	
Sulfates	24 hours	25 μg/m^3	Ion Chromatography	--	--	--
Lead	30-day Average	1.5 μg/m^3	Atomic Absorption	--	--	Atomic Absorption
	Calendar Quarter	--		1.5 μg/m^3	1.5 μg/m^3	
Hydrogen Sulfide Vinyl Chloride	24 hours	0.010 ppm (26 μg/m^3)	Gas Chromatography	--	--	--

Notes:

ppm = parts per million
μg/m3 = micrograms per cubic meter
mg/m3= milligrams per cubic meter
The California Air Resources Board has proposed to lower the California Ambient Air Quality Standards for NO2 to 0.18 ppm (338 μg/m3) over a 1-hour averaging period and 0.030 ppm (56 μg/m3) over an annual averaging period.
Source: California Air Resources Board 2007

All ambient air quality data presented in this section were published by the California Air Resources Board (CARB) on the ADAM Web site and/or by EPA on the AIRS data Web site. Ambient air

concentrations of ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), CO, PM_{10} and $PM_{2.5,}$ and airborne lead are recorded at monitoring stations throughout San Diego County.

The nearest criteria pollutant ambient monitoring station to the Project site is the Otay Mesa-Paseo Internacional monitoring station located just north of the Otay Mesa border crossing, approximately 1.2 miles south of the existing Larkspur Energy Facility. The Otay Mesa station monitors O_3, NO_2, SO_2, CO, and PM_{10}. This site may be subject to higher pollutant levels than other locations in the region due to the numbers of autos and trucks crossing the border and the extended idling times due to vehicle queues at the border crossing. The other ambient air quality monitoring station in the Project vicinity is the Chula Vista monitoring station, which monitors O_3, NO_2, SO_2, CO, and PM_{10} and $PM_{2.5}$. The Chula Vista monitoring station is located at 80 East J Street, approximately 8.6 miles northwest of the Project site.

Ozone

O_3 is an end product of complex reactions between VOCs and NO_x in the presence of intense ultraviolet radiation. VOC and NO_x emissions from vehicles and stationary sources, combined with daytime wind flow patterns, mountain barriers, persistent temperature inversions, and intense sunlight, generally result in the highest O_3 concentrations. For purposes of both state and federal air quality planning, the San Diego air basin is classified as a nonattainment area with respect to both the state and federal ambient standards for O_3.

Table 3.1-11 shows the measured O_3 levels at the Otay Mesa station during the last 5 years. As seen in the table, the 8-hour O_3 National Ambient Air Quality Standard (NAAQS) of 0.08 parts per million (ppm) was exceeded at Otay Mesa once in 2002, but this does not constitute a violation of the standard which is based on a 3-year average. The 1-hour California Ambient Air Quality Standard (CAAQS) for O_3 was exceeded twice in 2002 and 2005 and once in 2003 and 2004, but was not exceeded in 2006. The more stringent state 8-hour CAAQS of 0.070 ppm was exceeded 3 times in 2002, twice in 2003, and once in 2004, but was not exceeded in 2005 or 2006.

TABLE 3.1-11
OZONE LEVELS AT OTAY MESA
(PPM)

Otay Mesa – 1100 Paseo Internacional	2002	2003	2004	2005	2006
Maximum 1-Hour Average	0.108	0.097	0.095	0.112	0.087
Number of Days Exceeding California 1-Hour Standard (0.09 ppm)	2	1	1	2	0
Maximum 8-Hour Average	0.087	0.076	0.077	0.069	0.068
Number of Days Exceeding National 8-Hour Standard (0.08 ppm) [1]	1	0	0	0	0
Number of Days Exceeding California 8-Hour Standard (0.070 ppm)	3	2	1	0	0

Notes:

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html); and
EPA AIRS Web site (www.epa.gov/air/data/index.html)

[1]Number of days with an 8-hour average exceeding federal standard concentration of 0.08 ppm. The regulatory standard is to maintain 0.08 ppm as a 3-year average of the fourth-highest daily maximum. Therefore, number of days exceeding standard concentration is not the number of violations of the standard for the year.

NA = not applicable

ppm = parts per million

The federal 8-hour ozone NAAQS requires that the 3-year average of the fourth-highest values for individual years be maintained at or below 0.08 ppm. Therefore, the number of days in each year with maximum 8-hour concentrations above the standard concentration in Table 3.1-11, Ozone Levels at Otay Mesa, does not equate to the number of violations.

O_3 data completeness at the Otay Mesa monitoring station for each year was 97 percent for 2001, 99 percent for 2002, 99 percent for 2004, 97 percent for 2005, and 86 percent in 2006.

Nitrogen Dioxide

NO_2 is formed primarily from reactions in the atmosphere between NO (nitric oxide) and oxygen (O_2) or O_3. NO is formed during high-temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is much less harmful than NO_2, it can be converted to NO_2 in the atmosphere within a matter of hours, or even minutes, under certain conditions. The control of NO and NO_2 emissions is also important because both compounds contribute to the atmospheric formation of O_3.

Historical data presented in Table 3.1-12 show NO_2 levels at the Otay Mesa station for the years 2002 through 2006. For purposes of both state and federal air quality planning, the San Diego air basin is in attainment with regard to NO_2. During the last 5 years, there have been no violations of the CAAQS 1-hour standard (0.25 ppm) at the Otay Mesa station. The highest 1-hour concentration recorded was 0.148 ppm in 2003. The table also shows that there were no violations of the annual NAAQS (0.053 ppm) at this station during this period. It should be noted that on February 23, 2007, the CARB adopted more stringent CAAQS for NO_2 of 0.18 ppm for the 1-hour CAAQS and 0.030 for the annual CAAQS.

Maximum recorded levels at the Otay Mesa monitoring station were compliant with these new CAAQS during 2002-2006.

NO_2 data completeness for each year was 92 percent for 2002, 98 percent for 2003, 99 percent for 2004, 79 percent for 2005, and 49 percent for 2006.

TABLE 3.1-12
NITROGEN DIOXIDE LEVELS AT OTAY MESA
(PPM)

Otay Mesa – 1100 Paseo Internacional	2002	2003	2004	2005	2006
Maximum 1-Hour Average	0.126	0.148	0.125	0.109	0.092
Maximum Annual Average	0.021	0.020	0.023	0.024	0.021
Days Over State Standard (0.25 ppm, 1-hour)	0	0	0	0	0

Notes:

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html); and EPA AIRS Web site (www.epa.gov/air/data/index.html)

NA = not applicable

ppm = parts per million

Carbon Monoxide

CO is a product of incomplete combustion, and is emitted principally from automobiles and other mobile sources of pollution, although it is also a product of combustion from stationary sources (both industrial and residential) burning fossil fuels. Peak CO levels occur typically during winter months due to a combination of higher emission rates and stagnant weather conditions.

Table 3.1-13 shows the available data on maximum 1-hour and 8-hour average CO levels recorded at the Otay Mesa station during the period from 2002 to 2006. As indicated by this table, the maximum 1-hour average CO levels comply with the NAAQS and CAAQS (35 ppm and 20 ppm, respectively) and the maximum 8-hour values comply with the NAAQS and CAAQS of 9.0 ppm.

Data completeness for CO concentrations at the Otay Mesa station for each year was 98 percent for 2002, 97 percent for 2003, 96 percent for 2004, 78 percent for 2005, and 48 percent for 2006.

TABLE 3.1-13
CARBON MONOXIDE LEVELS AT OTAY MESA
(PPM)

Otay Mesa – 1100 Paseo Internacional	2002	2003	2004	2005	2006
Maximum 1-Hour Average	8.4	7.0	6.9	7.9	4.8
Maximum 8-Hour Average	4.68	4.85	4.11	3.70	2.94
Days Over the 8-Hour California Standard (9.0 ppm)	0	0	0	0	0
Days Over the 8-Hour Federal Standard (9 ppm)	0	0	0	0	0

Notes:

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html); and EPA AIRS Web site (www.epa.gov/air/data/index.html)

NA = not applicable

ppm = parts per million

Sulfur Dioxide

SO_2 is produced by the combustion of any sulfur-containing fuel. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains nearly negligible sulfur, while fuel oils may contain much larger amounts. Because of the complexity of the chemical reactions that convert SO_2 to other compounds (such as sulfates), peak concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. The San Diego air basin is considered to be in attainment for SO_2 for purposes of state and federal air quality planning.

Background SO_2 data are provided in Table 3.1-14, Sulfur Dioxide Levels at Otay Mesa. The maximum 1-hour average SO_2 levels presented in Table 3.1-14 show that the CAAQS of 0.25 ppm has not been exceeded in the past 5 years; the maximum 1-hour value during this period was approximately 20 percent of the standard (0.045 ppm in 2004). The 3-hour federal secondary standard of 0.5 ppm has not been exceeded, and the maximum measured concentration for this averaging period was only 0.031 ppm in 2005.

SO_2 data completeness at Otay Mesa for each year was 94 percent for 2002, 94 percent for 2003, 95 percent for 2004, 90 percent for 2005, and 70 percent for 2006.

TABLE 3.1-14
SULFUR DIOXIDE LEVELS AT OTAY MESA
(PPM)

Otay Mesa – 1100 Paseo Internacional	2002	2003	2004	2005	2006
Highest 1-hour average	0.020	0.025	0.045	0.040	0.033
Highest 3-hour average	0.016	0.018	0.028	0.031	0.018
Highest 24-hour average	0.009	0.011	0.015	0.013	0.007
Annual Average	0.004	0.003	0.006	0.005	0.002
Days Over 1-hour State Standard (0.25 ppm)	0	0	0	0	0
Days Over 24-hour State Standard (0.04 ppm)	0	0	0	0	0
Days Over 3-hour Federal Standard (0.5 ppm)	0	0	0	0	0
Days Over 24-hour Federal Standard (0.14 ppm)	0	0	0	0	0
Days Over the Annual Federal Standard (0.03 ppm)	0	0	0	0	0

Notes:

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html); and EPA AIRS Web site (www.epa.gov/air/data/index.html)

ppm = parts per million

The SO_2 data in Table 3.1-14 show that neither the 24-hour CAAQS of 0.04 ppm nor the 24-hour NAAQS of 0.14 ppm has been exceeded in the past 5 years. The highest recorded 24-hour average concentration was 0.015 ppm in 2004. The annual SO_2 monitoring data in the table demonstrate that the annual arithmetic mean concentrations have also been well below the NAAQS of 0.03 ppm for all years, with a maximum level of 0.006 ppm in 2004.

Particulate Matter

Particulates (PM_{10}) in the air are caused by a combination of windblown fugitive dust; particles emitted from combustion sources (usually carbon particles); and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides. In 1984, CARB adopted standards for PM_{10}, and phased out the total suspended particulate (TSP) standards that had previously been in effect. PM_{10} standards were substituted for TSP standards because PM_{10} corresponds to the size range of respirable particulates related to human health effects. In 1987, EPA also replaced national TSP standards with PM_{10} standards. At the end of 2006, EPA rescinded its annual PM_{10} standard, but has adopted more stringent standards for fine particulate matter ($PM_{2.5}$). For air quality planning purposes, the San Diego air basin is considered to be in attainment of the federal PM_{10} standard but is nonattainment with respect to the state PM_{10} standards.

Table 3.1-15 shows the maximum PM_{10} levels recorded at the Otay Mesa monitoring station during the period from 2002 through 2006 and the arithmetic annual averages for the same period (the arithmetic annual average is simply the arithmetic mean of the daily observations). PM_{10} is monitored on both the state and federal level. California uses a gravimetric or beta attenuation method, while federal standards are based on an inertial separation and gravimetric analysis. This accounts for the slightly differing 24-

hour concentrations listed in Table 3.1-15 that were recorded by means of the state and federal samplers. At the Otay Mesa station, the maximum 24-hour PM_{10} levels exceed the CAAQS state standard of 50 micrograms per cubic meter (µg/m^3) many times per year. The maximum daily concentration was 155 µg/m^3 (state samplers) in 2005. The maximum annual arithmetic mean concentration recorded at Otay Mesa was 58 µg/m^3 in 2005, which is above the CAAQS of 20 µg/m^3. Data recorded at the Otay Mesa station are influenced by emissions from the high levels of traffic crossing the border at the Otay Mesa border crossing. It is therefore likely that these background measurements overestimate the background concentrations at the Project site.

Particulate concentration data completeness at the Otay Mesa station for each year was 100 percent for 2002, 93 percent for 2003, 100 percent for 2004, 95 percent for 2005, and 82 percent for 2006.

TABLE 3.1-15
PARTICULATE MATTER (PM_{10}) LEVELS AT OTAY MESA
(µG/M^3)

Otay Mesa – 1100 Paseo Internacional	2002	2003	2004	2005	2006
Maximum 24-Hour Average (federal testing samplers)	130	130	137	155	97
Maximum 24-Hour State (state testing samplers)	131	133	138	154	99
Annual Arithmetic Mean	55	52	51	58	47
Estimated Number of Days Exceeding Federal Standard	0	0	0	1	0
Estimated Number of Days Exceeding California Standard	29	24	30	29	11

Notes:

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html); and
EPA AIRS Web site (www.epa.gov/air/data/index.html)

µg/m^3 = micrograms per cubic meter

PM_{10} = particulate matter less than 10 micrometers in diameter

Fine Particulates

The $PM_{2.5}$ data in Table 3.1-16 show that the previous 24-hour average NAAQS of 65 µg/m^3 was exceeded at the Chula Vista station once in the past 5 years. This is the closest monitoring station for which $PM_{2.5}$ data during recent years are available. That exceedance, which occurred in 2003, occurred during the Cedar Fire event in October and is not considered representative of $PM_{2.5}$ background levels in San Diego County. In 2006, the EPA adopted a more stringent $PM_{2.5}$ standard of 35 µg/m^3. That level would have been exceeded in 2002 and 2003, but not in 2004 through 2006. The annual $PM_{2.5}$ data are also presented in the table. The maximum annual arithmetic mean recorded was 14.4 µg/m^3 in 2003, which is below the annual NAAQS of 15 µg/m^3, but above the CAAQS of 12 µg/m^3.

TABLE 3.1-16
PARTICULATE MATTER ($PM_{2.5}$) LEVELS AT CHULA VISTA
($\mu G/M^3$)

Chula Vista – 80 East J Street	2002	2003	2004	2005	2006
Maximum	41.0	239.2	32.7	34.3	30.2
Annual Arithmetic Mean	13.9	14.4	12.2	11.8	11.0
Estimated Number of Days Exceeding Federal Standard	0	1	0	0	0

Notes:

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html); and EPA AIRS Web site (www.epa.gov/air/data/index.html)

$\mu g/m^3$ = micrograms per cubic meter

$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter

Airborne Lead

Pb pollution has historically been emitted predominantly from the combustion of fuels. However, legislation in the early 1970s required gradual reduction of the lead content of gasoline. Coupled with the introduction of unleaded gasoline in 1975, lead levels have been dramatically reduced throughout the United States, and violations of the ambient standards for this pollutant have been virtually eliminated.

Airborne Pb was measured at the Chula Vista monitoring station in 2002 and 2003, but because of the low levels of Pb recorded in San Diego County, Pb monitoring was discontinued after the first quarter of 2003. Table 3.1-17 shows the recorded 24-hour and quarterly Pb concentration averages measured at the Chula Vista station for the years 2002 and 2003. Both state and federal standards limit long-term average Pb concentrations to 1.5 $\mu g/m^3$, although NAAQS pertains to a quarterly average, while CAAQS applies to a 30-day average. The maximum recorded 24-hour level was 0.10 $\mu g/m^3$ during 2003. The maximum quarterly average at the Chula Vista station was 0.02 $\mu g/m^3$ in 2002 and 0.03 $\mu g/m^3$ during the first quarter of 2003. Both maxima are far below the state and federal standards for Pb.

TABLE 3.1-17
LEAD LEVELS AT CHULA VISTA
($\mu G/M^3$)

Chula Vista – 80 East J Street	2002	2003
Maximum 24- hour Average	0.08	0.10
Maximum Quarterly Average	0.02	0.03

Notes:

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html); and EPA AIRS Web site (www.epa.gov/air/data/index.html)

$\mu g/m^3$ = micrograms per cubic meter

Other State-Designated Criteria Pollutants

California has designated sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles as criteria pollutants, in addition to the federal criteria pollutants. No monitoring stations within the San Diego air basin monitor these pollutants. The San Diego air basin thus remains unclassified for these pollutants.

3.1.2 Environmental Consequences

This section evaluates the potential air quality impacts of the Project. Project impacts would be considered significant if pollutant concentration resulting from the Project, when combined with background concentrations, exceeds an AAQS. Emissions estimates for all aspects of both construction and operation of the Project are presented. Dispersion model selection and the selection of model input data are also described (i.e., emissions scenarios and release parameters, building wake effects, meteorological data, and receptor locations), and analysis results are presented.

3.1.2.1 Construction Emissions

The primary emission sources during construction will include exhaust from heavy construction equipment and vehicles and fugitive dust generated in areas disturbed by grading, excavating, and erection of facility structures. The construction schedule calls for the Project site to be disturbed during various construction phases. Note that the existing Larkspur Energy Facility west of the proposed construction area has been previously developed, and is not included in the area potentially disturbed by construction of the Project.

Construction equipment and vehicle exhaust emissions were estimated using equipment lists, fuel usage estimates, and construction scheduling information provided by the Project design engineering firm.

Detailed spreadsheets are provided in Appendix A-2, Construction Emissions and Impact Analysis, showing the calculation of emissions from all Project construction activities and equipment. Table 3.1-18 and Table 3.1-19 respectively, present the estimated maximum daily emissions and total emissions of air pollutants over the 8-month Project construction period.

TABLE 3.1-18
DAILY MAXIMUM CRITERIA POLLUTANT CONSTRUCTION EMISSIONS
(LBS/DAY)

Emission Type	PM_{10}	CO	VOC	NO_x	SO_x
Site Clearing (Months 1 - 3)					
Combustion exhaust	1.06	7.63	2.82	29.03	0.03
Fugitive dust	0.85	-	-	-	-
Site Clearing Emissions Daily Max	1.9	7.6	2.8	29.0	0.03
Concrete Pouring (Months 4 – 8)					
Combustion exhaust	1.65	12.15	4.32	42.59	0.04
Fugitive dust	0.63	-	-	-	-
Concrete Pouring Emissions Daily Max	2.3	12.2	4.3	42.6	0.04
On Road Vehicles (Duration of Project)					
Heavy Trucks	9.32	0.36	0.08	1.29	0.00
Passenger Vehicles	7.78	15.6	1.68	1.68	0.01
Daily Emissions from On-Road Vehicles	17.1	16.0	1.8	3.0	0.01
Max Daily Emissions from Any Activity	19.4	28.2	6.1	45.6	0.1

Notes:

- = not applicable

CO = carbon monoxide

lbs = pounds

NOx = nitrogen oxide(s)

PM10 = particulate matter less than 10 micrometers in diameter

VOC = volatile organic compounds

SOx = sulfur oxide(s)

TABLE 3.1-19
TOTAL PROJECT CONSTRUCTION EMISSIONS OF CRITERIA POLLUTANTS (TONS)

Emission Type	PM10	CO	VOC	NOx	SOx
Site Clearing (Months 1 – 3)					
Combustion exhaust	0.01	0.10	0.04	0.36	0.00
Fugitive dust	0.01	-	-	-	-
Total Emissions from Site Clearing	0.02	0.10	0.04	0.36	0.00
Concrete Pouring (Months 4 - 8)					
Combustion exhaust	0.09	0.67	0.24	2.34	0.00
Fugitive dust	0.03	-	-	-	-
Total Emissions from Concrete Pouring	0.11	0.67	0.24	2.34	0.00

TABLE 3.1-19
TOTAL PROJECT CONSTRUCTION EMISSIONS OF CRITERIA POLLUTANTS (TONS)
(Continued)

On Road Vehicles (Duration of Project)					
Heavy Trucks	0.25	0.01	0.00	0.04	0.00
Passenger Vehicles	0.60	1.20	0.13	0.13	0.00
Total Emissions from On-Road Vehicles	0.85	1.21	0.13	0.13	0.00
Total Project Emissions (tons)	1.0	2.0	0.4	2.9	0.0

Notes:

- = not applicable

CO = carbon monoxide

NOx = nitrogen oxide(s)

PM10 = particulate matter less than 10 micrometers in diameter

VOC = volatile compounds

SOx = sulfur oxide(s)

3.1.2.2 Operational Emissions

The main emission source of the Project will be the simple-cycle combustion turbine generator (CTG 3) burning natural gas. Annual operational emissions from the turbine were estimated by summing the emissions corresponding to normal operating conditions and turbine startup/shutdown conditions. Estimated annual emissions of air pollutants for each turbine have been calculated based on 4,000 hours of normal operation, and up to 300 startup and shutdown events per year.

The criteria pollutant emission rates provided by the turbine vendor for three load conditions (50 percent, 75 percent, and 100 percent) and three ambient temperatures (104ºF, 63.6ºF, and 38ºF) are presented in Table 3.1-20. These scenarios bound the expected normal operating range of the CTG 3 at the Project facility.

The Project will also include one 600-kW natural gas-fired black-start engine. This black-start unit will be tested for 2 hours per month for emergency preparedness, with individual tests limited to no more than 30 minutes. There are no other operational sources of air pollutants at the Project. The Project will not require a cooling tower.

TABLE 3.1-20
CTG 3 OPERATING LOAD SCENARIOS AND 1-HOUR OPERATING EMISSION RATES

Operating Temperature (ºF)	**104**	**104**	**104**	**63.6**	**63.6**	**63.6**	**38**	**38**	**38**
CT3 Load Level	100%	75%	50%	100%	75%	50%	100%	75%	50%
Stack Outlet Temperature (°F)	857.8	795.6	783.8	847.7	771.2	753.9	837.5	755.2	714.8
Exhaust Flow @ T	584,029	502,021	421,762	600,216	516,135	433,650	616,508	527,878	442,033

TABLE 3.1-20
CTG 3 OPERATING LOAD SCENARIOS AND 1-HOUR OPERATING EMISSION RATES
(Continued)

Operating Temperature (ºF)	**104**	**104**	**104**	**63.6**	**63.6**	**63.6**	**38**	**38**	**38**
stack (acfm)									
Stack Exit Velocity, ft/min	5,163	4,439	3,729	5,307	4,563	3,834	5,451	4,667	3,908
Emissions (lbs/hr)									
NO_X at 2.5 ppmvd BACT level	3.99	3.18	2.42	4.19	3.30	2.50	4.33	3.40	2.57
CO at 6.0 ppmvd BACT level	5.87	4.61	3.49	6.19	4.72	3.67	6.34	5.01	3.78
VOC at 2.0 ppmvd BACT level	1.25	0.99	0.76	1.31	1.03	0.78	1.11	0.85	0.75
SO_2	0.83	0.66	0.50	0.87	0.69	0.52	0.90	0.71	0.53
PM_{10}	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
NH_3 at 5 ppmvd BACT level	2.97	2.33	1.77	3.13	2.39	1.86	3.21	2.54	1.91

The expected emissions and durations associated with individual turbine startup and shutdown events are summarized in Table 3.1-21. Based on vendor information, turbine startup is expected to take 10 minutes, and turbine shutdown will take 8 minutes to be completed. Because hours that include startup and shutdown events will have higher NO_x, CO, and ROC emissions than the normal operating condition with functioning SCR and CO catalyst, they were incorporated into the worst-case short- and long-term emissions estimates for each turbine in the model simulations pertaining to these pollutants.

TABLE 3.1-21
CRITERIA POLLUTANT EMISSIONS
DURING STARTUP AND SHUTDOWN

Pollutant	Startup 10 minutes	Shutdown 8 minutes
	Startup Total lbs per Event	Total lbs per Event
NO_X	4.30	2.80
CO	3.70	2.40
ROC	0.10	0.09
SO_2	0.15	0.12
PM_{10}	0.40	0.60

Notes:

SO_2 emissions were estimated from the 0.83 lb/hr emission rate at full load over the indicated hour fractions for startup and shutdown.

CO = carbon monoxide

CTG = combustion turbine generator

lbs = pounds

NOx = nitrogen oxide(s)

PM_{10} = particulate matter less than 10 micrometers in diameter

ROC = reactive organic compounds

SO_2 = sulfur dioxide

Table 3.1-22 shows the equipment operations and pollutant emissions used to develop the worst-case emissions scenarios for each averaging time and pollutant combination addressed in the AAQSs. Some notes regarding the selection of these scenarios and the resulting emission calculations are provided below.

TABLE 3.1-22
CRITERIA POLLUTANT SOURCES AND EMISSION TOTALS FOR THE WORST-CASE PLANT-WIDE EMISSIONS SCENARIOS CORRESPONDING TO ALL AVERAGING TIMES

AVERAGING TIME	OPERATING EQUIPMENT	POLLUTANT	SOURCES	
			COMBUSTION TURBINE	BLACK-START ENGINE
			EMISSIONS IN LBS – ENTIRE PERIOD	
1-hour	Turbine operating in startup mode, and black-start engine testing (1/2 hour).	NO_x	7.91	0.44
		CO	8.99	2.22
		SO_2	0.90	0.002

TABLE 3.1-22
CRITERIA POLLUTANT SOURCES AND EMISSION TOTALS FOR THE WORST-CASE PLANT-WIDE EMISSIONS SCENARIOS CORRESPONDING TO ALL AVERAGING TIMES
(Continued)

AVERAGING TIME	OPERATING EQUIPMENT	POLLUTANT	SOURCES	
			COMBUSTION TURBINE	BLACK-START ENGINE
			EMISSIONS IN LBS – ENTIRE PERIOD	
3-hour	Turbine operating at 100% load (at 38ºF; with Sprint on and evaporative cooler off), with black-start engine testing (1/2 hour).	SO_2	2.69	0.00168
8-hour	Turbine operating at 100% load (at 38ºF; with Sprint on and evaporative cooler off) for 4 hours with two startups and two shutdowns, with black-start engine testing (1/2 hour).	CO	59.12	2.22
24-hour	Turbine operating at 100% load (at 38ºF; with Sprint on and evaporative cooler off) for 24 hours, with black-start engine testing (1/2 hour).	PM_{10}	96.00	0.138
		SO_2	21.60	0.00168
Annual	Turbine operating at 100% load (at 38ºF; with Sprint on and evaporative cooler off) for 4,000 hours with 300 startups and 300 shutdowns, with black-start engine testing (24 hours).	NO_x	19,450	21.29
		CO	27,204	106.43
		VOCs	5,297	229.89
		PM_{10}	16,300	6.62
		SO_2	3,668	0.08

Notes:

CO = carbon monoxide

lbs = pounds

NOx = nitrogen oxide(s)

PM_{10} = particulate matter less than 10 micrometers in diameter

SO_2 = sulfur dioxide

As described previously and shown in Table 3.1-22, emissions from the Project would be below the PSD emission thresholds and the Project would therefore not be subject to PSD regulations.

SO_2 emission rates were calculated assuming 100 percent conversion of the fuel sulfur to SO_2. The maximum gas turbine SO_2 emission rates for the 1-hour, 3-hour, 24-hour, and annual averaging periods

were conservatively calculated assuming a gas fuel sulfur concentration of 0.75 grains per 100 scf of natural gas, the maximum allowed under the SDG&E tariff.

Worst-case 1-hour emission rates for the turbine for CO and NO_x correspond to 100 percent load operations at 38ºF plus one startup. Short-term turbine SO_2 emission rates are the same for normal operations or for an hour that includes a startup event because the production of this pollutant is solely a function of fuel consumption rate and is unaffected by the operability/non-operability of post-combustion controls. CO is the only criteria pollutant with an 8-hour average ambient air quality standard. The maximum 8-hour emission scenario for both turbines consists of two startups and two shutdowns, plus 4 hours of 100 percent load operation at 38ºF.

Although there could be up to six startups and six shutdowns per day, the scenario selected to represent maximum 24-hour average emission rates for SO_2 and particulate matter assumes 24 hours operation at 100 percent load operation at 38ºF. This scenario resulted in the maximum 24-hour emissions for those pollutants.

Turbine Commissioning

The commissioning of the GE model LM6000-PC Sprint® natural gas turbine will entail several relatively short periods of turbine testing prior to and during installation and testing of the SCR and CO catalyst systems. During these test periods, emissions of NO_x and CO will be higher than the normal operating emissions scenarios previously discussed, because these controls will be either partially or completely inoperative.

Commissioning activities and expected emissions are discussed below. At the conclusion of the commissioning period, operational emissions rates will be at the controlled rates discussed previously in this section. The required continuous emissions monitoring system (CEMS) for NO_x and CO will be operable during the commissioning period to document actual emissions during this period.

The commissioning tests are likely to include Full Speed No Load Tests**,** Minimum Load Tests, Full Speed, No Load Tests (SCR Not Operational), and Multiple Load Tests (SCR and Oxidation Catalyst Fully Operational). Stack parameters and emissions for each of the six commissioning scenarios are presented in Table 3.1-23. As shown in the table, during the commissioning tests the worst-case NO_x and CO emission rates for the turbine may be as high as 36.93 lb/hour and 64.97 lb/hour, respectively. Actual test durations will vary, but total commissioning emissions for the new turbine are not expected to exceed totals based on these worst-case hourly rates over 200 hours of testing for the turbine (i.e., 7,386 pounds of NO_x and 12,994 pounds of CO).

TABLE 3.1-23
TURBINE COMMISSIONING SCENARIOS AND EMISSIONS

Scenario	Description	Duration Hours	Parameters	Stack Temp. (ºF)	Stack Flow Rate (lbs/hr)	NOx (lbs/hr[1])	VOC (lbs/hr[2])	CO (lbs/hr)
1	First Fire	28	NOx H_2O off SCR off Load - Constant	705	403,200	16.03	1.92	61.67
2	Controlled Break-In	20	NOx H_2O off SCR off Load - Constant	715	424,800	16.89	2.02	64.97
3	Dynamic automatic voltage regulation (AVR) and water injection	24	NOx H_2O off SCR off Load - Constant	780	491,414	19.54	1.22	5.23
4	Base Load AVR	16	NOx H_2O off SCR off Load - Constant	850	928,828	36.93	2.31	8.09
5	SCR Commissioning	24	NOx H_2O off SCR off Load - Constant	780	491,414	3.91	1.22	5.23
6	Full Load Testing	24	NOx H_2O off SCR off Load - Constant	850	928,828	7.39	2.31	8.09

Notes:

[1] As NO_2

[2] As CH_4

3.1.2.3 Air Dispersion Modeling

The purpose of the air dispersion modeling analysis is to demonstrate that criteria air pollutant emissions from the Project would not cause or contribute significantly to a violation of a State or National AAQS. Potential impacts of non-criteria pollutant emissions from the Project are evaluated in Section 3.8, Public Health and Safety. The criteria pollutant modeling addresses emissions from both Project construction and operations. Construction impacts are due to equipment and vehicle exhaust and fugitive dust caused by grading, excavation, and equipment travel on unpaved and paved surfaces. The impacts from

operations are associated with natural gas combustion in the combustion turbine and periodic black-start engine tests.

The air quality modeling methodology used for the Project was previously described in a modeling protocol submitted to CEC and the SDAPCD (URS 2007). See Appendix A-3, Air Quality Modeling Protocol, for a copy of the protocol. The modeling approaches used to assess various aspects of the Project's potential impacts to air quality are discussed below.

Model and Model Option Selections

The modeling was conducted using EPA AERMOD model (Version 07026) (EPA 2004b, 2006a). The AERMOD model is EPA's preferred regulatory model for evaluating impacts for stationary industrial sources. The model is appropriate for this application because it has the ability to assess dispersion of emission plumes from multiple point, area, or volume sources in flat, simple, and complex terrain and to utilize sequential hourly meteorological input data. The model was used for modeling concentrations of pollutants having short-term (i.e., 1-, 3-, 8-, and 24-hour) ambient standards. Modeling for pollutants governed by annual ambient air quality standards (i.e., NO_2, SO_2, and PM_{10}) was conducted using AERMOD with the ANNUAL option. The AERMOD model was run using the regulatory default model option.

Review of aerial photographs and U.S. Geological Survey (USGS) topographic maps and site visits indicate that the area surrounding the Project is more than 50 percent rural; therefore, rural dispersion coefficients were used in the modeling analyses for this Project.

Building Wake Effects

The effect of building wakes (i.e., downwash) on the stack plumes was evaluated for the turbines and black-start engine in accordance with EPA guidance (EPA 1985). Direction-specific building data were generated for stacks below good engineering practice (GEP) stack height using EPA's Building Profile Input Program – Prime (BPIP-Prime) (Version 04274) (EPA 1995). Nine structures (including existing structures at the site and proposed structures associated with CTG 3) and three storage tanks (including two existing tanks and a proposed tank) were identified in the Project layout to be included in the downwash analysis, including the following:

- Fuel Oil Tank (existing)
- Demineralized Water Storage Tank (existing)
- Demineralized Water Storage Tank (proposed)
- Combustion Turbine Generator 1 (existing)
- Combustion Turbine Generator 2 (existing)
- SCR/Catalyst housing 1 (existing)
- SCR/Catalyst housing 2 (existing)
- Control Room (existing)

- Combustion Turbine Generator 3 (proposed)
- Combustion Turbine Generator Inlet (proposed)
- SCR/Catalyst housing 3 (proposed)
- Black-start engine generator (proposed)

The results of the BPIP-Prime analysis were included in the AERMOD input files to enable downwash effects to be simulated. The AERMOD model considers direction-specific downwash using both the Huber-Snyder and Schulman-Scire algorithms, as evaluated in the BPIP-Prime program. Input and output electronic files for the BPIP-Prime analysis are included with those from all other dispersion modeling analyses on the compact disks that are being submitted to accompany this application.

Meteorological Data

The modeling analyses for the Project used 3 years of hourly meteorological data collected at the Chula Vista monitoring station located at 80 J Street in Chula Vista, which were provided by the SDAPCD. The monitoring station is the only station in the Project vicinity for which complete, processed surface meteorological data are available for use with AERMOD. The Chula Vista monitoring station is located approximately 8.6 miles northwest of the Project site. Profile data from the Point Loma profiler and upper air data from the MCAS Miramar monitoring station were used to process the meteorological data. The proximity and terrain similarities between the Project site and the Chula Vista station demonstrate that the meteorological data are suitable for use in this air quality assessment of emission sources at the existing Larkspur Energy Facility. In addition, staff of SDAPCD has verbally approved this data set as appropriate for Project modeling evaluation.

The topography of the Otay Mesa area is relatively flat in the immediate vicinity of the Project site, with terrain rising to the east toward the San Ysidro Mountains and Otay Mountain with an elevation of 3,566 meters (11,699 feet). The Otay Valley is located approximately 2 miles to the northeast of the existing Larkspur Energy Facility. The international border crossing at Otay Mesa is located approximately 1.2 miles to the south.

The terrain immediately surrounding the Chula Vista monitoring station and the Project site can be categorized as flat, or gradually sloping, developed lands. While the area immediately surrounding the Project site is less developed than the area surrounding the Chula Vista monitoring station, the immediate vicinity is developing as a commercial and light industrial area. Additionally, there are no significant terrain features in the area between the Chula Vista monitoring station and the Project site that cause substantial differences in wind or temperature conditions in these areas. Therefore the 3 years of meteorological data selected from the Chula Vista monitoring station were determined to be representative for the Project.

In accordance with the AERMET manual (EPA 2004c), meteorological data should be processed using characteristics of the monitoring site. The appropriate surface characteristics (albedo, Bowen ratio, and surface roughness) for use in the AERMET meteorological processing were determined using Tables 4-1, 4-2a, 4-2b, 4-2c, and 4-3 in the AERMET manual. Because of the mainly urban land use surrounding the monitoring site in Chula Vista, the meteorological data were processed assuming one 360 degree sector

with an urban classification. The AERMET surface characteristics were specified monthly, see Table 3.1-24.

The albedo, the fraction of total incident solar radiation reflected by the surface back to space without absorption, for all four seasons are between 0.14-0.18 per the AERMET manual. Because there is essentially no snowfall accumulation in the area, the winter surface characteristics described in the AERMET manual are not applicable to these sites; therefore, autumn parameters were used for the period from November through February. Spring parameters were used for March and April and summer parameters were used for May through October.

The Bowen ratio is a measure of atmospheric moisture. The Bowen ratio from AERMET Table 4-2c was used for November, December, January, February, and March. These months are during the rainy season in San Diego; therefore, wet conditions were assumed. For April and October, the Bowen ratio from Table 4-2b for average moisture conditions was used to represent the transition between the wet and dry season. For the remainder of the summer months the Bowen ratio was obtained from Table 4-2a for dry moisture conditions during the dry season.

Surface roughness was set at 1.0 meter based on the recommended value for urban conditions. Meteorological processing parameters used to process the Chula Vista meteorological data are presented in Table 3.1-24. A wind rose for the Chula Vista meteorological data is presented in Figure 3.1-2.

TABLE 3.1-24
AERMET METEOROLOGICAL PROCESSING PARAMETERS
CHULA VISTA METEOROLOGICAL DATA

Month	Albedo	Bowen Ratio	Surface Roughness
January	0.18	1.0	1.0
February	0.18	1.0	1.0
March	0.14	0.5	1.0
April	0.14	1.0	1.0
May	0.16	4.0	1.0
June	0.16	4.0	1.0
July	0.16	4.0	1.0
August	0.16	4.0	1.0
September	0.16	4.0	1.0
October	0.16	2.0	1.0
November	0.18	1.0	1.0
December	0.18	1.0	1.0

According to the AERMOD Implementation Guide (EPA 2005), in order to apply AERMOD in an urban setting without selecting its urban option, meteorological data must be sufficient to fully define the profiles of wind, temperature, and turbulence, including estimation of urban nighttime mixing height. Based on consultation with the SDAPCD, it was determined that the Chula Vista meteorological data set

was sufficient to define wind, temperature, and turbulence profiles and urban nighttime mixing height, and therefore the recommendation of the SDAPCD was to apply AERMOD without selecting its urban option.

Receptor Locations

Receptors were placed at off-property locations to evaluate the impacts of the Project (see Figure 3.1-3, Near-field Model Receptor Grid, and Figure 3.1-4, Far-field Model Receptor Grid). Receptor spacing varies according to distance from the Project property boundary. To ensure that the location of highest impact was identified, the receptor spacing was closest at the Project property boundary and increased with distance from the boundary. Receptors were placed as far as 10 km from the property boundary. The following receptor spacing was used in the modeling analysis:

- 25-meter spacing extending around the property boundary and out to 100 meters beyond the boundary
- 100-meter spacing between 100 meters and 1 km of the property boundary
- 500-meter spacing between 1 km and 5 km of the property boundary
- 1,000-meter spacing between 5 km and 10 km of the property boundary

An additional set of model receptors was used to ensure that the highest maximum pollutant concentrations would be captured. Specifically, a grid of finely spaced receptors was placed around the locations of the predicted maximum concentration for each pollutant and each averaging time (except those occurring along the property line where the receptor spacing was already sufficiently dense). This fine grid used a receptor spacing of 25 meters and extended 100 meters in each direction from the maximum concentrations on the original grid. The receptor spacing in this refined grid is shown in Figure 3.1-3.

Receptor locations were designated using Universal Transverse Mercator (UTM) coordinates (North American Datum 27). Receptor elevations were obtained from the USGS 7.5-minute digital elevation map (DEM) electronic terrain data, in accordance with the AERMOD Terrain Processer (EPA 2004d, 2006b). Electronic data for the portion of the modeling domain within Mexico were obtained from USGS as 3 arc second (approximately 90 m resolution) DEMs.

An analysis was conducted using the AERMAP module to determine if there are any significant terrain features surrounding the existing Larkspur Energy Facility. The San Ysidro Mountains to the east of the existing facility contain the only significant terrain features. It was determined that only a handful of the receptors within the 10 km modeling grid will have terrain features that rise more than 10 percent. All of these features were incorporated in the AERMAP analysis where the terrain domain was set to cover 28 km to the east of the facility, 32 km to the north, and 15 km to the west and 15 km to the south.

Turbine Impact Screening Modeling

Screening modeling was performed to determine which turbine operating modes produced “worst-case” impacts; i.e., maximum ground-level concentrations for each pollutant and averaging time. The screening modeling used the AERMOD model (Version 07026) as described in the previous subsections. Building

dimension information and the receptor grid described above were also used. All 3 years of meteorological data were used in the screening analysis. Stack operating parameters were provided by the turbine vendor for three ambient temperatures: the minimum wintertime temperature of 38ºF, the average annual temperature of 63.6ºF, and a maximum summer temperature of 104ºF. At each of these temperatures, stack parameters and emissions data for 50 percent load operations, 75 percent load operations, and 100 percent load operations were provided.

The AERMOD model simulated natural gas combustion emissions from one, 60-foot-tall (18.3 meter) stack with an inside diameter of 12 feet (3.66 meter). The stack was modeled as a point source at its proposed location. Table 3.1-25, CTG Screening Model Results, describes the combustion turbine screening results based on an emission rate of 1 gram/second for the three turbine operating loads and four different operating temperatures. Stack parameters supplied by the turbine vendor for the operating conditions shown in Table 3.1-26 are included in Appendix A-1.

TABLE 3.1-25
CTG SCREENING MODEL RESULTS
(X/Q) (μG/M^3/G/S)

Scenario		100% load	75% load	50% load
38ºF	1 hour	8.05025	9.16558	10.44705
	3 hour	5.61967	6.10213	7.27349
	8 hour	4.60034	5.41108	5.89103
	24 hour	1.73031	1.93245	2.23515
	Annual	0.29392	0.34118	0.39272
63.6ºF	1 hour	8.14365	9.27019	10.44522
	3 hour	5.66773	6.1676	7.23842
	8 hour	4.71465	5.453	5.89682
	24 hour	1.75208	1.95242	2.22989
	Annual	0.29921	0.34481	0.39227
104ºF	1 hour	8.26654	9.3871	10.52052
	3 hour	5.71162	6.24039	7.33848
	8 hour	4.82921	5.49755	5.92511
	24 hour	1.77501	1.97507	2.24882
	Annual	0.30483	0.34884	0.3957

Notes:

% = percent

The screening modeling results shown in Table 3.1-25 were multiplied by the appropriate mass emissions in Table 3.1-20 to determine the maximum concentrations in μg/m^3. The highest resulting concentrations for each pollutant and averaging time were used to identify the turbine stack parameters that led to the highest predicted ground-level concentration per pound of pollutant emitted for each averaging time. The resulting worst-case turbine operating conditions are summarized in Table 3.1-26.

TABLE 3.1-26
NATURAL GAS CTG STACK PARAMETERS CORRESPONDING TO MAXIMUM PREDICTED GROUND LEVEL POLLUTANT CONCENTRATIONS

Pollutant	Averaging Time	Operating Condition
NO_2	1 hour	100 percent load, 38 ºF
	Annual	100 percent load, 38 ºF
CO	1 hour	100 percent load, 38 ºF
	8 hour	100 percent load, 38 ºF
SO_2	1 hour	100 percent load, 38 ºF
	3 hour	100 percent load, 38 ºF
	24 hour	100 percent load, 38 ºF
	Annual	100 percent load, 38 ºF
PM_{10}	24 hour	50 percent load, 104 ºF
	Annual	50 percent load, 104 ºF

Notes:

CO = carbon monoxide

NO_2 = nitrogen dioxide

PM_{10} = particulate matter less than 10 micrometers in diameter

SO_2 = sulfur dioxide

In all subsequent modeling analyses, emissions from the natural gas turbine were modeled using the stack parameters of the worst-case operating scenarios discussed above. Specifically, stack parameters corresponding to the worst-case operating condition were used to model impacts from the turbine in the refined modeling analyses presented in the following subsections. However, pollutant emission rates corresponding to the maximum (100% load) emissions scenarios were conservatively assumed in the modeling analyses.

Ozone Limiting Method

Annual and 1-hour NO_2 concentrations were calculated using the Ozone Limiting Method (OLM) with hourly 1-hour O_3 concentrations input to calculate the 1-hour NO_2 concentrations for each hour within the AERMOD model. The OLM involves an initial comparison of the estimated maximum NOx concentration by volume and the concurrent ambient O_3 concentration to determine which is the limiting factor in NO_2 formation. If the O_3 concentration is greater than the maximum NOx concentration, total conversion is assumed. If the NOx concentration is greater than the O_3 concentration, the formation of NO_2 is limited by the ambient O_3 concentration. In this case, the NO_2 concentration is set equal to the O_3 concentration plus a correction factor that accounts for in-stack and near-stack thermal conversion. O_3 data from the Otay Mesa monitoring station for the same period as the meteorological data (2000 – 2002) were used for the OLM analysis.

Fumigation Analysis

Fumigation may occur when a plume that was originally emitted into a stable layer of air is mixed rapidly to ground-level when unstable air below the plume reaches plume height. Fumigation can cause relatively high ground-level concentrations for some elevated point sources. Fumigation can occur during the breakup of the nocturnal radiation inversion by solar warming of the ground surface (inversion breakup fumigation), or by the transport of pollutants from a stable marine environment to an unstable inland environment (shoreline fumigation).

A fumigation analysis was performed using EPA's model SCREEN3 (Version 96043) (EPA 1996). The SCREEN3 model was used to calculate concentrations from inversion breakup fumigation; no shoreline fumigation was performed for the Project site. A unit emission rate was used (1 gram per second) in the fumigation modeling to represent the plant emissions and the model results were given in terms of predicted maximum concentrations that were then scaled to reflect plant emissions for each pollutant. Inversion breakup fumigation concentrations were calculated for hourly, 3-hour, 8-hour, and 24-hour averaging times using EPA-approved conversion factors. These multiple-hour model predictions are very conservative since inversion breakup fumigation is a transitory condition that would most likely affect a given plume for only a few minutes at a time. Input and output electronic files for the fumigation modeling analysis are included in the modeling CDs submitted with this application.

3.1.2.4 Modeling Results - Compliance with Ambient Air Quality Standards

Air dispersion modeling was performed according to the methodology described in Section 3.1.2.3 to evaluate the maximum increase in ground-level pollutant concentrations resulting from the Project emissions, and to compare the maximum predicted impacts, including background pollutant levels, with applicable short-term and long-term NAAQS. The impacts from construction activities and plant operations were analyzed separately because they will occur during different time periods. The same 3-year record of hourly meteorological data described in Section 3.1.2.3 was used in the modeling to evaluate both construction and operational impacts. In each case, the AERMOD model predicted the increases in criteria pollutant concentrations at all receptor concentrations due to Project emissions only. Next, the maximum incremental increases for each pollutant and averaging time were added to the maximum background concentrations, based on air quality data collected at the most representative monitoring stations during the last 5 years (i.e., 2002 through 2006). These background concentrations are presented and discussed in Section 3.1.1.12, Existing Air Quality. The resulting total pollutant concentrations were then compared with the most stringent CAAQS or NAAQS. Modeled criteria pollutant impacts for the construction and operational phases of the Project are summarized in Table 3.1-27. Construction modeling results are described in Appendix A-2.

TABLE 3.1-27
AERMOD MODELING RESULTS: PROJECT OPERATIONS IMPACTS

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Impact Level[1] ($\mu g/m^3$)	Background[2] ($\mu g/m^3$)	Maximum Total Predicted Concentration ($\mu g/m^3$)	Most Stringent AAQS ($\mu g/m^3$)	UTM Coordinates	
							East (m)	North (m)
Operational Impacts								
CO	1 hour[4]	337.86	2,000	9,600	2,038	23,000	505368	3603143
	8 hour[5]	24.54	500	5,543	5,568	10,000	505368	3603143
NO_2	1 hour[4]	66.74	NA	277.88	344.62	470	505368	3603143
	Annual[6]	0.08893	1	45.06	45.15	100	505550	3603050
PM_{10}	24 hour[3,7]	1.13672	5	155	156.14	50	505500	3603050
	Annual[3,6]	0.09893	1	58	58.10	20	505550	3603050
$PM_{2.5}$	24 hour[7,8,9]	1.13672	NA	41	42.14	35	505500	3603050
	Annual[6,8]	0.09893	NA	13.9	14.0	12	505550	3603050
SO_2	1 hour[4]	0.91135	NA	117.55	118.46	655	505450	3603050
	3 hour[10]	0.63515	25	80.98	81.62	1,300	505450	3603025
	24 hour[7]	0.20143	5	39.18	39.38	105	505525	3603075
	Annual[6]	0.01648	1	15.67	15.69	80	505550	3603050

Notes:

[1] Source: 40 CFR 52.21.

[2] Background represents the maximum values measured at Otay Mesa (CO, NO_2, PM_{10}, SO_2) or Chula Vista ($PM_{2.5}$) monitoring stations, 2002-2006, depending on pollutant.

[3] PM_{10} background levels exceed ambient standards.

[4] Maximum hourly impact based on turbine at startup rate and 30 minutes of black-start engine.

[5] Maximum 8-hour impact based on turbine for 4 hours under 100% load, 38ºF operations, two startups and two shutdowns and 30 minutes of black start engine.

[6] Annual impact based on 4,000 hours of normal operation, 300 startups, and 300 shutdowns, and 24 hours of black-start engine operation.

[7] Maximum 24-hour impact based on turbine under 100% load, 38ºF operations and 30 minutes of black-start engine.

[8] All operational Project equipment PM_{10} emissions assumed to be $PM_{2.5}$.

[9] 2003 monitoring $PM_{2.5}$ data were excluded from the analysis because the data were influenced by the Cedar Fire event in October.

[10] Maximum 3-hour impact based on 3 hours of turbine under 100% load, 38ºF operations and 30 minutes of black-start engine operation.

µg/m3 = micrograms per cubic meter

CO = carbon monoxide

m = meters

NA = Not applicable

AAQS = Ambient air quality standard

NO_2 = nitrogen dioxide

OLM = ozone limiting method

PM_{10} = particulate matter less than or equal to 10 microns in diameter

$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter. All PM emissions during operation assumed to be $PM_{2.5}$

PSD = Prevention of Significant Deterioration

SO_2 = sulfur dioxide

UTM = Universal Transverse Mercator

Normal Plant Operations

As described previously, the emission rates and stack parameters used in the model simulations for the Project operations were selected to ensure that the maximum potential impacts would be addressed for each pollutant and averaging time corresponding to an ambient air quality standard.

As shown in Table 3.1-27, maximum modeled concentrations due to the operational plant are below the federal PSD significant impact levels (SILs) for all criteria pollutants. Although the Project emissions will be well below the levels that trigger PSD review, these SILs are often used as a measure of the potential impacts of proposed new sources in California. Table 3.1-27 also shows that the modeled impacts due to normal operations of the Project would not cause a violation of any NAAQS and would not significantly contribute to the existing violations of the federal and state PM_{10} standards. In addition, as described later, all of the Project's operational emissions of nonattainment pollutants and their precursors will be offset to result in a net air quality benefit. Figure 3.1-5, Locations of Maximum Predicted Ground-Level Pollutant Concentrations for the Operational Project, shows the locations of the maximum predicted operational impacts for all pollutants and averaging times.

Potential worst-case fumigation impacts were modeled as described in Section 3.1.2.3, and, as shown in Table 3.1-28, Project Operations Fumigation Impact Summary, the resulting incremental concentration predictions are all well below the maximum operational impacts shown in the lower part of Table 3.1-27.

TABLE 3.1-28
PROJECT OPERATIONS FUMIGATION IMPACT SUMMARY[1]

Pollutant	Source	Inversion Impact ($\mu g/m^3$)[2]	Distance to Max. Impact (m)
NO_2 1 hour[2]	Normal Operation Turbine	1.063	18,124
CO 1 hour[3]	Normal Operation Turbine	1.208	18,124
CO 8 hour[4]	Startup, Shutdown, and Normal Operation Turbine	0.696	18,124
PM_{10} 24 hour[5]	Normal Operation Turbine	0.0004	18,124
SO_2 1 hour[6]	Normal Operation Turbine	0.121	18,124
SO_2 3 hour	Normal Operation Turbine	0.109	18,124
SO_2 24 hour	Normal Operation Turbine	0.048	18,124

Notes:

[1] 1-hour SCREEN3 results multiplied by 0.9 to convert to 3 hour; 0.7 to convert to 8 hour; 24-hour inversion impacts were converted using a factor of 0.4.

[2] NO_2 modeled with turbine in 100% load operation, 38ºF, 0.9964 g/s and stack parameters of 50% load, 38ºF.

[3] CO modeled with turbine in 100% load operation, 38ºF, 1.1323 g/s and stack parameters of 50% load, 38ºF.

[4] CO modeled with 4 hours turbine in 100% load operation, 38ºF, 2 startups, 2 shutdowns, 0.9315 g/s and stack parameters of 50% load, 38ºF

[5] Turbine modeled with 0.00091325 g/s PM_{10}.

[6] SO_2 modeled with turbine at 0.113 g/s emissions and stack parameters of 50% load, 38ºF.

µg/m3 = micrograms per cubic meter

CO = carbon monoxide

M = meters

NO_2 = nitrogen dioxide

PM_{10} = particulate matter less than or equal to 10 microns in diameter

SO_2 = sulfur dioxide

Turbine Commissioning

The Proposed Larkspur CTG 3 could be operated for up to approximately 200 hours for purposes of commissioning the generating equipment. Emissions for the planned sequencing of commissioning tests were provided by the Project engineers for various commissioning phases (see Table 3.1-23). The purpose of the commissioning period is to demonstrate the guaranteed generator electrical output and heat rate for the turbine. As described in Section 3.1.2.2, six separate stages of commissioning are anticipated. Based on the turbine commissioning phases, emissions of NO_x were estimated to be highest during stage 4, Base Load AVR testing, and emissions of CO were estimated to be highest during stage 2, Controlled Break-In. However, the first fire test has a lower stack temperature and flow rate and could result in the highest impacts due to reduced plume rise. Accordingly, four separate commissioning scenarios were modeled to determine the commissioning phase that would result in the highest short-term impact: first fire (NO and CO), controlled break-in (NO and CO), dynamic AVR regulation (NO), and base load AVR testing (NO).

Maximum 1-hour NO_2 impacts were calculated using the OLM. The full 3-year meteorological input data were used for these simulations to ensure that maximum potential for impacts would be addressed.

Table 3.1-29, Project Commissioning Modeling Results, presents the maximum short-term impacts predicted during the commissioning period. As shown in the table, when these incremental commissioning impacts are added to applicable background concentrations and compared to the most stringent state or federal ambient standards, no violations of the AAQSs for these pollutants are predicted to occur during turbine commissioning.

Table 3.1-29
PROJECT COMMISSIONING MODELING RESULTS

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	Background[1] ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	Most Stringent Standard ($\mu g/m^3$)
Commissioning Impacts					
CO	1 hour	122.17	9,600	9,722	23,000
	8 hour	74.70	5,543	5,618	10,000
NO_2	1 hour	30.71	277.88	308.59	470

Notes:

[1] Background represents the maximum value measured at Otay Mesa monitoring station, 2002-2006.

$\mu g/m^3$ = micrograms per cubic meter

CO = carbon monoxide

NO_2 = nitrogen dioxide

3.1.2.5 Cumulative Impacts

CEC requirements specify that an analysis is required to determine the cumulative impacts of the Project and other projects within a 6-mile radius that have received construction permits but are not yet operational or that are in the permitting process or can be expected to do so in the near future. Based on review of SDAPCD and CEC information, there are two such projects planned within 6 miles from the Project site: the Otay Generating Station and the Pacific Energy landfill gas engine installation. The SDAPCD was contacted and provided modeling input parameters for the Otay Generating Station and the Pacific Energy landfill gas engines. The SDAPCD also provided emissions data for the projects.

In addition to the Otay Generating Station and the Pacific Energy landfill gas engines, the evaluation of potential cumulative impacts included the two existing Larkspur Energy Facility turbines (CTG 1 and CTG 2). The existing CalPeak Border facility, which is located to the south of the existing Larkspur Energy Facility, was also included in the cumulative impacts analysis to ensure that impacts in the immediate proximity of the Project site would be evaluated. SO_2 impacts were not modeled in the cumulative impact analysis as impacts for this pollutant were less than the PSD SILs for all facilities.

Table 3.1-30, Project Cumulative Impact Modeling Results, presents the maximum impacts predicted for the Project and other cumulative projects within a 6-mile radius of the existing Larkspur Energy Facility.

As shown in the table, when the cumulative incremental impacts are added to applicable background concentrations and compared to the most stringent state or national ambient standards, no violations of the AAQSs are projected for all pollutants except PM_{10}. The PM_{10} maximum background levels are already above the 24-hour and annual CAAQS; cumulative annual impacts are below the PSD significant impact level of 1 µg/m^3, but the maximum cumulative 24-hour impact is above the PSD significant impact level of 5 µg/m^3, based on worst-case emission estimates provided by the SDAPCD. The Project's contribution to this impact will be only 0.2343 µg/m^3 for CTG 3 and 0.00015 µg/m^3 for the black start engine; thus the impact is mainly due to the other cumulative sources in the area.

TABLE 3.1-30
PROJECT CUMULATIVE IMPACT MODELING RESULTS

Pollutant	Averaging Period	Maximum Cumulative Modeled Impact (µg/m^3)	PSD Significant Impact Level (µg/m^3)	Background[1] (µg/m^3)	Maximum Total Predicted Concentration (µg/m^3)	Most Stringent AAQS (µg/m^3)	UTM Coordinates	
							East (m)	North (m)
CO	1 hour	337.89	2,000	9,600	9.938	23,000	505368	3603143
	8 hour	35.23	500	5,543	5,578	10,000	505450	3603075
NO_2	1 hour[3]	67.74	NA	277.88	345.62	470	505368	3603143
	Annual[4]	0.84316	1	45.06	45.90	100	505475	3603050
PM_{10}	24 hour[2]	8.39	5	155	163	50	511050	3602700
	Annual[2]	0.71467	1	58	59	20	510975	3602625

Notes:

[1] Background represents the maximum values measured at Otay Mesa (CO, NO_2, PM_{10}) monitoring station, 2002-2006.

[2] PM_{10} background levels exceed ambient standards.

[3] Maximum hourly impact without ozone-limiting.

[4] Annual impact using default ARM of 0.75.

µg/m^3 = micrograms per cubic meter

CO = carbon monoxide

m = meters

NA = Not applicable

AAQS = ambient air quality standard

NO_2 = nitrogen dioxide

OLM = ozone limiting method

PM_{10} = particulate matter less than or equal to 10 microns in diameter

$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter. All PM emissions during operation assumed to be $PM_{2.5}$

PSD = Prevention of Significant Deterioration

SO_2 = sulfur dioxide

UTM = Universal Transverse Mercator

3.1.3 Mitigation Measures

3.1.3.1 Emissions Mitigations

The existing Larkspur Energy Facility is currently permitted as a non-major source under SDAPCD Rule 20.1-6. The Project would bring the facility's potential to emit above the major source threshold, but the Project would result in an incremental emissions increase that is less than the major modification threshold for each pollutant. Accordingly, based on the requirements of Rule 20.3 and consultation with the SDAPCD, emission offsets are not required under District regulations.

However, the Project has committed to purchasing emission reduction credits (ERC) to fully offset the Project's annual emissions of nonattainment pollutants and their precursors at a 1:1 ratio to fully mitigate Project emissions. The annual total Project emissions that define the requirement are presented in Table 3.1-4. The Applicant is pursuing prospective ERCs from the open market with Cantor Fitzgerald as their broker. The required Project emission offsets are outlined in Appendix A-4.

Mitigation measures to minimize emissions during Project construction are described in Section 3.1.2.1 and Appendix A-2.

3.1.3.2 BACT Analysis

In accordance with the requirements of SDAPCD Rule 20.3, any new or modified emission unit which has any increase in its potential to emit PM_{10}, oxides of nitrogen (NO), VOC, or oxides of sulfur (SO) and which unit has a post-project potential to emit 10 pounds per day or more of PM_{10}, NO, VOC or SOx shall be equipped with best available control technology (BACT) for each such air contaminant. Based on the emission estimates for the Project, the natural gas turbine is subject to BACT requirements for these pollutants. A detailed BACT analysis was conducted to evaluate available control options for the CTG 3. A summary of the analysis is presented in Appendix A-5, BACT Analysis.

No BACT analysis was performed for the black start engine pursuant to SDAPCD Rule 20.3, because the unit will emit less than 10 pounds per day of PM10, NO_x, VOC, or SO_x.

Summary of Proposed BACT

Table 3.1-32, presents the proposed BACT emission levels for the Project, based on the assessment described in Appendix A-5.

TABLE 3.1-32
SUMMARY OF PROPOSED BACT

Pollutant	Control Technology	Concentration ppm at 15 percent O_2 dry
NO_x	Dry low emissions combustors and SCR with ammonia injection	2.5
CO	Catalytic oxidation	6.0
ROC	Catalytic oxidation	2.0
SO_2	Pipeline quality natural gas	NA
PM_{10}	Pipeline quality natural gas	NA
Ammonia slip	Operational limitation	5.0

Notes:

BACT = Best Available Control Technology

CO = carbon monoxide

NA = not applicable

NO_x = nitrogen oxides

O_2 = oxygen

PM_{10} = particulate matter less than or equal to 10 microns in diameter

ppm = parts per million

SCR = selective catalytic reduction

ROC = reactive organic compounds

SO_2 = sulfur dioxide

3.1.4 Consistency with LORS

3.1.4.1 LORS

Table 3.1-33 presents data on all applicable LORS which affect the Project. LORS which were identified as clearly "not applicable" to the Project were not included in this listing. The table delineates the LORS citation, agency responsible for compliance or oversight, basic LORS requirements, and the Project's compliance strategy. The required discussion of conformance is contained in Table 3.1-34.

TABLE 3.1-33
APPLICABLE LORS

LORS Citation	Agency	LORS Requirement	Compliance Strategy
Federal			
CAAA of 1990, 40 CFR 50	EPA Region IX, CARB, SDAPCD	National Ambient Air Quality Standards	Larkspur 3 operations will not cause violations or state or federal AAQS.
40 CFR 52.21 SDAPCD Rule 20.3	EPA Region IX, CARB, SDAPCD	Prevention of Significant Deterioration Program	Larkspur is not subject to PSD
40 CFR 72-75 SDAPCD Rule 1402	SDAPCD	CAA Acid Rain Program	Larkspur will not be required to obtain SO_2 allowances but will submit all required applications for inclusion in the Acid Rain program. CEMS will be installed as required.
40 CFR 60 SDAPCD Regulation X	SDAPCD	New Source Performance Standards	Stationary gas turbines are regulated under Subpart KKKK, which imposes emission limits on NOx and SO_2. The normal controlled NO_x emission rate from the Project's stationary natural gas turbines of about 0.11 lb of NO_x per MW-hour will be well below the Subpart KKKK requirement of 0.39 lb of NO_x per MW-hour. The projected SO_2 emissions from the Larkspur CTG are less than 0.03 lb of SO_2 per MW-hour, which is substantially less than the Subpart KKKK requirement of 0.58 lb of SO_2 per MW-hour.
40 CFR 70 SDAPCD Regulation XIV	SDAPCD	CAAA Title V Operating Permit Program	The Larkspur facility currently has a Title V Operating Permit. The Project will submit an Enhanced Authority to Construct Application with its Authority to Construct application to modify the current Title V permit to include CTG 3 and the black start unit.
40 CFR 68	San Diego County Hazardous Materials Division	Risk Management Plan Program	The Larkspur facility currently has an RMP that covers aqueous ammonia. The RMP will be updated to reflect addition of the new turbine.
State			
CHSC 44300 et seq.	CARB, SDAPCD	Air Toxics Hot Spots Program	Larkspur will determine the applicability of the Air Toxics Hot Spots requirements and prepare inventory plans and risk assessments as required.

TABLE 3.1-33
APPLICABLE LORS
(Continued)

LORS Citation	Agency	LORS Requirement	Compliance Strategy
CHSC 41700 SDAPCD Rule 51	CARB, SDAPCD	Public Nuisance Provisions	Larkspur will comply with the requirement that no public nuisance will result from operation of the turbine.
CCR Title 14, 15002	CEC	Siting Provisions	AFC document satisfies CEC requirements
Local			
Regulation II, Rule 10	SDAPCD	Permits Required	Larkspur will obtain the necessary Authority to Construct and Permit to Operate for the CTG 3 and black-start engine
Regulation II, Rule 10.1	SDAPCD	NSPS and NESHAPS Requirements	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3
Regulation II, Rule 19	SDAPCD	Provision of Sampling and Testing Facilities	Larkspur will provide the necessary access to the facility to allow for required sampling and testing of emissions.
Regulation II, Rule 19.1	SDAPCD	NSPS and NESHAPS Sampling and Testing Facilities Requirements	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3
Regulation II, Rule 19.2	SDAPCD	Continuous Emissions Monitoring Requirements	The CTG 3 will be equipped with CEMS as required, and the CEMS will be operated in accordance with this requirement.
Regulation II, Rule 19.3	SDAPCD	Emission Information	Larkspur will provide emission information to the SDAPCD.
Regulation II, Rule 20.3	SDAPCD	New Source Review – Major Stationary Sources and PSD Stationary Sources	The AFC is considered equivalent to an Authority to Construct application to the SDAPCD. The AFC will be submitted to the SDAPCD for review and issuance of a Determination of Compliance
Regulation II, Rule 20.5	SDAPCD	Power Plants	The AFC is considered equivalent to an Authority to Construct application to the SDAPCD. The AFC will be submitted to the SDAPCD for review and issuance of a Determination of Compliance
Regulation III	SDAPCD	Fees	Larkspur will pay applicable fees to the SDAPCD.

TABLE 3.1-33
APPLICABLE LORS
(Continued)

LORS Citation	Agency	LORS Requirement	Compliance Strategy
Regulation IV, Rule 50	SDAPCD	Visible Emissions	Emission sources at the facility will not discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three minutes in any period of 60 consecutive minutes which is darker in shade than that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure an observer's view to a degree greater than does smoke of a shade designated as Number 1 on the Ringelmann Chart.
Regulation IV, Rule 50.1	SDAPCD	NSPS and NESHAPS Visible Emissions Requirements	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3.
Regulation IV, Rule 51	SDAPCD	Nuisance	Larkspur will not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.
Regulation IV, Rule 52	SDAPCD	Particulate Matter	Larkspur will not discharge into the atmosphere from the CTG particulate matter in excess of 0.10 grain per dry standard cubic foot (0.23 grams per dry standard cubic meter) of gas. The maximum estimated PM emission rate for the CTG 3 is 0.003 gr/dscf.

TABLE 3.1-33
APPLICABLE LORS
(Continued)

LORS Citation	Agency	LORS Requirement	Compliance Strategy
Regulation IV, Rule 53	SDAPCD	Specific Air Contaminants	Larkspur will not discharge into the atmosphere sulfur compounds calculated as sulfur dioxide (SO_2) greater than 0.05 percent, by volume, on a dry basis; or combustion particulates greater than 0.10 grains per dry standard cubic foot (0.23 grams per dry standard cubic meter) of gas which is standardized to 12 percent of carbon dioxide (CO_2) by volume. Compliance with applicable NSPS will ensure compliance with Rule 53.
Regulation IV, Rule 53.2	SDAPCD	NSPS and NESHAPS Specific Air Contaminants Requirements	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3.
Regulation IV, Rule 62	SDAPCD	Sulfur Content of Fuels	Larkspur will meet the fuel sulfur content through use of public utility natural gas provided by San Diego Gas & Electric.
Regulation IV, Rule 66	SDAPCD	Organic Solvents	Larkspur will use cleaning solvents that are in compliance with Rule 66.
Regulation IV, Rule 67	SDAPCD	Architectural Coatings	Larkspur will use Rule 67-compliant architectural coatings.
Regulation IV, Rule 68	SDAPCD	Fuel-Burning Equipment	This rule does not apply to the CTG, which is subject to Rule 69.3. The black-start unit at the facility is below 50 MMBtu/hr heat input and is not subject to Rule 68.
Regulation IV, Rule 68.1	SDAPCD	NSPS Requirements for Oxides of Nitrogen from Fuel-Burning Equipment	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3.
Regulation IV, Rule 69.3	SDAPCD	Stationary Gas Turbines – Reasonably Available Control Technology	Rule 69.3 requires natural gas-fired turbines to meet a NO_x emission limitation of 42 ppmv at 15% O_2. Larkspur will be in compliance with the NO_x emission limitations through compliance with the BACT emission limitation of 2.5 ppmv NOx at 15% O_2. Compliance will be demonstrated using CEMS.

TABLE 3.1-33
APPLICABLE LORS
(Continued)

LORS Citation	Agency	LORS Requirement	Compliance Strategy
Regulation IX	SDAPCD	Public Records	Larkspur will supply the SDAPCD information required for public records.
Regulation X	SDAPCD	New Source Performance Standards	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3.
Regulation XII, Rule 1200	SDAPCD	Toxics New Source Review	The AFC is considered equivalent to an Authority to Construct application to the SDAPCD. The Public Health section provides a Toxics New Source Review evaluation including a health risk assessment as required under Rule 1200. The AFC will be submitted to the SDAPCD for review and issuance of a Determination of Compliance.
Regulation XIV	SDAPCD	Title V Operating Permits	The Larkspur facility currently has a Title V Operating Permit. The Larkspur 3 Project will submit an Enhanced Authority to Construct Application with its Authority to Construct application to modify the current Title V permit to include CTG 3 and the black start unit.

TABLE 3.1-34
COMPLIANCE ANALYSIS FOR APPLICABLE LORS

LORS Citation	Compliance Analysis
CAAA of 1990, 40 CFR 50	Larkspur will comply with all permit conditions limiting emissions and operations, and will comply with the requirements of BACT. Modeling demonstrates that the Project will not cause violations or state or federal AAQS.
40 CFR 52.21 SDAPCD Rule 20.3	The AFC meets the requirements for New Source Review in accordance with the SDAPCD's Rule 20.3 requirements. The facility will comply with BACT, modeling, reporting, and monitoring requirements as required in the SDAPCD's ATC and PTO. Larkspur is not subject to PSD.
40 CFR 72-75 SDAPCD Rule 1402	Larkspur will not be required to obtain SO_2 allowances but will submit all required applications for inclusion in the Acid Rain program. CEMS will be installed as required.
40 CFR 60 SDAPCD Regulation X	Stationary gas turbines are regulated under Subpart KKKK, which imposes emission limits on NO and SO_2. The controlled NO emission rate from the Project's stationary natural gas turbines of less than 0.11 lb of NO_x per MW-hour will be well below the Subpart KKKK requirement of 0.39 lb of NO_x per MW-hour. The projected SO_2 emissions from the Larkspur CTG 3 are less than 0.03 lb of SO_2 per MW-hour, which is substantially less than the Subpart KKKK requirement of 0.58 lb of SO_2 per MW-hour.

TABLE 3.1-34
COMPLIANCE ANALYSIS FOR APPLICABLE LORS
(Continued)

LORS Citation	Compliance Analysis
40 CFR 70 SDAPCD Regulation XIV	The facility is subject to Title V because the facility is subject to the Acid Rain program. The Larkspur facility currently has a Title V Operating Permit. The Larkspur 3 Project will submit an Enhanced Authority to Construct Application with its Authority to Construct application to modify the current Title V permit to include CTG 3 and the black start unit.
40 CFR 68	The Larkspur facility currently has a RMP that covers aqueous ammonia. The RMP will be updated to reflect addition of the new turbine.
CHSC 44300 et seq.	The AFC provides an initial estimate of TAC emissions and a health risk assessment as regulated under the Air Toxics Hot Spots requirements. Larkspur will determine the applicability of the Air Toxics Hot Spots requirements and prepare inventory plans and risk assessments as required.
CHSC 41700 SDAPCD Rule 51	Larkspur will comply with the requirement that no public nuisance will result from operation of the turbine. The facility's operations will result in insignificant emissions of odorous or visible substances.
CCR Title 14, 15002	The AFC document satisfies CEC requirements.
Regulation II, Rule 10	The AFC meets the requirements for New Source Review in accordance with the SDAPCD's Rule 20.3 requirements. The facility will obtain the required ATC and PTO from the SDAPCD.
Regulation II, Rule 10.1	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3.
Regulation II, Rule 19	Larkspur will provide the necessary access to the facility to allow for required sampling and testing of emissions.
Regulation II, Rule 19.1	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3.
Regulation II, Rule 19.2	The CTG 3 will be equipped with CEMS as required, and the CEMS will be operated in accordance with this requirement.
Regulation II, Rule 19.3	Larkspur will provide emission information to the SDAPCD.
Regulation II, Rule 20.3	The AFC is considered equivalent to an Authority to Construct application to the SDAPCD. The AFC will be submitted to the SDAPCD for review and issuance of a Determination of Compliance. Rule 20.3(d)(1) requires the facility to comply with BACT emission limitations. The CTG will be equipped with SCR and an oxidation catalyst and will meet BACT emission limitations for simple-cycle natural gas-fired turbines of 2.5 ppmvd NOx at 15% O_2, 6.0 ppmvd CO at 15% O_2, and 2.0 ppmvd VOC at 15% O_2. Rule 20.3(d)(2) requires an Air Quality Impact Assessment to demonstrate that the facility will not cause or contribute to violations of any air quality standard or prevent or interfere with the attainment or maintenance of any air quality standard. The AFC includes a modeling assessment that demonstrates that the CTG 3 and black-start unit will be in compliance with the requirements of Rule 20.3(d)(2).
Regulation II, Rule 20.5	The AFC is considered equivalent to an Authority to Construct application to the SDAPCD. The AFC will be submitted to the SDAPCD for review and issuance of a Determination of Compliance.
Regulation III	Larkspur will pay applicable fees to the SDAPCD.

TABLE 3.1-34
COMPLIANCE ANALYSIS FOR APPLICABLE LORS
(Continued)

LORS Citation	Compliance Analysis
Regulation IV, Rule 50	Emission sources at the facility will not discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three minutes in any period of 60 consecutive minutes which is darker in shade than that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure an observer's view to a degree greater than does smoke of a shade designated as Number 1 on the Ringelmann Chart.
Regulation IV, Rule 50.1	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG.
Regulation IV, Rule 51	Larkspur will not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.
Regulation IV, Rule 52	Larkspur will not discharge into the atmosphere from the CTG particulate matter in excess of 0.10 grain per dry standard cubic foot (0.23 grams per dry standard cubic meter) of gas. Particulate emissions will be limited to 4 lbs/hour which will meet the requirements of Rule 52.
Regulation IV, Rule 53	Larkspur will not discharge into the atmosphere sulfur compounds calculated as SO_2 greater than 0.05 percent, by volume, on a dry basis; or combustion particulates greater than 0.10 grains per dry standard cubic foot (0.23 grams per dry standard cubic meter) of gas which is standardized to 12 percent of CO_2 by volume. Compliance with applicable NSPS will ensure compliance with Rule 53. Stationary gas turbines are regulated under Subpart KKKK, which imposes emission limits on NOx and SO_2. The projected SO_2 emissions from the Larkspur CTG 3 are less than 0.03 lb of SO_2 per MW-hour, which is substantially less than the Subpart KKKK requirement of 0.58 lb of SO_2 per MW-hour. Particulate emissions will be limited to 4 lbs/hour which will meet the requirements of Rule 53.
Regulation IV, Rule 53.2	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3.
Regulation IV, Rule 62	Larkspur will meet the fuel sulfur content through use of public utility natural gas provided by SDG&E.
Regulation IV, Rule 66	Larkspur will use cleaning solvents that are in compliance with Rule 66, and will not emit more than 15 lbs/day of VOCs from use of cleaning solvents.
Regulation IV, Rule 67	Larkspur will use Rule 67-compliant architectural coatings.
Regulation IV, Rule 68.1	Larkspur will comply with the applicable NSPS (Subpart KKKK) for the CTG 3
Regulation IV, Rule 69.3	Rule 69.3 limits emissions of NOx to 42 ppm at 3% O_2 during normal operations, excluding startup and shutdown periods not to exceed 120 minutes. The CTG will meet a BACT emissions limitation of 2.5 ppm at 15% O_2, which exceeds the requirements of Rule 69.3. The CEMS will provide necessary compliance information to demonstrate compliance with Rule 69.3.
Regulation IX	Larkspur will comply with reporting requirements as specified in the PTO and will supply the SDAPCD information required for public records.

TABLE 3.1-34
COMPLIANCE ANALYSIS FOR APPLICABLE LORS
(Continued)

LORS Citation	Compliance Analysis
Regulation X	Stationary gas turbines are regulated under Subpart KKKK, which imposes emission limits on NOx and SO_2. The controlled NO_x emission rate from the Project's stationary natural gas turbines of less than 0.11 lb of NO_x per MW-hour will be well below the Subpart KKKK requirement of 0.39 lb of NO_x per MW-hour. The projected SO_2 emissions from the Larkspur CTG 3 are less than 0.03 lb of SO_2 per MW-hour, which is substantially less than the Subpart KKKK requirement of 0.58 lb of SO_2 per MW-hour.
Regulation XII, Rule 1200	The AFC is considered equivalent to an Authority to Construct application to the SDAPCD. The Public Health section provides a Toxics New Source Review evaluation including a health risk assessment as required under Rule 1200. The AFC will be submitted to the SDAPCD for review and issuance of a Determination of Compliance
Regulation XIV	The Larkspur facility currently has a Title V Operating Permit. The Larkspur 3 Project will submit an Enhanced Authority to Construct Application with its Authority to Construct application to modify the current Title V permit to include CTG 3 and the black start unit.

3.1.4.2 Jurisdictional Agencies, Contacts, and Permit Requirements

Table 3.1-35 provides information on the following: (1) air quality agencies which may or will exercise jurisdiction over air quality issues resulting from the Project, (2) the most appropriate agency contact for the Project, (3) contact address and phone information, and (4) agency involvement in required permits or approvals.

TABLE 3.1-35
JURISDICTIONAL AGENCIES, CONTACT, AND PERMIT REQUIREMENTS

Agency	Contact	Jurisdictional Area	Permit Status
California Energy Commission	Assigned Project Manager Assigned CEC Member 1516 Ninth Street Sacramento, CA 95814	Primary reviewing and certifying agency.	Will certify the Project under the Siting Regulations and CEQA. Certification will contain conditions governing air quality requirements for emissions and operations.
San Diego Air Pollution Control District	Tom Weeks Chief, Engineering Division 10124 Old Grove Road San Diego, CA 92131 (858) 586-2715	Primary air permitting, regulatory, and enforcement agency. Provides Determination of Compliance to CEC, issues Authority to Construct and Permit to Operate.	Determination of Compliance will be prepared subsequent to submittal of AFC. ATC will be issued by SDAPCD upon review of AFC.

TABLE 3.1-35
JURISDICTIONAL AGENCIES, CONTACT, AND PERMIT REQUIREMENTS
(CONTINUED)

Agency	Contact	Jurisdictional Area	Permit Status
California Air Resources Board	Mike Tollstrup Chief, Project Assessment Branch 1001 I Street, 6th Floor Sacramento, CA 95814 (916) 322-6026	Oversight of APCD stationary source permitting and enforcement programs.	CARB staff will provide comments on AFC Air Quality and Public Health sections. CARB staff will have an opportunity to comment on draft ATC.
Environmental Protection Agency, Region IX	Gerardo Rios Chief, Permits Section EPA Region IX 75 Hawthorne Street San Francisco, CA 94105 (415) 947-3974	Oversight of all APCD programs, including permitting and enforcement programs.	EPA Region IX staff will receive a copy of the Determination of Compliance and will have an opportunity to comment on draft ATC.

3.1.5 References Cited

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URS. 2007. Modeling Protocol for the Larkspur 3 Project, San Diego County, California. Prepared by URS Corporation for submittal to the San Diego Air Pollution Control District and the California Energy Commission. March.

3.1.6 Conditions of Certification

3.1.6.1 CEC Conditions

The existing Larkspur Energy Facility was approved by CEC in 2001 with Conditions of Certification. Because the existing Project was reviewed by CEC under the emergency 21-day approval process that was in effect at the time, CEC delegated the authority for air quality permitting to the San Diego Air Pollution Control District, which issued an Authority to Construct (ATC) with permit conditions. CEC added two additional conditions: (1) require mitigation of emissions during construction (not covered under the ATC permit); and (2) require adherence to the conditions of the ATC. The first of these conditions is applicable to the Project and is repeated below:

AQ-1 Prior to the commencement of Project construction, the Project owner shall prepare a Construction Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed for the construction of the Project and related facilities.

Measures that should be addressed include the following:

- The identification of the employee parking area(s) and surface of the parking area(s)
- The frequency of watering of unpaved roads and disturbed areas
- The application of chemical dust suppressants
- The stabilization of storage piles and disturbed areas
- The use of gravel in high traffic areas
- The use of paved access aprons
- The use of posted speed limit signs
- The use of wheel washing areas prior to large trucks leaving the Project site
- The methods that will be used to clean tracked-out mud and dirt from the Project site onto public roads
- For any transportation of borrowed fill material, the use of covers on vehicles, wetting of the material, and ensuring appropriate freeboard of material in the vehicles

Verification: The Project owner shall submit to the Compliance Project Manager (CPM) a letter attesting to compliance with the above and shall report any violations to the CPM.

3.1.6.2 SDAPCD ATC Permit Conditions

Since the Project is not being reviewed under the emergency 21-day process, CEC may issue Conditions of Certification for Project operations as well. It is anticipated that these conditions will largely mirror those in the existing Larkspur Energy Facility ATC permit, with modifications as required to reflect differences in current BACT emission limits and the presence of new equipment. Proposed wording for the ATC conditions that will need to change for the Project is provided below.

1. CTG 3 shall be fired on Public Utility Commission (PUC) quality natural gas only. The applicant shall maintain, on site, quarterly records of the natural gas sulfur content (grains of sulfur compounds per 100 dscf of natural gas) and the higher and lower heating values (Btu/scf), and provide such records to District personnel upon request.
2. Permittee shall submit to the District a complete Acid Rain permit application to include CTG 3, (including a monitoring plan) prior to commencement of construction in accordance with 40 CFR Part 72 and provide a copy to EPA, Region IX.
3. Sufficient SO_2 trading allowances will be purchased by the permittee to offset potential SO_2 emissions from CTG 3 in accordance with the requirements of 40 CFR 73. Permittee shall hold allowances, as of the allowance transfer deadline, in the facility's (Department of Energy's Office of Regulatory Information System "ORIS" code for each unit, both turbines is a "unit") compliance sub-account (after deductions under 40 CFR 73.34 (c)) for an amount not less than the total annual emissions of SO_2 for the previous calendar year from the CTG unit.

4. Within 1 year of commencing commercial operation of CTG 3, the plant operator shall submit a 40 CFR 70 permit application (Title V) to the District pursuant to District Regulation XIV. (Pursuant to 40CFR72.2 commencing commercial operation means to have begun to generate electricity for sale, including the sale of test generation).
5. Except during startups and shutdowns, the CTG 3 water injection system and SCR and oxidation catalyst (if required) control systems, including the automatic ammonia injection systems serving the CTG 3 turbine, shall be in full operation at all times when the turbine is in operation.
6. An application for modification of District permits for this equipment shall be required for any proposed physical or operational modification to the equipment described herein, such as a modification to convert these simple cycle turbines to combined cycle units. Applicable BACT requirements for the proposed equipment modification shall be re-evaluated at that time.

(*Emission limits*)

1. The NO_x, CO, and VOC limits defined in the following conditions (Nos. 8 through 17) shall not apply during the first continuous 30 minutes immediately following a cold startup or during the 30 continuous minutes immediately preceding a shutdown. Startup is defined as the time when fuel flow begins. Shutdown is defined as the moment fuel flow ceases. These events shall be recorded by the Data Acquisition System (DAS), as required by 40CFR75. This condition may be modified by the District based on field performance of the equipment.
2. When operating on natural gas, emissions of oxides of nitrogen (NO_x), calculated as NO_2, from each turbine exhaust stack shall not exceed 5 parts per million volume on a dry basis (ppmvd) corrected to 15 percent O_2 and averaged over each clock hour. Compliance with this limit shall be demonstrated at the time of the initial compliance test and continuously thereafter.
3. When operating on natural gas, the NO_x mass emission rate from the turbine shall not exceed 4.33 pounds per hour of nitrogen oxides (NO_x) calculated as NO_2 averaged over each clock hour period. Compliance with these limits shall be demonstrated at the time of the initial compliance test and continuously thereafter.
4. Emissions of carbon monoxide (CO) from the turbine exhaust stack shall not exceed 6 ppmvd corrected to 15 percent O_2 and averaged over each continuous rolling 3-hour period. Compliance with this limit shall be demonstrated at the time of the initial compliance test and continuously thereafter.
5. Emissions of carbon monoxide (CO) from each turbine exhaust stack shall not exceed 6.34 pounds per hour, averaged over each continuous rolling 3-hour period. Compliance with this limit shall be demonstrated at the time of the initial compliance test and continuously thereafter.
6. Emissions of volatile organic compounds (VOCs), calculated as methane, from each turbine exhaust stack shall not exceed 2 ppmvd corrected to 15 percent O_2 (3-hour average). Compliance with this limit shall be demonstrated at the time of the initial compliance test and annually thereafter.
7. Ammonia emissions from the gas turbine shall not exceed 5 ppmvd @ 15 percent O_2. Compliance with this limit shall be demonstrated at the initial compliance test and at least annually thereafter.

8. The discharge of particulate matter from the exhaust stack of the turbine shall not exceed 0.10 grain per dry standard cubic foot (0.23 grams/ dscf). Compliance with this limit shall be demonstrated at the initial compliance test, when operating on liquid fuel. The District may require periodic testing to verify compliance with this standard.
9. Visible emissions from the lube oil vents and the exhaust stack of the turbine shall not exceed 20 percent opacity for more than 3 minutes in any period of 60 consecutive minutes.

(*Monitoring and recordkeeping*)

1. An operating log or Data Acquisition System (DAS) records shall be maintained on site to record actual times and durations of all startups, shutdowns, quantity of each fuel used, hours of daily operation, and total cumulative hours of operation during each calendar year.
2. A Continuous Emission Monitoring System (CEMS) shall be installed and calibrated to measure and record the concentrations of NO_x, VOCs, CO in the exhaust gas on a dry basis (ppmvd) corrected to 15 percent O_2, and O_2 in the exhaust gas. Upon initial firing and prior to final approval of the permanent CEMS, a portable properly calibrated CEMS shall be used to continuously measure and record these conditions. The portable CEMS shall remain in full operation at all times when the turbine is in operation until the permanent CEMS has been properly installed and certified. The permanent CEMS shall thereafter be in full operation at all times when the turbine is in operation.
3. All CEMS shall be installed, certified, and maintained in accordance with applicable federal regulations including the requirements of Sections 75.10 and 75.12 of Title 40, Code of Federal Regulations Part 75 (40 CFR 75), the performance specifications of Appendix A of 40 CFR 75, the quality assurance procedures of Appendix B of 40 CFR 75, and a CEMS protocol approved by the District. At least 60 days prior to the operation of both the portable and permanent CEMS, the applicant shall submit a CEMS operating protocol to the District for written approval.
4. The District shall be notified in writing at least 2 weeks prior to any changes made in the CEMS software that affects the measurement, calculation, or correction of data displayed and/or recorded by the CEMS.
5. On and after initial startup, the turbine shall be equipped with continuous parametric monitors to measure (or calculate) and to record the following operational characteristics:
   a. hours of operation (hours)
   b. natural gas flow rate (scfh)
   c. exhaust gas temperature (°F)
   d. ammonia injection rate (lbs/hr)
   e. water injection rate (gal/hr)
   f. ratio of water injection to fuel consumption (lb of water to lb of fuel)
   g. molar ratio of ammonia injection rate to turbine NOx emission rate at SCR inlet (instantaneous)
   h. stack opacity (%)

i. inlet temperature of the SCR and oxidation catalyst beds (°F), and

j. power output (MW)

These monitors shall be installed, calibrated, and maintained in accordance with the manufacturer's recommended procedures and a protocol approved by the District. Such protocol shall be submitted to the District for written approval at least 60 days prior to initial startup. This protocol shall include, at a minimum, a description of the equipment used for direct measurement of operating characteristics and the methodology used to calculate the remaining operating characteristics. All monitors shall be in full operation at all times when the turbine is in operation.

6. Non-resettable totalizing meters with an accuracy of at least ±5 percent shall be installed in each natural gas fuel line to measure volumetric flow rate corrected for temperature and pressure of natural gas. Monthly and annual records of fuel usage shall be maintained and made available to the District upon request. These records shall indicate actual times and duration of all startups and shutdowns.
7. Water flow meters or other means of measuring the rate of water injection shall be installed in the combustion turbine water injection systems and shall be calibrated and maintained to be accurate to at least ± 5 percent.
8. The ammonia injection flow rate shall be continuously monitored, recorded, and controlled. Records of ammonia injection rate and flow rate device calibration shall be maintained and made available to the District.
9. A monitoring plan in conformance with 40 CFR 75.53 shall be submitted to EPA Region IX and the District at least 45 days prior to the initial source test, as required in 40 CFR 75.62.

(*Source Test Requirements*)

1. The exhaust stack shall be equipped with source test ports and platforms to allow for the measurement and collection of stack gas samples consistent with all approved test protocols. The ports and platforms shall be constructed in accordance with San Diego Air Pollution Control District Method 3A, Appendix Figure 2, and approved by the District.

2. No later than 90 days after the turbine commences commercial operation (40CFR70.4(b)(2)), a Relative Accuracy Test Audit (RATA) and all other required certification tests shall be performed and completed on the permanent CEMS in accordance with 40 CFR Part 75 Appendix A performance specifications. At least 45 days prior to the test date, the applicant shall submit a test protocol to the District for approval. Additionally, the District shall be notified a minimum of 45 days prior to the test so that observers may be present. Within 30 days of completion of this test, a written test report shall be submitted to the District for approval.

3. Within 60 days after the initial startup of the turbine, an initial source test shall be conducted by an independent, ARB approved tester or the District, at the applicant's expense, to determine initial compliance with the emission standards of this ATC. A source test protocol shall be submitted to the District for approval prior to the issuance of a Startup Authorization. The source test protocol shall comply with the following requirements:

- Measurements of outlet (NO_x, CO, and stack gas oxygen content (O_2%) shall be conducted in accordance with the District Source test method 100, or the Air Resources Board (ARB) Test Method 100 as approved by the U.S. Environmental Protection Agency (EPA).
- Measurements of outlet non-methane hydrocarbon (NMHC) emissions shall be conducted in accordance with the San Diego Air Pollution Control District Methods 18 and 25A.
- Measurements of outlet ammonia shall be conducted in accordance with Bay Area Air Quality Management District (BAAQMD) test method ST-1B.
- Source testing shall be performed at no less than 80 percent of the turbine rated load.

4. Within 30 days after completion of the initial source test, a final test report shall be submitted to the District for review and approval.
5. In the event the initial source test results do not demonstrate compliance with District Rules and Regulations and emissions standards specified herein, to the satisfaction of the District, the applicant shall take corrective action to meet these standards. Any proposed corrective action that would result in a modification to the equipment shall require an application for a District ATC for such modification.
6. This equipment shall be source tested during natural gas fired operations at least once per permit year, before the Permit To Operate renewal date, to demonstrate compliance with the outlet NO_x, outlet CO, outlet VOC, and outlet ammonia emission standards of this ATC, using District approved methods, unless otherwise directed in writing by the District.
7. Based on source testing, additional monitoring parameters may be established to ensure compliance. Operating characteristics monitored by continuous parametric monitors may also be restricted to specified ranges or limits, as determined by the District, based upon manufacturer's recommended operating procedures and initial compliance source test results.

(*Construction Completion Notice*)

1. This ATC authorizes temporary operation of the above-specified equipment. This temporary permit to operate shall take effect upon written notification to the District that construction has been completed in accordance with this ATC. This temporary permit to operate will remain in effect, unless withdrawn or modified by the District, until the equipment is inspected by the District and a revised temporary permit (Startup Authorization) is issued or a Permit to Operate is granted or denied.
2. Upon completion of construction in accordance with this ATC, and prior to commencing operation, the applicant must complete and mail, deliver, or fax the enclosed Construction Completion Notice to the District. After mailing, delivering, or faxing the Notice, the applicant may commence operation of the equipment. Operation must be in compliance with all of the conditions of this ATC and applicable District rules.