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FIGURES

Figure 4.7-1 SDG&E Service Area and Simplified Transmission Topology

4.7 AIR QUALITY

4.7.1 Introduction

This section presents the methodology and results of an analysis performed to assess potential impacts of airborne emissions from the construction and routine operation of the Quail Brush Generation Project (Project). Section 4.7.1 presents the introduction, Applicant information, and applicability of the respective SDAPCD and USEPA New Source Review (NSR) and Prevention of Significant Deterioration (PSD) requirements to the proposed Project. Section 4.7.2 presents the Project description and describes both the existing site conditions and the increase in emissions attributable to the proposed Project. Section 4.7.3 presents data on the emissions of criteria and air toxic pollutants from the proposed Project. Section 4.7.4 discusses the BACT evaluation for the Project. Section 4.7.5 presents the air quality impact analysis for the proposed Project. Section 4.7.6 presents applicable laws, ordinances, regulations, and standards (LORS). Section 4.7.7 presents agency contacts, and Section 4.7.8 presents permit requirements and schedules. Section 4.7.9 contains references cited or consulted in preparing this section. The following appendices contain support information referenced in the aforementioned subsections:

Appendix F.1	Emissions Calculations and Support Data
Appendix F.2	Dispersion Modeling and Air Quality Impact Analysis Support Data
Appendix F.3	Dispersion Modeling Protocol
Appendix F.4	Health Risk Assessment Support Data
Appendix F.5	Construction Emissions Analysis and Support Data
Appendix F.6	BACT Analysis for Criteria and GHG Pollutants
Appendix F.7	Mitigation of Impacts
Appendix F.8	Cumulative Impacts Protocol and Support Data
Appendix F.9	SDAPCD Permit Application Forms
Appendix F.10	Miscellaneous Support Data

The Applicant is proposing to construct and operate the Project located on Sycamore Landfill Road in the City of San Diego and just west of the City of Santee, California. The Project will be a nominal 102.3 MW power plant utilizing natural gas-fired internal reciprocating engine technology. The engines proposed for use are Wartsila 20V34SG-C2s. Each engine is rated at approximately 9.3 MW. In addition to the power cycle engines, the plant will have a dry “radiator” cooling system, fuel gas and warm start heaters, and an emergency fire pump system.

4.7.1.1 Regulatory Items Affecting Project

Although a regulatory compliance analysis (LORS) is presented in Section 4.7.6, this section summarizes some key points concerning applicability of SDAPCD’s nonattainment NSR permitting program and USEPA’s PSD regulations to the proposed Project:

- SDAPCD does not, at this time, have PSD delegation; therefore, USEPA Region 9 will issue the PSD permit. (SDAPCD 2010).

- Because PSD review is triggered for the Project under the Tailoring Rule[1] due to its emissions of greenhouse gases (GHGs), the Project will also be subject to PSD review for those attainment/unclassifiable criteria pollutants emitted in quantities exceeding the PSD significant emissions rates (SERs).
- Although the Project constitutes a major stationary source subject to PSD review due to its emissions of GHGs under the Tailoring Rule, it does not constitute a major stationary source under SDAPCD's nonattainment NSR permitting program (see Rules 20.1(c)(35) and 20.2). (SDAPCD 2011).
- Based on data derived from discussions with SDAPCD staff, the APCD is classified as a Subpart 1 basic nonattainment area for ozone (O_3). But, the SDAPCD has requested a reclassification to Subpart 2 "serious" O_3 nonattainment, which could become effective prior to the CEC's and EPA's respective issuance of the license and PSD permit for the Project.
- SDAPCD Rule 20.1 defines the major source emissions thresholds for serious O_3 nonattainment areas as follows:
  - Particulate matter less than 10 microns in size (PM_{10}) 100 tons per year (TPY)
  - NO_X 50 TPY
  - Volatile organic compounds (VOCs) 50 TPY
  - Sulfur oxide (SO_x) 100 TPY
  - Carbon monoxide (CO) 100 TPY
- SDAPCD Rule 20.1 further defines NO_x and VOC as precursors to O_3. Notwithstanding this definition, the region is designated attainment for NO_2 and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) (for which NO_x is presumed to be a precursor), and as such, if emissions of NO_x exceed the 40 TPY PSD SER, the plant will be subject to PSD for NO_x (NO_2) in addition to any other applicable pollutants exceeding their respective SERs.

4.7.2 Project Description

4.7.2.1 Current Site Conditions

The proposed Project consists of the power plant site, the 8-inch gas pipeline lateral, the 230kV gen tie, and the utility switchyard. There are no stationary sources of air pollutants located on the proposed plant site at this time. The property is vacant; no buildings or structures are on the site.

The Project is located west-northwest of the City of Santee, California (San Diego County). The site is located on the north side of SR 52, and adjacent to and east of Sycamore Landfill Road. The Sycamore Landfill lies to the north of the site approximately 0.42 miles. The City of Santee lies in close proximity to the site to the northeast (1.3 miles), east (0.94 mile), and southeast (0.3 miles). The topography of the site and surrounding area is essentially low rolling hills, with elevations ranging from 250 to over 800 feet (amsl). The site elevation ranges from approximately 415 to 530 feet amsl. The site and immediate surrounding area to the north, west, and south-southwest are primarily uninhabited vacant open space in nature. The site

[1] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule; Final Rule, 75 Federal Register (Fed. Reg.) 31,514 (Jun. 3, 2010).

occupies approximately 21.6 acres of presently vacant “industrial” land. The MCAS Miramar boundary is to the north of the Project approximately 1.55 miles, and the main runway complex at MCAS Miramar is 6 miles to the northwest. Gillespie Field (airport) lies approximately 3 miles to the southeast, and Montgomery Field (airport) lies 6.4 miles to the southwest.

According to the Auer (Auer 1978) land use classification scheme, a 3-kilometer (km) radius boundary around the proposed plant site yields a predominately rural classification. This is consistent with the current (City of San Diego) land use and general plan designation for the site and surrounding area as “open space,” i.e., a large portion of the land surrounding the proposed site (to the southwest, west, northwest, and northeast) is vacant. The site is zoned RS-1-8 (single family residential), although it is unlikely that residential units will be built in such close proximity to the Sycamore Landfill. The Sycamore landfill, which lies to the north of the Project site is zoned “industrial employment.”

4.7.2.2 Proposed Power Plant

The proposed power plant will consist of eleven (11) Wartsila 20V34SG-C2 engine generator sets, each rated at approximately 9.3 MW. These engine generator sets will incorporate lean-burn design for primary NO_x control. Each engine will have its own exhaust stack. In addition to lean burn design, each unit will be equipped with a selective catalytic reduction (SCR) system using urea as the reaction agent in the final NO_x control process, and a CO oxidation catalyst for control of CO (and VOC and VOC hazardous air pollutants (HAPs) emissions. Each stack will have a CEMS as required by the local SDAPCD regulations, as well as an exhaust gas silencer system.

Each of the engines will operate in simple-cycle mode, i.e., no heat recovery from the engine exhaust will be used to augment engine power production, and will fire natural gas only. The Wartsila 20V34SG-C2 engines are four-stroke, port injected, turbocharged, inter-cooled, spark-ignited engines, working on the Otto process, lean burn principle. The engines are classified as medium-speed units, and have been proven to be highly efficient, low polluting, power production sources for peaking and cogeneration applications. Approximately 33 seven-fan radiator banks, three banks per engine generator set, will be provided for engine cooling. (Wartsila 2005).

Other equipment to be located on the plant site that will support the combustion process is as follows: fuel gas heater, two warm start heaters, fire-pump system, engine cooling water treatment and distribution system, water storage tank and forwarding pumps, electrical switchyard area, urea storage (one 20,000-gallon aboveground storage tank) and containment area, administration building, gas compressor area, etc. Based upon a natural gas heat content of 1,019 Btu/scf (~22,900 Btu/lb), each engine will have a maximum heat rating of approximately 80.18 MMBtu/hr HHV, with gross and net heat rates of 8,600 and 8,834 Btu/kWh HHV, respectively. Each engine will consume fuel at a rate of approximately 78,685 standard cubic feet per hour at maximum rated load. The plant is being evaluated for an operational scenario of 4,032 hours per year (which includes startups and shutdown times, as well as 3,800 hours per year of normal operations). Daily operations will vary depending upon the dispatch requirements of San Diego Gas and Electric Company and CAISO.

Proposed equipment specifications are summarized as follows:

Power Cycle Engines

- Engine Manufacturer: Wartsila
- Engine Model: 20V34SG-C2
- Fuel: Natural Gas
- Nominal MW rating: 9.3 MW (~12874 hp) each
- Number of engines: 11
- Heat rating: ~80.18 MMBtu/hr (HHV) each
- Hours per year: 4,032 (each)

Fuel Heater

- Manufacturer: To be determined
- Model: To be determined
- Number of heaters: 1
- Fuel: Natural Gas
- Heat Rate: 4 MMBtu/hr (HHV)
- Hours per year: 4232
- Burner Type: Low NO_x Burner
- Fuel consumption: 3925.4 scf/hr (@1,019 Btu/scf)

Warm Start Heaters

- Manufacturer: To be determined
- Model: To be determined
- Number of heaters: 2*
- Fuel: Natural Gas
- Heat Rate: 4 MMBtu/hr (HHV)
- Hours per year: 4,928
- Burner Type: Low NO_x Burner
- Fuel consumption: 3925.4 scf/hr (@1,019 Btu/scf)

  * One of the warm start heaters is a backup, and as such, only one unit will be operated at any given time, and the total operation of both units combined will not exceed 4,928 hours per year.

Diesel Engine Fire Pump System

- Mfg: John Deere
- Model: Clarke JU4H-UFADW8
- Tier: 3

- BHP: 144
- Fuel: Diesel
- Fuel Use Rate: 10 gallons/hour (gals/hr)
- Annual operations: 50 hours/year (hrs/yr)

The only fuel to be combusted onsite by the Wartsila engine generator sets and the fuel gas and warm start heaters is Public Utilities Commission (PUC)-grade natural gas supplied by the local gas company (Sempra Utilities). The gas will have a HHV of approximately 1,019 Btu/scf, and a sulfur content that is not expected to exceed 0.25 grains/100 scf (~4 ppm). The diesel fire pump engine will fire only California-certified low-sulfur low-aromatic diesel fuel. Table 4.7-1 presents a fuel use summary for the proposed plant. Fuel use values are based on the maximum heat input rating of each system, fuel specifications, and maximum operational scenarios.

Table 4.7-1 Estimated Fuel Use Summary for the Proposed Project

System	Units	Per Hour	Per Day	Per Year
Single Engine	Million Standard Cubic Feet (MMscf)	0.078685	1.88844	317.26
All Engines	MMscf	0.865535	20.773	3489.84
Fuel Gas Heater	MMmscf	0.0039254	0.09421	16.613
Warm Start Heater(s)	MMscf	0.0039254	0.09421	19.345
Fire Pump Diesel Engine	gallons	10	10	500

Notes:
Natural gas at 1,019 Btu/scf HHV.
Daily fuel use is based on maximum operation, 24 hrs/day.
Diesel fuel use per manufacturer's specification, 50 hours per year estimated runtime. Modeling based on 1 hour per day, 1 day per week (50 weeks per year).

Table 4.7-2 presents a typical natural gas composition analysis for the San Diego regional area.

Table 4.7-2 Typical Natural Gas Fuel Analysis

Component	Analysis (Average)
Methane	96.444%
Ethane	1.652%
Propane	0.266%
Butanes, Pentanes, Hexanes	0.1204%
N_2	0.28%
CO_2	1.239%
Sulfur	0.25 grs/100scf
Btu/scf	~1019 (HHV)

Table 4.7-3 presents a typical fuel analysis for California low sulfur diesel fuel.

Table 4.7-3 Typical Diesel Fuel Analysis

Parameter	Average Data
Carbon %	85.86
Hydrogen %	13.35
Oxygen %	0.65
Nitrogen %	0.097
Sulfur %	0.0015 – 0.05
Ash %	0.01
Btu/gallon (HHV)	~138,000
Lbs/gallon	~7.05
Btu/lb	~19575

4.7.2.3 Climate and Meteorology

The City of Santee and the northeastern portion of the City of San Diego where the proposed plant site is located are in the southwestern corner of southern California. The prevailing winds and weather are tempered by the Pacific Ocean, with the result that summers are cool and winters warm in comparison with other places along the same general latitude. Temperatures of freezing or below have rarely occurred at the nearest National Weather Service meterological station in San Diego since the record began in 1871, but hot weather, 90° F or above, is more frequent.

Dry easterly winds sometimes blow in the vicinity for several days at a time, bringing temperatures in the 90s and at times even in the 100s in the eastern sections of the City of San Diego and outlying suburbs. At the National Weather Service station itself, however, there have been relatively few days on which 100 degrees or higher was reached.

As these hot winds are predominant in the fall, highest temperatures occur in the months of September and October. Records show that over 60 percent of the days with 90 degrees or higher have occurred in these two months. High temperatures are almost invariably accompanied by very low relative humidity, which often drops below 20 percent and occasionally below 10 percent.

A marked feature of the climate is the wide variation in temperature within short distances. In nearby valleys daytimes are much warmer in summer and nights noticeably cooler in winter, and freezing occurs much more frequently than in the City of San Diego. Although records show unusually small daily temperature ranges, only about 15 degrees between the highest and lowest readings, a few miles inland these ranges increase to 30 degrees or more.

Strong winds and gales associated with Pacific, or tropical storms, are infrequent due to the latitude. The seasonal rainfall is about 10 inches in the City of San Diego, but increases with elevation and distance from the coast. In the mountains to the north and east, the average is between 20 and 40 inches, depending on slope and elevation. Most of the precipitation falls in winter, except in the mountains where there is an occasional thunderstorm. Eighty-five percent of the rainfall occurs from November through March, but wide variations take place in monthly and seasonal totals. Infrequent measurable amounts of hail occur in San Diego, but snow is practically unknown at the Weather Service Office location. In each occurrence of snowfall only

a trace was recorded officially, but in some locations amounts up to or slightly exceeding a half-inch fell, and remained on the ground for an hour or more.

As on the rest of the Pacific Coast, a dominant characteristic of spring and summer is the nighttime and early morning cloudiness. Low clouds form regularly and frequently extend inland over the coastal valleys and foothills, but they usually dissipate during the morning and the afternoons are generally clear.

Considerable fog occurs along the coast, but the amount decreases with distance inland. The fall and winter months are usually the foggiest. Thunderstorms are rare, averaging about three a year in the City. Visibilities are good as a rule. The sunshine is plentiful for a marine location, with a marked increase toward the interior.

Additional climate and historical meteorological data are presented in Appendix F.2 for the San Diego regional area and for the following stations: La Mesa (044735), El Cajon (042706), and San Diego AP (047740) (WRCC 2011). The meteorological data supplied by the SDAPCD as representative of the site are presented in Appendix F.2. These data were derived from the Overland Avenue monitoring station, combined with upper air data from Miramar for the period 2003 through 2005.

4.7.3 Emissions Evaluation

4.7.3.1 Current Site Emissions

The proposed plant site is vacant with no stationary sources of air pollutants located on the site. As such, the current site has a “potential to emit” of zero for all pollutants.

4.7.3.2 Proposed Plant Emissions

Installation and operation of the proposed engine generator sets and ancillary equipment will result in an increase in emissions from operations at the site. Criteria pollutant emissions from the proposed new engines, and ancillary equipment are delineated in the following sections, while emissions of HAPs are delineated in Section 4.8 (see Appendix F.1 for emissions data calculations).

4.7.3.3 Normal Operations

Operation of the proposed process and equipment systems will result in emissions to the atmosphere of both criteria pollutants and toxic air pollutants. Criteria pollutant emissions will consist primarily of NO_x, CO, VOCs, SO_x, and PM_{10}/$PM_{2.5}$. Air toxic pollutants will consist of a combination of toxic gases and toxic particulate matter species. Table 4.7-4 lists the pollutants that may potentially be emitted from the proposed plant.

Table 4.7-4 Criteria and Toxic Pollutants Potentially Emitted from the Proposed Project

NO_x	Ethylbenzene
CO	Formaldehyde
VOC	Hexane
SO_x	Naphthalene
$PM_{10}/PM_{2.5}$	Propylene
Ammonia	Biphenyl
Polycyclic Aromatic Hydrocarbons (PAHs)	Methanol
Acetaldehyde	Toluene
Acrolein	Xylene
Benzene	Diesel Particulate Matter
1,3-Butadiene	

4.7.3.4 Criteria Pollutant Emissions

Tables 4.7-5A presents worst-case Wartsila criteria pollutant emissions for a single engine based on a normal operating scenario of 100 percent load. Table 4.7-5B presents the worst-case criteria pollutant emissions for a single engine, including startup and shutdown events. Table 4.7-5C presents the combined worst-case criteria pollutant emissions expected from all eleven Wartsila power cycle engines assuming normal operations at 100 percent load and with startup and shutdown events included. The worst-case annual operational profile assumed for each engine was based on the following:

1. 4032 hr/yr/engine which includes startup and shutdown
2. 3800 hrs/yr/engine of steady state operations
3. 300 cold starts per year
4. 100 warm starts per year
5. 400 shutdowns per year
6. Cold start = 30 minutes
7. Warm start = 15 minutes

Tables 4.7-5D and 4.7-5E presents the anticipated emissions from the fuel gas and warm start heaters, respectively.

Table 4.7-5A Estimated Steady State Maximum Hourly, Daily, and Annual Criteria Pollutant Emissions for a Single Wartsila Engine

Pollutant	Max Hourly Emissions, lbs (each engine) Steady State	Max Daily Emissions, lbs (each engine) Steady State	Max Annual Emissions, tons (each engine) Steady State
NO_x	1.317	31.61	2.50
CO	1.564	37.54	2.97
VOC	1.584	38.02	3.01
SO_x	0.256	6.14	0.49
$PM_{10}/PM_{2.5}$	1.379	33.10	2.62
NH_3	1.08	25.92	2.18

Table 4.7-5B Estimated Maximum Hourly, Daily, and Annual Criteria Pollutant Emissions for a Single Wartsila Engine (including Startups and Shutdowns)

Pollutant	Max Hourly Emissions, lbs (each engine)	Max Daily Emissions, lbs (each engine)	Max Annual Emissions, tons (each engine)
NO_x	9.49	58.25	3.99
CO	13.44	74.18	4.99
VOC	7.52	57.31	4.16
SO_x	0.28	6.23	0.52
$PM_{10}/PM_{2.5}$	2.38	37.46	3.00
NH_3	1.08	25.92	2.18

Table 4.7-5C Estimated Maximum Hourly, Daily, and Annual Criteria Pollutant Emissions for All the Wartsila Engines (including Startups and Shutdowns)

Pollutant	Max Hourly Emissions, lbs (all engines)	Max Daily Emissions, lbs (all engines)	Max Annual Emissions, tons (all engines)
NO_x	104.41	640.71	43.86
CO	147.84	816.03	54.84
VOC	82.74	630.43	45.74
SO_x	3.07	68.55	5.73
$PM_{10}/PM_{2.5}$	26.23	412.07	32.98
NH_3	11.88	285.12	23.95

Table 4.7-5D Fuel Gas Heater Emissions for the Proposed Project

Pollutant	Emission Factor (lb/mmscf)	Max Hour Emissions (lbs)	Max Daily Emissions (lbs)	Max Annual Emissions (tons)
$PM_{10}/_{2.5}$*	7.13	0.028	0.672	0.0592
NO_x	49.24	0.193	4.63	0.408
CO	91.7	0.360	8.64	0.762
VOC	40.8	0.160	3.84	0.339
SO_x	0.60	0.0024	0.057	0.00498

Notes:
Natural gas at 1,019 Btu/scf (HHV).
24 hrs/day, 4,232 hrs/year. (USEPA 1985a).

Table 4.7-5E Warm Start Heater Emissions for the Proposed Project

Pollutant	Emission Factor (lb/mmscf)	Max Hour Emissions (lbs)	Max Daily Emissions (lbs)	Max Annual Emissions (tons)
$PM_{10}/_{2.5}$*	7.13	0.028	0.672	0.069
NO_x	49.24	0.193	4.63	0.476
CO	91.7	0.360	8.64	0.887
VOC	40.8	0.160	3.84	0.394
SO_x	0.60	0.0024	0.057	0.0058

Notes:
Natural gas at 1,019 Btu/scf (HHV).
24 hrs/day, 4,928 hrs/year.

Table 4.7-6 summarizes the fire pump engine emissions.

Table 4.7-6 Fire Pump Engine Emissions for the Proposed Project

Pollutant	Emission Factor grams/horsepower-hour (g/hp-hr)	Max Hour Emissions (lbs)	Max Daily Emissions (lbs)	Max Annual Emissions (tons)
$PM_{10}/_{2.5}$*	0.09	0.03	0.03	0.001
NO_x	2.8	0.89	0.89	0.023
CO	1.0	0.32	0.32	0.008
VOC	0.10	0.03	0.03	0.001
SO_x	-	0.0021	0.0021	0.0001

Notes:

* All particulate matter is classified as diesel particulate matter (DPM). 1 hr/day, 50 hrs/yr.

SO_2 emissions based on fuel S calc and fuel use rates.

Table 4.7-7 summarizes the total plant emissions.

Table 4.7-7 Summary of Plant Emissions for the Proposed Project

Pollutant	lbs/hour[a]	lbs/day[a]	tons/year[a]
NO_x	105.7	650.9	44.8
CO	148.9	833.6	56.5
VOC	83.1	638.1	46.5
SO_x	3.8	68.7	5.74
$PM_{10}/_{2.5}$	26.3	413.4	33.1
NH_3	11.9	285.1	23.95

Notes:

[a] Includes emissions from fire pump for 1 hour per week, 50 hours per year, and fuel gas and warm start heaters and includes Wartsila engine operated for 3,800 hours in normal operations and 232 hours during startup and shutdown.

Table 4.7-8 presents data on the startup and shutdown emissions for the engine generator sets. The engine manufacturer defines a cold start as one which occurs after the engine has been shut down for a period of approximately 6 hours or more. A warm start is defined as a start that occurs after the engine has been shut down for a period ranging from 2 hours to less than 6 hours. The startup/shutdown event and emissions data presented in Table 4.7-8 will also serve as the proposed BACT emissions limits for such periods.

Table 4.7-8 Plant Startup/Shutdown Emission Rates for Each Engine for the Proposed Project

Scenario	NO_x	CO	VOC	$PM_{10}/2.5$	SO_x
Cold Start, lb/event	8.82	12.57	6.614	1.54	0.137
Warm Start, lb/event	2.43	1.322	1.764	1.54	0.07
Shutdown, lb/event	0.2	0.31	0.34	0.35	0.05
Hourly Based Emissions Estimates for Startup and Shutdown Events					
Cold Start, lb/hr	9.48	13.35	7.41	2.23	0.27
Warm Start, lb/hr	3.42	2.50	2.95	2.57	0.26
Shutdown, lb/hr	1.33	1.65	1.70	1.53	0.27

Notes:
Estimates based on startup/shutdown data supplied by engine mfg.
Cold start sequence is 30 minutes, while a warm start sequence is 15 minutes or less. Note that the engines can achieve maximum capacity within 10 minutes; the additional time required is for emissions control systems to reach full abatement efficiency. The remaining part of the cold or warm startup hour would be at steady state, full control levels.
Shutdown is 8.5 minutes. The remaining part of the shutdown hour would be at steady state, full control levels.

Table 4.7-9 compares the proposed potential to emit for the new plant to the calculated potential to emit for the current site emissions profile.

Table 4.7-9 Potential to Emit Comparison of the Current Site Emissions Profile to the Proposed Project

Pollutant	Current Site TPY	Proposed Plant TPY	Difference* TPY	SDAPCD Rule 20.1, 20.2 Offset Thresholds, TPY
NO_x	0	44.8	44.8	50
CO	0	56.5	56.5	100
VOC	0	46.5	46.5	50
SO_x	0	5.74	5.74	100
PM_{10}	0	33.1	33.1	100
$PM_{2.5}$	0	33.1	33.1	100
CO_2e**	0	191,589	+191,589	n/a

Notes:
* Approximate emissions increases (+) and decreases (-).
** Stationary source emissions only, w/o 10 percent contingency (see BACT Appendix F.6).

Based on the values in Tables 4.7-7 and 4.7-9, the proposed plant will be a minor source under Rules 20.1 and 20.2. Detailed emissions data on the proposed plant are presented in Appendix F.1. The proposed plant emissions of greenhouse gases (carbon dioxide equivalent [CO_2e]) will trigger the PSD program requirements under the provisions of the Tailoring Rule adopted by USEPA. In addition, the plant will be required to undergo PSD review for the following pollutants; NO_x, VOC, PM_{10}, and $PM_{2.5}$, because each of these attainment/ unclassifiable pollutants will have annual potential to emit values above the PSD SERs. The plant will not be required to obtain emissions offset pursuant to the SDAPCD NSR rules (20.1, 20.2). The proposed criteria pollutant mitigation strategy for the Project is discussed in Appendix F.7.

4.7.3.5 Hazardous Air Pollutants

See Section 4.8 for a detailed discussion and quantification of hazardous air pollutant emissions from the proposed plant. See Appendix F.4 for the public health analysis and support materials.

4.7.3.6 Construction

Construction-related emissions are expected to be similar to other construction Projects of industrial and commercial nature due to the following:

- The site is 21.6 acres in size. Only 11 acres of the proposed site will be disturbed during the various construction phases, and only 3 acres of the 16 acres will be subject to disturbance activities on any given construction day.
- The site lies in gently rolling hills, and as such, a moderate amount of grading and cut and fill activity will be required to prepare the site for actual power plant construction.
- Construction activity is expected to last for a total of 18 months. The grading and site preparation phase is expected to last for 1.5 to 2 months, with power plant construction anticipated to last for 14 to 14.5 months. There will be some level of overlap between the two main phases of construction (most likely in month 2).

Construction-related issues and emissions at the plant site are consistent with issues and emissions encountered at any construction site. Compliance with the provisions of the following permits will generally result in minimal site emissions: (1) grading permit, (2) storm water pollution prevention plan requirements (construction site provisions), (3) use permit, (4) building permits, and (5) the air district Determination of Compliance, which will require compliance with the provisions of all applicable fugitive dust rules that pertain to the site construction phase. An analysis of construction site emissions is presented in Appendix F.5. This analysis incorporates the following mitigation measures or control strategies:

- Construction equipment exhaust emissions will comply with all applicable USEPA and California emissions standards for each equipment type and category.
- Construction equipment will use only California-certified diesel (low sulfur, low aromatic content) and gasoline fuels.
- Each piece of equipment will be included in a preventative maintenance program to ensure correct operation and to minimize exhaust emissions.
- Equipment use scheduling will minimize equipment onsite time as well as idling time once onsite.
- Water will be used as the primary fugitive dust suppression control method. Water will applied to all disturbed portions of the site, including unpaved roads, parking and laydown areas, at a minimum of three times daily.
- Track-out sites will either be swept or water flushed on a daily basis to remove track-out materials from all paved access roads.
- Vehicle speeds will be generally limited to 5 miles per hour onsite.
- Reasonable erosion control strategies will be implemented to prevent soil and silt runoff from the site.
- Disturbed areas will be revegetated as soon as practical.
- All trucks entering or leaving the site will cover all loads of soils, sands, and other loose materials, or each truck will provide a minimum freeboard height of 2 feet.
- Water or chemical surface stabilizers will be used on any storage piles or identified wind erosion areas.

Use of these mitigation measures and control strategies will ensure that the site does not cause any violations of existing air quality standards as a result of construction-related activities. (MRI 1996, SCAQMD 1993).

4.7.4 Best Available Control Technology Evaluation

4.7.4.1 Proposed Plant Best Available Control Technology

Table 4.7-10 presents the BACT summary for the proposed new engines. A detailed BACT evaluation performed in accordance with USEPA's "top-down" method is provided at Appendix F.6.

Table 4.7-10 Proposed BACT for the Power Plant Wartsila 20V34SG Engines

Pollutant	Proposed BACT Emissions Level	Proposed BACT System(s)	Meets Current BACT Requirements
NO_x	1.317 lbs/hr	Lean-burn design, Spark Ignition, Natural Gas, with SCR* and Good Combustion Practices	Yes
CO	1.564 lbs/hr	Lean-burn design, Spark Ignition, Natural Gas, with CO Catalyst and Good Combustion Practices	Yes
VOC	1.584 lbs/hr	Lean-burn design, Spark Ignition, Natural Gas, CO Catalyst, and Good Combustion Practices	Yes
SO_x	0.256 lbs/hr**	Natural Gas with total sulfur less than 0.25 gr/100 scf	Yes
PM_{10}/ $PM_{2.5}$	1.379 lbs/hr	Natural Gas with total sulfur less than 0.25 gr/100 scf	Yes
Ammonia Slip	1.08 lbs/hr 10 ppmvd @ 15% O_2	SCR catalyst with urea (ammonia) reactant*	NA

Notes:
See Tables 4.7-5A through 4.7-5C for BACT-related mass emissions values.
* Urea-based system for SCR injection.
** Includes lube oil contribution to SO_2 emissions. See Appendix F.1.
*** Ammonia is not a pollutant subject to BACT under either SDAPCD regulations or EPA PSD regulations. However it is included here for the sake of completeness and to assure that BACT for NO_x does not result in any unacceptable environmental impacts. (CARB 2011a; CARB 1999; SDAPCD 2011.)

These emissions rates, as proposed for BACT, are consistent with recent BACT determinations, as summarized in the BACT analysis in Appendix F.6.

Table 4.7-11 presents the BACT summary for GHGs. The GHG BACT analysis is presented in Appendix F.6.

Table 4.7-11 Proposed BACT Summary for GHGs for the Proposed Power Plant

Pollutant	Process	Proposed BACT
Combustion CO_2e	Power Generation Engines	Efficient lean-burn reciprocating engines. Use of natural gas fuel. Efficient design of auxiliary load-consuming equipment (fans, step-up transformer). Maintain engines per manufacturer's specifications. Perform engine tune-ups as specified by mfg's recommendations. Track engine run hours and fuel use.
Combustion CO_2e	Fire Pump Engine	Meet USEPA/ California Air Resources Board (CARB) Tier emissions standards for engine class and size. Use low sulfur diesel fuel. Tune engine according to manufacturer's specifications annually. Track engine run hours and fuel use.
Combustion CO_2e	Fuel Gas and Warm Start Heaters	Use of natural gas fuel. Maintain heater per manufacturer's specifications. Perform heater tune-ups as specified by mfg's recommendations. Track heater run hours and fuel use.
SF_6	Electrical Breakers	Utilize breakers with SF_6 fugitive leak rates less than or equal to 1% (by weight) per year.

Based on the above data, the proposed emissions levels for the new Wartsila 20V34SG-C2 engines, and ancillary processes, meet the BACT requirements of the SDAPCD and USEPA.

4.7.5 Air Quality Impact Analysis

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

Potential air quality impacts were evaluated based on air quality dispersion modeling, as described in herein. All input and output modeling files are contained on a CD-ROM disk provided to CEC Staff under separate cover. All modeling analyses were performed using the techniques and methods as discussed with the SDAPCD (De Siena 2011, USEPA 1985b, 1989, 1991).

4.7.5.1 Dispersion Modeling

The USEPA dispersion models used to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations include the AERMOD modeling system (version 11103 with the associated receptor processing program AERMAP version 11103) for modeling most Plant operational and construction impacts in both simple and complex terrain, the Building Profile Input Program for PRIME (BPIP-PRIME version 04274) for determining building dimensions for downwash calculations in AERMOD, the CTSCREEN model (version 94111) for determining PM impacts in complex terrain, the

SCREEN3 model (version 96043) for determining inversion breakup, impacts, and the use of the California Health Risk Assessment models/protocols for determining toxic impacts, which includes the HARP On-Ramp program. AERMOD meteorological data were processed by SDAPCD using AERMET version 06341 and AERSURFACE, version 08009. The models were used for the following (USEPA 2005):

- Comparison of operational and construction impacts to significant impact levels (SILs), ambient monitoring significance thresholds, California Ambient Air Quality Standards (CAAQS), National Ambient Air Quality Standards (NAAQS), and PSD Increments using AERMOD and/or CTSCREEN (as needed)
- Cumulative impacts analyses with AERMOD in accordance with local/state/USEPA/ CEC requirements
- Toxics analyses using ARB algorithms as incorporated into state/CEC requirements
- Assessment of impacts to soil and vegetation
- Class II Visibility Impacts

4.7.5.2 Model Selection

The AERMET pre-processed meteorological data was provided to the Applicant by the SDAPCD. Three years (2003–2005) of hourly data collected in Kearney Mesa (Overland Avenue monitoring station) was combined with 3 years of district operated multi-level profiler data from Marine Corps Air Station Miramar for the same time period and was input into AERMET for processing by the SDAPCD.

As part of the input requirements into AERMET and AERMOD, a land use classification must be made. The area surrounding the plant site, within 3 km, can be characterized as rural, made up mostly of shrub lands and grasslands, based on review of land use/land cover data as well as recent aerial photo data. In accordance with the Auer land use classification methodology (USEPA's *Guideline on Air Quality Models*, 40 CFR Pt. 51, App. W), land use within the area circumscribed by a three km radius around the plant is greater than 50 percent rural. Therefore, in the modeling analyses supporting the permitting of the plant, no urban coefficients were assigned.

AERMOD input data options are listed below:

- Final plume rise
- Stack tip downwash
- Ozone Limiting Method for NO_2
- Regulatory default option (calm and missing meteorological data processing)
- Elevated receptor terrain heights option

Use of these options follows the USEPA's Modeling Guideline (40 CFR Pt. 51, App. W), SDAPCD guidance, and/or sound scientific practice. An explanation of these options and the rationale for their selection is provided below.

Several other USEPA models and programs were used to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations. The additional models used were Building Profile Input Program for PRIME (BPIP-PRIME, current version 04274), the SCREEN3 (version 96043) dispersion model for fumigation impacts, the VISCREEN (version 1.01) visibility screening model for assessing Class I visibility impacts, and the HARP On-Ramp Preprocessor (Version 1.4D), which is used in the health risk assessment.

In addition to AERMOD, the CTSCREEN model was used to assess the $PM_{10/2.5}$ SILs and increment consumption in the complex terrain surrounding the Project site. The CTSCREEN model, in the screening mode of CTDMPLUS, is a refined point source Gaussian air quality model for use in all stability conditions for complex terrain applications. The use of refined modeling techniques to assess air quality impacts is summarized in USEPA's Modeling Guideline, 40 CFR Part 51, Appendix W. In particular, upon revising Appendix W to adopt AERMOD as the replacement for ISC3, EPA specifically retained CTDMPLUS and CTSCREEN as appropriate models for detailed complex terrain analysis (s*ee* Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule, 70 Fed. Reg. 68,218, 68,225-26 (Nov. 9, 2005). The refined modeling analyses consists of those analytical techniques that provide more detailed treatment of physical and chemical atmospheric processes, require more detailed and precise input data, and provide more specialized concentration estimates. As a result, they provide a more refined and, at least theoretically, a more accurate estimate of source impact and the effectiveness of control strategies. These are referred to as refined techniques and models.

Complex terrain is defined as terrain with elevations above plume height, while intermediate terrain is defined as terrain with elevations between stack top and final plume rise height. Simple terrain is defined as terrain below stack height. Historically, a distinction has been made between simple, intermediate, and complex terrain because of the capability of different air quality dispersion models to effectively handle the simulation of the dispersion of pollutants in the different terrain regimes. Most of the models approved by the USEPA were originally developed either for use with simple or complex terrain. The most widely used model for simple terrain has been the ISCST3 model, which was replaced as the preferred model by AERMOD. For complex terrain, AERMOD is the preferred model, which replaced COMPLEXI. AERMOD uses algorithms similar to CTDM and RTDM.

In addition to the AERMOD model, the USEPA has approved the CTDMPLUS model for use in complex terrain modeling applications. *See id*., 70 Fed. Reg. at 68,233. CTDMPLUS is a preferred/recommended USEPA dispersion model for terrain impacts and "provides greater resolution of concentrations about the contour of the hill feature than does AERMOD through a different plume-terrain interaction algorithm." *Id*. The challenge to using the CTDMPLUS model in many situations is the additional meteorological and terrain data that is required by the model. However, the USEPA developed a screening version of the CTDMPLUS model, called CTSCREEN. The CTSCREEN model is a refined point source Gaussian air quality model for use in all stability conditions for complex terrain applications.

CTDMPLUS in screening mode (CTSCREEN) serves several purposes in regulatory applications. When meteorological data are unavailable, "CTSCREEN can be used to obtain

conservative [safely above those of refined models], yet realistic, worst-case estimates" of impacts from particular sources in complex terrain. *Id*. These estimates can be used to determine the necessity and value of obtaining on-site data for refined modeling or can simply provide conservative emission-limit estimates. In addition, CTSCREEN can be a valuable tool for designing meteorological and pollutant monitoring programs. It is important to note that CTSCREEN and the refined model, CTDMPLUS, are the same basic model. The primary difference in their make-up is in the way in which CTSCREEN obtains the meteorological conditions. For example, wind direction in CTSCREEN is calculated based on the source-terrain-dividing streamline geometry to ensure computation of the highest impacts that are likely to occur. The daytime mixed-layer heights are based on fractions of the terrain height. Other meteorological variables or parameters are chosen through a variety of possible combinations from a predetermined matrix of values.

As a result of the CTSCREEN model accounting for the dimensional nature of the plume and terrain interaction, the model requires digitized terrain of the nearby topographical features. The mathematical representation of terrain is accomplished by the terrain preprocessors, FITCON and HCRIT. CTSCREEN and CTDMPLUS are virtually the same air quality model, with the main difference between the two being the meteorological data used. The wind direction used in CTSCREEN is based on the source-terrain geometry, resulting in computation of the highest impacts likely to occur. Other meteorological variables are chosen from possible combinations from a set of predetermined values. CTSCREEN provides maximum concentration estimates that are similar to, but on the conservative side of, those that would be calculated from the CTDMPLUS model with a full year of on-site meteorological data.

CTSCREEN is appropriate for the following applications:

- Elevated point sources
- Terrain elevations above stack top
- Rural areas
- One hour to annual averaging time periods

Meteorological data used by the CTSCREEN model is internally derived by the model itself, but is similar to those 1-hour values used in the screening version of ISCST3. As well as calculating maximum 1-hour concentrations at all receptors, the CTSCREEN model is designed to provide conservative estimates of worst case 3-hour, 24-hour, and annual impacts. Scaling factors, as presented in Table 4.7-12, were used to convert calculated 1-hour concentrations to 3-hour, 24-hour, and annual estimates.

Table 4.7-12 Model Persistence Factors

Averaging Period	CTSCREEN Scaling Factor
1-hour	1.0
3-hour	0.7
8-hour	NA
24-hour	0.15
Annual	0.03

These models were used for the following:

- Comparison of impacts to significant impact levels and increments
- Compliance with state (CAAQS) and national (NAAQS) ambient air quality standards
- Calculation of health risk impacts

Federal 1-hour NO_2 NAAQS Modeling

USEPA recently established a new 1-hour NO_2 standard at a level of 100 ppb (188.68 µg/m^3), based on the 3-year average of the annual 98th percentile of the daily maximum 1-hour concentrations in addition to the existing annual secondary standard (100 µg/m^3). USEPA has also established requirements for a NO_2 monitoring network that will include monitors at locations where maximum NO_2 concentrations are expected to occur, including within 50 meters of major roadways, as well as monitors sited to measure the area-wide NO_2 concentrations that occur more broadly across communities.

To assess the Project's impacts on compliance with the federal 1-hour NO_2 Standard, the methods summarized in the Draft California Air Pollution Control Officers Association (CAPCOA) Guidance Document *Modeling Compliance of the Federal 1-hour NO_2 NAAQS* (CAPCOA, 2011) were used.

Specifically:

- First high with Ozone Limiting Method was used for significant impact levels (SILs) for 1-hour NO_2.
- Ozone Limiting Method with recommended CAPCOA in stack NO_2/NO_x ratios based on the most recent updated data provided on the SDAPCD web site.
- Three-year average of the modeled 98th percentile coupled with seasonal hour of day (3rd highest) background.
- Background Ozone and NO_2 data from Overland Avenue monitoring station.
- Missing background NO_2 and Ozone data was filled in following the CAPCOA Gap Filling Procedures.

The rationale for using the Ozone Limiting Method (OLM) was presented in the modeling protocol and is summarized below. Hourly O_3 data collected at Overland Avenue was used in the OLM analysis to calculate hourly NO_2 concentrations from hourly modeled NO_x concentrations. The 3 years of O_3 data used were for the same 3 years as the modeled meteorological data. The OLM is incorporated into the AERMOD program and involves an initial comparison of the estimated maximum NO_x concentration and the 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 NO_x concentration, total conversion is assumed. If the NO_x 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.

As summarized in the CAPCOA Guidelines as well as through the USEPA Policy Memorandum, the use of OLM was based on five selected criteria:

1. **The model has received a scientific peer review:**

   As noted in the USEPA's June 2010 guidance document, because AERMOD is the preferred model for dispersion for a wide range of applications, the alternative model demonstration for use of the Ozone Limiting Method/Plume Volume Molar Ratio Method (OLM/PVMRM) options within AERMOD focus on the treatment of NO_x chemistry within the model, and does not need to address basic dispersion algorithms within AERMOD. The chemistry for OLM has been peer-reviewed, as noted by the documents posted on the USEPA's Support Center for Regulatory Air Modeling web site. The posted documents include *Sensitivity Analysis of PVMRM and OLM in AERMOD* (MACTEC 2004) and *Evaluation of Bias in AERMOD-PVMRM* (MACTEC 2005). Both documents indicate that the models appear to perform as expected.

2. **The model can be demonstrated to be applicable to the problem on a theoretical basis:**

   As noted in the document entitled *Sensitivity Analysis of PVMRM and OLM In AERMOD* prepared by Roger W. Brode, "This report presents results of a sensitivity analysis of the PVMRM and OLM options for NO_x to NO_2 conversion in the AERMOD dispersion model. Several single source scenarios were examined as well as a multiple-source scenario. The average conversion ratios of NO_2/NO_x for the PVMRM option tend to be lower than for the OLM option and for the Tier 2 option or the Ambient Ratio Method which has a default value of 0.75 for the annual average. The sensitivity of the PVMRM and OLM options to emission rate, source parameters and modeling options appear to be reasonable and are as expected based on the formulations of the two methods. For a given NO_x emission rate and ambient O_3 concentration, the NO_2/NO_x conversion ratio for PVMRM is primarily controlled by the volume of the plume, whereas the conversion ratio for OLM is primarily controlled by the ground-level NO_x concentration.

   Overall the PVMRM option appears to provide a more realistic treatment of the conversion of NO_x to NO_2 as a function of distance downwind from the source than OLM or the other NO_2 screening options (Hanrahan 1999a, 1999b). No anomalous behavior of the PVMRM or OLM options was identified as a result of these sensitivity tests."

   Based on this report for both OLM/PVMRM appear to be applicable to the problem of NO_2 formation and as noted by the author provides a better estimation of the NO_2 impacts compared to other screening options (Tiers 1 and 2).

3. **The databases which are necessary to perform the analysis are available and adequate:**

   The data needed to conduct an OLM run with hourly seasonal background NO_2 data are hourly meteorological data, hourly O_3 data, hourly NO_2 data, and in-stack NO_2/NO_x ratios. The hourly $O_3$and meteorological data exist for the same time period at the same Overland Avenue Monitoring Station, operated by the SDAPCD.

The Overland Avenue monitoring site is located on Overland Avenue in the County Operations Center, which is in the northern section of Kearny Mesa. The site collects and records NO_x/NO_2, Ozone, CO, PM_{10}, $PM_{2.5}$ along with surface meteorology which includes wind speed, wind direction, temperature and solar radiation. The SDAPCD considers this monitoring station as representative of where reactive photochemistry will occur most extensively.

The site is an urban/commercial area and is bounded by SR 52 to the north, Interstate 805 to the west, and Interstate 15 to the east. Adjacent communities include Serra Mesa, Clairemont, and Tierrasanta. The air quality in this location is representative of a large part of the metropolitan portion of San Diego due to the diurnal onshore and offshore flow, which mixes the pollutants throughout the metropolitan region.

This monitoring station is located next to major transportation corridors and population centers, so it is able to provide representative concentration data for a significantly large area. The SDAPCD classifies the monitoring objective at this site as “Representative Concentration,” which is defined to represent the air quality concentrations for a pollutant that is expected to be similar throughout a geographical area. Such monitoring stations may not always indicate the highest concentrations in the area, but review of Table 4.7-17 1-hour NO_2 data for Overland Avenue indicates that many of the high concentrations for 1-hour NO_2 have been recorded at Overland Avenue. Part of the reason for the relatively high NO_2 concentrations may be due to the location of the monitor with respect to SR 52. Based on prevailing wind direction, the Overland Avenue monitoring station appears to be directly impacted from SR 52 mobile source emissions.

For this Project, the use of the Overland Avenue monitoring station satisfies the Environmental Protection Agency's new requirements for the placement of NO_2 monitors near major roadways in urban areas in order to determine the highest concentrations in an area covered by a monitoring network. The new federal 1-hour NO_2 standard requires that monitoring networks be designed to measure the expected highest concentrations. Each of the SDAPCD monitoring stations has unique objectives that are associated with a spatial scale for each site. These spatial scales are defined in 40 CFR Part 58, Appendix D. Additionally, the desired spatial scale of a monitoring site must conform to established criteria for the distance from roadways, based on traffic volumes as defined in 40 CFR Part 58, Appendix E. The goal in siting monitoring stations is to match the spatial scale with the desired monitoring objective.

The new federal 1-hour NO_2 standard is focused on short-term peak concentrations, which may occur near roadways. As summarized in the 2009 San Diego Air Monitoring Network Plan (June 2010) and based on the last four years of 1-hour NO_2 monitoring data, the Overland Avenue monitoring objective appears to be population oriented (typical concentrations in areas of high population density in order to protect public health) and highest concentration (monitoring at locations expected to have the highest concentrations). Based on the major roadways that surround the monitoring station, the use of the Overland Avenue NO_2 monitoring data appears to satisfy the revised USEPA population and highest concentration oriented monitoring station requirements for the new 1-hour standard.

NO_2/NO_x ratios will be determined from published data provided by the San Joaquin Valley SDAPCD. Based on the recommended ratios provided by the San Joaquin Valley SDAPCD, the following are proposed:

- Wartsila Natural Gas Fired Reciprocating Engine with post-combustion controls: 1.15 percent
- Natural Gas Fired Fuel Heaters: 10 percent

4. **Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates:**

   As noted in *Evaluation of Bias in AERMOD-PVMRM* (MACTEC, 2005), which was prepared by Roger W. Brode, PVMRM has been judged to provide unbiased estimates based on criteria that are comparable to, or more rigorous than, evaluations performed for other dispersion models. At the present time no assessment of bias has been conducted for the OLM algorithm. It has been shown in the sensitivity analysis that OLM provides similar more conservative results than PVMRM. Therefore is it assumed that OLM would also provide an unbiased estimate of the modeled NO_2 concentrations.

5. **A protocol on methods and procedures to be followed has been established.**

   The methods and procedures outlined in this protocol are proposed for implementation.

Based on the above selected criteria, OLM modeled NO_2 concentrations were combined with seasonal hour of the day NO_2 background in order to assess compliance with the 1-hour federal NO_2 standard.

California State 1-hour NO_2 Standard

In order to assess compliance with the California State Standard for 1-hour NO_2, OLM was used with concurrent hourly background NO_2 and O_3 data from Overland Avenue. The time frame for the background NO_2 and O_3 monitoring data matched the meteorology used to assess the total NO_2 concentrations. The first high modeled results at each receptor were used for comparisons with the 1-hour standard.

Annual NO_2 Standard

The annual average concentrations of NO_2 were computed following the revised USEPA guidance for computing these concentrations (August 9, 1995, Federal Register, 60 FR 40465). The annual average was calculated using the ambient ratio method (ARM) with the national default value of 0.75 for the annual average NO_2/NO_x ratio.

4.7.5.3 Good Engineering Practice Stack Height Analysis

Good engineering practice (GEP) stack height is calculated as the greater of 65 meters (213 feet) or 27.4 meters (90 feet) based on existing onsite structure dimensions. The design stack height of 100 feet does not exceed GEP stack height, thus downwash effects were included in the modeling analysis.

BPIP-PRIME was used to generate the wind-direction-specific building dimensions for input into AERMOD. All onsite and the nearby offsite structures were included for analysis with BPIP-PRIME. The building location plan, located in Appendix F.2, shows the buildings included in the downwash analysis. (USEPA 1985d, 1985e)

4.7.5.4 Receptor Grid Selection and Coverage

Receptor and source base elevations were determined from the USGS National Elevation Dataset (NED) data in the GeoTIFF format at a horizontal resolution of 1/3 arc-second (approximate 10 meter spacing). Because of the format of the NED data, all coordinates (both sources and receptors) were referenced to UTM North American Datum 1983 (NAD83, Zone 11). Elevation locations in the NED dataset were interpolated by AERMAP to normal UTM locations appropriate for the receptor grid spacings shown below.

Cartesian coordinate receptor grids are used to provide adequate spatial coverage surrounding the Project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. The receptor grids used in this analysis are as follows:

- 10-meter resolution grid along the Project fenceline.
- 20-meter resolution grid that extends outwards from the fenceline to 500 meters in all directions. This is referred to as the downwash grid.
- 50-meter resolution grid that extends outwards from the edge of the downwash grid to 1000 meters in all directions. This is referred to as the intermediate grid.
- 100-meter resolution grid that extends from the edge of the intermediate grid outwards in all directions to 2000 meters.
- 200-meter resolution grid that extends from the edge of the 100-meter grid outwards 5000 meters in all directions.
- 500-meter resolution grid that extends from the edge of the 200-meter grid outwards 10,000 meters in all directions. The 100-meter, 200-meter, and 500-meter grids are referred to as the coarse grid.
- 20-meter resolution around any location outside the downwash grid where a maximum impact is modeled. These additional receptors are referred to as refined grids.

Concentrations within the plant fenceline will not be calculated. The coarse and fine receptor grid figure, located in Appendix F.2, displays the receptors grids used in the modeling assessment. A plant boundary figure is also presented in Appendix F.2.

4.7.5.5 Meteorological Data Selection

The proposed use of the three (3) years of SDAPCD supplied surface meteorological data collected at the Kearny Mesa monitoring location would satisfy the definition of on-site data. USEPA defines the term “on-site data” to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Specifically, the meteorological data requirement originates from the Clean Air Act (CAA) in Section 165(e)(1), which requires an analysis “of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility

for each pollutant subject to regulation under [the Act] which will be emitted from such facility." This requirement and USEPA's guidance on the use of on-site monitoring data are also outlined in the *On-Site Meteorological Program Guidance for Regulatory Modeling Applications* (USEPA 1987). The representativeness of meteorological data is dependent upon: (a) the proximity of the meteorological monitoring site to the area under consideration; (b) the complexity of the topography of the area; (c) the exposure of the meteorological sensors; and (d) the period of time during which the data are collected (USEPA 1985c).

First, the meteorological monitoring site and proposed Project location are in close proximity (9.4 km), at approximately the same elevation and with similar topography surrounding each location. Second, the Kearny Mesa (Overland Avenue) monitoring site and proposed Project location are located roughly about the same distance and in the same orientation to significant terrain features that might influence wind flow patterns. There are two small-scale localized terrain features near the proposed Project site; Cowles and Fortuna Mountains which extend approximately 700 feet in height above both the monitoring and Project site base elevations. These terrain features are part of the same large-scale terrain features in the area that are oriented in a northeast-southwest direction. Cowles and Fortuna Mountain are bisected with passes and canyons that run in the same northeast and southwest directions as the larger terrain features in the area. Based on the small size of the terrain, it is unlikely that either of these two features will influence the predominant meteorology in the Project area. Third, as discussed below, the surface characteristics roughness length, Bowen ratio, and albedo are relatively consistent throughout the area and are nearly identical between the Project site and the meteorological monitoring location.

Representativeness is defined in the document *Workshop on the Representativeness of Meteorological Observations* (Nappo et al. 1982) as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application." Judgments of representativeness should be made only when sites are climatologically similar, as is the case with the meteorological monitoring site and the proposed Project location. In determining the representativeness of the meteorological data set for use in the dispersion models at the Project site, the consideration of the correlation of terrain features to prevailing meteorological conditions, as discussed earlier, would be nearly identical to both locations since the orientation and aspect of terrain at the proposed Project location correlates well with the prevailing wind fields as measured by and contained in the meteorological dataset. In other words, the same mesoscale and localized geographic and topographic features that influence wind flow patterns at the meteorological monitoring site also influence the wind flow patterns at the proposed Project site.

Surface characteristics were determined with AERSURFACE using Land Use/Land Cover (LULC) data in accordance with USEPA guidance documents (*AERMOD Implementation Guide,* 1/09/08; and *AERSURFACE User's Guide*, USEPA-454/B-08-001, 1/08) as described below. AERSURFACE uses USGS National Land Cover Data 1992 archives (NLCD92) to determine the midday albedo, daytime Bowen ratio, and surface roughness length representative of the surface meteorological station. ***Bowen ratio*** is based on a simple unweighted geometric mean, while ***albedo*** is based on a simple unweighted arithmetic mean for the 10x10-km-square area centered on the selected location (i.e., no direction or distance dependence for either parameter). ***Surface roughness length*** is based on an inverse distance-weighted geometric

mean for upwind distances up to 1 km from the selected location. The circular surface roughness length area (1-km radius) can be divided into any number of sectors as appropriate (USEPA guidance recommends that no sector be less than 30º in width). As noted above, SDAPCD executed AERMET using one 360-degree sector for roughness lengths obtained from AERSURFACE for the Kearny Mesa monitoring location

Running AERSURFACE at both the meteorological monitoring and proposed site locations produced almost identical results for both Bowen ratio and Albedo, based on the 10-km area around each location. There were some variations in land cover and roughness lengths between the two locations based on a 1-km radius, but both areas are mostly rural. Table 4.7-13 presents the AERSURFACE land use types within 1 km of the meteorological monitoring and Project locations. Based on the Auer land use classifications, both locations are classified as rural and there is good correlation of the rural characteristic land types between the two locations. Within the 1-km radius around the Kearny Mesa Monitoring Station, there is a 51.4 percent urban classification, but review of the photo aerial data suggests that most of this is due to the airport runways being classified as LULC category 23 (transportation). These areas, although including the paved runway surfaces, have low surface roughness lengths more closely comparable to rural categories than areas with commercial/industrial buildings/structures. Comparing the LULC data at the Project site to the meteorological monitoring site showed that the same general land use categories exist around the Project site and the meteorological monitoring site, with the both locations having over 75 percent associated with open, rural areas. Thus, the predominant land use in the area is made up of rural categories.

Table 4.7-13 AERSURFACE Land Cover Counts: Surface Roughness (1 km)

		Quail Brush Project Site			Kearny Mesa Monitoring Site		
LULC Category		Count	%Rural	%Urban	Count	%Rural	%Urban
11	Open Water:	9	0.3%	-	0	-	-
12	Perennial Ice/Snow:	0	-	-	0	-	-
21	Low Intensity Residential:	29	0.8%	-	145	4.2%	-
22	High Intensity Residential:	11	-	0.3%	0	-	-
23	Commercial/Industrial/Trans:	9	-	0.3%	1794	-	51.4%
31	Bare Rock/Sand/Clay:	256	7.3%	-	201	5.8%	-
32	Quarries/Strip Mines/Gravel:	0	-	-	0	-	-
33	Transitional:	0	-	-	0	-	-
41	Deciduous Forest:	121	3.5%	-	7	0.2%	-
42	Evergreen Forest:	390	11.2%	-	51	1.5%	-
43	Mixed Forest:	90	2.6%	-	105	3.0%	-
51	Shrubland:	1904	54.5%	-	1085	31.1%	-
61	Orchards/Vineyard/Other:	0	-	-	0	-	-
71	Grasslands/Herbaceous:	665	19.0%	-	66	1.9%	-
81	Pasture/Hay:	0	-	-	3	0.1%	-
82	Row Crops:	0	-	-	4	0.1%	-
83	Small Grains:	2	0.1%	-	0	-	-
84	Fallow:	0	-	-	1	0.0%	-
85	Urban/Recreational Grasses:	1	0.0%	-	27	0.8%	-

		Quail Brush Project Site			Kearny Mesa Monitoring Site		
LULC Category		Count	%Rural	%Urban	Count	%Rural	%Urban
91	Woody Wetlands:	1	0.0%	-	0	-	-
92	Emergent Herbaceous Wetlands:	5	0.1%	-	4	0.1%	-
	Total:	3493	99.4%	0.6%	3493	48.6%	51.4%

Comparing the AERSURFACE outputs in Table 4.7-14, using one 360 degree sector around each location, shows that the average surface characteristics by season are also very similar. For roughness length, the variations between the two sites are minimal. Roughness lengths are often categorized into classes between 0 (water) and 4 (urban). Open land areas, low vegetation areas, and agriculture are often assigned roughness lengths of 0.01 (class 1) to 0.16 (class 2). Thus, it is noted that there are no changes in classes between the two locations and the predominant land use activity in the Project and meteorological monitoring locations are associated with open or rural land uses.

Table 4.7-14 AERSURFACE Results/Inputs for Project and Meteorological Monitoring Locations

Parameter by Season (Month)	Quail Brush Project Site	Kearny Mesa Monitoring Site*
Surface Roughness (meters)		
Winter (none)	-	-
Spring (Mar-Apr)	0.286	0.530
Summer (May-Sept)	0.322	0.540
Fall (Oct-Feb)	0.322	0.539
Albedo		
Winter (none)	-	-
Spring (Mar-Apr)	0.17	0.17
Summer (May-Sept)	0.17	0.17
Fall (Oct-Feb)	0.17	0.17
Bowen Ratio		
Winter (none)	-	-
Spring (Mar-Apr)	0.85	0.97
Summer (May-Sept)	0.81	0.95*
Fall (Oct-Feb)	1.25	1.30
AERMOD Inputs		
Latitude/UTM-X(m)	32.851	32.83645
Longitude/UTM-Y(m)	-117.029	-117.12875
Datum	NAD83	NAD83
Source	Google Earth	Google Earth
Snow Cover	NO	NO
Arid Region	NO	NO
Airport Location	NO	NO
Surface Moisture	AVERAGE	AVERAGE
Surface Roughness Radius (km)	1.0	1.0
Number of Sectors	1 (0-360deg)	1 (0-360deg)

Notes:
*0.94 Bowen ratio in SDAPCD Stage 3 AERMOD input file is the only difference.

For these reasons, the Kearny Mesa meteorological data selected for the proposed Project are expected to satisfy the definition of representative meteorological data. Thus, it is our assessment that this meteorological data are identical to the dispersion conditions at the Project site and to the regional area. As noted above, these data have been processed by the SDAPCD using AERMET (Version 06341) based on one (1) 360-degree sector for roughness lengths in AERSURFACE based on the Kearny Mesa monitoring location.

4.7.5.6 Background Air Quality

In 1970, the United States Congress instructed the USEPA to establish standards for air pollutants, which were of nationwide concern. This directive resulted from the concern of the effects of air pollutants on the health and welfare of the public. The resulting CAA set forth air quality standards to protect the health and welfare of the public. Two levels of standards were promulgated—primary standards and secondary standards. Primary national ambient air quality standards (NAAQS) are "those which, in the judgment of the administrator [of the USEPA], based on air quality criteria and allowing an adequate margin of safety, are requisite to protect the public health (state of general health of community or population)." The secondary NAAQS are "those which in the judgment of the administrator [of the USEPA], based on air quality criteria, are requisite to protect the public welfare and ecosystems associated with the presence of air pollutants in the ambient air." To date, NAAQS have been established for seven criteria pollutants as follows: SO_2, CO, O_3, NO_2, sub 10-micron particulate matter (PM_{10}), sub 2.5-micron particulate matter ($PM_{2.5}$), and lead.

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

Two basic elements comprise each federal or state AAQS: (1) a numerical limit expressed as an allowable concentration, and (2) an averaging time which specifies the period over which the concentration value is to be measured. Table 4.7-15 presents the current federal and state AAQS.

Table 4.7-15 State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards Concentration	National Standards Concentration
Ozone	1 hr	0.09 ppm (180 μg/m^3)	-
	8 hr	0.070 ppm (137 μg/m^3)	0.08 ppm (157 μg/m^3) (3-year average of annual 4th-highest daily maximum)
Carbon Monoxide	8 hr	9.0 ppm (10,000 μg/m^3)	9 ppm (10,000 μg/m^3)
	1 hr	20 ppm (23,000 μg/m^3)	35 ppm (40,000 μg/m^3)

Pollutant	Averaging Time	California Standards Concentration	National Standards Concentration
Nitrogen dioxide	Annual Average	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)
	1 hr	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3) (3-year average of 98th percentiles)
Sulfur dioxide	Annual Average	-	0.030 ppm (80 μg/m^3)
	24 hr	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)
	3 hr	-	0.5 ppm (1,300 μg/m^3)
	1 hr	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)
Respirable particulate matter (10 micron)	24 hr	50 μg/m^3	150 μg/m^3
	Annual Arithmetic Mean	20 μg/m^3	-
Fine particulate matter (2.5 micron)	Annual Arithmetic Mean	12 μg/m^3	15.0 μg/m^3 (3-year average)
	24 hr	-	35 μg/m^3 (3-year average of 98th percentiles)
Sulfates	24 hr	25 μg/m^3	-
Lead	30 day	1.5 μg/m^3	-
	Calendar Quarter	-	1.5 μg/m^3
	Rolling 3-month	-	0.15 μg/m^3

Source: CARB ADAM website (CARB 2011b); table updated 9/8/10.

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

Ozone—Ozone is a reactive pollutant that is not emitted directly into the atmosphere, but rather is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving precursor organic compounds (VOC) and NO_x. VOC and NO_x are, therefore, known as precursor compounds for O_3 Significant O_3 production generally requires O_3 precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of VOC and NO_x under the influence of wind and sunlight. Short-term exposure to O_3 can irritate the eyes and cause constriction of the airways. In addition to causing shortness of breath, O_3 can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

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

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

NAAQS for particulate matter were first established in 1971. The standards covered total suspended particulate matter (TSP), or particles that are 30 microns or smaller in diameter. In 1987, USEPA changed the standards from TSP to PM_{10} as the new indicator. The new standards were based on a comprehensive study of information on the health effects from inhaling particulate matter. In December 1994, the USEPA began a long review process to determine if the PM_{10} standards set in 1987 provide a reasonable margin of safety, and if a new standard should be established for finer particles.

Based on numerous epidemiological studies and other health- and engineering-related information, USEPA established new standards for $PM_{2.5}$ in 1997. Before establishing the new $PM_{2.5}$ standards, discussions were conducted with the Clean Air Scientific Advisory Committee (CASAC). CASAC is a group of nationally recognized experts in the fields related to air pollution, environmental health, and engineering. CASAC reviewed and commented on the information generated by USEPA regarding proposed particulate matter standards.

Subsequent to these discussions and reviews, USEPA established $PM_{2.5}$ standards of 35 $\mu g/m^3$, 24-hour average concentration, and 15 $\mu g/m^3$, annual average concentration. USEPA also confirmed the national PM_{10} standards of 150 $\mu g/m^3$, 24-hour average, as providing an adequate margin of safety for limiting exposure to larger particles. The annual standard of 50 $\mu g/m^3$ has been deleted by USEPA. The recommendations for new $PM_{2.5}$ standards and for maintaining the PM_{10} standards were released in a staff report that presents the conclusions of the USEPA and of the CASAC review committee.

Several studies that USEPA relied on for its staff report have shown an association between exposure to particulate matter, both PM_{10} and $PM_{2.5}$, and respiratory ailments or cardiovascular disease. Other studies have related particulate matter to increases in asthma attacks. In general, these studies have shown that short-term and long-term exposure to particulate matter can cause acute and chronic health effects. $PM_{2.5}$, which can penetrate deep into the lungs, causes more serious respiratory ailments.

Nitrogen Dioxide and Sulfur Dioxide—Nitrogen dioxide (NO_2) and SO_2 are two gaseous compounds within a larger group of compounds, NO_x and SO_x, respectively, which are products of the combustion of fuel. NO_x and SO_x emission sources can elevate local NO_2 and SO_2 concentrations, and both are regional precursor compounds to particulate matter. As described above, NO_x is also an O_3 precursor compound and can affect regional visibility. (Nitrogen dioxide is the “whiskey brown-colored” gas readily visible during periods of heavy air pollution.) Elevated concentrations of these compounds are associated with increased risk of acute and chronic respiratory disease.

SO_2 and NO_x emissions can be oxidized in the atmosphere to eventually form sulfates and nitrates, which contribute to acid rain. Large power plants with high emissions of these substances because of the use of coal or oil are subject to emissions reductions under the Phase I Acid Rain Program of Title IV of the 1990 CAA Amendments. Power plants, with individual equipment capacity of 25 MW or greater that use natural gas or other fuels with low sulfur content, are subject to the Phase II Program of Title IV. The Phase II program requires plants to install CEMS in accordance with the Code of Federal Regulations (40 CFR Part 75) and report annual emissions of SO_x and NO_x.

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

Table 4.7-16 presents the current attainment and/or nonattainment designations for San Diego County (and the Project area).

Table 4.7-16 SDAPCD Attainment Status Listing

Pollutant	Federal Status	State Status
Ozone	Nonattainment*	Nonattainment
$PM_{10}/PM_{2.5}$	Attainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Lead	Attainment	Attainment

Notes:

* Federal Ozone Status Ranking = "basic," but in June of 2011 the SDAPCD expects the ranking to be upgraded to "serious."

Air quality monitoring data from several sites surrounding the proposed Project site are summarized in Table 4.7-15. Data from these sites (primarily SD-Overland Avenue) were used to establish the background levels in Table 4.7-17, and were used in the air quality impact analyses that follow:

Table 4.7-17 Air Quality Summary for Most Recent 4 Years[1]

Pollutant	Site	Average Time	2007	2008	2009	2010
Ozone, ppm	El Cajon	1 hr	.11	.107	.098	.102
	Del Mar		.11	.097	.097	.085
	Escondido		.094	.116	.093	.105
	Alpine		.134	.139	.119	.105
	SD-Overland		.088	.100	.105	.100
Ozone, ppm	El Cajon	8 hr (4th max)	.073	.093	.082	.078
	Del Mar		.072	.078	.084	.072
	Escondido		.075	.098	.080	.084
	Alpine		.086	.109	.097	.088
	SD-Overland		.076	.093	.082	.073

Pollutant	Site	Average Time	2007	2008	2009	2010
PM_{10}, µg/m^3	El Cajon	24 hr	61	40	55	41
	Escondido		68	82	73	42
	SD-Overland		65	41	50	33
PM_{10}, µg/m^3	El Cajon	Annual AM	27	27	25	21
	Escondido		24	25	25	21
	SD-Overland		22	24	25	19
$PM_{2.5}$, µg/m^3	El Cajon	24 hr (98th pctl)	42.7	30.7	56.5	27.7
	Escondido		124	44	78.3	48.4
	SD-Overland		31	27.2	25.1	18.7
$PM_{2.5}$, µg/m^3	El Cajon	Annual AM	12.8	13.4	12.1	10.8
	Escondido		13.3	13	13	12
	SD-Overland		10	12	10.5	8.7
CO, ppm	Escondido	8 hr	3.2	2.8	3.24	2.46
CO, ppm	Escondido	1 hr	5.2	4.6	ND	ND
NO_2, ppm	El Cajon	1 hr[2]	.065	.054	.054	.058
	SD-Overland		.087	.056	.06	.073
	Escondido		.072	.073	.073	.064
	Alpine		.057	.042	.056	.052
NO_2, ppm	El Cajon	Annual	.015	.016	.014	.013
	SD-Overland		.015	.014	.014	.013
	Escondido		.016	.018	.016	.014
	Alpine		.010	.008	.008	.007
SO_2, ppm	San Diego Beardsley	Annual	-	.003	.001	.000
SO_2, ppm	San Diego Beardsley	24 hr	.006	.007	.006	.002
SO_2, ppm	San Diego Beardsley	3 hr	.010	.014	ND	ND
SO_2, ppm	San Diego Beardsley	1 hr	.018	.019	ND	ND

Notes:

1 Data from USEPA AIRS, San Diego SDAPCD, CARB ADAM (CARB 2011b).

2 98th percentile is the correct value to be used for federal. The 98th percentile background value is 104 µg/m^3.

3 (CARB 2009; CARB 2011b; SDAPCD 2007; 2009.)

Table 4.7-18 shows the background air quality values based upon the data presented in Table 4.7-17. The background values (primarily SD-Overland) represent the highest or average values reported for the site during any single year of the most recent 3-year period (2008-2010). Appendix F.2 presents the background air quality data summaries.

Table 4.7-18 Estimated Background Air Quality Values

Pollutant and Averaging Time	Background Value
Ozone – 1 Hour	0.105 ppm (210 µg/m^3)
Ozone – 8 Hour	0.093 ppm (182.5 µg/m^3)
PM_{10} – 24 Hour	50 µg/m^3
PM_{10} – Annual	25 µg/m3
$PM_{2.5}$ – 24 Hour	23.667 µg/m^3

Pollutant and Averaging Time	Background Value
$PM_{2.5}$ – Annual	12 μg/m^3
CO – 1 Hour	4.6 ppm (5290 μg/m^3)
CO – 8 Hour	3.24 ppm (3600 μg/m^3)
NO_2 – 1 Hour (based on 98th percentile data analysis) Federal	0.0553 ppm (104 μg/m^3)
NO_2 – 1 Hour (based on 1st high data analysis) State	0.073 ppm (137.5 μg/m^3)
NO_2 – Annual	0.014 ppm (26.4 μg/m^3)
SO_2 – 1 hr	0.019 ppm (49.8 μg/m^3)
SO_2 – 3 hr	0.014 ppm (36.4 μg/m^3)
SO_2 – 24 Hour	0.007 ppm (18.4 μg/m^3)
SO_2 – Annual	0.003 ppm (7.9 μg/m^3)

Table 4.7-19 summarizes the federal permitting criteria and applicable evaluation thresholds.

Table 4.7-19 Federal Program Evaluation Data

Regulated Pollutant	Major Source Thresholds, tpy		Averaging Time Period	Standard Form	NAAQS				PSD Increments, μg/m^3			Significant Emissions Increase	Significant Impact Levels	Monitoring *de minimis* Levels
					Primary		Secondary		Area Classifications					
	PSD	NAA			μg/m^3	ppb	μg/m^3	ppb	I	II	III		μg/m^3	μg/m^3
PM_{10}	250/100	100/70	24 hr	a	150	-	150	-	8	30	60	15	5	10
			Annual	b	-	-	-	-	4	17	34		1	-
$PM_{2.5}$	250/100	100	24 hr	c	35	-	35	-	2	9	18	10	1.2	4
			Annual	d	15	-	15	-	1	4	8		0.3	-
SO_2	250/100	100	1 hr	g	196	75	-	-	-	-	-	40	7.8*	-
			3 hr	e	-	-	1,300	500	25	512	700		25	-
			24 hr	k	365	140	-	-	5	91	182		5	13
			Annual	k	80	30	-	-	2	20	40		1	-
NO_2	250/100	100	1 hr	j	188	100	-	-	-	-	-	40	7.5	-
			Annual	f	100	53	100	53	2.5	25	50		1	14
Ozone	250/100	100/50/ 25/10	8 hr	h	147	75	147	75	-	-	-	40/25/ any	-	-
CO	250/100	100/50	1 hr	e	40,000	35,000	-	-	-	-	-	100	2,000	-
			8 hr	e	10,000	9,000	-	-	-	-	-		500	575
Lead	250/100	100	Calendar Qtr	i	1.5	-	1.5	-	-	-	-	0.6	-	0.1
TSP	250/100	-	-	n/a	-	-	-	-	-	-	-	25	-	-

Notes:

a. 99th percentile, 3 yr average
b. Annual arithmetic mean, 3 yr average
c. 98th percentile, 3 yr average
d. Annual arithmetic mean (single or multiple monitors), 3 yr average
e. Not to be exceeded more than once per calendar year
f. Annual arithmetic mean
g. 99th percentile, 3 yr average, 1 hr daily maximums
h. 3 yr average of 4th highest daily maximum 8 hr concentration
i. Maximum quarterly arithmetic mean
j. 98th percentile, daily 1 hr maximums
k. Standard will be revoked on August 3, 2011

4.7.5.7 Engine Load Screening and Refined Impact Analysis

Facility sources, including the fuel gas heaters and emergency fire pump diesel engine, were modeled in the analysis for comparisons with Significant Impact Levels (SILs) and CAAQS/NAAQS, as necessary.

Operational characteristics of the engines, such as emission rate, exit velocity, and exit temperature vary by operating load and ambient temperature. A screening modeling analysis, using AERMOD and 3 years of hourly meteorology (2003–2005) was performed for the 100 percent load, 75 percent load, and 50 percent load conditions in order to determine the engine operating condition that will result in the highest modeled concentrations for averaging periods of 24 hours or less. These conditions were considered for three ambient temperature conditions: 35°F (a cold winter day), 64°F (annual average day), 70°F, 81°F (an average summer day), and 95°F (a hot summer day). The 64°F condition was assumed to represent annual average conditions. As such, no screening analyses were performed for annual average concentrations, which were modeled later for the 64°F case at 100 percent load, which is the typical operating scenario.

The results of the load screening analysis are listed in Appendix F.2. The screening analysis shows that the worst-case load and ambient temperature condition is 100 percent load at 70°F for short-term SO_2 and NO_2 impacts, and 50 percent load at 81°F for short-term CO and $PM_{10/2.5}$ impacts. The worst case stack parameters associated for each pollutant and averaging period, based upon the screening analysis, were used in the refined impact analysis.

For the startup modeling analyses, all 11 engines were assumed to startup or shutdown simultaneously within the same hour. For longer averaging periods such as the 3-hour, 8-hour, and 24-hour averaging times, multiple startups/shutdowns along with full load operation for all engines were modeled in order to calculate the worst-case impacts. Start-up and shutdown engine NO_x, CO, and SO_2 emissions were modeled with worst case stack characteristics based on pollutant from the load screening analysis. For 24-hour $PM_{10/2.5}$ and 24-hour SO_2 averages, the startup and shutdown emissions were automatically included in the regular modeling analyses.

Detailed emission calculations for all averaging periods are included in Appendix F.1.

The worst-case modeling input information for each pollutant and averaging period are shown in Table 4.7-20 for normal operating conditions and engine startup/shutdown conditions. As discussed above, the combustion engine stack parameters used in modeling the impacts for each pollutant and averaging period reflected the worst-case operating condition for that pollutant and averaging period identified in the engine load screening analysis. Stack parameters associated with operation at 100 percent load at the average temperature of 64°F were used in modeling annual average impacts.

Table 4.7-20 Stack Parameters and Emission Rates for Refined AERMOD Modeling

Equipment/ Input Data	Stack Parameters				Emission Rates (g/s)[a]			
	Stack Height (m)	Stack Diameter (m)	Stack Temp. (deg K)	Exhaust Velocity meters per second (m/s)	NO_X	SO_2	CO	$PM_{10/2.5}$
Averaging Period: 1-hour for Normal Operating Conditions								
Engines (each) – SO_2/NO_X	30.48	1.219/1.2192	663.150	24.983	0.1659	0.03226	n/a	n/a
Engines (each) – CO	30.48	1.2192	712.039	14.771	n/a	n/a	0.19706	n/a
Fire Pump Engine[b]	9.144	0.1016	833.150	43.077	0.1121	2.646E-4	0.04032	n/a

Equipment/ Input Data	Stack Parameters				Emission Rates (g/s)[a]			
	Stack Height (m)	Stack Diameter (m)	Stack Temp. (deg K)	Exhaust Velocity meters per second (m/s)	NO_X	SO_2	CO	$PM_{10/2.5}$
Fuel Gas Heater	9.144	0.5969	819.261	3.783	0.0243	3.024E-4	0.04536	n/a
Warm Start Heater	9.144	0.5969	819.261	3.783	0.0243	3.024E-4	0.04536	n/a
Averaging Period: 3 hours for Normal Operating Conditions								
Engines (each)	30.48	1.219	663.150	24.983	n/a	0.03226	n/a	n/a
Fire Pump Engine	9.144	0.1016	833.150	43.077	n/a	8.820E-5	n/a	n/a
Fuel Gas Heater	9.144	0.5969	819.261	3.783	n/a	3.024E-4	n/a	n/a
Warm Start Heater	9.144	0.5969	819.261	3.783	n/a	3.024E-4	n/a	n/a
Averaging Period: 8 hours for Normal Operating Conditions								
Engines (each)	30.48	1.2192	712.039	14.771	n/a	n/a	0.19706	n/a
Fire Pump Engine	9.144	0.1016	833.150	43.077	n/a	n/a	5.04E-3	n/a
Fuel Gas Heater	9.144	0.5969	819.261	3.783	n/a	n/a	0.04536	n/a
Warm Start Heater	9.144	0.5969	819.261	3.783	n/a	n/a	0.04536	n/a
Averaging Period: 24 hours for Normal Operating Conditions								
Engines (each) – SO_2	30.48	1.219	663.150	24.983	n/a	0.03270	n/a	n/a
Engines (each) – PM	30.48	1.2192	712.039	14.771	n/a	n/a	n/a	0.1967
Fire Pump Engine	9.144	0.1016	833.150	43.077	n/a	1.1025E-5	n/a	1.575E-4
Fuel Gas Heater	9.144	0.5969	819.261	3.783	n/a	3.024E-4	n/a	3.528E-3
Warm Start Heater	9.144	0.5969	819.261	3.783	n/a	3.024E-4	n/a	3.528E-3
Averaging Period: Annual for Normal Operating Conditions[c]								
Engines (each)	30.48	1.2192	663.706	25.009	0.1147	0.0150	n/a	0.0862
Fire Pump Engine	9.144	0.1016	833.150	43.077	6.6567E-4	1.5707E-6	n/a	2.2438E-5
Fuel Gas Heater	9.144	0.5969	819.261	3.783	0.0117	1.4609E-4	n/a	1.7044E-3
Warm Start Heater	9.144	0.5969	819.261	3.783	0.0137	1.7012E-4	n/a	1.9847E-3
Averaging Period: 1-hour for Engine Start-up/Shutdown Conditions								
Engines (each) – SO_2/NO_X	30.48	1.219/1.2192	663.150	24.983	1.195740	0.04284	n/a	n/a
Engines (each) – CO	30.48	1.2192	712.039	14.771	n/a	n/a	1.69344	n/a
Fuel Gas Heater	9.144	0.5969	819.261	3.783	0.024318	3.024E-4	0.04536	n/a
Warm Start Heater	9.144	0.5969	819.261	3.783	0.024318	3.024E-4	0.04536	n/a
Averaging Period: 3-hour for Engine Start-up/Shutdown Conditions								
Engines (each)	30.48	1.219	663.150	24.983	n/a	0.03343	n/a	n/a
Fire Pump Engine	9.144	0.1016	833.150	43.077	n/a	8.820E-5	n/a	n/a
Fuel Gas Heater	9.144	0.5969	819.261	3.783	n/a	3.024E-4	n/a	n/a
Warm Start Heater	9.144	0.5969	819.261	3.783	n/a	3.024E-4	n/a	n/a
Averaging Period: 8 hours for Engine Start-up/Shutdown Conditions								
Engines (each)	30.48	1.2192	712.039	14.771	n/a	n/a	0.39989	n/a
Fire Pump Engine	9.144	0.1016	833.150	43.077	n/a	n/a	5.04E-3	n/a
Fuel Gas Heater	9.144	0.5969	819.261	3.783	n/a	n/a	0.04536	n/a
Warm Start Heater	9.144	0.5969	819.261	3.783	n/a	n/a	0.04536	n/a

Notes:

[a] Modeled emission rates based on estimated hours of operation (see Appendix F.1).

[b] Due to infrequent operations of firepump testing, the firepump engine is not included in the 1-hour NO_2 modeling for NAAQS assessment based on USEPA guidance.

[c] Annual averaging periods include startup/shutdown emissions, where applicable.

4.7.5.8 Normal Operations Impact Analysis

AERMOD was initially used in order to determine the magnitude and location of the maximum impacts for each pollutant and averaging period for comparison with the SILs. Table 4.7-21 summarizes maximum modeled concentrations for each criteria pollutant and associated averaging periods. In order to assess the significance of the modeled concentrations, the maximum first high concentrations were compared to the Class II PSD SILs. The SILs were exceeded for the following pollutants and averaging periods: 1-hour NO_2, 24 hour PM_{10} and $PM_{2.5}$, annual $PM_{2.5}$, and 1-hour SO_2.

Based on the locations of the maximum impacts, several refined 20-meter resolution receptor grids were developed. The refined receptor grids were prepared for the following pollutants and averaging periods:

- 1-hour NO_2 startup and commissioning (federal and state standards)
- 1-hour NO_2 base load operation (federal standard)
- 24-hour SO_2, PM_{10}, and $PM_{2.5}$ base load operation (federal and state standards)
- 8-hour CO startup (state standard)
- 1- and 8-hour CO commissioning (state standard)
- Annual SO_2, PM_{10}, and $PM_{2.5}$ (federal standard)

The results of the refined grid modeling are presented in Table 4.7-21 as well as Table 4.7-24 (startup and shutdown impacts). Commissioning impacts are delineated in the text below. Thus, comparisons with the appropriate SILs and state and federal ambient air quality standards were all based on 20-meter receptor grids in order to calculate the maximum impact from the proposed Project.

The AERMOD results for the refined grid indicate that the “Project-only” $PM_{2.5}$ 24-hour concentration could exceed the available $PM_{2.5}$ increment. If the background concentration were added to this modeled impact, the result would also exceed the 24-hour NAAQS. Additionally, the Project-only 24-hour PM_{10} concentration exceeds the 24-hour SIL, which could trigger PM offset requirements as per SDAPCD Rule 20.2. All of these modeled locations where concentrations were predicted in excess of the relevant increment, NAAQS or SIL were located in the complex terrain surrounding the Project site. To provide a more accurate estimate of the Project’s potential impacts in this complex terrain, the CTSCREEN model was used to model the Project’s impacts at these locations. The use of CTSCREEN and the results are discussed in more detail below. The results of the CTSCREEN modeling, which are shown in parentheses in Table 4.7-21 below, clearly demonstrate that the 24-hour $PM_{2.5}$ NAAQS and increment will not be exceeded and that the 24-hour PM_{10} SIL will also not be exceeded.

Table 4.7-21 Air Quality Impact Summary for Normal Operating Conditions

Pollutant	Avg. Period	Maximum Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS	
						($\mu g/m^3$)	($\mu g/m^3$)
NO_2[a]	1-hour Federal	132.4	(included by AERMOD)	132.4	7.5	-	188
	1-hour State	265.3	(included by AERMOD)	265.3	-	339	-
	Annual	0.91	26.4	27.3	1	57	100
PM_{10}	24-hour	21.9 (3.77)*	50	71.9	5	50	150
	Annual	0.74	25.0	25.7	1	20	-
$PM_{2.5}$	24-hour	18.3 (3.77)*	23.7	42.0 (27.5)*	1.2	-	35
	Annual	0.74	12.0	12.7	0.3	12	15.0
CO	1-hour	261.2	5290	5551	2000	23,000	40,000
	8-hour	58.4	3600	3658	500	10,000	10,000
SO_2	1-hour	18.5	49.8	68.3	7.8	655	196
	3-hour	9.0	36.4	45.4	25	-	1,300
	24-hour	3.0	18.4	21.4	5	105	365
	Annual	0.13	7.9	8.0	1	-	80

Notes

[a] Ambient Ratio Method (ARM) used for annual NO_2 impacts with 75 percent ratio and Ozone Limiting Method (OLM) used for 1-hour NO_2 impacts, with Kearny Mesa NO_2 background included in the modeling results (USEPA-default 2008–2010 hourly-seasonal background used for 1-hour federal NAAQS and SDAPCD-provided 2003–2005 hourly NO_2 concurrent with meteorological data used for 1-hour state CAAQS. The 1-hour SIL is an interim value.

*The maximum modeled 24-hour PM_{10} and $PM_{2.5}$ impact locations were remodeled with CTSCREEN.

Based on the above modeling results, emissions from the proposed Project will not significantly affect the attainment status of the airshed, cause any new exceedances or consume excess increment.

4.7.5.9 Commissioning Impacts Analysis – Power Cycle Engines

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

For the purposes of air quality modeling, NO_2 and CO impacts could be higher during commissioning than under other operating conditions already evaluated. Likewise, while undergoing equipment commissioning, although natural gas will be the sole fuel fired during commissioning, $PM_{10/2.5}$ impacts also could be higher during commissioning than under other operating conditions already evaluated.

The commissioning activities for each engine are expected to consist of several phases. Though precise emission values during the phases of commissioning cannot be provided, given the consideration for contingencies during shakedown, the emissions profile during expected commissioning-period operating loads are estimated as follows in Table 4.7-22. The engine manufacturer provided ppm values at 15 percent O_2, by volume dry, for a 20V34SG engine rated at 73 MMBtu/hr. These values were used to recalculate potential emissions for the 20V34SG-C2 engine rated at 80.18 MMBtu/hr. These revised commissioning emissions were modeled to determine their impacts.

Table 4.7-22 Commissioning Emissions Used for Modeling Analysis for Each Lean Burn Engine at Four Load Points[1]

Pollutant	100%	90%	75%	50%
NO_x	120 ppm 35.44 lbs/hr	120 ppm 31.90 lbs/hr	110 ppm 24.37 lbs/hr	100 ppm 14.77 lbs/hr
CO	260 ppm 46.74 lbs/hr	260 ppm 42.07 lbs/hr	300 ppm 40.45 lbs/hr	400 ppm 35.96 lbs/hr
$PM_{10/2.5}$	25 mg/Nm^3 3.86 lbs/hr	25 mg/Nm^3 3.47 lbs/hr	30 mg/Nm^3 3.47 lbs/hr	40 mg/Nm^3 3.09 lbs/hr

Notes:

1 Concentration emissions in ppm and mg/normal cubic meter (Nm^3) are based on 15 percent O_2, by volume, dry, as provided by engine manufacturer.

2 Hourly emission values were revised based on standard F-factor calculations. See Appendix F.1.

Each engine's commissioning period (prior to catalyst loading), is expected to consist of the following phases:

- **Initial load testing and checkout of an engine (typical for all 11 engines)** – Two to four operating days of unsynchronized operation, for approximately 2 to 4 hours per day, followed by approximately an average of 1 to 2 days per engine of low load checkout (low load checkout also is estimated at approximately 2 to 4 hours per day). The average operating load for this initial load testing is expected to be 5 to 10 percent, based on a range of 0 percent and 10 percent load.
- **Initial tuning** – Fifteen to thirty operating days of testing and tuning at various loads and up to full load per engine for not more than an average of 8 operating hours per day. The average operating load is expected to be 75 percent, based on a typical commissioning range of 50 percent and 100 percent load. Upon completion of this phase, the SCR and the oxidation catalyst will be loaded (about 50 to 80 operating hours after first fire of a given engine).
- **Final tuning** – Fifteen to thirty operating days of SCR and oxidation catalyst tuning and pre-witness testing performance verification at an average of not more than 10 to 12 hours per day. The average operating load is expected to be 75 percent, based on a range of 50 percent and 100 percent load.

During the commissioning period, multiple engines will be undergoing various phases of commissioning at the same time. Not all 11 engines will begin commissioning on the same day, however; typically, three engines will be tested concurrently. Although the final sequencing and schedule of commissioning for the 11 engines is not final, the following presents a general description of the worst-case scenario during commissioning for each pollutant:

- NO_x – Worst-case commissioning emissions occurs at 100 percent load
- CO – Worst-case commissioning emissions occurs at 100 percent load
- $PM_{10/2.5}$ – Worst-case commissioning emissions occurs at 100 percent load

The calculation methodology for commissioning emissions is presented in Appendix F.1

As discussed above and presented in Appendix F.1 (i.e., emission calculation methodology) and Appendix F.2 (i.e., air quality modeling support information), there are several potential scenarios under which NO_x, CO and PM_{10} impacts could be higher than under other operating conditions already evaluated.

Under these scenarios, the maximum emission impacts during commissioning with AERMOD modeling analysis, when added to background, are as follows:

NO_x emissions can be conservatively estimated to be 35.44 lb/hr per engine with three engines operating at 100 percent load. The maximum 1-hour federal NO_2 impact during commissioning was conservatively calculated to be 160.14 µg/m.^{3} The maximum 1-hour state NO_2 impact during commissioning is 223.39 µg/m^3. CO emissions can be conservatively estimated to be 46.74 lb/hr per engine with three engines operating at 100 percent load.

The maximum 1-hour and 8-hour CO impacts during commissioning were calculated to be 1,347.8 , µg/m^3 and 373.7 µg/m^3, respectively. With the maximum background 1-hour and 8-hour CO concentration of 5,290 µg/m^3 and 3,600 µg/m^3 the maximum total impacts would be 6,637.8 µg/m^3 and 3,973.7 µg/m^3, respectively. These impacts are each below the state and federal standards for CO.

$PM_{10/2.5}$ emissions can be conservatively estimated to be equivalent to 3.86 lb/hr per engine with up to three engines operating at 100 percent load. Modeling was not performed for $PM_{10/2.5}$ commissioning impacts as the worst-case commissioning event would only occur for up to 8 hours per day. Normalizing the 3.86 lb/hr per engine for three engines over 8 hours results in emissions that are less than 11 engines at full load for 24 hours. Thus, the maximum 24-hour $PM_{10/2.5}$ impact during commissioning would be less than base load.

4.7.5.10 Start-up and Shutdown Impacts Analysis

Start-up and shutdown activities typically affect emissions of NO_x and CO. (During startup, PM_{10}/$PM_{2.5}$, and SO_2 emissions are expected to be no greater than for full-load operations.) A separate modeling assessment for startup emissions is presented as the startup emissions by themselves are greater than the worst-case hourly emissions. Modeling was performed with AERMOD as discussed previously for 1-hour and 8-hour CO, 1 and 3 hour SO_2, and 1-hour NO_2 concentrations. CO and NO_x emissions for 1-hour averaging times were modeled for one cold startup period, assumed to occur for the entire hour. CO emissions for 8-hour averaging times were modeled assuming one cold startup and one warm startup during the 8-hour period. The $PM_{10/2.5}$ and SO_2 emissions for 24-hour averages already contain the startup/shutdown emissions for the worst-case day. It was assumed that both fuel heaters were operational during the engine startup. It was also assumed that all 11 engines would be simultaneously started during the same hour. These emissions and stack characteristics are shown in Table 4.7-20 above. The initial maximum startup impacts for 1-hour NO_2 (both federal and state) and 8-hour

CO occurred in 50-meter intermediate grids. Thus, 20-meter resolution refined receptor grids were developed around the NO_2 and CO startup locations.

Table 4.7-23 presents a summary of the startup and shutdown emission estimates for the engines. Appendix F.1 presents more details with regards to startup/shutdown emissions and assumptions.

Table 4.7-23 Plant Startup/Shutdown Emission Rates for Each Engine for the QBGP

Scenario	NO_x	CO	VOC	$PM_{10/2.5}$	SOx
Cold Start, lb/event	8.82	12.57	6.614	1.54	0.137
Warm Start, lb/event	2.43	1.322	1.764	1.54	0.07
Shutdown, lb/event	0.2	0.31	0.34	0.35	0.05
Hourly Based Emissions Estimates for Startup and Shutdown Events					
Cold Start, lb/hr	9.48	13.35	7.41	2.23	0.27
Warm Start, lb/hr	3.42	2.50	2.95	2.57	0.26
Shutdown, lb/hr	1.33	1.65	1.70	1.53	0.27

Notes:
Estimates based on startup/shutdown data supplied by engine manufacturer.
Cold start sequence is 30 minutes, while a warm start sequence is 15 minutes or less. Time required for control systems to reach full abatement efficiency. The remaining part of the cold or warm startup hour would be at steady state, full control levels.
Shutdown is 8.5 minutes. The remaining part of the shutdown hour would be at steady state, full control levels.

Table 4.7-24 presents the results of the startup/shutdown modeling. CO concentrations due to startup/shutdown conditions are less than the Class II significance levels and modeled 1-hour NO_x impacts are less than the 1-hour state and federal standards.

Table 4.7-24 Startup and Shutdown Modeling Results

Pollutant	Avg. Period	Maximum Concentration (µg/ m^3)	Background (µg/ m^3)	Total (µg/ m^3)	Class II Significance Level (µg/ m^3)	Ambient Air Quality CAAQS/NAAQS	
						(µg/ m^3)	(µg/ m^3)
NO_2[a]	1-hour Federal	182.7	(included by AERMOD)	182.7	7.5	-	188
	1-hour State	229.8	(included by AERMOD)	229.8	-	339	-
CO	1-hour	1363	5290	6653	2000	23,000	40,000
	8-hour	95.7	3600	3696	500	10,000	10,000
SO_2	1-hour	24.6	49.8	74.4	7.8	655	196
	3-hour	9.3	36.4	45.7	25	-	1,300

Notes:
[a] Ozone Limiting Method (OLM) used for 1-hour NO_2 impacts, with Kearny Mesa NO_2 background included in the modeling results (USEPA-default 2008–2010 hourly-seasonal background used for 1-hour federal NAAQS and SDAPCD-provided 2003–2005 hourly NO_2 concurrent with meteorological data used for 1-hour state CAAQS.

Fumigation Analysis

Fumigation analyses with the USEPA Model SCREEN3 (version 96043) were conducted for inversion breakup conditions based on USEPA guidance given in *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised* (USEPA-454/R-92-019) (USEPA 1992b). The worst-case stack parameters identified in the screening analysis for the engine stacks for 1-hour CO averaging times were modeled. Shoreline fumigation impacts were not assessed.

An inversion breakup fumigation impact was predicted to occur at 4,842.35 meters from the engine stacks. These results are predicted to occur by SCREEN3 for rural conditions of F stability and 2.5 m/s wind speeds at the stack release heights. No inversion breakup fumigation impacts are predicted by SCREEN3 for the short firepump engine and heater stacks. Since the site vicinity is rural in nature, there was no need to adjust fumigation impacts for urban dispersion conditions. One-hour averaging times were evaluated first (fumigation impacts are generally expected to occur for 90 minutes or less).

For total facility inversion breakup fumigation impacts, maximum SCREEN3 impacts under rural conditions for all SCREEN3 meteorological combinations were determined for the other sources at the inversion breakup distances. These impacts were combined with the fumigation impact as shown in the following table. These maximum 1-hour total fumigation impacts are less than the SCREEN3 maxima predicted to occur under normal dispersion conditions for CO and NO_x. Since one-hour fumigation impacts are less than the maximum overall SCREEN3 one-hour impacts for these pollutants, no further analysis of additional short-term averaging times (3 hours, 8 hours, or 24 hours) is required as described in Section 4.5.3 of *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised* (USEPA-454/R-92-019) for CO and NO_x. It should be noted that the maximum 1-hour total fumigation impacts for all pollutants (NO_x, CO, and SO_2) are expected to be less than the maximum 1-hour AERMOD facility impacts as shown in Table 4.7-25, so the refined analysis impacts are conservative.

For the SO_2 impacts, where 1-hour fumigation impacts were greater than 1-hour SCREEN3 impacts, 3-hour and 24-hour fumigation impacts were calculated assuming 90-minutes of persistence of fumigation at the fumigation impact location (maximum SCREEN3 impacts under normal conditions at the fumigation impact location for the balance of the 3-hour or 24-hour period were assumed). The USEPA averaging time ratios of 0.9 and 0.4 were applied to SCREEN3 results for 3-hour and 24-hour averaging times, respectively, for the engines and heaters. Since the firepump only operates for 1-hour per day (at most and if at all), 1-hour firepump impacts were divided by 3 and 24 to obtain impacts for 3-hour and 24-hour averaging times, respectively. This gives 3-hour and 24-hour SO_2 fumigation inversion breakup impacts of 1.49 and 0.44 µg/m^3, respectively. The comparable maximum 3-hour and 24-hour SCREEN3 impacts under normal dispersion conditions for SO_2 were 1.98 and 0.87 µg/m^3, respectively, at the engine maximum impact location. These impacts are also less than the AERMOD refined modeling analysis results of 9.0 and 3.0 µg/m^3 for SO_2 for 3-hour and 24-hour averaging times, respectively.

Table 4.7-25 Fumigation Impact Summary

Pollutant/ Average Time	Engine Impacts ($\mu g/m^3$)	Heater Impacts ($\mu g/m^3$)	Firepump Impacts ($\mu g/m^3$)	Total Facility Impact ($\mu g/m^3$)	Maximum AERMOD Impact ($\mu g/m^3$)
Engine Inversion Breakup Location (4842 meters)					
NO_2 1-hour	11.644	1.970	5.866	19.480	76.44[a]
CO 1-hour	13.832	3.677	2.110	19.619	261.2
SO_2 1-hour	2.265	0.025	0.014	**2.304**	**18.5**
Engine SCREEN3 Max. Location/Normal Dispersion (777 meters)					
NO_2 1-hour	10.921	4.293	24.158	39.372	76.44[a]
CO 1-hour	12.973	8.014	8.689	29.676	261.2
SO_2 1-hour	2.124	0.053	0.057	2.234	18.5
Heaters SCREEN3 Max. Location/Normal Dispersion (32 meters)					
NO_2 1-hour	0.000	57.348	306.481	363.829	76.44[a]
CO 1-hour	0.000	107.050	110.235	217.285	261.2
SO_2 1-hour	0.000	0.714	0.723	1.437	18.5
Firepump Engine SCREEN3 Max. Location/Normal Dispersion (28 meters)					
NO_2 1-hour	0.000	57.056	320.942	**377.998**	**76.44[a]**
CO 1-hour	0.000	106.505	115.436	**221.941**	**261.2**
SO_2 1-hour	0.000	0.710	0.758	1.468	18.5

Notes:

[a] AERMOD NO2 impact (rather than NO_X) based on Ozone Limiting Method (i.e., AERMOD NO_X impacts would be expected to be higher than the SCREEN3 impacts shown above).

4.7.5.11 Significant Impact Levels

PSD Source Impact Analysis. Under USEPA's PSD regulations, an applicant must conduct a "source impact analysis," which demonstrates that "allowable emission increases from the source in conjunction with all other applicable emissions increases or reductions (including secondary emissions), would not cause or contribute to air pollution in violation of: (1) Any NAAQS in any region; or (2) Any applicable maximum allowable increase over the baseline concentration in any area." 40 CFR § 52.21(k).

Subparagraph (1) is required to ensure that the source's emissions will not cause a violation of the NAAQS, which, in this case, consist of the 24-hour and annual PM_{10} and $PM_{2.5}$ standards and the 1-hour and annual NO_2 standards. Subparagraph (2) is the "increment consumption analysis," which ensures that, in those locations currently meeting the federal NAAQS (i.e., those deemed "attainment" or "unclassifiable"), the concentration of a given pollutant cannot increase by an amount greater than the "maximum allowable increase" specified by the CAA and/or the PSD regulations for the particular pollutant.

USEPA has recently promulgated the final SILs and PSD increments for $PM_{2.5}$. USEPA has also recently proposed draft 1-hour NO_2 SILs but has not yet proposed a PSD increment.

Role of Significant Impact Levels. For purposes of the PSD program, USEPA has traditionally applied SILs as a *de minimis* value, which represents the offsite concentration predicted to result from a source's emissions that does not warrant additional analysis or mitigation.

If a source's modeled impact at any offsite location exceeds the relevant SIL, the source owner must then conduct a "multi-source" (or "cumulative") air quality analysis to determine whether or not the source's emissions will cause or contribute to a violation of the relevant NAAQS or applicable PSD increment. SILs have also been widely used in the PSD program as a screening tool for determining when a new major source or major modification that wishes to locate in an attainment or unclassifiable area must conduct a more extensive air quality analysis to demonstrate that it will not cause or contribute to a violation of the NAAQS or PSD increment in the attainment or unclassifiable area. The USEPA considers a source whose individual impact falls below a SIL to have a *de minimis* impact on air quality concentrations. Thus, a source that demonstrates its impact does not exceed a SIL at the relevant location is not required to conduct more extensive air quality analysis or modeling to demonstrate that its emissions, in combination with the emissions of other sources in the vicinity, will not cause or contribute to a violation of the NAAQS at that location.

The Class I and II SILs, increments, and NAAQS are presented in Table 4.7-19.

Based on the significant major source emission rates for NO_x, PM_{10}, and $PM_{2.5}$, the modeled concentrations of these pollutants exceeded the applicable Class II SILs for 1-hour NO_2, 24-hour PM_{10} and $PM_{2.5}$, and annual $PM_{2.5,}$ thus triggering the requirements for a NAAQS and PSD increment analyses as appropriate. Figures F.2-9 through F.2-11 (Appendix F.2) present the areal extent of the SILs for 24-hour PM_{10} and 24-hour and annual $PM_{2.5}$. According to USEPA guidance, the impact area was established by taking the distance from the Project site to the farthest of these locations and then drawing a circle with that distance as its radius.

The 24-hour PM_{10} SIL radius is 5.2 km. The 24-hour $PM_{2.5}$ SIL radius is 13.8 km while the annual SIL radius is 4.5 km. The 1-hour NO_2 SIL radius is 12 km. The annual SILs for NO_2 and PM_{10} were not exceeded. While the 1-hour SO_2 interim SIL was exceeded, the Project is not a major source for this pollutant, thus no NAAQS or increment analyses are required.

NAAQS Compliance Demonstration. To demonstrate that the emissions from the proposed Projects will not cause or contribute to a violation of the 24-hour $PM_{10/2.5}$ NAAQS, the annual $PM_{2.5}$ NAAQS, or the 1-hour NO_2 NAAQS, a multi-source cumulative modeling analysis will be conducted in accordance with USEPA requirements. This analysis will consider both the existing background concentrations, as established by ambient monitoring data,[2] and the contribution from additional sources, which might not be reflected by the monitoring data, but could interact with the facility's potential impacts. Both Appendix W and the *Draft NSR*

2 *See Guideline on Air Quality Models*, 40 CFR Pt. 51, Appendix W (App. W), § 7.2.1.1.a. According to Appendix W, "[t]ypically, air quality data should be used to establish background concentrations in the vicinity of the source(s) under consideration." *Id*. § 8.2.1.b For comparison with the 24-hour PM2.5 NAAQS, the background concentration is based on the average of the 98th percentile 24-hour values measured over the last 3 years of available data. *Id*., § 10.1.c. For the annual $PM_{2.5}$ NAAQS, the background is established by the 3-year average of the annual averages.

Workshop Manual require that the cumulative impacts analysis include "nearby sources," which includes "[a]ll sources expected to cause a significant concentration gradient in the vicinity of the source or sources under consideration." Appendix W further instructs that the "impact of nearby sources should be examined at locations where interactions between the plume of the point source under consideration and those of nearby sources (plus natural background) can occur." Emphasizing that "[t]he number of sources is expected to be small except in unusual situations," Appendix W leaves identification of nearby sources to the "professional judgment" of the permitting agency.

If, after adding in the background concentration, the modeled contribution from the source and any other modeled sources, the result is less than the relevant NAAQS at all locations, then no violation would occur and the cumulative impacts analysis is complete. If a violation is predicted by the model, the source may still demonstrate that it does not "cause or contribute to" a violation of the NAAQS by demonstrating that its own contribution is lower than the SIL at the particular location and time of the modeled violation.[3] This is referred to as a culpability analysis.

The Applicant will work with the SDAPCD and USEPA Region 9 to develop a cumulative source inventory for NO_2 and $PM_{10/2.5}$ and to identify nearby sources whose contribution is not already reflected by the background monitoring data.

It should be noted that initial modeling analysis using AERMOD estimated Project impacts of 18.3 $\mu g/m^3$ (3-year average of the first highest 24-hour impacts), which, when combined with the 24-hour $PM_{2.5}$ background of 23.7 $\mu g/m^3$, would indicate an exceedance of the standard of 35 $\mu g/m^3$. All locations where AERMOD predicted possible NAAQS exceedances were plotted as shown in Appendix F.2, Figure F.2-12. This included all locations where the maximum modeled $PM_{2.5}$ impact equaled or exceeded 11.3 $\mu g/m^3$ (3-year average of the first highest 24-hour impacts), which is the concentration that, when added to the background concentration of 23.7 $\mu g/m^3$, would indicate a possible exceedance of the NAAQS of 35 $\mu g/m^3$. As can be seen in Appendix F.2, Figure F.2-12, these impacts occurred along the flanks of the north and south peaks of Fortuna Mountain. To more accurately predict the Project's actual impacts in this complex terrain, a more detailed modeling assessment was conducted using CTSCREEN, which is an EPA-approved preferred model for modeling analyses in complex terrain. *See* 40 CFR Part 51, App. W, Guideline on Air Quality Models, § 4.2.1.2. According to EPA's Modeling Guideline, "CTSCREEN can be used to obtain conservative, yet realistic, worst-case estimates for receptors located on terrain above stack height." *Id*. The results from the CTSCREEN analyses described below show that maximum 24-hour $PM_{2.5}$ impacts in these complex terrain areas are significantly less than initially estimated by AERMOD and will not cause exceedances of the 24-hour $PM_{2.5}$ NAAQS.[4]

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3 *Draft NSR Workshop Manual*, Draft October 1990, at C.52: ("The source will not be considered to cause or contribute to the violation if its own impact is not significant at any violating receptor at the time of each predicted violation.")

4 These results will need to be confirmed upon completion of a cumulative impacts analysis that reflects the contribution from any nearby sources not already reflected by the background monitoring data. As indicated above, the Applicant will work with SDAPCD and USEPA Region 9 to develop an appropriate cumulative impacts inventory.

CTDMPLUS Terrain Feature Processing

CTDMPLUS requires construction of a mathematical representation of the complex terrain being analyzed. For each of the complex terrain regions to be modeled, the contours of the specific terrain feature of interest were digitized and used as input to the FITCON and HCRIT processing programs. The FITCON and HCRIT programs use the digitized data to develop continuous contours, complete the contours and extend the contours down to the stack base, fit a series of ellipses to these contour data, create polynomial equations that represent the fitted ellipses, and format the results so CTDMPLUS can use them. Contour data were based on 7.5-minute USGS topographic maps, and contour intervals of 100 feet or less as needed to accurately digitize the individual terrain features. Three primary terrain features were digitized as presented in Appendix F.2, Figure F.2-12.

The RECGEN receptor utility program was used to place model receptor locations on each terrain feature. Receptors were placed along the digitized contours.

CTSCREEN utilized the same $PM_{2.5}$ 24-hour stack parameters as determined from the engine load screening analysis.

CTSCREEN Results

CTSCREEN digitized terrain inputs were used to model the Project impacts at locations where AERMOD predicted possible exceedances of the 24-hour $PM_{2.5}$ NAAQS maximum impacts, i.e., where the maximum concentration predicted by AERMOD equaled or exceeded 11.3 $\mu g/m^3$ (35 - 23.7 $\mu g/m^3$). As indicated above, all these locations occurred along the flanks of the north and south peaks of Fortuna Mountain. The results from the CTSCREEN analyses described above show that maximum 24-hour $PM_{2.5}$ impacts of 3.77 $\mu g/m^3$ in these complex terrain areas are much less than initially estimated by AERMOD, as shown in Table 4.7-21. Thus, the Project by itself will not cause exceedances of the 24-hour $PM_{2.5}$ NAAQS.

CAAQS Compliance Demonstration

Based on the results presented in Tables 4.7-21 and 4.7-24 (as well as data presented in Appendix F.2), no violations of the CAAQS are expected to occur. Where the background already exceeds the CAAQS, the Project by itself will not cause new violations of the standards.

4.7.5.12 SDAPCD Rule 20.2 AQIA for PM_{10}

AERMOD and CTSCREEN were used to assess the Project's 24-hour PM_{10} concentrations for comparisons with the Rule 20.2 air quality impact assessment (AQIA) requirements. These methods were discussed with the SDAPCD.

Pursuant to SDAPCD Rule 20.2(d)(2), further analysis was performed with respect to the California 24-hour PM_{10} ambient air quality standards (AAQS). This rule requires that the Applicant demonstrate to the satisfaction of the Air Pollution Control Officer (APCO) through an AQIA that the Project will not cause additional exceedances of the CAAQS for PM_{10} anywhere the standard is already being exceeded. To perform this analysis for the Project, modeling was performed using the meteorology on specific days when monitored background PM_{10} concentrations equaled or exceeded the California standard of 50 $\mu g/m^3$. Two days were

identified in the 3-year modeling period from 2003–2005 with background concentrations over 50 µg/m^3.

AERMOD modeling analyses of plant PM_{10} impacts for those two days showed a number of modeled receptors with impacts greater than the SDAPCD 24-hour significance level of 5 µg/m^3. This level is used to determine whether offsets are needed for the Project. The receptors with plant PM_{10} impacts equal to or greater than 5.0 µg/m^3 were plotted and are shown on Figure F.2-12. As can be seen, these impacts all occur in the complex terrain areas southwest of the plant site. These three complex terrain features were modeled in four CTSCREEN runs (North Fortuna Mountain Peak, South Fortuna Mountain Peak, the terrain feature south of Mission Gorge, and the terrain feature between Shepherd Canyon and Fortuna Mountain). The terrain where the 24-hour PM_{10} SILs were equaled or exceeded was digitized as described in Section 4.7.5.11.

The CTSCREEN contours for these features are shown on Figure F.2-12. CTSCREEN receptors were placed along each CTSCREEN contour above the engine stack release heights. The results of the CTSCREEN analyses demonstrate that maximum plant PM_{10} impact of 3.77 µg/m^3 during these two days are less than the 24-hour PM_{10} significance level. Thus, the Project will not contribute to violations of the CAAQS. The Projects annual modeled PM_{10} impacts are also less than significance. Thus, the requirements of SDAPCD Rule 20.2 are satisfied and no offsets are required.

4.7.5.13 Preconstruction Monitoring Data

USEPA's PSD regulations require an applicant to provide preconstruction monitoring data for purposes of use in the Source Impacts Analysis. However, a source is exempt from this requirement if its modeled impact in any area is less than pollutant-specific "significant monitoring concentrations" (SMC), as listed in Table 4.7-19.

Even if a source's potential impacts exceeds the corresponding SMC, and the Applicant must therefore provide preconstruction monitoring data as part of its Source Impact Analysis, this does not necessarily mean the Applicant must install and operate a new monitor at the Project site. Rather, according to USEPA guidance, an applicant may satisfy the preconstruction monitoring obligation in one of two ways: (i) Where existing ambient monitoring data is available from representative monitoring sites, the permitting agency may deem it acceptable for use in the Source Impacts Analysis; or (ii) where existing, representative data are not available, then the Applicant must obtain site-specific data.

As a general matter, the permitting agency has substantial discretion "to allow representative data submissions (as opposed to conducting new monitoring) on a case-by-case basis." In determining whether existing data are representative, USEPA guidance has emphasized consideration of three factors: monitor location, data quality, and use of most current data. The permitting agency also may approve use of data from a representative "regional" monitoring site for purposes of the NAAQS compliance demonstration.

A facility may, with the District's approval, rely on air quality monitoring data collected at District monitoring stations to satisfy the requirement for preconstruction monitoring even when the Project impact exceed the preconstruction significance levels. In such a case, in accordance

with Section 2.4 of the USEPA PSD guideline, the last 3 years of ambient monitoring data may be used if they are representative of the area's air quality where the maximum impacts occur due to the proposed source.

The SDAPCD maintains air quality and meteorological monitoring stations throughout the entire air basin with sufficient resolution in order to adequately determine representative background concentrations for attainment/nonattainment determinations. Most monitored pollutants impact the air basin on a regional level, thus adding additional monitors in areas already served by existing monitoring stations does not provide any additional benefit. As such, the Applicant proposes that the existing monitoring data collected at the Overland Avenue site over the last three most recent years satisfies USEPA requirement for exemption of preconstruction monitoring. As such, no monitoring is proposed for this Project.

4.7.5.14 Class I Area Impacts

The closest Class I area is the Agua Tibia National Wilderness, located approximately 62 km north of the Project site. Additionally, San Jacinto Wilderness is located 103 km north-northeast of the Project site. To assess the potential for Class I increment consumption, which is a separate requirement from the air quality related value (AQRV) analysis, receptors were placed within the boundaries of Agua Tibia and are displayed in Figure F.2-13. Receptors were also placed within the boundaries of San Jacinto Wilderness and are displayed in Figure F.2-14. (USDAFS 2002)

The Agua Tibia modeled impacts are summarized in Table 4.7-26 and the San Jacinto modeled impacts are summarized in Table 4.7-27, which are then compared to the Class I significance levels. The modeled concentrations of $PM_{2.5}$ at both Class I areas are less than the USEPA's Class I SILs for $PM_{2.5}$, which are 0.07 and 0.04 µg/m^3 (as a 24-hour and annual average concentration, respectively). Similarly, the PM_{10} and NO_X impacts are also less than the Class I SILs. USEPA has stated that its decision to set the Class I SILs at 4 percent of the proposed Class I increments was based on its belief that, "where a proposed source contributes less than 4 percent to the Class I increment, concentrations are sufficiently low so as not to warrant a detailed analysis of the combined effects of the proposed source and all other increment-consuming emissions." *See* 72 Fed. Reg. at 54140. *Id*. In conclusion, the analysis demonstrates that no significant impacts on Class I areas are expected as a result of the Project.

Table 4.7-26 PM_{10}, $PM_{2.5}$, and NO_2 Class I SILs and Increments for the Agua Tibia National Wilderness Class I Area

Pollutant	Averaging Interval	Maximum Modeled Impact (µg/m^3)	Class I Significant Impact Level (µg/m^3)	Class I PSD Increment (µg/m^3)
PM_{10}	24-Hour	0.0198	0.3	10
	Annual	0.00085	0.2	5
$PM_{2.5}$	24-Hour	0.0158	0.07	2
	Annual	0.00085	0.04	1
NO_2	Annual	0.00115	0.1	2.5

Table 4.7-27 PM_{10}, $PM_{2.5}$, and NO_2 Class I SILs and Increments for the San Jacinto Wilderness Class I Area

Pollutant	Averaging Interval	Maximum Modeled Impact ($\mu g/m^3$)	Class I Significant Impact Level ($\mu g/m^3$)	Class I PSD Increment ($\mu g/m^3$)
PM_{10}	24-Hour Annual	0.0091 0.00044	0.3 0.2	10 5
$PM_{2.5}$	24-Hour Annual	0.0069 0.00044	0.07 0.04	2 1
NO_2	Annual	0.00059	0.1	2.5

4.7.5.15 PSD Increment Analysis

The PSD Source Impact Analysis also includes the "increment consumption analysis," which ensures that, in those locations currently meeting the federal NAAQS (i.e., those deemed "attainment" or "unclassifiable"), the concentration of a given pollutant cannot increase by an amount greater than the "maximum allowable increase" specified by the CAA and/or the PSD regulations for the particular pollutant.

As described above, USEPA has recently promulgated final PSD increments for $PM_{2.5}$. The proposed Project will trigger the baseline date for $PM_{2.5}$. Thus, the application for the proposed Project could be deemed the first completed PSD application received after the trigger date and would, consequently, trigger both the minor source baseline date and major source baseline date. In light of this, the Project would not need to consider any other stationary sources for purposes of its increment consumption analysis, unless such sources had increased their emissions since the date when the application was complete.

Currently there is no promulgated 1-hour NO_2 increment.

Based on the results of the 24-hour PM_{10} SILs analysis, the Project will need to perform a multi-source PM_{10} increment consumption analysis that demonstrates that the available increment is not exceeded. The Applicant will work with the SDAPCD and USEPA Region 9 to develop an applicable increment source inventory. Increment consuming sources will be identified as those sources existing within the SIL, plus a 50-km screening area beyond the maximum extent of the SIL, as per USEPA Guidance.

The increment analysis will be submitted after the necessary consultations with the SDAPCD and USEPA. (It should be noted that a complete copy of the San Diego County California Emissions Inventory Data Acquisition System (CEIDARS) emissions inventory has been requested from CARB for support of this analysis.)

Based on the $PM_{2.5}$ baseline date, the "Project only" increment consumption analysis with AERMOD produced several receptor locations where the 24-hour $PM_{2.5}$ increment was exceeded. Figure F.2-12 presents the geographical locations of the AERMOD receptors. Using the AERMOD results to identify the geographic locations of possible exceedances of the 24-hour $PM_{2.5}$ increment, the CTSCREEN model was used as a refined terrain model, as per

the Appendix W Guidelines, to assess these impact locations. Specifically, all AERMOD receptors that equaled or exceeded 9 $\mu g/m^3$ were input into CTSCREEN for this analysis.

Based on the CTSCREEN results, the maximum 24-hour $PM_{2.5}$ concentration from the Project was 3.77 $\mu g/m^3$, as summarized in Table 4.2-21. Because the highest modeled concentrations from the Project are significantly below the Class II 24-hour $PM_{2.5}$ increment (9 $\mu g/m^3$), the Project, by itself, will not cause or contribute to an exceedance of a PSD increment.[5]

4.7.5.16 AQRV Analysis

Two Class I areas are within 150 km of the proposed Project. Agua Tibia National Wilderness is located approximately 62 km north of the Project site. Additionally, San Jacinto Wilderness is located 103 km north east. Following the most recent FLAG Workshop procedures (June 2010), the use of the Screening Procedure (Q/D) to determine if the Project could opt (screen) out of an Air Quality Related Value (AQRV) assessment for visibility and deposition with CALPUFF was made. Following the screening procedures in FLAG, the emissions of NO_x, SO_x, $PM_{10/2.5}$, and H_2SO_4 (not emitted from the proposed plant) were summed after adjusting the emissions to reflect 8,760 hours of operation. The screening analysis is summarized below:

- $Q = sum(NO_x+PM_{10/2.5}+SOx+H_2SO_4)*(8760/4032) = 181.72$
- $D_{agua\ tibia} = 62$ km
- $D_{san\ jacinto} = 103$ km
- (Q/D) = 2.93 for Agua Tibia National Wilderness
- (Q/D) = 1.76 for San Jacinto Wilderness

If Q/D is less than 10, then no AQRV analysis is required. Based on the ratio of Q/D, both Class I areas are less than 10 and no further analysis of AQRV is required. The screening assessment does not apply to Class I increment or NAAQS, which was assessed above.

4.7.5.17 Deposition Analysis

A deposition analysis is not required pursuant to the AQRV analysis presented in Section 4.7.5.16.

4.7.5.18 Plume Blight Analysis

A plume blight analysis was conducted for surrounding Class II area for emissions from the proposed Project. The VISCREEN model (version 1.01) was used to conduct the plume blight analysis with a background visual range of 40 km, as recommended in the *Workbook for Plume Visual Impact Screening and Analysis* (EPA-450/4-88-015).

5 Note that, for the 24-hour NAAQS, Appendix W instructs that the highest, second-highest increase in estimated concentration must be less than or equal to the relevant increment. 40 CFR Pt. 51, App. W, § 10.2.3.3.a. Thus, comparison of the maximum modeled impact using CTSCREEN to the increment represents a conservative and protective approach.

VISCREEN was developed to conduct visual effect evaluations of a plume as observed from a given vantage point located 10 km from the Project site. Emissions input into the model are assumed to create an infinitely long, straight plume, traveling toward the specified area. The model outputs the change in light extinction in terms of Delta E and contrast against both a terrain and sky background.

Table 4.7-28 contains the results of the Level 1 VISCREEN analysis for the surrounding Class II area. NO_x and PM emissions from the worst-case day were used for this analysis. SO_2 emissions are not required to be input because over the short distance and stable plume transport conditions typical of plume visual impact screening, secondary sulfate (SO_4) is not formed to a significant degree in plumes. Results of the VISCREEN analysis were compared to criteria provided in FLAG.

Table 4.7-28 Level 1 VISCREEN Analysis Results

Class II Area	Nearest Boarder	Furthest Boarder	Delta E				Contrast			
			Sky 10	Sky 140	Terrain 10	Terrain 140	Sky 10	Sky 140	Terrain 10	Terrain 140
Class II Visibility Analysis (inside Class II Area)	10	20	2.198	0.665	3.373	0.740	0.020	-0.018	0.039	0.027
Class II Visibility Analysis (outside Class II Area)	10	20	6.610	1.406	3.373	0.740	0.089	-0.056	0.133	0.093
Criteria[1]			2.00	2.00	2.00	2.00	0.05	0.05	0.05	0.05

Notes:

[1] Criteria for Delta E and Contrast are the default criteria suggested by FLAG.

4.7.5.19 Soils and Vegetation

Impacts on soils, vegetation, and sensitive species were determined to be “insignificant” for the following reasons:

- No soils were identified in the Project area, which are recognized to have any known sensitivity to the types or amounts (ambient concentrations) of air pollutants expected to be emitted by the proposed plant. Soil classification was made using data from the National Resources Conservation Service (NRCS) . The NRCS classified the soil on site as Diablo Clay (DaE), which makes up approximately 22 percent of the site, and Redding Cobbly Loam (RfF), which makes up the remaining 78 percent of the site. Project operations would not result in impacts to the soil from erosion or compaction. Routine vehicle traffic during Project operation would be limited to existing roads and plant operations areas, all of which will be paved. Impacts to soil resources from Project operational emissions would be less than significant. Support data for soils impacts can be found in Appendix J. In addition, Appendix K contains the geotechnical report for the Project site (including soils information).

- No vegetation or sensitive species were identified in the Project area, which are recognized to have any known sensitivity to the types or amounts (ambient concentrations) of air pollutants expected to be emitted by the proposed plant. Support data for biological and vegetation/soils impacts can be found in Sections 4.12 and 4.14, respectively. In addition, Appendix H contains support data for the analyses noted in the aforementioned sections.
- The plant emissions are expected to be in compliance with all applicable air quality rules and regulations.
- The plant impacts are not predicted to result in violations of existing air quality standards, nor will the emissions cause an exacerbation of an existing violation of any quality standard.

4.7.5.20 Growth Analysis

SDG&E provides electric service to approximately 1.3 million customers in San Diego County and the southern portion of Orange County. SDG&E also provides natural gas service to approximately 775,000 gas customers. The electric customer base comprises 89 percent residential and 11 percent commercial and industrial customers.

SDG&E's electric transmission network is comprised of 135 substations with 868 circuit miles of 69kV, 242 circuit miles of 138kV, 494 circuit miles of 230kV, and 283 miles of 500kV transmission lines. Local ("on system") generating resources are the Encina plant (connected into SDG&E's grid at 138kV and 230kV), Otay Mesa Energy Center, and the Palomar Energy Center (connected at 230kV) and a number of combustion turbine facilities located around the service area (connected at 69kV). Imported resources are received via the Miguel Substation as the delivery point for power flow on the Southwest Power Link, which is SDG&E's 500kV transmission line that runs from Arizona to San Diego along the United States/Mexico border, and via the SONGS 230kV switchyard (SDG&E 2011).

Figure 4.7-1 shows a simplified diagram of existing SDG&E's service area and the electric transmission topology in San Diego County and the southern portion of Orange County. Planned or approved transmission facilities for the future (if any) are not shown on this map.

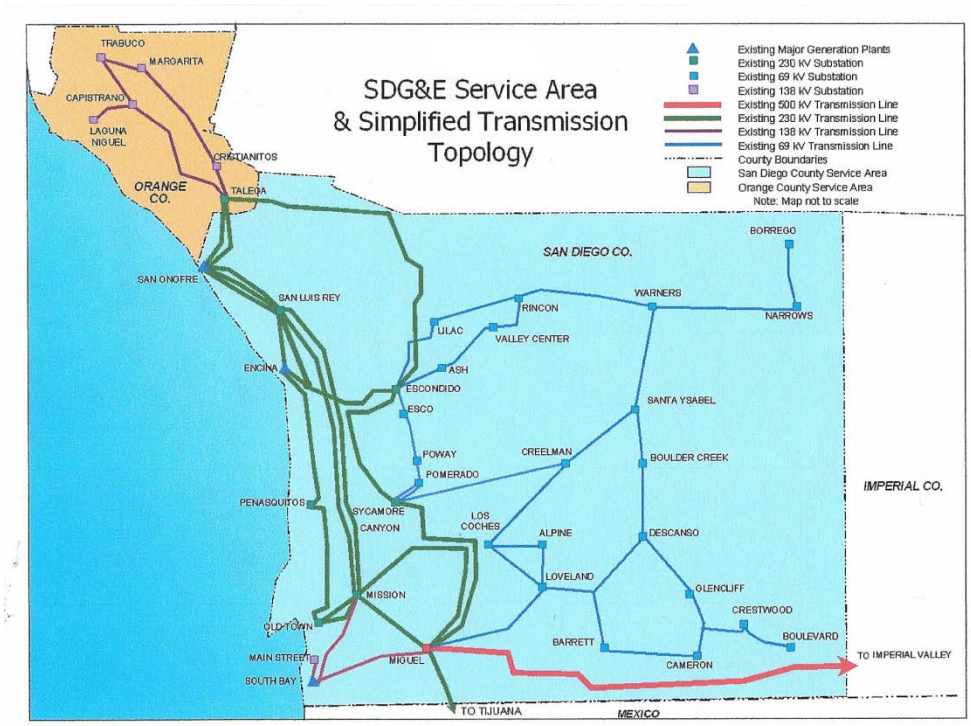
The Project is being proposed and built in response to electricity demands within the SDG&E service area. These demands are clearly outlined in the *CEC-California Energy Demand 2008-2018 Staff Revised Forecast, CEC-200-2007-015-SF2, 11/07, Chapter 4,* which presents the historical and predicted electrical demands for the SDG&E service area (CEC 2007). Chapter 4 of the aforementioned report is present in Appendix F.10 (Miscellaneous Support Data). Based on the CEC demand analysis for future years, the Applicant concludes that the proposed Project is <u>not</u> a growth inducing project, but rather a response to both current and anticipated future electrical needs within the service area. In addition, the Applicant is not aware of any type of industrial or commercial facility that would be built in response to the construction or operation of the proposed Project.

Section 4.6 (Socioeconomic Analysis) presents data on the short- and long-term impacts of the proposed Project. Short-term impacts are related to construction activities which cover an approximate period of 18 months. Long-term impacts are associated with plant operations over

the forecasted plant life of 30 years. More information on the electrical need and demand issues is presented in Section 2.5, Project Description.

Figure 4.7-1

SDG&E Service Area and Simplified Transmission Topology



4.7.6 Laws, Ordnances, Regulations, and Standards

Table 4.7-29 presents a summary of local, state, and federal LORS deemed applicable to the proposed modification.

Table 4.7-29 Applicable LORS for Air Quality

Regulation Citation	Compliance Strategy/Determination
Federal	
CAAA of 1990, 40 CFR 50	Plant operations will not cause violations of state or federal AAQS.
40 CFR 52.21	Project is subject to PSD due to GHG emissions under Tailoring Rule. Impact analysis demonstrates Project will not cause exceedance of NAAQS or increments; BACT analysis demonstrates Project will meet BACT for all PSD pollutants; PSD application has been filed with USEPA Region 9.

Regulation Citation	Compliance Strategy/Determination
40 CFR 72-75	Title IV Acid Rain – requires Title IV permit and compliance with acid rain provisions. Each lean-burn engine at the plant is connected to a generator that is less than 25 MW. The engines combust clean fuels with sulfur contents less than or equal to 0.05 percent by weight, and the engines will commence commercial operations after 11-15-90. Engines are not subject to Title IV requirements per 40 CFR 72.7 definition of affected units. Title IV is not applicable to the plant. NO_x, CO, Opacity, and O2 CEMS will be installed, certified, operated, and maintained as required per SDAPCD rules and/or 40 CFR 60.
40 CFR 60	Applicant will determine new source performance standard (NSPS) subpart applicability and comply with all emissions, monitoring, and reporting requirements. Potentially applicable subparts are: Subpart IIII, and Subpart JJJJ. Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Plant fire pump engine (emergency fire pump) is a compression ignition engine. Engine will meet the USEPA Tier 3 requirements; engine also will meet State Air Toxics Control Measure (ATCM) requirements. Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. Plant has lean-burn engines that are spark-ignited. Imposition of BACT as delineated in Appendix F.6 and compliance with the BACT emissions limits as stated in Table 4.7-10 will insure compliance with Subpart JJJJ.
40 CFR 70	Based on the current definitions in District Rule 1401 (a) and (b), the Applicant believes that the plant and emissions units are not currently subject to Title V for criteria pollutants or HAPs, but the plant will be subject to Title V based on GHG emissions, therefore a Title V application will be submitted within 12 months of the commencement of operations.
40 CFR 68	Applicant will evaluate substances and amounts stored, determine applicability, and comply with all program level requirements. Urea is the only identified substance potentially subject to RMP provisions at this time. See Sections 4.8 and 4.9.
40 CFR 63	Applicant will determine NESHAPs subpart applicability and comply with all emissions, monitoring, and reporting requirements. Subpart ZZZZ: National Emission Standards for HAPs for Stationary Reciprocating Internal Combustion Engines (RICE). Plant lean-burn engines are each greater than 500 hp. Plant is not a major source of HAPs; individual HAPs less than 10 tpy and total HAPs less than 25 tpy. An affected source that is a new or reconstructed stationary RICE located at an area source must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart JJJJ. No further requirements apply for such engines under this part. (§ 63.6590(c)). Subpart is not applicable.
State	
CHSC 44300 et seq. (AB 2588)	Applicant will determine applicability, and prepare inventory plans and reports as required. SDAPCD will determine submittal schedules.
CHSC 41700	SDAPCD Authority to Construct (ATC) will ensure that no public nuisance results from operation of plant.
Local SDAPCD Regulations	
Rule 10 and Rule 14 – Permits Required	This application and the enclosed district permit forms constitute compliance with these rules. See Appendix F.9.

Regulation Citation	Compliance Strategy/Determination
Rule 11 – Exemptions from Permits	The proposed power cycle and fire pump engines are not exempt from the permitting requirements of Rules 10 and 14, but the proposed fuel gas and warm start heaters are exempt from District permitting requirements.
Rule 50 and Rule 50.1 – SDAPCD/NSPS/NESHAPs Visible Emissions	The proposed Project will comply with all applicable SDAPCD/NSPS/NESHAPs visible emissions limitations.
Rule 51 – Nuisance	The proposed Project is not expected to create any type of public nuisance.
Rule 52 – Particulate Matter	PM emissions from the combustion of natural gas in the proposed engines are not expected to exceed 0.10 grains per standard cubic feet (gr/scf). The proposed Project engines are exempt from this rule. See Appendix F.1.
Rule 52.1 – NSPS/NESHAPs PM	The proposed Project will comply with all NSPS/NESHAPs PM limitations.
Rule 53 – Specific Air Contaminants	Applicable provisions in (d)(1) and (2) are complied with through the use of natural gas fuels. This rule does not apply to liquid fueled engines. See Table 4.7-2.
Rule 53.2 – NSPS/NESHAPs Specific Contaminants	The proposed Project will comply with all NSPS/NESHAPs specific contaminant limitations.
Rule 54 – Dust and Fumes	Not applicable to fuel combustion sources.
Rule 54.1 – NSPS/NESHAPs Dust and Fumes	The proposed Project will comply with all NSPS/NESHAPs dust and fume limitations.
Rule 55 – Fugitive Dust Control	The Applicant will comply with all provisions of this rule during construction and subsequent operations. See Appendix F.5.
Rule 60 - Circumvention	The Applicant is not proposing an action in this application which could be construed as circumvention.
Rule 62 – Sulfur Content of Fuels	Use of natural gas fuels will insure compliance with the rule limits. Use of liquid fuels meeting the sulfur requirements of this rule will insure compliance. See Tables 4.7-2 and 4.7-3.
Rule 62.1 – NSPS/NESHAPs Fuel Sulfur	Use of natural gas fuels will insure compliance with all applicable NSPS/NESHAPs rule limits. See Table 4.7-2.
Rule 68 – NO_x Limits/Fuel Burning	Use of natural gas fuels and BACT will insure compliance with all applicable NO_x limits. See Appendices F.1 and F.6.
Rule 68 and 68.1 – SDAPCD/NSPS/NESHAPs NO_x Limits	Use of natural gas fuels and BACT will insure compliance with all applicable SDAPCD/NSPS/NESHAPs rule NO_x limits. See Appendices F.1 and F.6.
Rule 69.4 – IC Engines RACT	The new IC engines will comply with all rule provisions and USEPA/CARB tier standards. Rule only applicable to NO_x from affected engines at major sources. Not applicable to emergency use engines such as the proposed fire pump engine.
Rule 69.4.1 – IC Engine BARCT	The new IC engines will comply with all rule provisions and USEPA/CARB tier standards. Not applicable to emergency use engines such as the proposed fire pump engine.
Rules 20.1-20.3 – NSR	This application and support documentation demonstrates compliance with all applicable requirements of SDAPCD's New Source Review (NSR) program.
Rule 20.5 – Power Plants	This application constitutes the equivalent of an application for Authority to Construct per Rule 20.5 and will trigger SDAPCD's commencement of Determination of Compliance (DoC) review process. Upon CEC's issuance of license and confirmation that Project is complying with conditions of license and DoC, SDAPCD will then issue Permit to Operate.
Rule 1200 – Toxics NSR	Plant risk pursuant to the HRA does not exceed any SDAPCD significance thresholds. See Section 4.8, and Appendix F.4.
Rule 1210 – HRA Public Notice	Plant risks are below the public notice threshold values. See Section 4.8 and Appendix F.4.

Regulation Citation	Compliance Strategy/Determination
Regulation XIV – Title V	Based on the current definitions in District Rule 1401 (a) and (b), the Applicant believes that the plant and emissions units are not currently subject to Title V for criteria pollutants or HAPs, but the plant will be subject to Title V based on GHG emissions, therefore a Title V application will be submitted within 12 months of the commencement of operations.
Regulation XV - Conformity	Construction emissions are well below the conformity thresholds for nonattainment pollutants (and precursors). Plant operational emissions are exempt from a conformity determination due to applicability of NSR and PSD.

4.7.7 Agencies, Agency Contacts, and Jurisdiction

Table 4.7-30 presents data on the following: (1) air quality agencies that may or will exercise jurisdiction over air quality issues resulting from the proposed power plant, (2) the most appropriate agency contact for the proposed Project, (3) contact address and phone information, and (4) the agency involvement in required permits or approvals.

Table 4.7-30 Agencies, Contacts, Jurisdictional Involvement, and Required Permits for Air Quality

Agency	Contact	Phone	Email	Mailing Address	Jurisdictional Area	Permit Status
California Energy Commission	Eric Solorio, Project Manager	(916) 651-0966	Esolorio @energy.state.ca.us	1516 Ninth Street Sacramento, CA 95814	Primary reviewing and certification agency.	Will certify the proposed Project under the energy siting regulations and CEQA. Certification will contain a variety of conditions pertaining to emissions and operation.
California Energy Commission	Gerald R. Bemis, CEC Staff Analyst	(916) 654-4960	Gbemis @energy.state.ca.us	1516 Ninth Street Sacramento, CA 95814	Primary reviewing and certification agency.	Will certify the proposed Project under the energy siting regulations and CEQA. Certification will contain a variety of conditions pertaining to emissions and operation.
San Diego Air Pollution Control District	Tom Weeks, Chief, Engineering Division	(858) 586-2715	tom.weeks @sdcounty.ca.gov	10124 Old Grove Road. San Diego, CA 92131	Prepares Determination of Compliance (DoC) for CEC; upon CEC issuance of license and confirmation that Project compliance with license and DOC, issues SDAPCD Permit to Operate; primary air regulatory and enforcement agency.	DoC will be prepared subsequent to AFC submittal. Although AFC considered to be equivalent of application for Authority to Construct (ATC) per Rule 20.5, separate ATC application submitted to SDAPCD concurrent with AFC.

Agency	Contact	Phone	Email	Mailing Address	Jurisdictional Area	Permit Status
California Air Resources Board	Mike Tollstrup, Chief, Project Assessment Branch	(916) 322-6026	Mtollstr @arb.ca.gov	1001 I Street, 6th Floor Sacramento, CA 95814	Provides guidance on SDAPCD implementation of its stationary source permitting and enforcement program.	CARB staff may provide comments on applicable AFC sections affecting air quality and public health. CARB staff will also have opportunity to comment on preliminary DoC.
Environmental Protection Agency, Region IX	Gerardo Rios, Chief, Permits Section USEPA-Region 9	(415) 972-3974	rios.gerardo @epa.gov	75 Hawthorne Street San Francisco, CA 94105	Oversight of SDAPCD NSR permitting program and rules approved as part of California State Implementation Plan (SIP); PSD permitting authority.	USEPA Region 9 staff will receive a copy of the AFC and DoC. USEPA Region 9 will process and issue the required PSD permit.

4.7.8 Required Permits and Permitting Schedules

Although SDAPCD rules otherwise require an applicant to obtain an Authority to Construct prior to construction of any emissions source (*see* SDAPCD Rule 10(a)), State law provides that the CEC's issuance of license shall be in lieu of any permit or similar document required by any other state or local agency (Cal. Health & Saf. Code § 25500). Accordingly, SDAPCD Rule 20.5(d) provides that, for power plants subject to the CEC's jurisdiction, the Air Pollution Control Officer shall consider the AFC to be equivalent to an application for an Authority to Construct during the Determination of Compliance review, and shall apply all provisions of the District rules and regulations which apply to applications for an Authority to Construct. SDAPCD Rule 20.5(i) provides that, upon CEC's issuance of license and confirmation that the source complies with all license and Determination of Compliance conditions, the source shall be issued a Permit to Operate. In addition, a PSD application will be filed with USEPA Region 9 concurrent with submittal of the AFC to the CEC. The SDAPCD and PSD permit applications will consist of a complete copy of the AFC, required agency application forms, and any support analyses required as identified prior to submittal.

The San Diego SDAPCD permitting application forms are presented in Appendix F.9.

4.7.9 References

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DATA ADEQUACY WORKSHEETS

Adequacy Issue: Adequate ____ Inadequate ____

DATA ADEQUACY WORKSHEET

Revision No. 0 Date ____

Technical Area: **Air Quality** Project: Quail Brush Power Project Technical Staff: ____

Project Manager: Eric Solorio Docket: ____ Technical Senior: ____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 4.7 (Air Quality), subsections 4.7.2.1, 4.7.2.2, 4.7.2.3, 4.7.3, (pgs 4.7-2 thru 4.7-12). Appendices F.1, F.2, F.5, F.7, and F.8. Section 4.7 (Air Quality), Subsection 4.7.4 (pgs 4.7-12,13). Subsection 4.7.6 (pgs 33-36).		
Appendix B (g) (8) (A)	The information necessary for the air pollution control district where the project is located to complete a Determination of Compliance.	Section 4.7 (Air Quality) Section 4.8 (Public Health) Section 2.0 (Project Description) Appendices F.1 thru F.10		
Appendix B (g) (8) (B)	The heating value and chemical characteristics of the proposed fuels, the stack height and diameter, the exhaust velocity and temperature, the heat rate and the expected capacity factor of the proposed facility.	Section 4.7.2.2 (pgs 4.7-2 thru 4.7-5) Appendices F.1, F.2, F.3. Section 2.0 Project Description		
Appendix B (g) (8) (C)	A description of the control technologies proposed to limit the emission of criteria pollutants.	Section 4.7.4 (pgs 4.7-12,13), Appendix F.6		
Appendix B (g) (8) (D)	A description of the cooling system, the estimated cooling tower drift rate, the rate of water flow through the cooling tower, and the maximum concentrations of total dissolved solids.	Cooling system is closed loop radiators, no cooling towers. Section 4.7.1 (Pg 4.7-1), Appendix F.1.		
Appendix B (g) (8) (E)	The emission rates of criteria pollutants and greenhouse gases (CO_2, CH_4, N_2O, and SF_6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all on-site secondary emission sources.	Section 4.7.3 (pgs 4.7-6 thru 4.7-12), Appendix F.1, and F.6.		

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (8) (F)(i)	A description of typical operational modes, and start-up and shutdown modes for the proposed project, including the estimated frequency of occurrence and duration of each mode, and estimated emission rate for each criteria pollutant during each mode.	Section 4.7.3 (pgs 4.7-6 thru 4.7-12), Appendix F.1, F.4, and F.6.		
Appendix B (g) (8) (F)(ii)	A description of the project's planned initial commissioning phase, which is the phase between the first firing of emissions sources and the commercial operations date, including the types and durations of equipment tests, criteria pollutant emissions, and monitoring techniques to be used during such tests.	Section 4.7.5.9 (pgs 4.7-36 thru 4.7-38), Appendix F.1		
Appendix B (g) (8) (G)	The ambient concentrations of all criteria pollutants for the previous three years as measured at the three Air Resources Board certified monitoring stations located closest to the project site, and an analysis of whether this data is representative of conditions at the project site. The applicant may substitute an explanation as to why information from one, two, or all stations is either not available or unnecessary.	Section 4.7.5.6 (pgs 4.7-25 thru 4.7-30). Appendix F.2.		
Appendix B (g) (8) (H)	One year of meteorological data collected from either the Federal Aviation Administration Class 1 station nearest to the project or from the project site, or meteorological data approved by the California Air Resources Board or the local air pollution control district.	Section 4.7.5.5 (pgs 4.7-22 thru 4.7-25) Appendices F.2, and F.3. Met files on CD.		

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (8) (H) (i)	If the data is collected from the project site, the applicant shall demonstrate compliance with the requirements of the U.S. Environmental Protection Agency document entitled "On-Site Meteorological Program Guidance for Regulatory Modeling Applications" (EPA - 450/4-87-013 (August 1995)), which is incorporated by reference in its entirety.	Data not collected at site. Data supplied by SDAPCD. See Section 4.7.5.5 (pgs 4.7-22 thru 4.7-25) Appendices F.2, and F.3. Met files on CD.		
Appendix B (g) (8) (H) (ii)	The data shall include quarterly wind tables and wind roses, ambient temperatures, relative humidity, stability and mixing heights, upper atmospheric air data, and an analysis of whether this data is representative of conditions at the project site.	See Section 4.7.5.5 (pgs 4.7-22 thru 4.7-25) Appendices F.2, and F.3. Met files on CD.		
Appendix B (g) (8) (I)	An evaluation of the project's direct and cumulative air quality impacts, consisting of the following:	Section 4.7.5 (pgs 4.7-14 thru 4.7-51) Appendices F.2, F.3, F.5, F.8.		
Appendix B (g) (8) (I) (i)	A screening level air quality modeling analysis, or a more detailed modeling analysis if so desired by the applicant, of the direct criteria pollutant impacts of project construction activities on ambient air quality conditions, including fugitive dust (PM_{10}) emissions from grading, excavation and site disturbance, as well as the combustion emissions [nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter (PM2.5)] from construction-related equipment;	Section 4.7.5 (pgs 4.7-14 thru 4.7-51) Appendices F.2, F.3, F.5, F.8.		

Adequacy Issue: Adequate ____ Inadequate ____

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SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (8) (I) (ii)	A screening level air quality modeling analysis, or a more detailed modeling analysis if so desired by the applicant, of the direct criteria pollutant (NO_x, SO_2, CO, PM_{10}, and $PM_{2.5}$) impacts on ambient air quality conditions of the project during typical (normal) operation, and during shutdown and startup modes of operation. Identify and include in the modeling of each operating mode the estimated maximum emissions rates and the assumed meteorological conditions;	Section 4.7.5 (pgs 4.7-14 thru 4.7-51) Appendices F.2, F.3, F.5, F.8.		
Appendix B (g) (8) (I) (iii)	A protocol for a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary emissions sources within a six mile radius which have received construction permits but are not yet operational, or are in the permitting process. The cumulative inert pollutant impact analysis should assess whether estimated emissions concentrations will cause or contribute to a violation of any ambient air quality standard; and	Appendices F.3 and F.8.		
Appendix B (g) (8) (I) (iv)	An air dispersion modeling analysis of the impacts of the initial commissioning phase emissions on state and federal ambient air quality standards for NO_X, SO_2, CO, PM_{10}, and $PM_{2.5}$.	Section 4.7.5.9 (pgs 4.7-36 thru 4.7-38) Appendices F.2, F.3, F.5, F.8.		
Appendix B (g) (8) (J)	If an emission offset strategy is proposed to mitigate the project's impacts under subsection (g)(1), provide the following information:	See Appendix F.7.		
Appendix B (g) (8) (J) (i)	The quantity of offsets or emission reductions that are needed to satisfy air permitting requirements of local permitting agencies (such as the air district), state and federal oversight air agencies, and the California Energy Commission. Identify by criteria air pollutant, and if appropriate, greenhouse gas; and	Section 4.7.3.4 (pgs 4.7-7 thru 4.7-11) See Appendix F.7. See Emissions in Appendix F.1, and BACT in Appendix F.6.		

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (8) (J) (ii)	Potential offset sources, including location, and quantity of emission reductions;	See Appendix F.7.		
Appendix B (g) (8) (K)	A detailed description of the mitigation, if any, which an applicant may propose, for all projects impacts from criteria pollutants that currently exceed state or federal ambient air quality standards, but are not subject to offset requirements under the district's new source review rule.	See Appendix F.7.		
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Section 4.7.6, (Pgs 4.7-52 thru 4.7-56)		
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 4.7.7 (pgs 4.7-57)		
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 4.7.8 (pgs 4.7-57)		

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SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 4.7.8 (pgs 4.7-57), Appendix F.9.		