8.1 Air Quality

8.1.1 Introduction

This section presents the evaluation of emissions and impacts resulting from the construction and operation of Eastshore Energy Center (Eastshore), as well as the proposed mitigation measures to be used to minimize emissions and limit impacts to below established significance thresholds. This analysis was prepared in accordance with California Energy Commission (CEC) Application for Certification (AFC) power plant siting regulations and the rules and regulations of the Bay Area Air Quality Management District (BAAQMD or District). This analysis is one part of a larger analysis that seeks a Certification Decision from the CEC and a Determination of Compliance (DOC) from the BAAQMD.

8.1.1.1 Project Schedule

The anticipated project schedule is as follows:

- Submittal of the completed AFC document on or about third quarter (3Q) 2006
- Submittal of the completed air quality permitting application to the BAAQMD on or about 3Q 2006
- Completion of anticipated 12-month CEC review process on or about 3Q 2007
- Construction commencement on or about 4Q 2007
- Construction completion on or about 4Q 2008
- Commissioning, startup, and testing commencement on or about 4Q 2008
- Facility operation on or about 2Q 2009

This section is organized as follows:

- Subsection 8.1.2 presents data on project description; proposed processes and equipment; emissions of criteria and toxic pollutants; information on fuel, emissions control technologies; and data on construction-related emissions.
- Subsection 8.1.3 presents information on project location, climate and meteorology, existing air quality, population and land use, existing soils and vegetation, and sensitive species.
- Subsection 8.1.4 presents data on the best available control technology (BACT) determinations for the primary electrical generation systems, as well as for identified ancillary equipment or systems.
- Subsection 8.1.5 presents a detailed listing of applicable laws, ordinances, regulations, and statutes affecting the proposed project, as well as the proposed project's compliance strategy.
- Subsection 8.1.6 presents data on the county and air basin emissions inventory for both criteria and toxic pollutants.

- Subsection 8.1.7 presents an overview of the air quality modeling and impacts analysis procedures and assumptions.
- Subsection 8.1.8 presents the air quality impacts analysis.
- Subsection 8.1.9 lists agencies with jurisdiction over the proposed project, agency contacts, and permit requirements and timelines.

The following appendices contain support information referenced in the aforementioned subsections:

- Appendix 8.1A – Emissions: Calculations and Support Information for Maximum Hourly, Daily, and Annual Emissions
- Appendix 8.1B – Modeling Support Data
- Appendix 8.1C – Protocol for Increments Analysis
- Appendix 8.1D – Health Risk Assessment Support Data
- Appendix 8.1E – Construction Emissions and Impact Analysis
- Appendix 8.1F – Evaluation of Best Available Control Technology
- Appendix 8.1G – Offset Listing
- Appendix 8.1H – Cumulative Impacts Analysis Protocol

8.1.2 Project Description

Eastshore will be a nominal 115.5-megawatt (MW) net intermediate and peaking load facility operating up to 4,000 hours per year using lean-burn, natural gas-fired, reciprocating engine technology. Eastshore will be located at 25101 Clawiter Road in the City of Hayward, Alameda County, California, on a 6.22-acre parcel owned by Eastshore Energy, LLC, the project owner. Major features of the Eastshore project include the following:

- Demolition of the existing site building, foundations and paved surface.
- Grading of site and installation of new foundations, piping, and utility connections.
- Fourteen nominal 8.4-MW (gross) Wärtsilä Model 20V34SG natural gas-fired generator sets (gen sets) that each contain a reciprocating engine and a generator package.
- Fourteen state-of-the-art air pollution control systems representing BACT, one system per engine, consisting of a selective catalytic reduction (SCR) unit for oxides of nitrogen (NO_x) control and an oxidation catalyst unit for carbon monoxide (CO) and precursor organic compounds (POC) control.
- Fourteen approximately 70-foot tall, 48-inch outside-diameter stacks, each with a separate exhaust silencer and continuous emissions monitoring system (CEMS).
- One nominal 225-kilowatt (kW) Caterpillar Model C9 ATAAC, diesel fuel-oil-fired emergency engine gen set (i.e., “black start” engine) that is U.S. Environmental

Protection Agency (EPA) Tier 3 certified. This emergency generator will use California Air Resources Board (CARB) ultra-low-sulfur diesel fuel.

- One fuel-gas heater, either electric or natural gas type, used for heating the natural gas fuel to the reciprocating engines to 25 degrees Fahrenheit (°F) above the dew point of the gas. If a natural gas-fired heater is ultimately required and selected, its firing rate will not exceed 7.15 million British thermal units per hour (MMBtu/hr) heat input. Final requirements and selection of heater type will be addressed during final design.
- An acoustically engineered main building enclosing all 14 engines, with stacks located outside the building.
- A closed-loop cooling system consisting of multiple fan-cooled radiator assemblies outside of the main engine building.
- Two 10,000-gallon (each) nominal 19 percent aqueous ammonia storage tanks, handling system, ammonia pump skids, ammonia injection system and associated controls, and surveillance system integrated into the plant operations control system.
- One raw water storage tank, approximately 35,000 gallons.
- Miscellaneous ancillary equipment.
- Pre-existing onsite water and wastewater service interconnections.
- Onsite 115-kV switchyard, including switchgear and step-up voltage transformers.
- Approximately 1.1 mile of 115-kV single-circuit transmission line interconnecting to PG&E's Eastshore Substation.
- Approximately 200-foot offsite natural gas line connection to Pacific Gas and Electric Company (PG&E) Line 153.
- Chain-link security fencing enclosing the facility, with a secured entrance on Clawiter Road.
- A 4.65-acre temporary construction laydown and parking area located immediately across Clawiter Road from the Eastshore site on property owned by Berkeley Farms.

The 6.22-acre parcel is mostly covered with a large industrial building and asphalt paving. The building is not currently being used as an industrial facility but was last used as a metal stamping facility for the manufacture of automobile parts. The existing building will be demolished to make room for the new facilities.

As demonstrated in the foregoing subsections, Eastshore emissions will have no significant impacts on ambient air quality. Air quality benefits of the project are as follows:

- Generation of electricity using clean-burning natural gas as the fuel
- Use of state-of-the-art generation technology that significantly reduces pollutant emissions compared with older generation technology

- Use of BACT to control emissions of NO_x, CO, POC, sulfur dioxide (SO_2), and particulate and fine particulate matter ($PM_{10}/_{2.5}$)

8.1.2.1 Proposed Project

Eastshore Energy, LLC, proposes to construct Eastshore and operate a nominally rated 118-MW (gross) and 115.5-MW (net) intermediate and peaking load power plant in Hayward, California. The site will be 25101 Clawiter Road on a 6.22-acre, industrially zoned site, located at the southwest corner of the intersection of the Union Pacific (UP) railroad corridor and Clawiter Road, in the City of Hayward. The parcel is in Section 30, Township 3 South, Range 4 East, in Alameda County. An approximate 4.65-acre parcel immediately across Clawiter Road and just to the south of the site will be used for additional construction laydown and temporary parking.

8.1.2.2 Lean-burn Internal Combustion Engines

Electricity will be produced at the generating facility by 14 Wärtsilä 20V34SG reciprocating engine/gen sets. These gen sets are four-stroke, lean-burn, pre-chamber, spark-ignited, port injected, turbocharged, and inter-cooled. Total site generating capacity will be 118 MW gross, or 115.5 MW net.

The exhaust of each gen set will be treated by its own SCR system, containing a catalyst to reduce NO_x emissions, and an oxidation catalyst to reduce CO and POC emissions. Each gen set will have a gross capacity of approximately 8.4 MW (gross) within its design temperature range of 32 to 100°F.

Associated equipment will include emission control systems necessary to meet the proposed emission limits. NO_x emissions will be controlled to 5 parts per million (ppm) by volume, dry basis (ppmvd), corrected to 15 percent oxygen using an SCR system in a catalyst housing and injection of 19 percent aqueous ammonia. Ammonia slip will be limited to 20 ppmvd at 15 percent oxygen. An oxidation catalyst will also be installed in the catalyst housing to limit CO emissions to 13 ppmvd at 15 percent oxygen and to limit POC emissions to 25 ppmvd at 15 percent oxygen.

The specifications for the gen sets are as follows:

- Engine manufacturer: Wärtsilä Corporation
- Engine model: 20V34SG
- Nominal rating: 8.4 MW gross
- Engine brake horsepower (bhp): Approximately 11,660 bhp
- Bhp rating: 720 rpm
- Fuel: Natural gas
- Number of cylinders: 20
- Compression ratio: 12:1
- Heat input: Approximately 72 MMBtu/hr (high heating value, or HHV)
- Ignition type: Spark
- Combustion configuration: Lean burn (Otto Cycle)

The gen sets are equipped with the following required accessories to provide safe and reliable operation:

- Auxiliary modules, which include the engine preheating unit, a booster pump, various engine controls and indication, and piping
- A fuel-gas system
- A charge air system, including filter, silencer, and preheater
- An exhaust gas-driven turbocharger/charge air compressor and cooler
- A lubricating oil system
- A compressed air system
- A closed-loop cooling system
- Fire detection and suppression
- An exhaust system

Air emissions from the gen sets will be controlled using lean-burn combustion of natural gas in the engines and state-of-the-art emission control systems. Emissions that will be controlled include NO_x, POC, and CO. Oxides of sulfur (SO_x) and $PM_{10}/_{2.5}$ are minimized through the use of natural gas. To ensure that the abatement systems perform correctly, CEMS will be used. The CEMS will be integrated into Eastshore's control system for operations control, intervention, and surveillance of air emissions for each engine.

The project will be permitted to operate up to 4,000 hours for each engine annually, which is equivalent to an annual capacity factor of 45.7 percent. The project will be limited to no more than 300 startups for each engine annually. Eastshore's actual operating profile will depend on PG&E's exclusive rights under the PPA to dispatch the facility. PG&E will dispatch the facility based on system load requirements and NP-15 market conditions.

8.1.2.3 Ancillary Equipment

The following describes key ancillary and support equipment, which are relevant to the air quality impact analysis:

- One Caterpillar C9 ATAAC black start diesel engine with generator and controls, which will serve as an emergency engine gen set and will fire ultra-low-sulfur CARB diesel fuel oil. The black start engine/gen set will be EPA Tier 3 certified and be fired exclusively on ultra-low-sulfur (15 ppm sulfur, by weight) diesel fuel oil, which will meet CARB requirements for diesel fuel. The maximum operating scenarios for the black start diesel engine are not more than 1 hour per day and not more than 30 hours per year for maintenance and testing purposes. Engine specifications are as follows:
  - Engine manufacturer: Caterpillar
  - Engine model: C9 ATAAC
  - Nominal rating: 225 kW
  - Engine bhp: Approximately 302 hp (based on net output)
  - Bhp rating: 1,800 rpm
  - Fuel: ultra-low-sulfur diesel fuel oil
  - Number of cylinders: 6

  - Compression ratio: 16:1
  - Heat input: Approximately 2.6 MMBtu/hr (HHV)
  - Ignition type: Compression

- One fuel-gas heater, either electric type or natural gas-fired type. The heater will be used for heating of the natural gas fuel to the reciprocating engines to 25°F above dew point of the gas. If a natural gas-fired heater is ultimately selected, its firing rate will not require more than 7.15 MMBtu/hr (HHV) heat input. Should natural gas supply temperatures require a fuel-gas heater, the selection of heater type will be addressed during final design. If the natural gas-fired type heater is selected, the heater would be fired solely on natural gas. In addition, the heater would operate no more than the hours of operation of the lean-burn engines, 24 hours per day, 4,000 hours per year. Because of the heater's potential size, it will be exempt from needing an air permit. (See Section 8.1.5 for the regulatory applicability.)

- Two 10,000-gallon capacity aqueous ammonia (19 percent) storage tanks and associated injection system, including pumps, nozzles, and controls, as part of the SCR system. Maximum monthly usage of aqueous ammonia will be approximately 49,000 gallons. Average monthly usage is estimated to be 20,000 gallons.

8.1.2.4 Fuels

Natural gas will be the exclusive fuel for the reciprocating engines and fuel-gas heater. The natural gas will be California Public Utilities Commission (PUC) grade supplied by the PG&E gas system. The gas will have a heat value of approximately 1,018 Btu/scf (HHV), and a sulfur content average of 0.153 grains/100 scf. A typical analysis of the proposed natural gas is presented in Table 8.1-1.

TABLE 8.1-1
Typical Natural Gas Composition Analysis

Component	Analysis Value
Nitrogen	0.86% vol
CO_2	1.04% vol
Methane	95.75% vol
Ethane	1.90% vol
Propane	0.30% vol
i-Butane	0.05% vol
n-Butane	0.05% vol
i-Pentane	0.02% vol
n-Pentane	0.01% vol
C_6	0.01% vol
Total	99.99% vol
Specific Gravity	0.583
Sulfur Content	0.153 grains/100 scf or 2.58 ppm

TABLE 8.1-1
Typical Natural Gas Composition Analysis

Component	Analysis Value
HHV	1,018 Btu/scf

Notes:
Natural gas average properties from PG&E for the period January 1, 2005, through May 1, 2006.
Percent values are based on value.
ppm = parts per million

Ultra-low-sulfur diesel fuel oil will be combusted on site by the black start diesel engine. The diesel fuel oil will meet the requirements for fuel oil set forth by the CARB. The general properties of the ultra-low-sulfur diesel fuel oil are expected to have an HHV of approximately 140,000 Btu per gallon and a sulfur content of not more than 15 ppm or 0.0015 percent sulfur by weight. Appendix 8.1A presents a representative Material Safety Data Sheet for a CARB-certified diesel fuel oil.

Total fuel combustion for Eastshore is presented in Table 8.1-2. Fuel use values are based on the maximum heat rating of each engine, fuel specifications, and maximum operational scenario. Each lean-burn engine heat input is estimated at 71.99 MMBtu/hr (HHV). Fuel consumption for the black start engine is 18.2 gallons per hour (gal/hr) at HHV.

TABLE 8.1-2
Hourly, Daily, and Annual Fuel Use Estimates

Data Category	Wärtsilä 20V34SG[a]	Caterpillar C9 ATAAC[b]
Max. Hours per Day, Each Engine	24 Hours	1 Hours
Max. Hours per Year, Each Engine	4,000 Hours	30 Hours
Average Hours per Year, Each Engine	1,740 Hours	30 Hours
Max. Fuel per Hour, Each Engine	71.99 MMBtu	18.2 gal
Max. Fuel per Hour, All Engines	1.01×10^3 MMBtu	18.2 gal
Max. Fuel per Day, Each Engine	1.73×10^3 MMBtu	18.2 gal
Max. Fuel per Day, All Engines	2.42×10^5 MMBtu	18.2 gal
Max. Fuel per Year, Each Engine	2.88×10^5 MMBtu	546 gal
Max. Fuel per Year, All Engines	4.03×10^6 MMBtu	546 gal
Average Fuel per Year, All Engines	1.76×10^6 MMBtu	546 gal
Total Number of Engines	14	1

[a]Based on maximum heat input for full-load operation for each lean-burn engine; operations assumed at 24 hours per day and 4,000 hours per year.
[b]Based on assumed maximum fuel consumption for full-load operation at 1 hour per day and 30 hours per year.

8.1.2.5 Project Emissions

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, POC, SO_x, and $PM_{10}/_{2.5}$. Toxic air pollutants will consist of a combination of toxic gases and toxic particulate matter species. Table 8.1-3 delineates the anticipated pollutants to be emitted from the proposed facility. (Section 8.6, Public Health, further discusses the toxic air pollutants.)

TABLE 8.1-3
Criteria and Toxic Air Pollutants Emitted from Eastshore[a, b, c]

Constituents	Constituents
NO_x	Chrysene[d]
CO	Copper
POC	Dibenz-ah-anthracene[d]
SO_x	Diesel Particulate Matter
$PM_{10}/_{2.5}$	Ethylbenzene
1-3 Butadiene	Fluoranthene[d]
Acenapthene[d,g]	Fluorene[d]
Acenapthylene[d,g]	Formaldehyde
Acetaldehyde	Hexane
Acrolein[f]	Indeno-123cd-pyrene[d]
Ammonia[e]	Lead (Pb)
Anthracene[d,g]	Manganese
Arsenic	Mercury
Benzene	Naphthalene[d]
Benzo-a-anthracene[d]	Nickel
Benzo-a-pyrene[d]	Phenanthrene[d,g]
Benzo-a-fluoranthene[d,g]	Propylene
Benzo-ghi-perylene[d,g]	Pyrene[d,g]
Benzo-k-fluoranthene[d]	Selenium
Beryllium	Toluene
Cadmium	Xylenes
Chromium VI	Zinc

[a]EPA Hazardous Air Pollutant (HAP) per Federal Clean Air Act (CAA), Title III, Section 112.
[b]California toxic air contaminant (TAC) per AB2588, Air Toxics Hot Spots Program, and the CARB Toxic Air Contaminant Identification Program, AB1807.
[c]California Proposition 65 chemical per California Health and Safety Code 25249.8.
[d]These compounds are polycyclic aromatic hydrocarbons (PAH).
[e]Listed under California AB1807 as a Category IIB contaminant but not a TAC.
[f]The BAAQMD currently does not require acrolein to be included in health risk assessments per the *Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines* (June 2005).
[g]Compounds with no risk assessment health values specified by the Office of Environmental Health Hazard Assessment (OEHHA) (cancer potency slope factor, or non-cancer reference exposure levels [REL]).

8.1.2.6 Lean-burn and Black Start Engines – Criteria Pollutant Emission Estimates

Table 8.1-4 presents data on the criteria pollutant emissions from the lean-burn gen sets under normal operating scenarios (not including startup and shutdown operations) and

maximum daily and annual hours of operation,. Table 8.1-5 presents data on the criteria pollutant emissions expected from the black start diesel engines. Appendix 8.1A includes a summary of the emission calculation method for these engines. Although it has not yet been determined whether an electric or gas heater will be installed, emission estimates for a gas heater (which would be exempt from BAAQMD permitting) are included in Appendix 8.1A.

TABLE 8.1-4
Maximum Hourly, Daily, and Annual Criteria Pollutant Emissions for Lean-burn Engines

Pollutant	Exhaust Gas Concentration[a]	Emission Factor lb/MMBtu	Max. Hour Emissions, lb (each engine)	Max. Daily Emissions, lb (each engine)	Max. Annual Emissions, tons (each engine)[e]
NO_x	5 ppm	0.019	1.38	33.05	2.75
CO	13 ppm	0.030	2.18	52.30	4.36
POC	25 ppm	0.033	2.39	57.47	4.79
SO_x[b]	NA[d]	0.0032	0.23	5.52	0.46
$PM_{10}/_{2.5}$[c]	NA[d]	0.034	2.43	58.22	4.85
Pollutant	**Exhaust Gas Concentration[a]**	**Emission Factor lb/MMBtu**	**Max. Hour Emissions, lb (all engines)**	**Max. Daily Emissions, lb (all engines)**	**Max. Annual Emissions, tons (all engines)[e]**
NO_x	5 ppm	0.019	19.28	462.64	38.55
CO	13 ppm	0.030	30.51	732.17	61.01
VOC	25 ppm	0.033	33.52	804.58	67.05
SO_x[b]	NA[d]	0.0032	3.22	81.42	6.44
$PM_{10}/_{2.5}$[c]	NA[d]	0.034	33.96	815.14	67.93

[a]NO_x, CO, and POC at 15 percent oxygen by volume, dry. Values are based on vendor guarantee. Emissions from startup and shutdown values not included.
[b]SO_x is based on 0.153 grains/100 scf sulfur in natural gas and 100 percent conversion to SO_2. (See Table 8.1-1)
[c]All PM_{10} emissions are assumed to be $PM_{2.5}$. The hourly emission value provided by the vendor is 2.426.
[d]NA means not available; only mass emission rates provided by the manufacturer.
[e]Annual emissions do not include startup and shutdown operations.

TABLE 8.1-5
Maximum Hourly, Daily, and Annual Criteria Pollutant Emissions for Black Start Diesel Engine

Pollutant	Emission Factor (grams/bhp-hr)[a]	Max. Hour Emissions, lb	Max. Daily Emissions, lb	Max. Annual Emissions, tons
NO_x	2.69	1.79	1.79	2.68 E-02
CO	0.32	0.21	0.21	3.19 E-03
POC	0.11	0.07	0.07	1.10 E-03
SO_x[b]	NA[d]	0.0038	0.0038	5.77 E-05
PM_{10}	0.159	0.11	0.11	1.59 E-03
$PM_{2.5}$[c]	0.159	0.11	0.11	1.59 E-03

[a]Based on black start diesel engine vendor data.
[b]Based on fuel oil sulfur content no greater than 0.0015 percent sulfur by weight.
[c]All PM_{10} emissions are assumed to be $PM_{2.5}$.
[d]NA means not available from manufacturer; only mass emission rates provided by the manufacturer.

Table 8.1-6 presents data on the startup and shutdown emissions for the main power generation engines. The plant's actual operating profile will depend upon PG&E's exclusive rights under the PPA to dispatch the facility. PG&E will dispatch the facility based on system load requirements and NP-15 market conditions.

The estimated maximum frequency of occurrence is no more than 300 startups for each engine annually. As presented in Table 8.1-6, a cold catalyst startup presents the worst-case emissions compared to the warm startup cycle. The duration of a cold startup is estimated at 30 minutes. The duration of a warm startup is estimated at 15 minutes. Based on manufacturer experience, these durations are the estimated time frames to achieve full control efficiency by the catalyst systems. The shutdown emission estimates (lb/shutdown) are based on a duration of approximately 8.5 minutes; this duration also is based on discussions with the manufacturer. Emissions during shutdown were, therefore, estimated by multiplying the full-load hourly emissions in Table 8.1-4 by the ratio of 8.5:60.

TABLE 8.1-6
Startup and Shutdown Emissions Estimates for Lean-burn Engines (each engine)

Pollutant	Cold Catalyst Start, lb/start	Warm Catalyst Start, lb/start	Shutdown Period, lb/shutdown	Cold Startup Cycle[a], lb/event	Warm Startup Cycle[b], lb/event
NO_x	9.17	2.52	0.20	9.36	2.71
CO	13.76	2.38	0.31	14.06	2.60
POC	6.87	1.90	0.34	7.21	2.17
SO_x[c]	NA[c]	NA[c]	NA[c]	NA[c]	NA[c]
$PM_{10}/_{2.5}$	2.52	2.06	0.35	2.87	2.41

[a]A cold catalyst startup cycle is defined as a cold start followed immediately by shutdown of the engine. A cold catalyst startup occurs when the catalyst is at or below 25°C. The cold startup cycle is estimated to be a total of 38.5 minutes.
[b]A warm catalyst startup cycle is defined as a warm catalyst start followed immediately by shutdown of the engine. A warm catalyst startup occurs when catalyst temperature is at least 270°C. The warm startup cycle is estimated to be a total of 23.5 minutes.
[c]NA means not available from the manufacturer. The SO_x emissions during startup and shutdown are assumed to be no greater than emissions under normal full-load operations. (See Table 8.1-4).

8.1.2.7 Toxic Air Pollutant Emissions

Tables 8.1-7 and 8.1-8 present data on the expected levels of the identified toxic air pollutant emissions from the facility equipment. (Section 8.6, Public Health, further discusses the toxic air pollutants.)

TABLE 8.1-7
Maximum Hourly and Annual Toxic Air Pollutant Emissions for the Lean-burn Engines

Toxic Air Pollutant	Uncontrolled Emission Factor lb/MMBtu[a]	Max. Hour Emissions lb/hr[b]	Max. Annual Emissions lb/yr[b]
1-3 Butadiene	3.60E-04	2.18E-01	8.70E+02
Acetaldehyde	5.19E-04	3.14E-01	1.25E+03
Acrolein[c]	5.78E-05	3.50E-02	1.40E+02
Ammonia	2.72E-02	2.74E+01	1.10E+05
Benzene	2.14E-04	1.29E-01	5.17E+02
Benzo-a-anthracene	5.76E-08	3.49E-05	1.39E-01
Benzo-a-pyrene	2.65E-09	1.60E-06	6.40E-03
Benzo-b-fluoranthene	4.01E-08	2.42E-05	9.70E-02
Benzo-k-fluoranthene	7.68E-09	4.64E-06	1.86E-02
Chrysene	1.40E-08	8.48E-06	3.39E-02
Dibenz-ah-anthracene	2.65E-09	1.60E-06	6.40E-03
Ethylbenzene	6.97E-05	4.22E-02	1.69E+02
Formaldehyde	4.62E-03	2.79E+00	1.12E+04
Indeno-123cd-pyrene	7.03E-09	4.25E-06	1.70E-02
Naphthalene	2.46E-05	1.49E-02	5.95E+01
Propylene	5.27E-03	3.19E+00	1.28E+04
Toluene	2.34E-04	1.42E-01	5.67E+02
Xylenes	6.33E-04	3.83E-01	1.53E+03

[a]CARB's California Air Toxics Emission Factor (CATEF) Database for compounds with chemical potency values (uncontrolled, mean values for source type and category).
[b]Emission values assume that the oxidation catalyst will result in a reduction factor of 40 percent from the uncontrolled emissions. Because the engines are new with state-of-the-art combustion controls and will have oxidation catalyst emission controls for organics, this assumption is highly conservative.
[c]The BAAQMD currently does not require acrolein to be included in health risk assessments, per the *Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines* (June 2005). Based on discussions with BAAQMD and review of BAAQMD information, BAAQMD expressed concerns regarding source testing procedures and the accuracy of source test results. OEHHA also has expressed concerns over the validity of the current CATEF emission rates for acrolein, but has not provided specific guidance to remove it from health risk assessments (HRA). The acrolein emissions have been retained herein for completeness.

TABLE 8.1-8
Maximum Hourly and Annual Toxic Air Pollutant Emissions, Black Start Diesel Engine

Toxic Air Pollutant	Uncontrolled Emission Factor lb/1000 gal[a]	Max. Hour Emissions lb/hr[b]	Max. Annual Emissions lb/yr[b]
Acetaldehyde	3.47E-03	6.25E-05	1.87E-03
Acrolein[c]	1.07E-03	1.93E-05	5.78E-04
Arsenic	1.60E-03	2.88E-05	8.64E-04
Benzene	1.81E-01	3.26E-03	9.77E-02
Benzo-a-anthracene	9.60E-05	1.73E-06	5.18E-05
Benzo-a-pyrene	7.90E-05	1.42E-06	4.27E-05
Benzo-k-fluoranthene	7.83E-05	1.41E-06	4.23E-05
Cadmium	1.50E-03	2.70E-05	8.10E-04
Chromium VI	1.00E-04	1.80E-06	5.40E-05
Chrysene	1.30E-04	2.34E-06	7.02E-05
Copper	4.10E-03	7.38E-05	2.21E-03
Dibenz-ah-anthracene	8.20E-05	1.48E-06	4.43E-05
Diesel Particulate Matter	5.85E+00	1.05E-01	3.20E+00
Ethylbenzene	6.76E-03	1.22E-04	3.65E-03
Formaldehyde	5.10E-02	9.18E-04	2.75E-02
Hexane	1.39E-03	2.50E-05	7.51E-04
Indeno-123cd-pyrene	8.45E-05	1.52E-06	4.56E-05
Pb	8.30E-03	1.49E-04	4.48E-03
Manganese	3.10E-03	5.58E-05	1.67E-03
Mercury	2.00E-03	3.60E-05	1.08E-03
Naphthalene	1.60E-02	2.88E-04	8.64E-03
Nickel	3.90E-03	7.02E-05	2.11E-03
Propylene	3.41E-01	6.14E-03	1.84E-01
Selenium	2.20E-03	3.96E-05	1.19E-03
Toluene	6.10E-02	1.10E-03	3.29E-02
Xylenes	2.10E-02	3.78E-04	1.13E-02
Zinc	2.24E-02	4.03E-04	1.21E-02

[a]CARB CATEF Database for organic compounds, Ventura County emission factors for metal compounds, and manufacturer data for diesel particulate matter. Only compounds with chemical potency values are listed (uncontrolled, mean values for source type and category). Emissions assume maximum 30 hours per year operation at 18 gallons per hour fuel usage rate.
[b] Following CARB guidance, diesel particulate matter emissions are to be used as a surrogate to calculate cancer risk and chronic non-cancer risk from specific compounds emitted from diesel engines (*Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines*, October 2000). Acute non-cancer risk

TABLE 8.1-8
Maximum Hourly and Annual Toxic Air Pollutant Emissions, Black Start Diesel Engine

Toxic Air Pollutant	Uncontrolled Emission Factor lb/1000 gal[a]	Max. Hour Emissions lb/hr[b]	Max. Annual Emissions lb/yr[b]

calculations have been made for specific compounds with acute reference exposure levels. See Appendix 8.1D for details on the emission rates input to HARP.
[c]The BAAQMD currently does not require acrolein to be included in health risk assessments, per the *Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines* (June 2005). Based on discussions with BAAQMD and review of BAAQMD information, BAAQMD expressed concerns regarding source testing procedures and the accuracy of source test results. OEHHA also has expressed concerns over the validity of the current CATEF emission rates for acrolein, but has not provided specific guidance to remove it from HRAs. The acrolein emissions have been retained herein for completeness.

Appendix 8.1A includes a summary of HAP emissions from the lean-burn gen sets and the black start diesel engine. The summary presents that the facility is not a major source of hazardous air pollutants. As presented in the appendix, an individual substance's annual emissions are no greater than 10 tons per year (tpy); the annual emissions of the total HAP substances are no greater than 25 tpy.

8.1.2.8 Emission Reductions – Offsets and Mitigation

District Regulations 2-2-215, 302, and 303 require Eastshore to provide emission offsets (emissions reduction credits [ERC]) when emissions exceed specified levels on a pollutant-specific basis. Section 2-2-302 requires POC and NO_x ERCs to be provided at an offset ratio of 1.0:1.0 or 1.15:1.0, depending on emissions levels. Because both POC and NO_x contribute to the Bay Area Basin ozone levels, Section 2-2-302.2 allows ERCs of POCs to be used to offset increased emissions of NO_x, at the required offset ratios, as stated above.
Section 2-2-303 requires emissions offsets for emissions increases at facilities that emit more than 100 tpy of SO_2 and PM_{10}. Because facility emissions of SO_2 and $PM_{10}/_{2.5}$ will be below 100 tpy, SO_2 and $PM_{10}/_{2.5}$ offsets are not required by BAAQMD regulations.

Sections 2-2-304 and 2-2-305 impose emissions offset requirements, or require project denial, if SO_2, NO_2, $PM_{10}/_{2.5}$, or CO air quality modeling results indicate emissions will either interfere with the attainment or maintenance of the applicable ambient air quality standards, or exceed Prevention of Significant Deterioration (PSD) increments. For many of the pollutants and averaging periods, District regulations do not require Eastshore to conduct these analyses because the modeled impacts of the proposed facility are not significant under District rules. However, modeling for these pollutants has been conducted to address CEC staff concerns regarding compliance with the CEC's California Environmental Quality Act (CEQA) equivalent process. The modeling analyses show that facility emissions will not interfere with the attainment or maintenance of the applicable air quality standards.

Emissions offset applicability and requirements are shown in Tables 8.1-9 and 8.1-10, respectively. The project applicant will provide necessary documentation to show control or ownership of the required emissions offsets prior to issuance of the facility Permit to Operate by the BAAQMD per BAAQMD Regulation 2-2-410. Offsets may be acquired from the District bank or from other sources, such as shutdowns or non-traditional sources of emissions reductions credits.

For major sources subject to PSD review, Regulation 2-2-305 requires an applicant to either demonstrate through modeling that its emissions will comply with the CO ambient air quality standards, or provide contemporaneous emission offsets. Because the Eastshore project will not be a major source for CO (see Table 8.1-9) and air quality impacts from the project will not cause a violation of any applicable CO ambient air quality standard, project CO emission offsets are not required.

A current listing of deposits in the BAAQMD offset bank is included in Appendix 8.1G. Should the project applicant decide to acquire offsets from the District bank, negotiations on amounts and market prices will be undertaken with various certificate owners. Because of the highly competitive nature of the offset market, confidential treatment of the initial identification and negotiations with the various owners is being requested. Such information will be supplied to the CEC and BAAQMD under separate cover.

TABLE 8.1-9
Cumulative Emissions Increases and Required Offsets per Regulations 2-2-215, 2-2-302, and 2-2-303

Pollutant	Cumulative Offset Threshold	Offset Ratio	Cumulative Increase Since April 5, 1991	Eastshore Emission Rates[1]	Cumulative Emissions Increase[1, 2]	Offsets Required
NO_x	10/35 tpy	>10 but < 35 1.0:1.0 => 35 1.15:1.0	0	56.39	56.37	Yes
CO	100 tpy	> 100-tpy increase Modeling plus offsets to show attainment and maintenance of standard	0	87.62	87.27	No
POC	10/35 tpy	>10 but < 35 1.0:1.0 => 35 1.15:1.0	0	78.96	78.75	Yes
SO_2	100 tpy	If major and increase is > 1 tpy, then 1.0:1.0	0	6.79	6.44	No
PM_{10}[3]	100 tpy	If major and increase is > 1 tpy, then 1.0:1.0	0	71.93	70.67	No

[1]Eastshore emission rates assumes worst-case emissions from operations of lean-burn and black start engines and of startup and shutdown emissions from lean-burn engines (Tables 8.1-4 through 8.1-6). Appendix 8.1A presents the calculation methodology for the annual emissions for the lean-burn engine, including the startup and shutdown emissions. Maximum cold startups and shutdowns of the lean-burn engines are assumed to be not more than 300 per year per engine.
[2]Annual modeled emissions may be slightly higher than the emissions presented in this table and in Appendix 1A.
[3]Eastshore Energy, LLC, expects annual operating hours and actual PM_{10} emission rates to be substantially different from those that will be included in its permit application to the BAAQMD. Eastshore Energy, LLC, will submit additional documentation, separate from this AFC, substantiating expected annual PM_{10} emissions.

TABLE 8.1-10
Offset Requirements for Eastshore per Regulations 2-2-302 and 2-2-303

Pollutant	New Facility Offset Threshold	Eastshore Emission Rates[1]	Offsets Required	Offset Ratio	Amount of Offsets Required by BAAQMD[2]
NO_x	10/35 tpy	56.37	Yes	1.0:1.0/1.15:1.0	64.82
CO	100 tpy	87.27	No	1.0:1.0	0
POC	10/35 tpy	78.75	Yes	1.0:1.0/1.15:1.0	90.56
SO_2	100 tpy	6.44	No	1.0:1.0.	0
PM_{10}	100 tpy	70.67	No	1.0:1.0	0

[1]Eastshore emission rates as presented in Table 8.1-9 for worst-case annual emissions.
[2]Offsets are not required by BAAQMD regulations for CO, SO_2 and PM_{10}. However, the BAAQMD is designated nonattainment for PM_{10}. Because both PM_{10} and SO_2 emissions may contribute to ambient PM_{10} concentrations, Eastshore will be working with the CEC staff to agree upon appropriate mitigation for project PM_{10} and SO_2 emissions impacts during nonattainment periods.

Eastshore does not trigger offset requirements under the BAAQMD New Source Review (NSR) rule because the PM_{10} and SO_2 emissions are less than the emission offset thresholds for these pollutants, as presented in Table 8.1-9. However, the BAAQMD is designated nonattainment under California ambient air quality standards for PM_{10} and $PM_{2.5}$. Because project $PM_{10}/_{2.5}$ and SO_2 emissions may contribute to ambient $PM_{10}/_{2.5}$ concentrations, mitigation of project $PM_{10}/_{2.5}$ and SO_2 emissions impacts during PM_{10} nonattainment periods is appropriate under CEQA. Eastshore will mitigate its PM_{10}, SO_2, and associated $PM_{2.5}$ emissions in accordance with CEQA at a 1.0:1.0 ratio. Eastshore proposes to offset its emissions of $PM_{10}/_{2.5}$ and SO_2 during the fall and winter PM nonattainment season. This mitigation will be achieved through the purchase of PM_{10} and SO_2 ERC Certificates and/or through the development of a mitigation program where source emissions of $PM_{10}/_{2.5}$ and SO_2, near Eastshore, could be reduced. In either way, the applicant will work with the CEC to develop an acceptable mitigation program.

To determine the emissions for a CEQA evaluation, Eastshore has retained Global Energy Decisions as consultant to model the expected run-hour profile of this facility for 30 years. Based on the results of Global Energy Decisions' analysis as described in Appendix 8.1A, which includes a summary of the run hours during the fall and winter PM_{10} nonattainment season, Eastshore proposes to mitigate 6.38 tons of $PM_{10}/_{2.5}$ emissions and 2.80 tons of SO_2 emissions.

8.1.2.9 Exhaust Stacks and Emissions Points

Table 8.1-11 presents physical data on the engine emissions points.

TABLE 8.1-11
Emissions Point Data for Lean-burn Engines and Black Start Engine

Parameter	Wärtsilä 20V34SG	Caterpillar C9 ATAAC
Exhaust Exit Height AGL, feet	70	32.8
Exhaust Exit Inside Diameter, feet	3.96	0.58
Exhaust Exit Temperature, ºF[1]	713 (695.3)	863.6
Exhaust Velocity, feet per minute[1]	4614.16 (4383.86)	8,076

[1]The stack parameter presents the engine vendor's value for the 59°F at 100 percent load case. The stack parameter in parentheses is the value used for air quality modeling (discussed in Subsection 8.1.8). The engine vendor noted a range of +/-10°C for the exit temperature and a range of +/- 5 percent for the exhaust velocity.

8.1.2.10 Construction Emissions and Proposed Mitigation Measures

Construction of Eastshore, inclusive of startup and testing, is planned to last 18 months. The construction will occur in the following four main phases:

- Site preparation, including demolition of the existing structure
- Foundation work
- Construction and installation of major structures and equipment
- Startup and testing of the equipment

Construction-related emissions are expected to be minimal because of the following:

- The site is 6.22 acres in size, and essentially flat.
- A 4.65-acre temporary construction laydown and parking area is located immediately across Clawiter Road and just to the south of the Eastshore site on property owned by Berkeley Farms.
- Minimal site preparation will be required prior to construction of the building pads, foundations, and support structures.
- Construction (inclusive of startup testing and commissioning) is expected to last a total of 18 months.

An analysis of construction site emissions is presented in Appendix 8.1E. Emissions were estimated for fugitive dust and exhaust emissions associated with construction-related activities. Air quality modeling was conducted to determine construction impacts and to compare their modeled emissions impact to ambient air quality standards.

Construction-related issues and emissions at the Eastshore site are comparable to those at other construction project sites. Compliance with the provisions of the following permits and requirements 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 authority to construct (ATC) permit, which will require compliance with the provisions of all applicable fugitive dust rules that pertain to the site construction phase. The following mitigation measures are

proposed to control exhaust emissions from the diesel heavy equipment used during construction of Eastshore:

- Operational measures, such as limiting time spent with the engine idling by shutting down equipment when not in use
- Regular preventive maintenance to prevent emission increases due to engine problems
- Use of low-sulfur and low-aromatic fuel meeting California standards for motor vehicle diesel fuel
- Use of low-emitting gas and diesel engines meeting state and federal emissions standards (Tier I and II) for construction equipment, including, but not limited to, catalytic converter systems and particulate filter systems

The following mitigation measures are proposed to control fugitive dust emissions during construction of Eastshore:

- Using ater application to control dust emissions from onsite unpaved road travel and unpaved parking areas
- Using periodic vacuum sweeping or water flushing of paved road surface to remove buildup of loose material, to control dust emissions from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas
- Either covering all trucks hauling soil, sand, and other loose materials, or requiring them to maintain at least 2 feet of freeboard
- Limiting traffic speeds on all unpaved site areas to 5 miles per hour (mph)
- Installing sandbags or other erosion control measures to prevent silt runoff to roadways
- Replanting vegetation in disturbed areas as quickly as possible
- Using wheel washers or washing the tires of all trucks exiting the construction site
- Mitigating fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by applying either water or chemical dust suppressants

Use of these mitigation measures and control strategies will typically ensure that the site does not cause violations of existing air quality standards as a result of construction-related activities.

8.1.3 Regional and Site Environment

8.1.3.1 Project Location

The project will be located at 25101 Clawiter Road, approximately 1 kilometer (km) north of Highway 92 and approximately 2.1 km south of the Hayward Air Terminal complex. The Universal Transverse Mercator (UTM) coordinates of the site are 577538.8 meters easting,

4165760 meters northing (NAD 27, or North American Datum 27). The nominal site elevation is approximately 23 feet above mean sea level (AMSL).

8.1.3.2 Population and Land Use

Several figures representing population and land use information are presented in the following sections or appendices:

- Sensitive receptors – Appendix 8.1D, Figure 8.1D-1 presents the sensitive receptors, which extend approximately 6 miles in radius.
- Census tract – Appendix 8.1D, Figure 8.1D-2 presents Alameda County Census Tract 4371, with the population distribution. The site is within Tract 4371 at a scale of 1:19200. This figure also shows a 6-mile radius boundary.
- Terrain above stack height – Section 8.6, Figure 8.6-1, presents the terrain above stack height at a scale of 1:24000.

Appendix 8.1D contains data on population statistics for all the census tracts within the 3- and 6-mile radius boundaries, as well as the census data for the maximum impact area.

According to the Auer land use classification scheme, a 3-km radius boundary around the proposed site yields a predominately urban classification. This is consistent with the current land use and zoning designation for the site and surrounding area as "industrial (I)." The site is located in the City of Hayward Industrial Corridor, which extends to Hayward Air Terminal to the north, and to the east for about 1 mile. To the west and south of the site lie predominately open lands and municipal properties. The nearest residential area lies approximately 1,100 feet from the site entrance, directly east of the site, adjacent to west side of the Mt. Eden cemetery complex. The total amount of residential housing in the immediate area is small. The General Plan designation for the site and surrounding area is "west industrial" because the site lies within the West Industrial Planning Area.

Table 8.1-12 presents a summary of air basin statistics by county, based on information from the BAAQMD Web site.

TABLE 8.1-12
Air Basin/County Summary Statistics for 2004-2005

County	Population $x10^3$	Land Area mi^2	Water Area mi^2	Total Area mi^2	Daily Nat Gas Use mmscf	Daily Gasoline Use $x10^3$ gals	Daily Vehicle Miles $x10^6$
Alameda	1,517	738	84	822	143	1,714	31.4
Contra Costa	1,016	720	82	802	817	1,111	23.1
Marin	251	520	308	828	24	332	6.1
Napa	134	754	35	789	11	163	2.9
San Francisco	798	47	185	232	139	953	10.5
San Mateo	723	449	292	741	68	940	18.9

TABLE 8.1-12
Air Basin/County Summary Statistics for 2004-2005

County	Population $x10^3$	Land Area mi^2	Water Area mi^2	Total Area mi^2	Daily Nat Gas Use mmscf	Daily Gasoline Use $x10^3$ gals	Daily Vehicle Miles $x10^6$
Santa Clara	1,750	1,291	13	1,305	184	2,102	40.7
Solano[a]	302	370	64	434	48	334	6.4
Sonoma[a]	419	664	4	668	29	485	8.5
Totals	6,910	5,553	1,067	6,621	1,463	8,134	148.5

[a]Portion of county in air basin
Source: BAAQMD Web site, June 7, 2006

Notes:
mi^2 = square miles;
mmscf = million standard cubic feet
gal = gallon

8.1.3.3 Existing Climate

8.1.3.3.1 Large Scale Influences. The summer climate of the West Coast and the Bay Area region is dominated by a semi-permanent high centered over the northeastern Pacific Ocean. Because this high-pressure cell is quite persistent, storms rarely affect the California coast during the summer. Thus, the conditions that persist along the coast of California during summer are a northwest air flow and negligible precipitation. A thermal low-pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay Area much of the summer.

The steady northwesterly flow around the eastern edge of the Pacific high-pressure cell exerts a stress on the ocean surface along the West Coast. This induces upwelling of cold water from below. Upwelling produces a band of cold water that is approximately 80 miles wide off San Francisco. During July, the surface waters off San Francisco are 30°F cooler than those off Vancouver, more than 700 miles farther north.

Air approaching the California coast, already cool and moisture-laden from its long trajectory over the Pacific, is further cooled as it flows across this cold bank of water near the coast, thus accentuating the temperature contrast across the coastline. This cooling is often sufficient to produce condensation – a high incidence of fog and stratus clouds along the Northern California coast in summer.

In winter, the Pacific high weakens and shifts southward, upwelling ceases, and winter storms become frequent. Almost all of the Bay Area's annual precipitation takes place in the November through April period. During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate, and air pollution potential is very low. During winter periods when the Pacific high becomes dominant, inversions become strong and often are surface-based; winds are light and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area and often include tule fog.

8.1.3.3.2 Southwestern Alameda County. This region encompasses the low-lying area on the southeast side of the San Francisco Bay, from south of Highway 580/Dublin Canyon to north of Milpitas. The region is bordered on the east by the 1,600-foot East Bay Hills, and on the west by San Francisco Bay. Most of the area is flat. The cities in this region are San Leandro, Hayward, Union City, Newark, and Fremont.

Situated between the western and eastern portions of the Coast Range, this region is protected from the direct effects of the marine airflow. Marine air entering through the Golden Gate is forced to diverge into northerly and southerly paths because of the blocking effect of the East Bay Hills. The southern flow is directed southeasterly down the bay, parallel to the hills, where eventually it passes over southwestern Alameda County. These sea breezes are strongest in the afternoon. The further from the ocean the marine air travels, the more it is modified. Thus, although the climate in this region is affected by sea breezes, it is affected less so than the regions closer to the Golden Gate, to the north.

The climate of southwestern Alameda County is also modified by its proximity to the San Francisco Bay. Evaporation from the bay cools the air in contact with it during warm weather; during cold weather, the bay can act as a heat source. The normal northwest wind pattern then carries this air onshore. During periods of flat pressure gradients, the bay can generate its own circulation system. This bay breeze, similar to the sea breeze, pushes cool air onshore during the day and draws air from the land offshore at night. Bay breezes are common in the morning, before the sea breeze begins.

Winds are predominantly out of the northwest quadrant in this region, particularly during summer months. In the winter, winds are equally likely out of the east. Cold air over land areas creates high pressure to the east, which forces air toward the west. Easterly surface flow into southern Alameda County passes through three major gaps: Hayward/Dublin Canyon, Niles Canyon, and Mission Pass. Areas north of the gaps then experience southeast winds, and areas south of the gaps experience northeast winds. Wind speeds are moderate in this region. Annual average wind speeds close to the bay are about 7 mph; farther inland, at Fremont, they are 6 mph.

Air temperatures are moderated by both the proximity to the bay and to the sea breeze. Temperatures in this region are slightly cooler in the winter and slightly warmer than East Bay cities to the north. Average daily maximum temperatures in winter at Newark are in the high 50-60°F. During the summer months, average daily maximum temperatures are in the mid-60°Fs. Average minimum temperatures are in the low 40°Fs in winter and mid-50°Fs in the summer.

Rainfall amounts in the region are lower than other East Bay sites to its north. Areas near the bay, such as Newark, have lower rainfall amounts because of the rain shadow effect of the Santa Cruz Mountains. Newark's annual rainfall is 14 inches. Areas closer to the hills have higher rainfall amounts because they are farther from the Santa Cruz Mountains and because of orographic effects. That is, air that is forced to ascend the mountains will cool and condense, leading to increased rain.

Pollution potential is relatively high in this region during summer and fall months. When high pressure dominates the weather, low mixing depths and combined with bay and ocean wind patterns can concentrate and carry pollutants from other cities to this area, adding to

the locally emitted pollutants. The polluted air is then pushed up against the East Bay Hills. Flow eastward through the gaps is weak because winds in the Livermore Valley are usually from the east. Winter pollution levels are moderate.

Historical climatic data for the project area were derived from the following sites located to the south and southeast of the Eastshore site:

- Newark, CA, Station #046144, Period of Record July 1, 1948, to December 31, 2005.
- Oakland WSO, Station #046335, Period of Record July 1, 1948, to December 31, 2005.

A summary of data from these sites indicates the following:

- Maximum average daily temperature 65-68°F
- Minimum average daily temperature 49-50°F
- Mean annual precipitation 14.5-18 inches per year

Detailed climatic summaries for these sites are presented in Appendix 8.1B.

Figures representing seasonal wind patterns in the project region are presented in Appendix 8.1B, which are the cumulative annual and quarterly wind roses for the Union City meteorological station for the period 1990 through 1994. The wind roses indicate that winds are from the west through the northwest during a major portion of the year. Calm conditions occur approximately 0.42 percent of the time. About 56 percent of the winds come from west through north-northwest. Generally, the northwesterly winds are the result of a convective flow of cool marine air off of San Francisco Bay to the inland areas, during the warm periods of the day and year. In addition, there is also a significant incidence of southeast through south-southeast wind flow (approximately 16.8 percent). These southeasterly winds occur under conditions of relatively cold temperatures inland, when temperatures over the bay are warmer than those inland, resulting in an offshore convective flow. Also included in Appendix 8.1B is a figure that shows the cumulative (all met years) stability rose for the Union City station data.

For the region, Appendix 8.1B includes figures of seasonal wind flow patterns for the Bay Area. Statistical data for these patterns are summarized in Table 8.1-13.

Atmospheric mixing height data observed at Oakland, the nearest upper-level meteorological station (located approximately 15 miles north of the project site), indicate that the typical morning mixing heights for the 2-year period of 1979-1980 were approximately 1,770 feet in summer and fall, and 3,600-3,900 feet in winter and spring. The typical afternoon mixing heights ranged between 2,150 and 3,030 feet in summer and fall, and more than 3,900 feet in winter and spring. Mixing height data derived from Holzworth indicate that the mean annual morning mixing height for the project region is approximately 500-600 meters (1,640-1,970 feet), and the mean annual afternoon mixing height is approximately 800-900 meters (2,620-2,950 feet). These typical mixing heights provide generally favorable conditions for the dispersion of pollutants.

TABLE 8.1-13
Bay Area Air Basin Surface Airflow Types (Seasonal and Diurnal Percent of Occurrence, 1977-1981)

Pacific Standard Time	Ia North-westerly (Moderate to Strong)	Ib North-westerly (Weak)	II Southerly	III South-easterly	IV North-easterly	V Bay Inflow	VI Bay Outflow	VII Calm
Winter								
4 a.m.	4	3	19	14	8	21	5	24
10 a.m.	5	4	19	20	10	11	19	9
4 p.m.	16	16	16	12	13	3	22	1
10 p.m.	9	6	14	14	10	20	3	21
All times	9	7	17	15	10	14	12	14
Spring								
4 a.m.	25	27	11	2	4	15	5	12
10 a.m.	25	29	14	6	5	3	17	1
4 p.m.	60	22	7	4	4	2	2	*
10 P.M.	34	40	8	2	4	5	3	5
All times	36	29	10	3	4	6	7	5
Summer								
4 a.m.	37	40	4	*	0	6	2	10
10 a.m.	44	37	4	*	1	1	13	0
4 p.m.	77	20	2	0	1	0	*	0
10 p.m.	55	39	2	0	*	1	1	1
All times	53	34	3	0	1	2	4	3
Fall								
4 a.m.	13	25	7	6	3	22	3	19
10 a.m.	15	28	6	11	6	7	23	4
4 p.m.	46	31	5	2	6	2	2	*
10 p.m.	24	37	6	4	3	13	13	12
All times	24	30	6	6	4	11	11	9
Yearly								
4 a.m.	20	24	10	6	4	16	4	16
10 a.m.	22	25	11	9	6	6	18	4
4 p.m.	50	22	8	5	6	2	7	<0.5
10 p.m.	30	31	8	5	4	10	2	10
All times	30	26	9	6	5	8	8	8

8.1.3.4 Existing Air Quality

In 1970, the U.S. Congress instructed the EPA 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 and secondary. Primary national ambient air quality standards (NAAQS) are "those which, in the judgment of the administrator [of the EPA], 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 EPA], based on air quality criteria, are requisite to protect the public welfare and ecosystems associated with the presence of air pollutants in the ambient air." To date, NAAQS have been established for seven criteria pollutants, as follows: SO_2, CO, ozone (O_3), nitrogen dioxide (NO_2), PM_{10}, $PM_{2.5}$, and Pb.

The criteria pollutants are those that have been demonstrated historically to be widespread and have a potential for adverse health impacts. EPA 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 ambient air quality standards (AAQS) that further limit the allowable concentrations of certain criteria pollutants. Review of the established air quality standards are undertaken by both EPA and the State of California on a periodic basis. As a result of the periodic reviews, the standards have been updated, including amendments, additions, and deletions, over the ensuing years to the present.

Each federal or state ambient air quality standard comprises two basic elements: (1) a numerical limit expressed as an allowable concentration, and (2) an averaging time, which specifies the period over which the concentration value is to be measured. Table 8.1-14 presents the current federal and state ambient quality standards.

TABLE 8.1-14
California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards Concentration	National Standards Concentration
Ozone	1 hour	0.09 ppm (180 µg/m$^{3)}$	0.12 ppm (235 µg/m$^{3)}$
	8 hours	0.07 ppm (140 µg/m^3)	0.08 ppm (157 µg/m$^{3)}$ (3-year average of annual 4th-highest daily maximum)
CO	8 hours	9.0 ppm (10,000 µg/m^3)	9 ppm (10,000 µg/m^3)
	1 hour	20 ppm (23,000 µg/m^3)	35 ppm (40,000 µg/m^3)
NO_2	Annual Average	-	0.053 ppm (100 µg/m$^{3)}$
	1 hour	0.25 ppm (470 µg/m$^{3)}$	-
SO_2	Annual Average	-	0.03 ppm (80 µg/m$^{3)}$
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m$^{3)}$
	3 hours	-	0.5 ppm (1,300 µg/m$^{3)}$
	1 hour	0.25 ppm (655 µg/m$^{3)}$	-
Suspended particulate matter or PM_{10}	24 hours	50 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	50 µg/m^3
Suspended Particulate Matter or $PM_{2.5}$	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3 (3-year average)
	24 hours	-	65 µg/m^3 (3-year average of 98th percentiles)
Sulfates	24 hours	25 µg/m^3	-
Pb	30 days	1.5 µg/m^3	-
	Calendar Quarter	-	1.5 µg/m^3

µg/m^3 = micrograms per cubic meter

Brief descriptions of health effects for the main criteria pollutants follow.

8.1.3.4.1 Ozone. Ozone is a reactive pollutant, which is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving POCs and NO_x. POC and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately 3 hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of POC and NO_x under the influence of wind and sunlight. Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases, such as asthma, bronchitis, and emphysema.

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

8.1.3.4.3 Particulate Matter (PM_{10} and $PM_{2.5}$). 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.

National ambient air quality standards 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, EPA 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, EPA began a long review process to determine if the PM_{10} standards set in 1987 provided 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, EPA 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 EPA regarding proposed particulate matter standards.

Subsequent to these discussions and reviews, EPA established $PM_{2.5}$ standards of 65 micrograms per cubic meter, 24-hr average concentration, and 15 micrograms per cubic meter, annual average concentration. EPA also confirmed the national PM_{10} standards of 150 micrograms per cubic meter, 24-hr average, and 50 micrograms per cubic meter, annual

average, as providing an adequate margin of safety for limiting exposure to larger particles. 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 Agency and of the review committee, CASAC.

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

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

SO_2 and NO_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 (CAAA). 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 CEMSs in accordance with the Code of Federal Regulations (CFR) (40 CFR Part 75) and report annual emissions of SO_x and NO_x.

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

8.1.3.4.6 Hydrogen Sulfide. Hydrogen sulfide (H_2S) is a naturally occurring gas contained, as a example, in geothermal steam from the Geysers. H_2S has a "rotten egg" odor at concentration levels as low as 0.005 ppm. The state 1-hour standard of 0.03 ppm is set to reduce the potential for substantial odor complaints. At concentrations of approximately 10 ppm, exposure to H_2S can lead to health effects, such as eye irritation.

8.1.3.4.7 Toxic Air Contaminants. TACs are air pollutants that are believed to have carcinogenic or adverse non-carcinogenic effects but do not have a corresponding ambient air quality standard. There are hundreds of different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining, electric

utility and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust.

TACs are regulated under both state and federal laws. Federal laws use the term hazardous air pollutants to refer to the same types of compounds known as TACs under state law. Both terms generally encompass the same compounds. For simplicity, TAC will be used in this section when referring to these compounds. Under the 1990 CAAAs, approximately 190 substances are regulated under a two-phase strategy. The first phase involves requiring facilities to install Maximum Achievable Control Technology (MACT); EPA has established MACT standards for 20 industries that emit TACs and will continue to develop MACT standards for others over the next several years. Even if MACT is established for a given source category, a facility in that category is subject to MACT if emissions define the source as a "major source" of TACs, that is, only if the TAC emissions are 10 tpy or more for any substance or 25 tpy or more for any combination of TACs. Appendix 8.1A presents the annual emissions of the TACs in Table 8.1A-11. Table 8.1A-11 presents that the emissions from the lean-burn and black start diesel engines from Eastshore are less than the major source thresholds; therefore, the plant is not subject to MACT. Additionally, regulatory applicability for MACT is discussed in Section 8.1.5.

The second phase of control involves determining the residual health risk represented by TAC emissions sources after implementation of MACT standards. EPA will determine residual risks within 8 years after MACT standards for a source category are set. Results of this analysis will be used to determine if the residual risks allow for a reasonable margin of safety for public health.

With respect to state law, in 1983 the California legislature adopted Assembly Bill (AB) 1807, which established a process for identifying TACs and provided the authority for developing retrofit air toxics control measures on a statewide basis. In 1992, the state legislature adopted AB 2728 to provide a legal framework for the integration of the existing state air toxics programs, including those developed under AB 1807, with the new federal program discussed previously. Air toxics in California may also be regulated because of another state law, the Air Toxics "Hot Spots" Information and Assessment Act of 1987, AB 2588. Under AB 2588, TAC emissions from individual facilities are required to be quantified by the facility and reported to the local air pollution control agency. The facilities are prioritized by the local agencies based on the quantity and toxicity of these emissions, and their proximity to areas where the public may be exposed. High-priority facilities are required to perform a health risk assessment, and if specific risk thresholds are exceeded, they are required to communicate the results to the public in the form of notices and public meetings. Depending on the health risk levels, emitting facilities can be required to implement varying levels of risk reduction measures.

8.1.3.4.8 Criteria Pollutant Air Quality Monitoring Sites. The nearest criteria pollutant air quality monitoring sites to the proposed Eastshore site would be the stations located in the East Bay area, as follows: Fremont-Chapel Way, Hayward-La Mesa, San Leandro-County Hospital, and Richmond. Ambient monitoring data for these sites for the most recent 3-year period are summarized in Table 8.1-15. Table 8.1-16 presents a summary of historical air quality data for the air basin for the most recent 10-year period.

TABLE 8.1-15
Monitoring Data Summary (Highest Monitored Values)

Pollutant	Site	Avg. Time	2003	2004	2005
Ozone, ppm	Fremont	1 Hr	0.123	0.090	0.105
	Hayward		0.116	0.088	0.093
	San Leandro		0.097	0.104	0.099
Ozone, ppm	Fremont	8 Hr	0.090	0.071	0.078
	Hayward		0.092	0.070	0.070
	San Leandro		0.071	0.066	0.061
PM_{10}, µg/m^3	Fremont	24 Hr	37.1	46.3	51.7
PM_{10}, µg/m^3	Fremont	Annual	17.7	18.1	17.2
$PM_{2.5}$, µg/m^3	Fremont	24 Hr	33.5	39.9	33.4
$PM_{2.5}$, µg/m^3	Fremont	Annual	8.7	9.4	9.0
CO, ppm	Fremont	8 Hr	1.87	1.66	1.96
CO, ppm	Fremont	1 Hr	3.2	3.0	3.2
NO_2, ppm	Fremont	1 Hr	0.076	0.060	0.069
NO_2, ppm	Fremont	Annual	0.017	0.015	0.015
SO_2, ppm	Oakland	1 Hr	0.019	-	0.025
	Richmond		-	0.039	-
SO_2, ppm	Oakland	3 Hr	0.013	-	0.013
	Richmond		-	0.019	-
SO_2, ppm	Oakland	24 Hr	0.009	ND	ND
	Richmond		0.005	0.007	0.006
SO_2, ppm	Oakland	Annual	0.003	ND	ND
	Richmond		0.001	0.002	0.001

Note:
ND = no data available

TABLE 8.1-16
Bay Area Air Basin Historical Air Quality Data Summary

Air Basin Statistics

Ozone (ppm)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005[1]**
Maximum 1-hour Concentration	0.138	0.114	0.147	0.156	0.152	0.134	0.160	0.128	0.113	0.120
Maximum 8-hour Concentration	0.112	0.084	0.111	0.122	0.114	0.102	0.106	0.101	0.084	0.090
Days above State Standard	34	8	29	20	12	15	16	19	7	9
Days above National 1-hour Standard	8	0	8	3	3	1	2	1	0	0
Days above National 8-hour Standard	14	0	16	9	4	7	7	7	0	1
PM_{10} (µg/m3)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Maximum 24-hour Concentration	76	95	92	114	76	109	80	58	63	ND
Annual Average (Federal)	24.9	25.8	25.1	28.7	26.8	28.9	25.4	24.2	25.3	ND
Days above State 24-hour Standard	18	20	25	63	42	51	30	30	36	ND
Calculated Days above National 24-hour Standard	0	0	0	0	0	0	0	0	0	ND
CO (ppm)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Maximum 1-hour Concentration	8.8	10.7	8.7	9.0	9.8	7.6	7.7	8.6	4.8	ND
Maximum 8-hour Concentration	7.0	6.1	6.3	6.3	7.0	5.1	5.1	4.4	3.4	ND
Days above State 8-hour Standard	0	0	0	0	0	0	0	0	0	ND
Days above National 8-hour Standard	0	0	0	0	0	0	0	0	0	ND
Nitrogen Dioxide (ppm)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Maximum 1-hour Concentration	0.108	0.118	0.098	0.128	0.114	0.108	0.080	0.081	0.073	ND
Maximum Annual Average	0.025	0.025	0.025	0.026	0.025	0.024	0.019	0.018	0.017	ND
$PM_{2.5}$ (µg/m3)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Maximum 24–hour Concentration	ND	ND	ND	90.5	67.2	107.5	84.5	56.1	73.7	ND
Annual Average (State)	ND	ND	ND	ND	11.6	12.5	13.8	11.7	11.6	ND
Average of Quarterly Means (State)	ND	ND	ND	ND	13.6	12.5	13.8	11.7	11.6	ND

[1]Preliminary data only for January through October.
Source: The California Almanac of Emissions and Air Quality, 2006.
Note: There were no trend data for SO_2. See Table 8.1-15 for last 3 years of summary data.

Table 8.1-17 presents the current data on the attainment status of the District for each applicable pollutant.

TABLE 8.1-17
Bay Area Air Quality Management District Attainment Status

Pollutant	Averaging Time	California Status	Federal Status
Ozone	8 Hours	Unclassified	Nonattainment
	1 Hour	Nonattainment	Ns
CO	8 Hours	Attainment	Attainment
	1 Hour	Attainment	Attainment
NO_2	Annual	Ns	Attainment
	1 Hour	Attainment	Ns
SO_2	Annual	Ns	Attainment
	24 Hours	Attainment	Attainment
	1 Hour	Attainment	Ns
PM_{10}	Annual	Nonattainment	Attainment
	24 Hours	Nonattainment	Unclassified
$PM_{2.5}$	Annual	Nonattainment	Attainment
	24 Hours	Ns	Attainment
Sulfates	24 Hours	Attainment	Ns
Pb	Quarter	Ns	Attainment
	30 Days	Attainment	Ns

Ns= No standard applies or not applicable

8.1.3.5 Existing Soils and Vegetation

Table 8.1-18 delineates data on the predominant soils found on or adjacent to the proposed site. The site is located on and surrounded, to the north and west, by the Clear Lake soil series. To the south and east of the site lie the Danville series of soils.

TABLE 8.1-18
Soil Data for Site and Surrounding Area

Series	Depth, inches	Texture	Permeability inches per hour	Drainage	Erosion Hazard	pH	Salinity µ-ohms/cm
Clear Lake	0-60	Clay, silty clay	0.06-0.2	Poorly drained	None	6.1-8.4	<4
Danville	0-80	Clay, silty clay, silty clay loam	0.06-0.6	Well drained	None	6.1-8.4	<2

Other soils types noted in the surrounding area are the Reyes, Sycamore, and Willows series. None of the noted or identified soils have been classed as sensitive with respect to impacts due to air pollutants such as those estimated to be emitted from the proposed power plant.

The Eastshore site has little vegetation; this is a flat industrial site that has been used for warehouse activities, truck parking and turning around, and loading. Vegetation in the immediate area is composed of commercial and industrial site landscaping, consisting of horticultural trees, shrubs, and grasses. Other natural vegetation types in the surrounding area are as follows: (1) annual grasses, (2) seasonal salt grasses, (3) alkali heath, and (4) ruderal species (weedy plants that grow in disturbed areas). Section 8.2 presents detailed data on sensitive plant species found in the Eastshore site area. None of these species have been identified as being sensitive to air pollutants emitted from the proposed power plant.

8.1.3.6 Sensitive Species

Section 8.2 presents detailed discussions on sensitive plant and animal species on or in the vicinity of the proposed Eastshore site. None of these sensitive species are known to be adversely impacted by air pollutants expected to be emitted from the proposed facility, which will be in compliance with all applicable regulations, and will not, pursuant to Section 8.1.8, cause any violations of air quality standards, or be in excess of any established significance threshold value.

Table 8.1-19 shows the background air quality values based on the data presented in Table 8.1-15. The background values represent the highest values reported for any site during any single year of the most recent 3-year period.

TABLE 8.1-19
Highest Background Air Quality Values

Pollutant and Averaging Time	Background Value, µg/m3
Ozone – 1 Hour	241.0
Ozone – 8 Hours	181.0
PM_{10} – 24 Hours	51.7
PM_{10} – Annual	18.1
$PM_{2.5}$ – 24 Hours	39.9
$PM_{2.5}$ – Annual	9.4
CO – 1 Hour	3,680.0
CO – 8 Hours	2,178.0
NO_2 – 1 Hour	143.0
NO_2 – Annual	32.0
SO_2 – 1 Hour	102.2
SO_2 – 3 Hours	49.4
SO_2 – 24 Hours	23.5
SO_2 – Annual	8.0

8.1.4 Analysis of BACT for NO_x, CO, POC, SO_2, and PM_{10}

8.1.4.1 BACT Analysis for Process Equipment Systems

BACT, as defined in the BAAQMD regulations, means:

For any new or modified source, except cargo carriers, the more stringent of:

- The most effective emissions control device or technique which has been successfully used for the type of equipment comprising such a source; or
- The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source; or
- Any emission control device or technique determined to be technologically feasible and cost-effective by the APCO [Air Pollution Control Officer]; or
- The most effective emission control limitation for the type of equipment comprising such a source which the EPA states, prior to or during the public comment period, is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitations are not achievable. Under no circumstances shall the emission control required be less stringent than the emission control required by any applicable provision of federal, state, or District laws, rules or regulations.

The APCO shall publish and periodically update a BACT/TBACT [Toxics BACT] Workbook specifying the requirements for commonly permitted sources. BACT will be determined for a source by using the workbook as a guidance document, or on a case-by-case basis, using the most stringent definition of this Section 2-2-206.

Tables 8.1-20 to 8.1-21 delineate the applicability levels and preliminary BACT applicability determinations for the facility processes. Appendix 8.1F presents a summary of the BACT determinations for each pollutant.

TABLE 8.1-20
Facility Best Available Control Technology Requirements for Lean-burn Engines

Pollutant	Applicability Level	Emission Level (lb/day)[1]	BACT Required
Criteria Pollutants: District Regulation 2-2-301.1			
NO_x	10 lb/day	33.05	yes
CO	10 lb/day	52.30	yes
POC	10 lb/day	57.47	yes
SO_2	10 lb/day	5.52	no
PM_{10}	10 lb/day	58.22	yes

[1]Each engine, total of 14, with maximum operations of 24 hours per day.

Note:
lb/day = pounds per day

TABLE 8.1-21
Facility Best Available Control Technology Requirements for Black Start Diesel Engine

Pollutant	Applicability Level	Emission Level (lb/day)[1]	BACT Required
Criteria Pollutants: District Regulation 2-2-301.1			
NO_x	10 lb/day	1.79	no
CO	10 lb/day	0.21	no
POC	10 lb/day	0.07	no
SO_2	10 lb/day	0.0038	no
PM_{10}	10 lb/day	0.11	no

[1] Single engine, with maximum operations of 1 hour per day.
[2] Engine will meet the BAAQMD's Level 3 requirements by installing a EPA Tier 3-certified engine.

8.1.4.2 BACT for NO_x

BACT for NO_x emissions will be the use of the add-on control technology of an SCR system to each lean-burn engine. Each engine will emit not more than 5 ppmvd NO_x, corrected to 15 percent oxygen, at the anticipated load and operational ranges.

The BAAQMD BACT guidelines note that the typical technology for a reciprocating internal combustion engine with spark ignition, natural gas-fired, lean-burn engines is SCR. The District's Level 1 (i.e., "technologically feasible/cost-effective") for this pollutant indicates an exhaust concentration not to exceed 6 ppmvd NOx, corrected to 15 percent oxygen. As cited in the District's guidelines, this level is based on a project that was originally permitted by the Tehama County Air Pollution Control District; the project is equipped with SCR, is owned and operated by NEO California Power, LLC, and is located in the City of Red Bluff. Since the original permit issuance, this project's NO_x emission limit has been increased from 6 ppmvd to 9 ppmvd NO_x, corrected to 15 percent oxygen. The District's guideline also presents a Level 2 (i.e., "achieved in practice") with a level of 12 ppmvd NO_x, corrected to 15 percent oxygen.

Therefore, based on this information, Eastshore will meet the necessary BACT requirements for NO_x. The District BACT guideline determination for NO_x from lean-burn engines is shown in Appendix 8.1F.

8.1.4.3 BACT for CO

BACT for CO emissions will be achieved by use of natural gas, good combustion practices, and the installation of add-on control technology of an oxidation catalyst. Each engine will emit not more than 13 ppmvd CO, corrected to 15 percent oxygen at the anticipated load and operational ranges.

The BAAQMD BACT guideline notes the typical technology for a lean-burn reciprocating internal combustion engine with spark ignition and natural gas-fired is an oxidation catalyst. The District's Level 1 (i.e., technologically feasible/cost-effective) for this pollutant indicates an exhaust concentration not to exceed 12 ppmvd CO, corrected to 15 percent oxygen. As cited in the District's guidelines, this level is based on a project that was originally permitted by the Tehama County Air Pollution Control District; the project is

equipped with an oxidation catalyst, is owned and operated by NEO California Power, LLC, and is located in the City of Red Bluff. Since the original permit issuance, this project's CO emission limit has been increased from 12 ppmvd to 56 ppmvd CO, corrected to 15 percent oxygen. The District's guideline also presents a Level 2 (i.e., achieved in practice) with 74 ppmvd CO, corrected to 15 percent oxygen.

Therefore, based on this information, Eastshore will meet the necessary BACT requirements for CO. The District BACT guideline determination for CO from lean-burn engines is shown in Appendix 8.1F.

8.1.4.4 BACT for POC

BACT for POC emissions will be achieved by use of natural gas, good combustion practices, and the installation of add-on control technology of an oxidation catalyst. Each engine will emit not more than 25 ppmvd POC, corrected to 15 percent oxygen at the anticipated load and operational ranges, except for 50 percent load. At 50 percent load, each engine will emit not more than 33 ppmvd POC, corrected to 15 percent oxygen.

The BAAQMD BACT guideline notes the typical technology for a reciprocating internal combustion engine with spark ignition, natural gas-fired, lean-burn engines is an oxidation catalyst. The District's Level 1 (i.e., technologically feasible/cost-effective) for this pollutant indicates that no BACT determination has been made for the source category or BACT category under consideration. The District's guideline also presents a Level 2 (i.e., achieved in practice), with 32 ppmvd POC, corrected to 15 percent oxygen. By comparison to the previously mentioned NEO California Power, LLC, project in Tehama County Air Pollution Control District, the project's equivalent POC emission limit is 25 ppmvd POC, corrected to 15 percent oxygen. The District's guideline also presents a Level 2 (i.e., achieved in practice) with 32 ppmvd POC, corrected to 15 percent oxygen.

Therefore, based on this information, Eastshore will meet the necessary BACT requirements for POC. The District BACT guideline determination for POC from lean-burn engines is shown in Appendix 8.1F.

8.1.4.5 BACT for $PM_{10}/_{2.5}$

BACT for $PM_{10}/_{2.5}$ emissions will be achieved by use of California Public Utilities Commission (CPUC) pipeline-quality natural gas provided by PG&E. Use of this gaseous fuel will result in minimal particulate matter emissions. (It is assumed that PM_{10} includes $PM_{2.5}$ emissions.)

The BAAQMD BACT guideline notes the typical technology for a reciprocating internal combustion engine with spark ignition, natural gas-fired, lean-burn engines is natural gas. The District's Level 1 (i.e., technologically feasible/cost-effective) for this pollutant indicates that no BACT determination has been made for the source category or BACT category under consideration. The District's Level 2 (i.e., achieved in practice) does not specify an emission level for this pollutant; a BACT determination has been made, but no specific emissions limitation has been set or the detailed equipment/process technology has not been specified.

Therefore, based on this information, Eastshore will meet the necessary BACT requirements for PM_{10}. The District BACT guideline determination for PM_{10} from lean-burn engines is shown in Appendix 8.1F.

8.1.5 Laws, Ordinances, Regulations, and Standards

8.1.5.1 LORS Summary

Table 8.1-22 presents data on the applicable laws, ordinances, regulations, and standards (LORS) that affect the proposed facility. LORS readily determined not applicable to the proposed facility were not included in this listing. LORS that often are applicable to similar projects are included, with a determination as to the applicability status for this project. The table delineates the LORS citation, agency responsible for compliance or oversight, basic LORS requirement, applicability, the proposed facility's compliance strategy, and the section reference for demonstration of conformance.

TABLE 8.1-22
Summary of Federal, State, and Local LORS Requirements

LORS Citation	Regulating Agency	LORS Requirement	Applicability	Compliance Strategy/ Permit Schedule	Conformance (Section Reference)
Federal Requirements					
CAAA of 1990, 40 CFR 50	EPA Region 9	NAAQS	Applies to facility. Compliance demonstration required in CEC AFC.	Air quality impact analysis shows compliance with NAAQS.	8.1
CAA Sec. 171-193, 42 USC 7501 [BAAQMD Reg. 2, Rule 2]	BAAQMD with EPA Region 9 oversight	NSR – requires NSR permit for new stationary sources	Facility is subject to NSR permit requirements.	Application for BAAQMD DOC will be submitted within 10 days of the CEC AFC submittal.	8.1
40 CFR 52.21 [also BAAQMD Reg. 2, Rule 2]	EPA Region 9	PSD – requires modeling to demonstrate no violation of NAAQS and PDS increments if applicable	Facility will not emit greater than 250 tpy of a federal PSD regulated, and therefore, facility is not subject to federal PSD requirements.	NA.	NA
40 CFR 60, Subpart IIII [BAAQMD Reg. 10]	EPA Region 9	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	Facility black start engine (emergency generator) is a compression ignition engine.	Engine will meet the EPA Tier 3 requirements; engine also will meet State Air Toxics Control Measure (ATCM) requirements. [See 17 CCR 93115]	8.1
40 CFR 60 (Proposed Subpart JJJJ)	NA	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	Facility has lean-burn engines that are spark-ignited.	Proposed New Source Performance Standards (NSPS), FR 71 Vol. 33804, June 12, 2006; future applicable requirement to be determined when promulgated.	NA
40 CFR 63, Subpart ZZZZ	BAAQMD with EPA Region 9 oversight	National Emission Standards for HAPs for Stationary Reciprocating Internal Combustion Engines (RICE)	Facility lean-burn engines are each greater than 500 hp. Facility is not a major source of HAPs; individual HAPs less than 10 tpy and total HAPs less than 25 tpy.	NA.	NA

TABLE 8.1-22
Summary of Federal, State, and Local LORS Requirements

LORS Citation	Regulating Agency	LORS Requirement	Applicability	Compliance Strategy/ Permit Schedule	Conformance (Section Reference)
40 CFR 64	EPA Region 9	Compliance Assurance Monitoring Rule (CAM)	The facility does not require a permit under either 40 CFR Part 70 or 71, and therefore, the CAM rule does not apply.	NA.	NA
40 CFR 68	EPA Region 9	Risk Management Plan (RMP) Program	Facility will use aqueous ammonia that is less than 20% solution, and therefore, federal RMP rules are not applicable.	NA.	NA
40 CFR 70, CAA Sec 401, 42 USC 7651 [BAAQMD Reg. 2, Rule 6]	BAAQMD, with EPA Region 9 oversight	CAAA Title V Operating Permit Program	Facility is not subject to Title V permit requirements as emissions of regulated pollutants are less than applicability thresholds.	NA.	NA
40 CFR 72, CAA Sec 401 42 USC 7651	BAAQMD, with EPA Region 9 oversight	Title IV Acid Rain – requires Title IV permit and compliance with acid rain provisions	Each lean-burn engine at the facility is connected to a generator that is less than 25 MW. Engines are not subject to Title IV requirements per 40 CFR 72.7 definition of affected units.	NA.	NA
State Requirements					
California Health & Safety Code (H&SC) 44300 et seq.	BAAQMD	Air Toxics “Hot Spots” Program – requires initial health risk assessment and biennial reporting of TAC/HAP inventory	Facility is subject to Air Toxic “Hot Spots” Program requirements.	Eastshore will prepare inventory plans and reports, as required.	8.1, 8.6

TABLE 8.1-22
Summary of Federal, State, and Local LORS Requirements

LORS Citation	Regulating Agency	LORS Requirement	Applicability	Compliance Strategy/ Permit Schedule	Conformance (Section Reference)
California H&SC 41700	BAAQMD	Public Nuisance Provisions – outlaws discharge of air contaminants causing nuisance, injury, detriment or annoyance	Applicable to the facility.	CEC conditions of certification and BAAQMD DOC conditions will ensure that no public nuisance results from operation of facility. Application for BAAQMD DOC will be submitted within 10 days of AFC submittal.	8.1
17 California Code of Regulations (CCR) 93115	BAAQMD	Airborne Toxic Control Measure (ATCM) for Stationary Compression (CI) Ignition Engines	Applicable to the black start engine. Eastshore will use an EPA Tier 3 certified engine fired with CARB Diesel (ultra-low-sulfur diesel fuel oil) and limit annual hours of maintenance and testing.	CEC conditions of certification and BAAQMD DOC conditions will insure that no public nuisance results from operation of facility. Application for BAAQMD DOC will be submitted within 10 days of AFC submittal.	8.1
19 CCR 2735 et seq., California H&SC Article 2, Section 6.95	City of Hayward Fire Department, local California Unified Permitting Agency (CUPA)	California Accidental Release Prevention (CalARP) Program requires a CalARP risk management program plan to be prepared	Facility will store aqueous ammonia at 19% solution with a total site inventory of 20,000 gallons. All forms of ammonia, including aqueous ammonia, trigger CalARP per Table 3, 19 CCR 2770, Note 5.	Eastshore will prepare the requisite CalARP plan in accordance with the regulatory timeframe for a new facility.	8.12
Title 14 CCR 15002	CEC	Siting Provisions	Applicable to facility.	CEC approval of AFC to be obtained before start of construction.	8.1
Local Requirements					
BAAQMD Regulation 1, Rule 1 Section 301 [see State section]	BAAQMD	Prohibits public nuisances	Applies to all new sources of air emissions.	CEC conditions of certification and BAAQMD DOC will ensure that no public nuisance results from operation of facility.	8.1

TABLE 8.1-22
Summary of Federal, State, and Local LORS Requirements

LORS Citation	Regulating Agency	LORS Requirement	Applicability	Compliance Strategy/ Permit Schedule	Conformance (Section Reference)
BAAQMD Regulation 2, Rule 1	BAAQMD	General requirements for air quality permits	Includes list of equipments, processes, and operations exempt from air quality permitting.	Eastshore will determine if equipment, processes, and operations require air permits.	8.1
BAAQMD Regulation 2, Rule 2 [see Federal section]	BAAQMD	NSR Provisions – requires preconstruction review, including BACT and offsets	Applies to all new sources of air emissions, including this facility.	NSR provisions will be addressed in the BAAQMD application for an ATC permit.	8.1, 8.6
BAAQMD Regulation 2, Rule 3	BAAQMD	Permits – Power Plants – requires Determination of Compliance by the Air Pollution Control Officer prior to ATC	Applies to power plants, including this facility.	Application for BAAQMD ATC for a DOC will be submitted within 10 days of AFC submittal. Final DOC will be obtained from the BAAQMD prior to ATC.	8.1
BAAQMD Regulation 2, Rule 5	BAAQMD	Air Toxics NSR – requires new sources of air toxics to complete health risk assessment as part of permit process	Applies to this facility as a source of air toxic emissions.	Refined health risk assessment will be included with BAAQMD application for ATC/DOC.	8.6
BAAQMD Regulation 6	BAAQMD	Limits particulate matter and visible emissions	Applies to this facility as a source of particulate emissions.	BAAQMD ATC/DOC will include any provisions necessary to ensure compliance.	8.1
BAAQMD Regulation 7	BAAQMD	Odorous substance discharges	Applicable only if facility receives 10 or more odor complaints within a 90-day period. Not applicable at this time.	Facility will properly operate and maintenance equipment.	NA
BAAQMD Regulation 8, Rule 3	BAAQMD	Architectural coating VOC limits	Applies to facility during construction and ongoing maintenance.	Facility will use compliant coatings.	NA

TABLE 8.1-22
Summary of Federal, State, and Local LORS Requirements

LORS Citation	Regulating Agency	LORS Requirement	Applicability	Compliance Strategy/ Permit Schedule	Conformance (Section Reference)
BAAQMD Regulation 8, Rule 4	BAAQMD	VOC emission limits from surface coating and general solvent use	Applicable to facility for general ongoing facility maintenance.	Facility will not exceed 5-tpy emission limit above which source control is required.	NA
BAAQMD Regulation 8, Rule 16	BAAQMD	Cold solvent cleaner requirements	Facility will use only compliance cold cleaning equipment that meets rule requirements or exemptions.	NA.	NA
BAAQMD Regulation 9, Rule 1	BAAQMD	SO_2 ground level concentration limits	Applies to facility.	Compliance will be demonstrated in the BAAQMD application for ATC/DOC.	8.1
BAAQMD Regulation 9, Rule 3	BAAQMD	NO_x limits from heat transfer equipment	Either an electric or natural gas heater may be installed. If a gas heater is installed, it will be fired solely on natural gas and not greater than 10 MMBtu/hr. Therefore, it would be permit exempt.	NA.	NA
Regulation 9 Rule 8	BAAQMD	IC engine NO_x and CO limits	Lean-burn engines applicable with NO_x/CO limits for lean-burn engines at 140 ppm and 2000 ppm, respectively. Black start engine fired on diesel.	Compliance will be demonstrated in the BAAQMD application for ATC/DOC. Application of BACT and use of natural gas will ensure compliance with NO_x and CO limits. Black start will meet ATCM requirements.	8.1

8.1.5.2 Regulatory Setting and Compliance Analysis

Four agencies currently have responsibilities in the area of air quality permitting, compliance, enforcement, and impact analysis with respect to the proposed project. These agencies are as follows:

- California Energy Commission (CEC)
- CARB
- BAAQMD
- EPA Region 9

Table 8.1-23 presents a summary of each agency's responsibilities as they apply to the proposed project's air quality permitting, analysis, and review process.

TABLE 8.1-23
Agency Responsibilities

Agency	Basic Responsibilities
CEC	Is the lead agency per the state's energy facility siting regulations for power plants rated at over 50 MW. The CEC coordinates all review efforts and includes the other air agencies in the review and certification process.
CARB	CARB has oversight authority on the local air districts' stationary source control programs. As such, CARB will not be a formal responsible agency but will have the opportunity to comment on the various project aspects, i.e., the air quality and public health analyses.
BAAQMD	The BAAQMD has the responsibility to analyze the project's emissions and air quality impacts and to prepare a Determination of Compliance for the CEC. In addition, the district requires that an application for an ATC permit for the project be filed separately with the agency; that the ATC be issued prior to start of construction; and that a Permit to Operate be issued when the project begins operation. The BAAQMD is the primary permitting and enforcement agency, but will share some of this responsibility with the CEC subsequent to project certification.
EPA Region 9	EPA Region 9 has oversight authority on the federally enforceable portions of the BAAQMD's programs, including Title V and Title IV. In addition, EPA is responsible for any PSD permitting efforts for projects in Region 9; however this project is not subject to PSD permitting requirements. EPA Region 9 will have the opportunity to comment on the various project aspects pursuant to provisions of the BAAQMD NSR rule.

The following Table 8.1-24 presents a more detailed compliance analysis for those LORS identified in Table 8.1-22.

TABLE 8.1-24
Compliance Analysis for Applicable LORS

LORS Citation	Compliance Analysis
Federal Requirements	
CAA 1990, 40 CFR 50	Eastshore will comply with all permit conditions limiting emissions and operations. Modeling indicates that the proposed facility will not cause violations of any state or federal air quality standard.
40 CFR 52.21 BAAQMD Regulation 2 Rule 2	The project will undergo review per the District NSR rule, and will comply with the BACT, modeling, offsets, reporting, and monitoring provisions as outlined in the District ATC and PTO. The facility is not subject to PSD review.
40 CFR 60, Subpart IIII BAAQMD Regulation 10	The existing NSPS, Subpart IIII, for stationary compression ignition internal combustion engines applies to the black start diesel engine. The engine will meet the EPA Tier 3 requirements; engine also will meet state ATCM requirements. BAAQMD Regulation 10 currently does not reference Subpart IIII.
State Requirements	
California H&SC 44300 et seq.	Eastshore will develop the required AB2588 air toxics inventory plan and report as directed by the BAAQMD.
California H&SC 41700	Eastshore will minimize nuisance with proper operations and maintenance and will adhere to the CEC conditions of certification and BAAQMD DOC conditions.
17 CCR 93115	Eastshore's black start engine will be an EPA Tier 3 certified engine fired with CARB Diesel (ultra low sulfur diesel fuel oil) at no more than 15 ppm sulfur content, will be function as an emergency generator and limit operations for maintenance and testing to no more than 30 hours per year.
19 CCR 2735 et seq., California H&SC Article 2, Section 6.95	Eastshore will prepare the requisite CalARP plan in accordance with the regulatory timeframe for a new facility. Eastshore will submit the CalARP to the City of Hayward Fire Department for the 20,000 gallons of 19 percent aqueous ammonia, which will be used in the SCR system process. See AFC Section 8.12.
Title 14 CCR 15002	Application for Certification is submitted for CEC review and approval before start of construction.
Local Requirements	
BAAQMD Regulation 1, Section 301	Regulation 1-301 addresses Public Nuisance. Eastshore will emit insignificant quantities of odorous or visible substances; therefore, Eastshore will comply with this regulation.
BAAQMD Regulation 2, Rule 1	Regulation 2-1-114 addresses exempt combustion operations. Heaters that are solely natural gas-fired less than 10 MMBtu/hr in heat input are exempt from undergoing BAAQMD air quality permitting. If Eastshore decides to install a gas-fired rather than electric heater, the gas-fired heater will be exempt.
BAAQMD Regulation 2, Rule 2	Per Regulation 2-2-301, BACT is required for those criteria pollutants whose daily emissions are 10 lb or greater. BACT will be applied to all pollutants – NO_x, CO, POC, PM_{10} and SO_2. Add-on control technology of SCR and oxidation catalyst systems will be installed to reduce NO_x, CO and POC emissions. Natural gas (solely) will be fired on the lean-burn engines. Proposed emissions of these pollutants meet the BAAQMD's BACT guideline for spark-ignited, natural gas fired, lean-burn engines. Per Regulation 2-2-302 offsets are required for project emissions of POC and NO_x that are 35 tpy or greater. POC and NO_x emissions are greater than 35 tpy. Offsets will be secured in the necessary amounts of project emissions multiplied by the required 1.15 offset ratio. Multiple approaches to secure sufficient offset will

TABLE 8.1-24
Compliance Analysis for Applicable LORS

LORS Citation	Compliance Analysis
	be considered and selected (e.g., banked emissions, emission broker, emission reduction programs). Rule 2-2-308 requires applicants to demonstrate that emissions from a project located within 10 km (6.2 miles) of a Class I area will not cause or contribute to the exceedance of any national ambient air quality standard or any applicable Class I PSD increment. Because the nearest Class I areas, Point Reyes National Seashore and Pinnacles National Park, are over 80 km from Eastshore, this section is not applicable to the proposed facility.
BAAQMD Regulation 2, Rule 3	Regulation 2, Rule 3 requires a Determination of Compliance (DOC) by the Air Pollution Control Officer prior to obtaining an ATC. An application for the ATC/PTO from the air district will be submitted separately from the AFC and will be based on the applicable AFC section and appendix contents: Sections 8.1, 8.6; Appendices to Section 8.1 and 8.6.
BAAQMD Regulation 2, Rule 5	Regulation 2, Rule 5 requires new sources of air toxics to complete health risk assessment as part of permit process. The facility has prepared a refined multiple-pathway, multiple pollutant health risk assessment using the HARP model (CARB/OEHHA). See AFC Section 8.6.
BAAQMD Regulation 6	Regulation 6 pertains to particulate matter and visible emissions. Any visible emissions from the project will not be darker than No. 1 when compared to a Ringlemann Chart for any period(s) aggregating 3 minutes in any hour. Because the Eastshore will burn clean fuels, the opacity standard of not greater than 20 percent for a period or periods aggregating 3 minutes in any hour and the particulate emission concentrations limit of 0.15 grains per standard cubic feet of exhaust gas volume will not be exceeded.
BAAQMD Regulation 7	Regulation 7 pertains to odorous substances. This provides for addressing citizen complaints, i.e., rule is applicable only if facility receives 10 or more odor complaints within a 90-day period. Facility will properly operate and maintenance equipment.
BAAQMD Regulation 8, Rule 3	Use of architectural coatings as defined within the rule will be limited to compliant coatings. The facility will establish the justification for the use of any exemptions prior to invoking such exemptions.
BAAQMD Regulation 8, Rule 4	Regulation 8, Rule 4 pertains to VOC emission limits from surface coating and general solvent use. Emissions of VOCs from the use of cleaning solvents will be well below the rule limit of 5 tpy.
BAAQMD Regulation 8, Rule16	Regulation 8, Rule 16, presents requirements for cold solvent cleaners. The facility will evaluate the need for any cold solvent cleaners and use, and will comply with the rule provisions (or exemptions), accordingly.
BAAQMD Regulation 9 Rule1	Regulation 9, Rule 1 specifies an emission standard of less than 300 ppm SO_2. Because of the insignificant quantities of sulfur in natural gas, this limit will be achieved. In addition, the ambient air quality modeling analysis shows that ground-level concentrations of SO_2 from Eastshore will not result in ground-level concentrations in excess of 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours.
BAAQMD Regulation 9, Rule 3	Regulation 9, rule 3 specifies NO_x emission standards. If a gas heater (rather than an electric heater) is installed, it will be solely natural gas-fired and below 10 MMBtu/hr (Regulation 2, Rule 1) and not be required to obtain and air permit; therefore, this rule does not apply to the heater.

TABLE 8.1-24
Compliance Analysis for Applicable LORS

LORS Citation	Compliance Analysis
BAAQMD Regulation 9 Rule 8	Regulation 9 Rule 8 applies to IC engines. For the lean-burn engines, rule limits NO_x and CO to 140 ppmvd and 2000 ppmvd at 15 percent oxygen, respectively. Application of BACT for NO_x and CO will ensure compliance with the rule limits. For the black start diesel engine, rule requires monitoring and recordkeeping of hours or fuel use; a non-resettable totalizing meter for hours will be installed, and monthly logs will be maintained as required by the rule. Lean-burn and black start diesel engines will obtain air permits.

8.1.6 Emissions Inventory

This section presents data on the basin wide and county emissions inventories for both criteria and toxic pollutants. Data presented yields a regional perspective on emissions levels, both current and predicted, and can be used to gain further perspective on the proposed facility emissions as compared to the regional and county inventory values.

8.1.6.1 Air Basin and County Criteria Pollutant Inventory

Table 8.1-25 presents data on the estimated Alameda County Emissions Inventory for 2004.

TABLE 8.1-25
Alameda County Emissions Inventory Data for 2004 (average tons/day)

Source Category	TOG	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Total Stationary Sources	110.2	18.8	3.1	6.3	1.5	3.3	2.1
Total Area Sources	30.2	18.9	33.5	3.9	0.1	27.5	8.9
Total Mobile Sources	51.6	47.3	423.4	100.8	2.5	4.3	3.5
Total Natural Sources	12.2	11.4	2.1	0.1	0.0	0.2	0.2
County Total	204.2	96.4	462.1	111.1	4.1	35.3	14.7

Source: CARB

Table 8.1-26 presents data on the estimated San Francisco Air Basin Emissions Inventory for 2004.

TABLE 8.1-26
Air Basin Emissions Inventory Data for 2004 (average tons/day)

Source Category	TOG	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Total Stationary Sources	517.6	89.4	42.3	68.3	58.6	16.0	12.3
Total Area Sources	160.8	90.1	175.4	19.3	0.6	151.6	48.6
Total Mobile Sources	255.3	233.4	2,104.6	472.3	12.4	21.3	17.1
Total Natural Sources	116.1	106.5	49.4	1.6	0.5	5.1	4.3
Basin Total	1,049.8	519.4	2,371.7	561.5	72.1	194.0	82.3

Source: CARB

Table 8.1-27 presents data on the future year predicted levels of criteria pollutants for the air basin.

TABLE 8.1-27
Future Year Emissions Inventory Data for the San Francisco Air Basin (average tons/day)

Pollutant	2010	2015	2020
NO_x	465	389	352
ROG (VOC)	337	307	292
PM_{10}	226	238	251
$PM_{2.5}$	94	99	103
CO	1,792	1,456	1,257

Source: CARB

Table 8.1-28 shows the predicted facility emissions levels in comparison to the county and air basin average daily emissions.

TABLE 8.1-28
Facility Emissions Comparison to County and Air Basin Inventories (average tons/day)

Source Category	TOG[1]	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Air Basin Total	1,049.8	519.4	2,371.7	561.5	72.1	194.0	82.3
County Total	204.2	96.4	462.1	111.1	4.1	35.3	14.7
Lean-burn Emissions[2,3]	-	0.47	0.52	0.34	0.04	0.42	0.42
Black Start Diesel Engine Emissions[2,4]	-	3.66 E-05	1.06 E-04	8.95 E-04	1.92 E-06	5.29 E-05	5.29 E-05
Facility Emissions[5]	-	0.47	0.52	0.34	0.04	0.42	0.42
Facility Emissions Percent of County	-	0.49	0.11	0.31	0.94	1.20	2.88
Facility Emissions Percent of Air Basin	-	0.09	0.02	0.06	0.05	0.22	0.52

[1]Eastshore POC emissions compared to inventory ROG emissions.
[2]Assumes that all PM_{10} emissions are $PM_{2.5}$ for conservative estimate.
[3]Daily emissions represent the total annual emissions of all 14 engines (Appendix 8.1A, Table 8.1A-8) at 24 hours per day operation, or a calculated 166.7 days per year.
[4]Daily emissions represent the total annual emissions of the black start diesel engine (Appendix 8.1A, Table 8.1A-9) at 1 hour per day operation or a calculated 30 days per year.
[5]Facility emissions include the 14 lean-burn gen sets and the black start diesel engine.

8.1.6.2 Air Basin and County Toxic Pollutant Inventory

Table 8.1-29 presents data on the current emissions inventories for selected air toxic pollutants within the air basin.

TABLE 8.1-29
Air Toxic Pollutant Emissions Inventory for 2004 (tpy)

Toxic Pollutant	Emissions
Acetaldehyde	1,355
Benzene	1,997
1-3 Butadiene	414
Carbon Tetrachloride	0.94
Hexavalent Chromium	0.10
para-dichlorobenzene	456
Formaldehyde	3,208
Methylene Chloride	956
Perchloroethylene	730
Diesel Particulate Matter	4,552

Additional data on these and other air toxic pollutants is presented in Section 8.6 and Appendix 8.1D. Emission estimates of these and other air toxic pollutants is presented in Appendix 8.1A.

8.1.7 Air Quality Modeling Analysis

8.1.7.1 Overview of Impact and Modeling Process

The applicant will submit air quality impact analyses to both the BAAQMD and the CEC. The modeling analysis will include impact evaluations for those pollutants that exceed the significant emissions thresholds of BAAQMD Regulations and the CEC requirements for evaluation of project air quality impacts. The purpose of this section is to explain the procedure for meeting the BAAQMD and CEC air quality modeling requirements for the proposed project. A complete description of the modeling assumptions and methods were outlined in the Modeling Protocol that was submitted to the BAAQMD in July 2006 for the agency's review and acceptance.

Air quality models use mathematical and numerical techniques to simulate the physical and chemical processes that affect air pollutants as they disperse and react in the atmosphere. Based on inputs of meteorological data and source information like emission rates and stack height, these models are designed to characterize primary pollutants that are emitted directly into the atmosphere and, in some cases, secondary pollutants that are formed as a result of complex chemical reactions within the atmosphere.

Several EPA models and programs were proposed for use to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations. The models proposed for use are Building Profile Input Program for PRIME (BPIPPRM, Version 04274), the SCREEN3 (Version 96043) dispersion model, and the Industrial Source Complex - Short Term (ISCST3, Version 02035). These models, along with

options for their use and how they are used, are discussed in the following subsections. These models were used for the following:

- Comparison of impacts to significant impact levels
- Compliance with state and federal AAQS
- Impacts to Class II areas

8.1.7.1.1 Simple and Complex Terrain Modeling Methods. For modeling the potential impact of the project in terrain that is both below and above stack top (defined as simple terrain when the terrain is below stack top and complex terrain when it is above stack top) the ISCST3 model was used with 5 years of hourly meteorological data from the Union City monitoring station for the years 1990 through 1994. The ISCST3 model is a steady-state, multiple-source, Gaussian dispersion model designed for use with point source emissions situated in simple and complex terrain. The ISCST3 model requires hourly meteorological data consisting of wind direction, wind speed, temperature, stability class, and mixing height. The model assumes that there is no variability in the meteorological parameters and the emissions sources over a 1-hour period, hence the term steady-state. The ISCST3 model allows for the input of multiple sources and is able to handle complex phenomena such as building-induced plume downwash.

The ISCST3 model was selected for this project because of the terrain features surrounding the project location. It was also selected because it incorporates algorithms for the treatment of aerodynamic downwash that are caused by buildings and structures. Downwash effects are of importance because the emission sources for this project are below Good Engineering Practice (GEP) stack height.

Technical options selected for the ISCST3 model are listed below. Use of these options follows the EPA's (November, 2005) modeling guidance, BAAQMD guidance, and/or sound scientific practice. An explanation of these options and the rationale for their selection is provided below.

- Gradual plume rise (BAAQMD requirement)
- Stack tip downwash
- Default option for temperature gradients, wind profile exponents, and calm processing
- Anemometer height = 20 m
- Urban dispersion parameters
- Elevated receptor terrain heights option

Buoyancy-induced dispersion, which accounts for the buoyant growth of a plume caused by entrainment of ambient air, will be included because of the relatively warm exit temperature and subsequent buoyant nature of the exhaust plumes. Stack tip downwash, which adjusts the effective stack height downward following the methods of Briggs (1972) for cases where the stack exit velocity is less than 1.5 times the wind speed at stack top, will be selected per EPA guidance.

As previously mentioned, based on the land use classification procedure of Auer (1978), land use within the area circumscribed by a three-km radius around the modified facility is greater than 50 percent urban. Therefore, in the modeling analyses supporting the permitting of the facility, urban coefficients were assigned.

The calm processing option allows the user to direct the program to exclude hours with persistent calm winds in the calculation of concentrations for each averaging period. This option is generally recommended by the EPA (2005) for regulatory applications. The ISCST3 model recognizes a calm wind condition as a wind speed of 0.0 meters/second. The calm processing option in the ISCST3 model will then exclude these hours from the calculation of concentrations.

8.1.7.1.2 Ambient Ratio Method and Ozone Limiting Method. Annual NO_2 concentrations will be calculated using the Ambient Ratio Method (ARM), adopted in Supplement C to the Guideline on Air Quality Models (EPA, 1994). The Guideline allows a nationwide default conversion rate of 75 percent for annual NO_2/NO_x ratios.

Should NO_2 concentrations need to be examined in a more rigorous manner, the Ozone Limiting Method (OLM) will be used. The maximum 1-hour ozone concentration will be used to calculate the 1-hour NO_2 concentration by using the maximum 1-hour NO_x concentration. The Ozone Limiting Method involves an initial comparison of the estimated maximum NO_x concentration and the ambient O_3 concentration to determine which factor limits 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.

8.1.7.1.3 Fumigation. The SCREEN3 model will be used to evaluate inversion breakup and shoreline fumigation impacts for all short-term averaging periods (24 hours or less). The methodology outlined in BAAQMD Modeling Guidance and EPA 454/R-92-019 (*Screening Procedures for Estimating the Air Quality Impact of Stationary Sources*, Revised) will be followed for this analysis. Combined impacts for all sources under fumigation conditions will be evaluated based on BAAQMD modeling guidelines.

Specifically, inversion breakup and shoreline fumigation (Type I and Type III) analyses were performed. The SCREEN3 model was used to perform both of these analyses. For the Type III analysis, the default Thermal Internal Boundary Layer (TIBL) factor in the SCREEN3 model is normally set at a value of 6. Shoreline fumigation for TIBL factors from 2 to 6 must were also calculated. The highest impact result from varying the TIBL factor was then considered the maximum shoreline fumigation impact.

For multiple sources, shoreline fumigation impacts were determined for each source. The shoreline fumigation impacts were then summed over all of the sources. For a more refined approach, ISCST3 can be run to determine the impacts of the other sources at the location of the fumigation impact for each source. Using F stability and a stack height wind speed of 2.5 meters per second (m/s), ISCST3 is run for the other sources whose plumes are under the TIBL. A receptor is placed at the location of the maximum shoreline fumigation concentration for that source (e.g., the maximum of varying the TIBL factor from 2 to 6). The concentration from the shoreline fumigation from the one source is then combined with the ISCST3 impact from the other sources. The resulting highest combination is the reported shoreline fumigation impact.

Fumigation impacts can affect concentrations longer than 1-hour average. Section 4.5.3 of *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources*, Revised (EPA-454/R-92-019), provides guidance on converting to 3-, 8- and 24-hour average concentrations.

Based upon land use classification, the following procedures were recommended for urban land use by the BAAQMD:

- Run SCREEN3 in rural mode, varying TIBL factor between 2 and 6. Also run SCREEN3 using flat terrain for downwind distances equal to maximum shoreline fumigation distances found by varying the TIBL factor between 2 and 6.
- Run SCREEN3 in urban mode using flat terrain for all downwind distances equal to maximum shoreline fumigation distances found by varying TIBL between 2 and 6.
- Calculate the SCREEN3 urban to rural ratio for each downwind distance for flat terrain. Multiply the distance dependent ratio times the rural shoreline fumigation impact for each TIBL factor. Report the highest impact as the Shoreline Fumigation Impact.
- Adjust concentration for appropriate averaging periods.
- If required, add in result of ISCST3 runs of other sources under TIBL.

8.1.7.1.4 Good Engineering Practice Stack Height and Downwash. ISCST3 can account for building downwash effects. Atmospheric downwash or building wake effects occur where a building or a series of structures creates eddies or wakes that cause the plume to be brought down to the ground in the area adjacent to the plant site. The EPA guidance ("Guideline for Determination of Good Engineering Practice Stack Height," Revised June 1985) for determining GEP stack height in order to reduce downwash effects is as follows:

$$H_g = H + 1.5L$$

Where:

H_g = Good Engineering Practice stack height, measured from the ground-level elevation at the base of the stack

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack

L = lesser dimension, height or maximum projected width, of nearby structure(s)

In using this equation, the guidance document indicates that both the height and width of the structure are determined from the frontal area of the structure, projected onto a plane perpendicular to the direction of the wind. For regulatory applications, a building is considered sufficiently close to a stack to cause wake effects when the downwind distance between the stack and the nearest part of the building is less than or equal to five times the lesser of the height or the projected width of the building.

GEP stack height was calculated at 121.8 feet based on existing onsite and offsite structure dimensions. The design stack height of 70 feet does not exceed GEP stack height, thus downwash effects were included in the modeling analysis.

BPIP was used to generate the wind direction specific building dimensions for input into ISCST3. All onsite and the nearby off-site structures were included for analysis with BPIP. Figure 8.1.7-1, located in Appendix 8.1B, shows the buildings included in the downwash analysis.

8.1.7.2 Meteorological Data Used in the Impact Analysis

The EPA 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 in the Clean Air Act at section 165(e)(1). Section 165(e)(1) defines onsite meteorology as the collection "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 definition and the EPA's guidance on the use of onsite monitoring data are also outlined in the "*On-Site Meteorological Program Guidance for Regulatory Modeling Applications*" (1987). The representativeness of the 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. As discussed below, we believe the meteorological data from the Union City monitoring station data satisfy the definition of onsite data.

Situated between the western and eastern portions of the Coast Range, this region is protected from the direct effects of the marine airflow. Marine air entering through the Golden Gate is forced to split into northerly and southerly paths due to the blocking effect of the east bay hills. The southern flow is directed southeasterly down the bay, parallel to the hills, where eventually it passes over southwestern Alameda County. These sea breezes are strongest in the afternoon. The further from the ocean the marine air travels, the more it is modified. Thus, although the climate in this region is affected by sea breezes, it is affected less so than the regions closer to the Golden Gate, to the north. The climate of southwestern Alameda County is also modified by its close proximity to the San Francisco Bay. During periods of flat pressure gradients, the bay can generate its own circulation system, which pushes cool air onshore during the daytime and draws air from the land offshore at night. Bay breezes are common in the morning, before the sea breeze begins.

Winds are predominantly out of the northwest in this region, particularly during summer months. In the winter, winds are equally likely out of the east. Cold air over land areas creates high pressure to the east, which forces air toward the west. Annual average wind speeds close to the bay are about 5.1 mph.

The windrose data for the Union City monitoring site indicates a good level of consistency of northwest winds as well as reinforcing the general seasonal wind patterns discussed earlier. Thus, use of the 10-meter Union City monitoring station to represent the project site wind speed, wind direction, and temperature would be considered representative with respect to the calculation of potential impacts from the project.

The area surrounding the project site can be characterized as urban. Areas within 3 km of the project site are predominately densely developed commercial and industrial sites. In accordance with the Auer land use classification methodology (EPA's "*Guideline on Air*

Quality Models"), land use within the area circumscribed by a three km radius around the modified facility is greater than 50 percent urban. Therefore, in the modeling analyses supporting the permitting of the facility, urban coefficients will be assigned.

Representativeness has also been defined in the "*Workshop on the Representativeness of Meteorological Observations*" 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 the project site and Union City monitoring station clearly are. Representativeness has also been defined in the PSD Monitoring Guideline as data that characterize the air quality for the general area in which the proposed project would construct and operate. The same large-scale topographic features that influence the Union City monitoring station also influence the proposed project site in the same manner.

In determining the representativeness of the Union City monitoring station relative to the project site, the following considerations were addressed.

- ***Aspect ratio of terrain, which is the ratio of height to width of hill at base*** - There are no major terrain features either near the proposed project site or the Union City monitoring station that would modify (influence) the prevailing wind pattern that is characteristic of the close proximity to the Bay. The elevations of the project site and the Union City monitoring station are essentially the same.
- ***Slope of terrain*** - Terrain in the immediate vicinity of the project site and the Union City monitoring station are relatively flat.
- ***Ratio of terrain height to stack/plume height*** – Terrain above the stack height is located at least 3.5 miles or more from the project site towards the east, northeast, and southeast. Terrain above the stack height is located in excess of 5 miles or more from the project site towards the west, north, northeast, and northwest.
- Final plume height (stack height plus plume rise) was calculated for D stability and a wind speed of 5 m/s to be about 350 meters. While complex and/or intermediate terrain occurs at significant distances from the project site, impacts in these areas will be addressed the modeling analysis. It is expected that no impacts in complex or intermediate terrain will be identified.
- ***Correlation of terrain features to prevailing meteorological conditions*** - As discussed earlier, the orientation and aspect of terrain in the project area correlates well with the prevailing wind fields as identified by the Union City windrose, with little to no apparent influence by local terrain perturbations (such as small land outcroppings or the water-land interface). Wind flow at the Union City monitoring station would therefore be nearly identical to the project site.

Thus, it is our assessment that the meteorological data collected at the Union City monitoring station are identical to the dispersion conditions at the project site and to the regional area. The windroses do not indicate any overwhelming effects on the potential dispersion of pollutants from the project site on a regional scale from influences other than the surface of the San Francisco Bay. Because of the distances to the complex terrain

features, it is likely that all short-term and annual impacts will occur in the immediate vicinity of the project site. Thus, the data set would satisfy the definition of onsite data, as defined in the PSD Monitoring Guidelines (1990) and the On-site Meteorological Program Guidance for Regulatory Modeling Applications (1987).

The five (5) years of meteorological data for Union City monitoring station were obtained from the BAAQMD for the years 1990-1994. The data set includes all the necessary parameters required for the ISCST3 dispersion modeling analyses (i.e., wind speed and direction, temperature, stability, and mixing height which is set to 600 meters). The data will not be modified in any way.

8.1.7.3 Receptor Grids

Receptor and source base elevations were determined from USGS Digital Elevation Model (DEM) data using the 7-minute format data (i.e., 10-meter spacing between grid nodes). All coordinates were referenced to UTM North American Datum 1927 (NAD27), zone 10. The receptor locations and elevations from the DEM files will be placed exactly on the DEM nodes. Every effort will be made to maintain receptor spacing across DEM file boundaries.

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

- 10-meter resolution from the project fence line and extending outwards in all directions 500 meters. This is called the downwash grid.
- 180-meter resolution that extends outwards from the edge of the downwash grid to 10 km in all directions. This is referred to as the coarse grid.
- 10-meter resolution around any location on the coarse grid where a maximum impact is modeled that is above the concentrations on the downwash grid. This “refined” grid will extend 500 meters in all directions from the maximum coarse grid impact location.

Concentrations within the facility fence line will not be calculated. Figure 8.1.7-2, located in Appendix 8.1B, displays the receptors grids used in the modeling assessment.

8.1.7.4 Background Ambient Air Quality

Historical background air quality data is presented in Section 8.1.3.4. Data is also presented on the most recent data from monitoring stations in close proximity to the site which are representative of site and regional air quality. Background air quality values were derived from the highest values which occurred over the last most recent 3 year monitoring period for each pollutant, i.e., highest value during any year at any monitoring site. These values are presented in Table 8.1-19 and reproduced here in Table 8.1-30, for convenience.

TABLE 8.1-30
Highest Background Air Quality Values

Pollutant and Averaging Time	Background Value, µg/m3
Ozone – 1 Hour	241.0
Ozone – 8 Hour	181.0
PM_{10} – 24 Hour	51.7
PM_{10} – Annual	18.1
$PM_{2.5}$ – 24 Hour	39.9
$PM_{2.5}$ – Annual	9.4
CO – 1 Hour	3680.0
CO – 8 Hour	2178.0
NO_2 – 1 Hour	143.0
NO_2 – Annual	32.0
SO_2 – 1 Hour	102.2
SO_2 – 3 Hour	49.4
SO_2 – 24 Hour	23.5
SO_2 – Annual	8.0

8.1.7.5 Baseline Areas and Baseline Dates

Pursuant to the PSD regulations in 40 CFR 52.21, and the potential annual emissions values per Table 8.1-9, the proposed facility is not subject to PSD review. Therefore, a delineation and analysis of the baseline dates and baseline areas for this proposed facility is not required. The proposed facility is subject to the 250 ton per year applicability criteria under the PSD regulations. The proposed facility is not subject to the 100 ton per year applicability criteria, i.e., the facility is not one of the listed 28 special source categories per 40 CFR 52.21(b)(1)(i)(a). In addition, since the source is not considered major for any applicable PSD pollutants, the significant emissions rates under the PSD rules also do not apply. These rates are delineated in Table 8.1-31, for informational purposes only.

TABLE 8.1-31
PSD Significant Emissions Rates[1]

Pollutant	Significant Emission Rate, tons/year
NO_2	40
SO_2	40
VOC	40
CO	100
$PM_{10}/PM_{2.5}$	15

[1] These rates do not apply to the proposed facility and are presented for information purposes. Because Eastshore is not subject to PSD, Appendix 8.1C further simply states that the increments analysis required when PSD is triggered, therefore, does not apply to Eastshore.

8.1.7.6 Significant Impact and Threshold Levels

Tables 8.1-32 and 8.1-33 present data on the significant impact and/or threshold levels applied to the proposed facility.

TABLE 8.1-32
BAAQMD (PSD) Significant Impact Threshold Values[1]

Pollutant	Averaging Time	SIL, µg/m^3
NO_2	1 Hour	19[2]
	Annual	1
SO_2	3 Hour	25
	24 Hour	5
	Annual	1
CO	1 Hour	2000
	8 Hour	500
$PM_{10}/PM_{2.5}$	24 Hour	5
	Annual	1

[1] EPA PSD significant impact level (SIL) values.
[2] BAAQMD value only.

8.1.8 Air Quality Impact Analysis – Modeling Results

This section describes the results, in both magnitude and spatial extent of ground level concentrations, resulting from emissions from the Eastshore project. 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 Section 8.1.7. All input and output modeling files are contained on the enclosed CD-ROM disk. All modeling analyses were performed using the techniques and methods as outlined in the modeling protocol submitted and approved by the BAAQMD, as well as in subsequent conversations with BAAQMD staff.

8.1.8.1 Screening Analysis

Operational characteristics of the engines, such as emission rate, exit velocity, and exit temperature vary by operating load. A screening modeling analysis, using ISCST3 and five (5) years of hourly meteorology was performed for the 100 percent, 90 percent, 75 percent, and 50 percent load conditions in order to determine the power engine operating condition that will result in the highest modeled concentrations for averaging periods of 24-hours or less. These conditions were labeled Case 1 through Case 12 and represent the load conditions for three ambient temperature conditions: 32°F, 59°F, and 100°F. The 59°F condition represents annual average conditions. As such, load screening for annual average concentrations were only modeled for the 59°F case at 100 percent load. All other

concentration averaging periods were modeled for all three ambient temperatures and operating loads.

The results of the load screening analysis are listed in Appendix 8.1B. The model calculates that the worst-case load and ambient temperature condition is associated with Case 9 (100 percent load at 100 °F) for all pollutants with the exception of PM_{10}. The worst-case 24-hour PM10 screening results were for Case 12, which represents 100°F at 50 percent load. However, all fourteen engines will not operate at 50 percent load for periods of 24-hours so this case was determined to be unrealistic and not evaluated further. For all 12 scenarios, the maximum-modeled short-term concentrations occurred for Case 9 (100 percent engine load for ambient conditions at 100 °F). Therefore, all additional short-term modeling analyses were performed using the Case 9 load conditions for stack parameters and emissions.

8.1.8.2 Refined Analysis

Facility sources, including all lean-burn engines and the black start diesel engine, but excluding a possible permit exempt natural gas-fired heater, were modeled in the analysis for comparisons with SILs and CAAQS/NAAQS, as necessary.

For the lean-burn engines, engine startup and shutdown emissions were also accounted for in the analysis for all short-term (24-hours or less) and long-term (annual) averages in the air quality modeling. Because the startup time for each engine is 30 minutes or less, the worst-case 1-hour impact analysis modeling accounted for 30 minutes in cold startup followed by 30 minutes in full load. In addition, all fourteen (14) engines were assumed to startup simultaneously. 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 fourteen (14) engines were modeled in order to calculate the worst-case impacts. Detailed emission calculations for all averaging periods are included in Appendix 8.1B.

The worst-case modeling input information for each pollutant and averaging period are shown in Table 8.1-33. As discussed above, the combustion engine stack parameters used in modeling the impacts for each pollutant and averaging period reflected the worst-case engine operating condition for that pollutant and averaging period identified in the load screening analysis. Stack parameters associated with operation at the average temperature of 59°F were used in modeling annual average impacts.

TABLE 8.1-33
Stack Parameters and Emission Rates for Refined ISCST3 Modeling[1]

					Emission Rates (g/s)			
	Stack Height (m)	**Stack Diameter (m)**	**Stack Temp. (deg K)**	**Exhaust Velocity (m/s)**	**NO_X**	**SO_2**	**CO**	**PM_{10}**
CO – Averaging Period: 1 hour								
Engines (14)	21.336	1.208	628.71	22.42	-	-	1.8698	-
Black Start Diesel Engine	10.0	0.1778	735.22	48.15	-	-	0.0270	-

TABLE 8.1-33
Stack Parameters and Emission Rates for Refined ISCST3 Modeling[1]

					Emission Rates (g/s)			
	Stack Height (m)	**Stack Diameter (m)**	**Stack Temp. (deg K)**	**Exhaust Velocity (m/s)**	**NO_X**	**SO_2**	**CO**	**PM_{10}**
CO – Averaging Period: 8 hours								
Engines (14)	21.336	1.208	628.71	22.42	-	-	1.8698	-
Black Start Diesel Engine	10.0	0.1778	735.22	48.15	-	-	0.0034	-
SO_2 – Averaging Period: 1 hour								
Engines (14)	21.336	1.208	628.71	22.42	-	0.03024	-	-
Black Start Diesel Engine	10.0	0.1778	735.22	48.15	-	4.79E-4	-	-
SO_2 – Averaging Period: 3 hours								
Engines (14)	21.336	1.208	628.71	22.42	-	0.03024	-	-
Black Start Diesel Engine	10.0	0.1778	735.22	48.15	-	1.60E-4	-	-
SO_2 – Averaging Period: 24 hours								
Engines (14)	21.336	1.208	628.71	22.42	-	0.03024	-	-
Black Start Diesel Engine	10.0	0.1778	735.22	48.15	-	2.0E-5	-	-
PM_{10} – Averaging Period: 24 hours								
Engines (14)	21.336	1.208	628.71	22.42	-	-	-	0.31254
Black Start Diesel Engine	10.0	0.1778	735.22	48.15	-	-	-	5.60E-4
NO_2 – Averaging Period: 1 hour								
Engines (14)	21.336	1.208	628.71	22.42	1.2442	-	-	-
Black Start Diesel Engine	10.0	0.1778	735.22	48.15	0.0270	-	-	-
NO_x, PM, and SO_2 – Averaging Period: Annual								
Engines (14)	21.336	1.208	641.48	22.27	0.11535	1.395E-2	-	0.1474
Black Start Diesel Engine	10.0	0.1778	735.22	48.15	7.73E-4	1.64E-6	-	4.596E-5

[1]All averaging periods include worst-case operating assumptions; for lean-burn engines, also includes startup emissions, where applicable.

8.1.8.3 Normal Operations Impact Analysis

In order to determine the magnitude and location of the maximum impacts for each pollutant and averaging period, the ISCST3 model using five years of hourly meteorological data (1990-1994) from Union City was used. The receptor grid used with the ISCST3 model was derived from 10 meter DEM data. A 180-meter resolution coarse receptor grid was extended in all directions from the facility out about 10 km. Within the coarse grid, for the area surrounding the project site, a finer downwash grid, with 10 meter grid spacing

extending from the facility out about 500 meters from the project site, and a set of receptors spaced at 10 meter intervals around the facility's fence line.

Table 8.1-34 summarizes maximum modeled concentrations for each criteria pollutant and associated averaging periods. In order to assess the significance of the modeled concentrations, the maximum concentrations were modeled and compared to the Class II PSD SILs. All pollutant concentrations with the exception of CO and SO_2 were above the SILs for those pollutants.

The maximum impacts for NO_2, SO_2 (3-hour, 24-hour, and annual averages), and PM_{10} (annual and 24-hour averages) all occurred adjacent to the facility fence line or within the downwash grid.

As discussed earlier, the project is located in a state PM_{10} nonattainment area. PM_{10} emissions are required to be mitigated (see Section 8.1.2.8 in AFC). Eastshore proposes to offset its emissions of $PM_{10}/_{2.5}$ during the fall and winter PM nonattainment season. Because both PM_{10} and SO_2emissions may contribute to ambient PM_{10} concentrations, Eastshore will be working with the CEC staff to agree upon appropriate mitigation for project PM_{10} and SO_2emissions impacts during nonattainment periods.

For CO, because the maximum modeled impacts are less than the significance levels, the Eastshore facility would not significantly affect the Bay Area attainment area.

TABLE 8.1-34
Maximum Modeled Criteria Pollutant Concentrations

Pollutant	Avg. Period	Max.[a] Concentration ($\mu g/m^3$)	Max. Year	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	BAAQMD SILs ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	($\mu g/m^3$)
NO_2	1-hour	314.28	1990	143.0	457.28	-	19	470	-
	Annual	3.22	1990	32.0	35.22	1	1	-	100
PM_{10}[1]	24-hour	49.76	1992	51.7	101.46	5	5	50	150
	Annual	5.46	1990	18.1	23.56	1	1	20	50
$PM_{2.5}$[1]	24-hour	49.76	1992	39.9	89.66	5	5	-	65
	Annual	5.46	1990	9.4	14.86	1	1	12	15
CO	1-hour	454.51	1990	3680.0	4,134.5	2000	2000	23,000	40,000
	8-hour	374.34	1993	2178.0	2,552.3	500	500	10,000	10,000
SO_2	1-hour	7.35	1990	102.2	109.55	-	-	655	-
	3-hour	7.21	1990	49.4	56.61	25	25	1300	1,300
	24-hour	4.81	1992	23.5	28.31	5	5	105	365
	Annual	0.52	1990	8.0	8.52	1	1	-	80

TABLE 8.1-34
Maximum Modeled Criteria Pollutant Concentrations

Pollutant	Avg. Period	Max.[a] Concentration ($\mu g/m^3$)	Max. Year	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)	BAAQMD SILs ($\mu g/m^3$)	Ambient Air Quality CAAQS/NAAQS ($\mu g/m^3$)	($\mu g/m^3$)

[1] The project is located in a state nonattainment area for $PM_{2.5}$ and PM_{10}. The modeled project impacts by themselves, without considering background, are less than the California State $PM_{2.5}$ and PM_{10} ambient air quality standards and thus, do not cause or contribute to the regional nonattainment status. The project does comply with all federal ambient air quality standards with the exception of 24-hour $PM_{2.5}$. However, because the project is located in a state nonattainment region for $PM_{2.5}$, the project will mitigate the modeled exceedance to a level of insignificance.

Based on the above modeling results, emissions from the proposed Eastshore facility will not significantly affect the ambient air quality of the area.

8.1.8.4 Commissioning Impacts Analysis – Lean-burn Engines

There are several scenarios that are possible during commissioning, which are expected to result in NO_x, CO, POC and $PM_{10}/_{2.5}$ emissions that are greater than during normal operations. (During commissioning, SO_2 emissions are expected to be no greater than full-load operations.) Typically, these commissioning activities occur prior to the installation of the abatement equipment, e.g., SCR and oxidation catalyst, while the engines are being tuned to achieve optimum performance. During engine tuning, NO_x, CO, and POC 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 under going 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 8.1-35. The engine manufacturer provided ppm values at 15 percent oxygen, by volume dry, as provided by the engine manufacturer. For those air pollutants whose emissions are modeled to determine their impacts, Table 8.1-35 presents a summary of the estimates for those pollutants.

TABLE 8.1-35
Commissioning Emissions Used for Modeling Analysis for Each Lean-burn Engine at Four Load Points[1]

Pollutant	100%	90%	75%	50%
NO_x[2]	120 ppm 33.05 lb/hr	120 ppm 33.05 lb/hr	110 ppm 30.29 lb/hr	100 ppm 27.54 lb/hr
CO[2]	260 ppm 43.58 lb/hr	260 ppm 43.58 lb/hr	300 ppm 50.29 lb/hr	400 ppm 67.05 lb/hr
$PM_{10}/_{2.5}$[3]	25 mg/Nm3 2.48 lb/hr	25 mg/Nm3 2.48 lb/hr	30 mg/Nm3 2.98 lb/hr	40 mg/Nm3 3.97 lb/hr

[1] Concentration emissions in ppm and mg/Nm^3 are based on 15 percent oxygen, by volume, dry, as provided by engine manufacturer; Nm3 refers to "Normal cubic meter."
[2] Hourly emission values were calculated based on engine manufacturer's F-factor calculations.
[3] Hourly emission values were provided by engine manufacturer (rather than a calculated value).

Each engine's commissioning period (prior to catalyst loading), with an estimated duration of 50 to 80 operating hours total per engine, is expected to consist of the following:

- ***Initial load testing and checkout of an engine (typical for all 14 engines)*** - Two to four operating days of unsynchronized operation, for approximately 2-4 hours per day, followed by approximately an average of 1-2 days per engine of low load checkout (low load checkout also is estimated at approximately 2-4 hours per day). The average operating load for this initial load testing is expected to be 5-10 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 50-80 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 12-16 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. However, for instance, not all 14 engines will begin commissioning on the same day; typically, two to four engines will be tested concurrently. Although the final sequencing and schedule of commissioning for the fourteen 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 50 percent load;
- $PM_{10}/_{2.5}$ – Worst-case commissioning emissions occurs at 50 percent load;

The calculation methodology of commissioning emissions are presented in Appendix 8.1A.

As discussed above and presented in Appendix 8.1A (i.e., emission calculation methodology) and Appendix 8.1B (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 ISCST3 modeling analysis are as follows:

- NO_x emissions can be conservatively estimated to be 33.05 lb/hr per engine with four engines operating at 100 percent load. The maximum 1-hour NO_x impact during commissioning was conservatively calculated to be 817.58 µg/m^3 without consideration for the limiting effects of ambient ozone on nitric oxide conversion. After applying ozone limiting by using the maximum 1-hour background ozone concentration, the 1-NO_2 concentration is estimated to be 312.8 µg/m3. With the maximum background 1-hour NO_2 concentration of 143 µg/m^3, the maximum total impact would be 455.8 µg/m^3, which is below the State 1-hour NO_2 standard of 470 µg/m^3.
- CO emissions can be conservatively estimated to be 67.05 lb/hr per engine with four engines operating at 50 percent load. The maximum 1-hour and 8-hour CO impacts during commissioning were calculated to be 1,046.64 µg/m^3 and 681.08 µg/m^3, respectively. With the maximum background 1-hour and 8-hour CO concentration of 3,680 µg/m^3 and 2,178 µg/m^3 the maximum total impacts would be 4,276.64 µg/m^3 and 2,859.08 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 3.97 lb/hr per engine with up to four engines operating at 50 percent load. The maximum 24-hour $PM_{10}/_{2.5}$ impact during commissioning was calculated to be 29.58 µg/m^3. With the maximum background 24-hour PM_{10} concentration of 29.58 µg/m^3, these impacts are below the state 24-hour standard of 50 µg/m^3. The maximum 24-hour $PM_{2.5}$ concentration that could occur during commissioning is also 29.58 µg/m3 which is less than the federal 24-hour $PM_{2.5}$ standard of 65 µg/m3.

8.1.8.5 Startup and Shutdown Impacts Analysis

Startup and shutdown activities typically affect emissions of NO_x and CO and, to a lesser degree, SO_2, POC, and $PM_{10}/_{2.5}$. (During startup, SO_2 emissions are expected to be no greater than full-load operations.) Startup for the lean-burn engines is relatively short-term. Because all startup times are less than 1-hour in length (typically 30 minutes or less), the refined modeling assessments presented above already include the startup emissions. Thus, no separate modeling assessment for startup emissions is presented as the startup emissions by themselves are less than the worst-case hourly emissions which already include startup with full-load operation.

Table 8.1-36, a copy of Table 8.1-6, is presented below, for convenience, and it presents a summary of the startup and shutdown emission estimates for the cold and warm catalyst startup and shutdown scenarios.

TABLE 8.1-36
Startup and Shutdown Emissions Estimates for Lean-burn Engines (each engine)

Pollutant	Cold Catalyst Start, lb/start	Warm Catalyst Start, lb/start	Shutdown Period, lb/shutdown	Cold Startup Cycle,[1] lb/event	Warm Startup Cycle,[2] lb/event
NO_x	9.17	2.52	0.20	9.36	2.71
CO	13.76	2.38	0.31	14.06	2.60
POC	6.87	1.90	0.34	7.21	2.17
SO_x[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]
$PM_{10}/_{2.5}$	2.52	2.06	0.35	2.87	2.41

[1] A cold catalyst startup cycle is defined as a cold start followed immediately by shutdown of the engine. A cold catalyst startup occurs when the catalyst is at or below 25°C. The cold startup cycle is estimated to be a total of 38.5 minutes.
[2] A warm catalyst startup cycle is defined as a warm catalyst start followed immediately by shutdown of the engine. A warm catalyst startup occurs when catalyst temperature is at least 270°C. The warm startup cycle is estimated to be a total of 23.5 minutes.
[3] NA means not available from the manufacturer. The SO_x emissions during startup and shutdown are assumed to be no greater than emissions under normal full-load operations. (See Table 8.1-4).

The estimated maximum frequency of occurrence is no more than 300 startups for each engine annually. As presented in Table 8.1-36, a cold catalyst startup presents the worst-case emissions compared to the warm startup cycle. The cold catalyst start emission estimates (lb/start) are based on a startup period of 30-minutes; the manufacturer expects that a cold startup duration will be approximately 30-minutes. The warm catalyst start emission estimates (lb/start) are based on emissions for a startup period of 30-minutes; a warm startup duration, however, is more reasonably approximated to be at most 15-minutes. The shutdown emission estimates (lb/shutdown) are based on a duration of approximately 8.5 minutes; this duration is based on discussions with the manufacturer. Emissions during shutdown are assumed to be no greater than the maximum operating emissions presented in Table 8.1-4; for estimation purposes, the hourly emissions in Table 8.1-4 are scaled, accordingly, based on the 8.5 minutes duration of a shutdown.

8.1.8.6 Fumigation Analyses

Fumigation analyses with the EPA Model SCREEN3 (version 96043) were conducted for both inversion breakup fumigation and shoreline fumigation. Shoreline fumigation impacts were evaluated for Thermal Internal Boundary Layer (TIBL) factors (A) from 2.0 to 6.0 and were shown not to occur for facility source emissions. The final plume height for the main facility engines is 85 meters for rural conditions of F stability and 2.5 meter/second (m/s) wind speeds at the stack release height. TIBL heights at the facility (which is approximately 2700 meters from the shoreline of the San Francisco Bay) range from 104 meters to 312 meters for TIBL factors from 2.0 to 6.0, respectively. Because the final plume height is less than the range of possible TIBL heights, no impacts due to shoreline fumigation would occur.

Inversion breakup fumigation impacts of 6.448 micrograms/cubic meter ($\mu g/m^3$) for a unitized emission rate (1 gram/second, g/s) were predicted to occur at 4,841 meters from the main facility engines. (No inversion breakup fumigation impacts were predicted to

occur by SCREEN3 for emissions from the much lower emergency generator stack.) Like the shoreline fumigation analyses, these results are predicted to occur for rural conditions of F stability and 2.5 m/s wind speeds at the stack release heights. Since the site vicinity is urban in nature, SCREEN3 impacts were evaluated in both rural and urban modes for the main facility engines at the inversion breakup distance of 4,841 meters for all SCREEN3 meteorological conditions. At this distance, the maximum urban impact was 1.49 times higher than the maximum rural impact (i.e., 4.524 $\mu g/m^3$ vs. 3.036 $\mu g/m^3$ for 1 g/s emissions). Thus, the inversion breakup fumigation impact was adjusted to 9.608 $\mu g/m^3$ for a unitized emission rate (i.e., 6.448 $\mu g/m^3$ x 1.49) to account for urban dispersion conditions. At the inversion breakup distance of 4,841 meters, the maximum emergency generator impact was 7.348 $\mu g/m^3$ for a 1 g/s emission rate under urban conditions for all SCREEN3 meteorological conditions.

These unitized impacts were used to calculate 1-hour inversion breakup impacts for all pollutants by multiplying the unitized impacts by the pollutant emission rates (in g/s). The fumigation impacts from the main engines are added to the emergency generator impacts at the same location to obtain combined pollutant impacts for the facility. Table 8.1-37 presents the results.

TABLE 8.1-37
Impacts ($\mu g/m^3$) at Inversion Breakup Location

Pollutant and Averaging Time	Fumigation Impacts for Main Engines	Black Start Diesel Engine Impacts	Total Impacts
NO_x 1-hour	166.94	1.66	168.60
SO_2 1-hour	4.068	0.00352	4.072
CO 1-hour	251.51	0.198	251.71

Maximum SCREEN3 impacts at all offsite locations under urban conditions were predicted to occur 1,344 meters from the main engine stacks and were higher than the fumigation impacts as shown below. Since 1-hour fumigation impacts are less than the maximum overall SCREEN3 1-hour impacts, no further analysis of additional short-term averaging times (3-hour, 8-hour, or 24-hour) is required as described in Section 4.5.3 of *"Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised"* (EPA-454/R-92-019).

TABLE 8.1-38
SCREEN3 Maximum Impacts for Urban Conditions ($\mu g/m^3$)

Pollutant and Averaging Time	Maximum Impacts for Main Engines	Black Start Diesel Engine at Same Location	Total Impacts
NO_x 1-hour	169.20	8.31	177.51
SO_2 1-hour	4.123	0.0176	4.141
CO 1-hour	254.91	0.993	255.90

8.1.8.7 Impacts on Class II Areas

A Class I area impact analysis is not required since the proposed source is not subject to the PSD regulations.

The following subsections present the impacts analysis on the Class II area in which the source is located. Table 8.1-35 presents data on the maximum impacts (i.e., maximum modeled concentrations plus background values).

8.1.8.8 Impacts on Visibility and Air Quality Related Values

The Eastshore project is not subject to the PSD regulations, and as such, a visibility and air quality related value analysis is not required.

8.1.8.9 Impacts on Soils and Vegetation

Impacts on soils and vegetation are determined to be insignificant for the following reasons:

- No soils were identified in the project area that are recognized to have any known sensitivity to the types or amounts of air pollutants expected to be emitted by the proposed facility.
- No vegetation species were identified in the project area that are recognized to have any known sensitivity to the types or amounts of air pollutants expected to be emitted by the proposed facility.
- The facility emissions are expected to be in compliance with all applicable air quality rules and regulations.
- The facility impacts are not predicted to result in violations of existing air quality standards, nor will the emissions cause exacerbation of an existing violation of any quality standard.

8.1.8.10 Impacts on Sensitive Animal Species

Impacts on animal species are determined to be insignificant for the following reasons:

- No animal species were identified in the project area, which are recognized to have any known sensitivity to the types or amounts of air pollutants expected to be emitted by the proposed facility.
- The facility emissions are expected to be in compliance with all applicable air quality rules and regulations.
- The facility 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.

8.1.8.11 Summary of Health Risk Impacts

Section 8.6 and Appendix 8.1D present a detailed discussion of public health and risk assessment issues pertaining to the proposed facility. Table 8.1-39 summarizes the health risk results as presented in Section 8.6

TABLE 8.1-39
Operational Health Risk Assessment Summary

Risk Category	Maximum Risk, 14 Lean-Burn Engines	Maximum Risk, 1 Black Start Diesel Engine	Facility Cumulative Maximum Risk[2]	Applicable Significance Threshold
Cancer Risk per Million	8.3	0.50	8.5	<= 10.0 with T-BACT
Acute Hazard Index with Acrolein; without Acrolein (BAAQMD)[1]	0.65 0.11	0.018 0.018	0.66 0.11	1.0
Chronic Hazard Index with Acrolein: without Acrolein (BAAQMD)[1]	0.23 0.15	0.0003	0.23 0.15	<=1.0 with T-BACT <=0.2 without T-BACT

[1]Because of concerns regarding source testing procedures, the BAAQMD does not require acrolein to be included in health risk assessments per the *Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines* (June 2005).
[2]The maximum risks from the 14 lean-burn engines (combined) alone, and from the diesel engine alone, occur at separate locations. The maximum project cumulative risk location is the same as the location of maximum risk from the 14 lean-burn engines.

8.1.8.12 CEQA Significance Assessment and Conformity Determination

Generally, project significance with respect to CEQA review is typically based on a set of "significant threshold levels" or "significant impact levels" established by the lead or responsible CEQA agency. In California, most of the local air districts have established such significance levels, in one or both of the following formats: (1) significance levels in terms of emissions expressed as a numerical emission value over a specified period for a particular pollutant, or (2) significance levels in terms of impacts expressed as a concentration value over a specified period. Examples of these values are as follows:

- The South Coast Air Quality Management District has established emissions based significance values for development projects via its CEQA manual. Values have been established for both construction and operational phases of a project, and are expressed in terms of lb/day for each specific pollutant.
- The South Coast AQMD has established concentration based significance values pursuant to its NSR rule (Regulation 13). These values are expressed as an ambient impact value measured over a specified averaging time (i.e., similar to an air quality standard).

Presently, the BAAQMD has established the following CEQA significance thresholds:

- A local CO concentration for addressing traffic impacts (not applicable to the proposed project).
- Project construction emissions and impacts are not subject to mass emissions significance criteria, but rather to the overall imposition of all feasible and reasonable control measures to reduce fugitive dust emissions. The BAAQMD's approach to construction impacts is to emphasize implementation of effective and comprehensive

control measures rather than expending valuable time and resources on detailed emissions quantification.

- Project operations emission thresholds for POC, NO_x, and PM_{10}. For each pollutant listed, two separate threshold values apply (i.e., on a tpy and lb/day basis).
- Odor significance thresholds based on facility type and distance to potential receptors (not applicable to the proposed facility).
- Accidental releases of acutely hazardous air emissions. Compliance is established through the CalARP program, which is administered by the local administering agency, the City of Hayward Fire Department.

Based on the above criteria, the proposed project would be considered "significant" for purposes of local CEQA review. Review pursuant to the CEC's certified equivalent CEQA program is considered to fulfill all the local CEQA requirements, including the BAAQMD provisions of its' CEQA guidance.

A conformity determination is not required for the proposed project due to the fact that the proposed project is presumed to be in conformance by virtue of the applicability and required review under the BAAQMD NSR and general permitting rules contained within the State Implementation Plan (SIP). Because the proposed project is required to have a permit from the BAAQMD, and will undergo review pursuant to the BAAQMD NSR and general permitting rules, conformance is established.

8.1.8.13 Cumulative Impacts Analysis

In order to adequately address the proposed project impacts in relationship to other projects in close proximity, a cumulative impacts analysis may be performed. Appendix 8.1H contains the protocol and assumptions that will be employed in performing the cumulative impacts analysis should such an analysis be required. This analysis will be submitted separately from the AFC due to the time period involved, at the air district, to gather and transmit the required data (i.e., source data, type, emissions, location data, physical release data).

8.1.8.14 Facility Closure Impacts

Closure of the facility at the end of its useful lifetime will involve the complete removal, disassembly, and potential demolition of such site characteristics as building and electrical above-ground structures. These activities will be conducted and accomplished under the applicable rules and regulations in place at the time of such closure. Materials derived from the site may be, for instance, sold for future use or for scrap value. Disposal of all materials will be accomplished in compliance with applicable handling, transport, and disposal regulations in effect at the time of closure and removal.

8.1.9 Jurisdictional Agencies, Contacts, and Required Permits

Table 8.1-40 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 8.1-40
Agencies, Contacts, Jurisdictional Involvement, and Required Permits

Agency	Contact	Jurisdictional Area	Permit Status
California Energy Commission	Assigned Project Manager Assigned CEC Member 1516 Ninth St. Sacramento, CA 95814	Primary reviewing and certification agency.	Will certify the proposed facility under the energy siting regulations and CEQA. Certification will contain a variety of conditions pertaining to emissions and operation.
Bay Area Air Quality Management District	Brian Bateman Director, Engineering Division 939 Ellis St. San Francisco, CA 94109 415-749-4653	Prepares DOC for CEC. Issues AQMD Permit to Construct and Operate. Primary air regulatory and enforcement agency	DOC will be prepared subsequent to AFC submittal. DOC application will be submitted to AQMD within 10 days of AFC submittal to CEC.
California Air Resources Board	Mike Tollstrup Chief, Project Assessment Branch 1001 I St., 6th Floor Sacramento, CA 95814 916-322-6026	Oversight of AQMD stationary source permitting and enforcement program	CARB staff will provide comments on applicable AFC sections affecting air quality and public health. CARB staff will also have opportunity to comment on draft ATC.
Environmental Protection Agency, Region 9	Gerardo Rios Chief, Permits Section EPA-Region 9 75 Hawthorne Street San Francisco, CA 94105 415-947-3974	Oversight of all AQMD programs, including permitting and enforcement programs	EPA Region 9 staff will receive a copy of the DOC. EPA Region 9 staff will have opportunity to comment on draft DOC.

8.1.10 References

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