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October 8, 2008

Ms. Angela Hockaday
California Energy Commission
Docket Unit
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: **SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY'S REVISED PERMIT TO CONSTRUCT/ PERMIT TO OPERATE APPLICATION FOR THE CANYON POWER PLANT DOCKET NO. 07-AFC-9**

Dear Ms. Hockaday:

Enclosed for filing with the California Energy Commission are one (1) original and twelve (12) copies of **SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY'S REVISED PERMIT TO CONSTRUCT/ PERMIT TO OPERATE APPLICATION**, for the Canyon Power Plant Project (07-AFC-9).

Sincerely,

David Wiseman

David Wiseman
Counsel to SCPPA

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
For the CANYON POWER PLANT
PROJECT

Docket No. 07-AFC-9

PROOF OF SERVICE
(REVISED 7/31/2008)

INSTRUCTIONS: All parties shall either (1) send an original signed document plus 12 copies or (2) mail one original signed copy AND e-mail the document to the address for the Docket as shown below, AND (3) all parties shall also send a printed or electronic copy of the document, which includes a proof of service declaration to each of the individuals on the proof of service list shown below:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 07-AFC-9
1516 Ninth Street, MS-15
Sacramento, CA 95814-5512
docket@energy.state.ca.us

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DECLARATION OF SERVICE

I, Ashley Garner, declare that on October 8, 2008, I deposited copies of the attached **SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY'S REVISED PERMIT TO CONSTRUCT/ PERMIT TO OPERATE APPLICATION FOR THE CANYON POWER PLANT** in the United States mail at Sacramento, CA with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Ashley Y Garner

REVISED PERMIT TO CONSTRUCT/PERMIT TO OPERATE APPLICATION FOR THE CANYON POWER PLANT

Prepared for

South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Prepared by
The Southern California Public Power Authority
Represented by the City of Anaheim
Public Utilities Department
Anaheim City Hall West
201 South Anaheim Blvd, Suite 802
Anaheim, CA 92805

~~December~~ ~~September~~August ~~2007~~2008

URS

1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108-4314
619.294.9400 Fax: 619.293.7920

URS

September 11, 2008

Ms. Vicky Lee
Air Quality Engineer
South Coast Air Quality Management District
21865 Copley Dr,
Diamond Bar, CA 91765

Subject: Revised *Permit to Construct/Permit to Operate* Application for the Canyon Power Plant

Dear Ms. Lee:

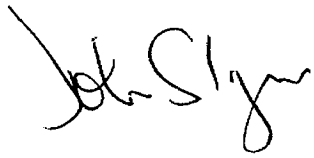
Accompanying this letter are two copies of a revised application for a Permit to Construct/Permit to Operate for the Canyon Power Plant. As requested by SCAQMD, the main text of the document is being submitted in the Track Changes mode of Microsoft Word. This format was chosen in order to clearly delineate changes in the project design and planned operating profile since the original application in December 2007, and to highlight additional data and analyses that have been requested by the District since the initial filing. We are also providing a revised set of appendices, including revised SCAQMD application forms and three new appendices. New Appendices E and J provide information on project emissions and input and output data for the revised air quality and health risk assessment modeling in the format that has been requested previously by the District. New Appendix I is the ECM white paper and BACT analysis that has been prepared to supplement Section 6 of the original application.

The required air quality dispersion modeling and health risk assessment modeling have been completely redone to reflect the parameters of this revised application. These analyses are described in Sections 4 and 5 of the document and several revised appendices. A DVD containing electronic copies of all the current air quality and public health input and output modeling files is being provided to you with this revised application.

We have made every effort to provide complete project information that will enable the District to proceed with the permit review for this project. Please do not hesitate to contact Suzanne Wilson of the City of Anaheim (714-765-4112) or me with questions or concerns regarding any aspect of this application, so that we can promptly make available the information you need to complete your evaluation. We look forward to working closely with you and your staff in this regard.

Sincerely,

URS CORPORATION



John Lague
Senior Air Quality Consultant

cc: Steve Sciortino, City of Anaheim
Suzanne Wilson, City of Anaheim
Cindy Poire, URS Corporation
Scott Galati, Galati/Blek LLP

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Appendix J	Emissions Calculations Confirming Project Offset Requirements (New Appendix)

$\mu g/m^3$	Micrograms per cubic meter
AAQS	Ambient Air Quality Standards
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AFC	Application for ~~certification~~Certification
AQRV	Air quality related values
ARB	Air Resources Board
BACT	Best available control technology
BPIP	Building profile input program
BPIP-Prime	Building Parameter Input Program – Prime
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CATEF	California Air Toxic Emissions Factors
CEC	California Energy Commission
CEMS	Continuous Emissions Monitoring System
CO	Carbon monoxide
CPP	Canyon Power Plant
CTG	Combustion turbine generator
DOC	Determination of compliance
ERC	Emission reduction credit
FLAG	Federal Land Managers' Air Quality Related Values Workgroup
g/s	gram per second
HARP	Hotspots analysis and reporting program
HHV	Higher heating value
HRA	Health risk assessment
ISCST3	Industrial Source Complex Short Term 3rd version
km	kilometers
LORS	Laws, ordinances, regulations, and standards
MMBTU/hr	Million British Thermal Unit per hour
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NNSR	Non-attainment New Source Review
NH_3	Ammonia
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NSR	New source review
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OLM	Ozone limiting method
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PM_{10}	Particulate matter less than 10 μm in diameter
$PM_{2.5}$	Particulate matter less than 2.5 μm in diameter
ppb	parts per billion
ppm	parts per million

PSD	Prevention of significant deterioration
ROG	Reactive organic gases
SCAQMD	South Coast Air Quality Management District
SCR	Selective catalytic reduction
SCPPA	Southern California Public Power Authority
SO_2	Sulfur dioxide
SO_x	Oxides of Sulfur
TAC	Toxic air contaminants
TBACT	Best available control technology for toxics
THI	Total Hazard Index
tpy	tons per year
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator

SECTIONONE

SECTION 1 INTRODUCTION

The Southern California Public Power Authority (SCPPA) is proposing to install a new electrical generating facility nominally rated at 200 megawatts (MW). SCPPA is a consortium of municipalities and an irrigation district established by a Joint Powers Agreement to develop, construct, and operate electric generation and transmission projects. SCPPA is the proponent and the owner of the Canyon Power Project (CPP). The City of Anaheim (COA) is the sole participating member city and will be the Project Manager and Operator. The output of the plant will be used to serve native load within the COA and to meet resource adequacy requirements.

The proposed facility, which is referred to as the Canyon Power Plant (CPP), will be located in the COA in Orange County, California. The site encompasses 9 acres of land approximately 3.25 miles northeast of downtown Anaheim and 25 miles southeast of downtown Los Angeles. The proposed project consists of four natural gas-fired General Electric (GE) LM 6000PC Sprint Combustion Turbine Generators (CTGs) operating in simple cycle mode. Throughout this document, the proposed project is referred to as the CPP, which will be operated by the City of Anaheim Public Utilities Department. The project will result in the installation of new sources of air pollutant emissions that will trigger the New Source Review requirements of Regulations XIII and XX of the South Coast Air Quality Management District (SCAQMD), the agency with regulatory authority over the area that includes the proposed project site.

The pollutant emission sources associated with the project will meet all applicable Best Available Control Technology (BACT) requirements of the SCAQMD, as shown in Section 6 of this revised application. As a result of these strict emission limitations, the project will not cause pollutant concentrations in excess of any applicable SCAQMD Significant Ambient Impact level and will not cause or significantly contribute to an exceedance of any California and National Ambient Air Quality Standards (CAAQS and NAAQS) (see Section 4).

In addition to the SCAQMD permitting process, the proposed project is also undergoing environmental review pursuant to the California Environmental Quality Act (CEQA), with the California Energy Commission (CEC) as the lead agency. Nearly all of the information presented in this revised application has been or will be provided to the CEC as part of the Application for Certification (AFC) that was originally submitted on December 20, 2007. The applicant understands that certification of the resulting CEQA document is a condition for issuing the Permit to Construct for this project.

The initial application for a Permit to Construct/Permit to Operate for the CPP was submitted to SCAQMD in December, 2007. This revised application has been prepared to document changes to the project design and operating profile that have occurred since the original application.

1.1 GENERAL FACILITY INFORMATION

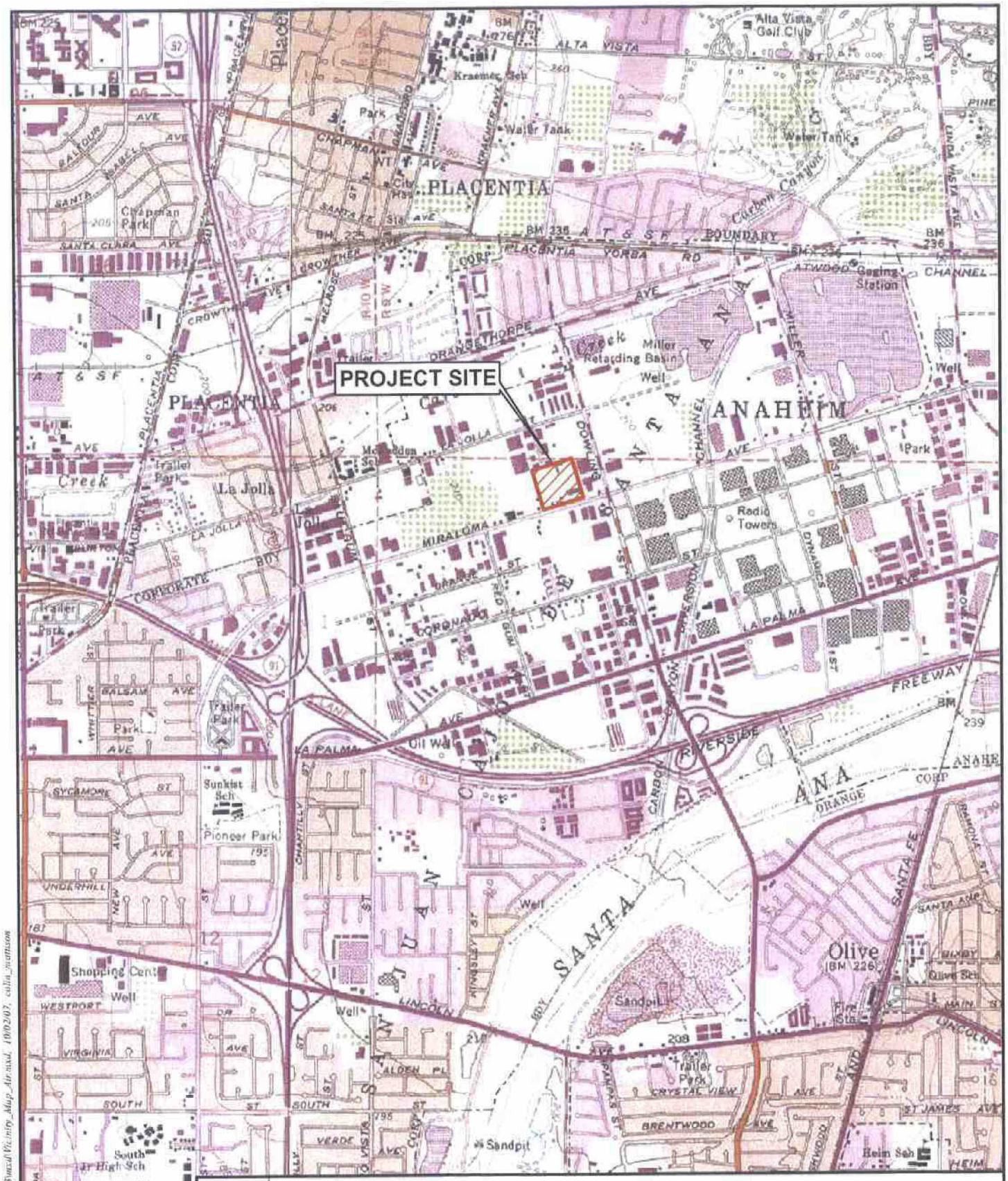
The proposed project will be a newly constructed peaker power plant located in northeastern Anaheim, California, at 3071 East Miraloma Avenue. The 9 acre proposed project site located is roughly 3.25 miles northeast of downtown Anaheim and 25 miles southeast of downtown Los Angeles. The vicinity of the proposed project is a developed, industrial urban area within Orange County, and the site is accessible

from East Miraloma Avenue. Approximately 5.6 acres of the 9.1 acre site will be used for the turbines and ancillary equipment, while the remaining area will be used for the laydown area during construction.

The proposed project site is located in the South Coast Air Basin, which is part of the SCAQMD's jurisdiction. Nearby towns include Placentia, Fullerton, and Yorba Linda. The site is located approximately three quarters of a mile northeast of the CA-91 (Riverside Freeway) and CA-57 (Orange Freeway) interchange. East Miraloma Avenue runs along the south side of the property, while north-south Kraemer Boulevard lies 0.05 miles to the east of the eastern property boundary. Figure 1-1 shows the general vicinity map for the proposed CPP facility.

The CPP will be owned by SCPPA and operated by Anaheim Public Utilities Department. The responsible official and facility contact is Steve Sciortino, Integrated Resources Manager. Mr. Sciortino's contact information is provided below

Integrated Resources Manager	Steve Sciortino	Anaheim Public Utilities Department Anaheim City Hall West 201 South Anaheim Blvd, Suite 802 Anaheim, CA 92805	Tel: (714) 765-5177 Fax: (714) 765-4140 **SSciortino@anaheim.net**



SOURCES: USGS (Topo, various dates)

GENERAL VICINITY
CANYON POWER PLANT POWER STATION
PLOT PLAN AND FENCELINE

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SCALE CORRECT WHEN PRINTED AT 8.5X11

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1.2 APPLICATION OVERVIEW

This revised application package has been designed to respond to the requirements of the SCAQMD New Source Review (NSR) and Title V Federal Operating Permits programs and is intended to provide all the information required to obtain approvals under these programs. It is understood that the ~~current~~ revised permit application supplies materials for permitting all of the following activities related to the proposed project.

- Addition of four 49 MW natural gas-fired General Electric LM 6000PC Sprint Combustion Turbine Generators (CTGs) equipped with evaporative inlet air cooling and water injection into the combustion zone, as well as selective catalytic reduction (SCR) and oxidation catalyst systems to control turbine emissions of air pollutants;
- Addition of one 4-cell chiller cooling tower to support the inlet air cooling;
- Addition of one 10,000-gallon aqueous ammonia storage tank to contain reagent for the SCR emission control system, in-plant distribution piping, and ammonia vaporizer(s);
- Addition of four 86-foot-tall stacks equipped with continuous emissions monitoring systems (CEMS), each stack discharging the exhaust from one CTG unit;
- Addition of one black start generator powered by a 1,141 horsepower diesel internal combustion engine and exhausted through a 20-foot-tall stack.

1.3 SCAQMD APPLICATION FORMS

Completed copies of the required SCAQMD Standard Permit Application Forms as revised since the original submittal are included with this revised permit application as Appendix A. These include:

- Eleven (~~11~~12) Forms 400-A, -Application for Permit to Construct (four each for the gas turbines and SCRs, one for the ammonia storage tank, one for the oil/water separator, one for the black start generator, one for entire project)
- Two~~One~~ (1) Form 400-CEQA, - California Environmental Quality Act (CEQA) Applicability (One for Oil/Water Separator permit)
- Four (4) Form 400-E-12, -Gas Turbines
- Four (4) Form 400-E-5 - SCR System
- One (1) Form 400-E-13a, -Internal Combustion Engines
- Five (5) Form 400-PS, -Plot plan and Stack Information
- ~~One~~ Two (1) Forms 400-E-18, -Storage Tank
- One (1) Form 500-A2, -Title V Certification
- One (1) Form 500-B, TITLE V Exempt Equipment
- One (1) Form 500-C1, TITLE V Compliance Status Certification
- One (1) Form 500-F1, TITLE IV Summary

- One (1) Form 500-H, TITLE V CAM Plan

SECTIONTWO

SECTION 2 FACILITY DESCRIPTION

2.1DESCRIPTION OF PROJECT COMPONENTS

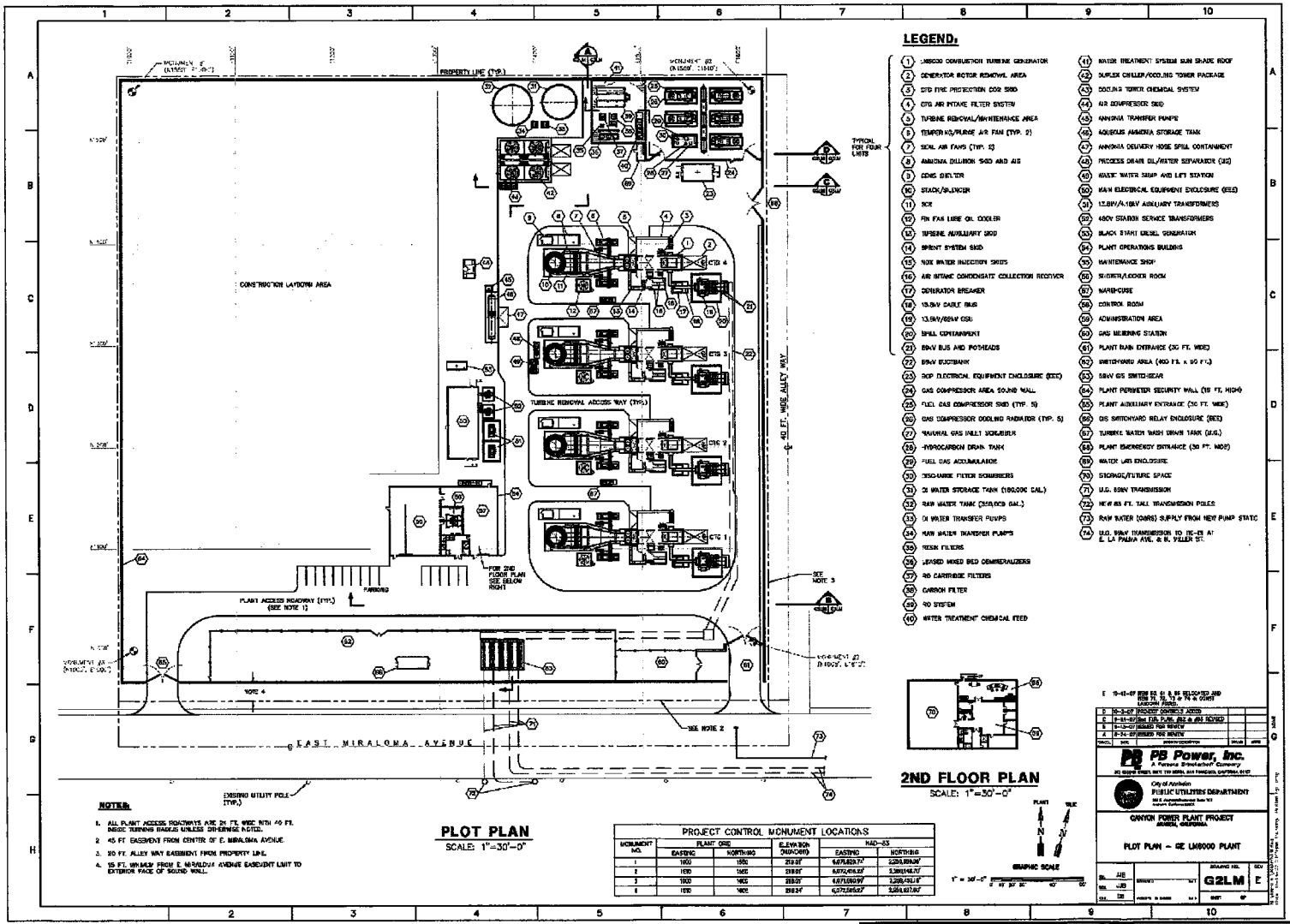
This section describes the major components and systems of the proposed project that will emit air pollutants, including the CTGs, black start engine generator, and chiller system. A list of major mechanical equipment is provided in Table 2-1. Figure 2-1 shows the layout of Project equipment and emissions sources within the proposed site.

Table 2-1
Major Equipment List

Quantity	Description	Size/Capacity[1]	Remarks
4	Combustion Turbine (CT)	49 MW	Water Injected for NO_x control
4	Generators	71,176 KVA	@ 59F, 13.8 kV, Air-Cooled, Brush, Included with CT
1	4-cell Chiller Cooling Tower		Evaporative Cooling System
4	Fuel Gas Compressors	285 psig suction, 650 psig discharge	12 mcf/day
4	SCR/CO Catalyst Emissions Control Systems	BACT	
1	Black Start Generator	1,141 hp	
1	Raw Water Storage Tanks	350,000 gals	
1	Treated Water Storage Tanks	180,000 gals	
1	Ammonia Storage Tank	10,000 gal	19% Aqueous Ammonia and forwarding system

Note:

[1]Approximate size/capacity for each piece of equipment. Final sizing and configuration will be determined during detailed design.
psig = pounds-force per square inch gauge



SOURCES: PB Power Inc. (Drawing 2007).

CANYON POWER PLANT PLOT PLAN AND FENCELINE

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~~2.1.1~~2.1 Combustion Turbine Generators

Thermal energy produced by the combustion of natural gas in the four CTGs will be converted into the mechanical energy required to drive the combustion turbine compressors and electric generators. Four aeroderivative CTGs have been selected for the project. General Electric will supply these CTGs. The aeroderivative technology is the most efficient simple-cycle CTG on the market, and has a documented availability record of 97.8 percent. The construction and commissioning process for the plant will take approximately 12 months.

Each CTG system will consist of a CTG with supporting systems and associated auxiliary equipment. The CTGs will have water injection for controlling NO_X emissions and for power augmentation; CTG exhaust emissions will be further reduced through the use of SCR and oxidation catalyst systems.

The CTGs will be equipped with the following accessories to provide safe and reliable operation:

- Inlet air chilling.
- Inlet air filters.
- Metal acoustical enclosure.
- Lube oil cooler.
- Water injection system.
- Turbine enclosure vent fans.
- Generator enclosure vent fans.
- Fire detection and protection system.

Inlet combustion air will be cooled via a chilled water system to increase turbine performance during high ambient temperature conditions. The combustion turbine also will have water injection spray evaporative inter-cooling between the low-pressure and high pressure compressor sections to increase CTG performance. Water injection into the CTG combustor will be used to suppress flame temperature and thereby control NO_x emissions at the outlet of the CTG.

The exhaust stack transition will be equipped with a post combustion control system that will use ammonia vapor in the presence of a selective catalyst, commonly referred to as the SCR system, to further reduce the NO_x concentration in the exhaust gases. The catalyst module will be located between the CTG exhaust gas transition section and the exhaust stack base. Diluted ammonia vapor (NH_3) will be injected into the exhaust gas stream through a grid of nozzles located upstream of the catalyst module. The subsequent chemical reaction will reduce NO_x to nitrogen and water, resulting in a NO_x concentration of less than 2.~~5~~3 ppmvd at 15 percent oxygen in the exhaust gas. The exhaust stack transition will also include an oxidation catalyst system in the ductwork between the CTG and the SCR system, which will control CO emissions to ~~6~~4 ppmvd at 15 percent oxygen. The oxidation catalyst will also aid in controlling ~~VOC~~ reactive organic gases (ROG) emissions to a level of 2 ppmvd or less, corrected to 15 percent oxygen.

~~2.1.2~~2.2 Black Start Generator Engine

~~2.1.3~~The plant will be designed to start operation without the benefit of power delivered from the City's 69 kV system. This will be achieved in the event of a loss of grid power by the use of a 750 kW diesel generator capable of generating sufficient power at 480 V to allow the plant to start up and then to deliver power into the City's 69 kV distribution system. This unit will meet the Tier II emission standards for stationary diesel internal combustion engines. The 1,141 horsepower black start engine will be tested once ~~hour~~ per month to ensure its operability in the event of an emergency loss of grid power. The applicant requests that the SCAQMD permit allow up to 200 hours per year of total engine operation.

~~2.1.3~~2.3 Chiller Cooling Tower

The proposed project will also include one mechanical draft evaporative chiller cooling tower with a total of four cells. The chiller tower will provide evaporative cooling for the inlet air to the CTGs to augment power production, and will operate during all hours of normal CTG operation.

2.4 Oil/Water Separator

The purpose of the underground separator is to allow gravitational separation of any lubricating oil that may be contained in water used to wash down the project equipment. The wash water, as well as stormwater will flow through equipment drains to the separator. Over time, these trace petroleum products will float to the top of the separator and may volatilize slightly to be vented to atmosphere, although for the most part these will be materials with very low vapor pressures that will be present in very dilute amounts. Based on some rough calculations with the EPA Tanks program, the annual ~~VOC~~ ROG emissions for this source will be limited to a few tenths of a pound, with the actual value depending on the assumptions made regarding the nature of the oils and the average quantity of water in the separator. An application form and supporting data on this source have been submitted to SCAQMD subsequent to the initial PTC/PTO application and are also included in this revised application.

SECTIONTHREE

SECTION 3 PROJECT EMISSIONS INFORMATION

This section provides quantitative estimates of air pollutant emissions that will result from operation of the proposed Project.

3.1 EMISSIONS ESTIMATION METHODOLOGY

The four CTGs will be the dominant sources of air pollutant emissions from the Project. Vendor guarantees have been provided specifying maximum emission levels for certain pollutants emitted by the proposed gas turbines. These levels will comply with the applicable BACT limits for such units, including maximum stack gas concentrations of 2.3~~5~~ ppmvd NO_x, ~~6~~ 4 ppmvd CO, and 2 ppmvd ~~volatile organic compounds (VOC)~~ ROG, all referenced to 15% O_2. The proposed CTGs will use pipeline-quality natural gas fuel exclusively. The natural gas will be supplied to the proposed project by Southern California Gas Company (SCGC). Estimated emissions of sulfur oxides for combustion of this fuel by proposed project equipment assumed full oxidation of all fuel sulfur to SO_2 and an average natural gas sulfur content of 0.25 grains per 100 dry standard cubic feet (dscf). The emission rate used in modeling annual average concentrations of this pollutant used this sulfur content. Modeling for short-term SO_2 concentrations (1-hour, 3-hour, and 24-hour averages) assumed the maximum sulfur content that SCGC may legally provide to the project (i.e., 1 grain per 100 dry standard cubic feet). This higher sulfur content was used in modeling short-term impacts to ensure evaluation that maximum possible concentrations of SO_2 would be addressed, although the likelihood that actual natural gas shipments will ever contain such high sulfur levels is considered very remote. The black start engine will use ultra-low sulfur diesel fuel. Estimated emissions of sulfur oxides for combustion of this latter fuel assumed full oxidation of all fuel sulfur to SO_2 and a diesel sulfur content of 15 ppm by weight. Calculation sheets showing detailed criteria pollutant emission calculations are provided in Appendix B to this revised application.

3.2 ESTIMATED CRITERIA POLLUTANT EMISSIONS

3.2.1 Normal Turbine Operating Emissions

The most important emission sources of the proposed project will be the new CTGs. Maximum short-term operational emissions from the CTGs were determined from a comparative evaluation of emissions corresponding to a full range of possible turbine loads and ambient conditions, as well as CTG startup/shutdown conditions. The long-term operational emissions from the CTGs were estimated by summing the anticipated annual emissions contributions from normal full-load operations and from the expected numbers of CTG startups and shutdowns. Estimated annual emissions of air pollutants from the CTGs have been calculated based on the expected operating schedule presented in Table 3-1. Table 3-1 has been revised to reflect the increase in startup time from 20 minutes assumed in the original application to 35 minutes which is necessary to achieve full compliance with the steady state emission limit. In addition normal operating hours have been reduced to ensure the CPP will emit less than 4 tons per year of PM_{10}.

Table 3-1 (Revised)
Maximum Proposed CTG Operating Schedules

Operating Conditions (CTGs 1 through 4)	Annual Numbers
Number of Startups/Shutdown Cycles per CTG	~~128.5~~129
Startup/Shutdown Time (hours per CTG)	~~60~~96.75
Normal Operating Hours (Combined hours for Four CTGs)	~~4,006~~2,408(4 x 602 hours/turbine)

Each CTG unit will be equipped with a new stack with the following dimensions:
Height – 86 feet (ft)
Diameter – 11.7 ft

The hourly criteria pollutant emission rates and stack parameters provided by the CTG vendors for three load conditions (50 percent, 75 percent, and 100 percent) at three ambient temperatures (38°F, 59°F, and 109°F) are presented in Table 3-2. Table 3-2 has been revised to reflect the lower concentration limit of CO of 4 ppm @ 15 percent O_2. The cases listed in this table also include emissions data for CTG operations with and without evaporative cooling of the inlet air to the turbines for full load CTG operation and/or for the higher ambient temperature conditions. The combined scenarios presented in this table bound the expected normal operating range of each proposed CTG.

Table 3-2 (Revised)
1-Hour Operating Emission Rates and Stack Parameters for Individual CTG Operating Load Scenarios

Case No.	1	2	3	4	5	6	7	8	9
Ambient Temperature (°F)	109	109	109	59	59	59	38	38	38
Stack Diameter (ft)	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67
Exhaust Flow (lb/hr)	1,066,554	907,936	764,619	1,080,197	963,857	832,416	1,085,651	992,555	867,866
CTG Load Level (percent)	100	75	50	100	75	50	100	75	50
Evaporative Cooler	ON	ON	NONE	ON	NONE	NONE	NONE	NONE	NONE
Exhaust Temperature (°F)	841.6	858.9	832.6	838.6	785.5	754.2	836.7	759.9	710.4
Exit Velocity, ft/minute	5,461.0	4,710.7	3,888.0	5,518.1	4,722.4	3,975.9	5,537.9	4,763.1	3,995.7
NO_X Emissions per Turbine Unit									
ppmvd @ 15 percent O_2	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32
lb/hr	3.99	3.19	2.40	4.05	3.20	2.38	4.03	3.18	2.39
CO Emissions per Turbine Unit									
ppmvd @ 15 percent O_2	~~6.0~~4.0	~~6.0~~4.0	~~6.0~~4.0	~~6.0~~4.0	~~6.0~~4.0	~~6.0~~4.0	~~6.0~~4.0	~~6.0~~4.0	~~6.0~~4.0
lb/hr	4.19~~6.28~~	3.34~~5.01~~	2.52~~3.78~~	4.24~~6.36~~	3.34~~5.01~~	2.50~~3.75~~	4.23~~6.34~~	3.34~~5.00~~	2.50~~3.76~~
~~VOC~~ **ROG Emissions per Turbine Unit**									
ppmvd @ 15 percent O_2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
lb/hr as methane (CH_4)	1.19	0.95	0.71	1.20	0.95	0.70	1.20	0.96	0.71
PM_{10} Emissions per Turbine Unit									
lb/hr[1]	2.95~~2.99~~	2.36~~2.39~~	1.78~~1.80~~	3.00~~3.04~~	2.37~~2.40~~	1.77~~1.79~~	2.99~~3.03~~	2.36~~2.39~~	1.78~~1.80~~

Table 3-2 (Revised)
1-Hour Operating Emission Rates and Stack Parameters for Individual CTG Operating Load Scenarios (Continued)

Case No.	1	2	3	4	5	6	7	8	9
SO_X Emissions per Turbine Unit									
(short-term rate) lb/hr[2]	1.34	1.07	0.81	1.36	1.07	0.80	1.35	1.07	0.80
(long-term rate) lb/hr[2]	0.33	0.27	0.20	0.34	0.27	0.20	0.34	0.27	0.20

Notes:

[1] As discussed with SCAQMD, the applicant will commit to meet a PM_{10} mass emission rate limit of 3.0 lb/hour/turbine during all unit operations, and this value is used in all subsequent analyses of this revised application.

[2] A worst-case short-term natural gas fuel sulfur content of 1.0 grains per 100 dry standard cubic feet was used to estimate the CTG emissions of SO_2 in this table for modeling purposes only and not for emission calculations. The actual expected average fuel gas sulfur content is 0.25 grains per 100 dry standard cubic feet; this latter value was used to estimate the annual SO_2 emission rates and all other emission calculations.

CO = carbon monoxide
CTG = combustion turbine generator
lb/hr = pounds per hour
NO_X = nitrogen oxide
ppmvd = parts per million by volume, dry
O_2 = oxygen
PM_{10} = particulate matter 10 microns in diameter
ppmvd = parts per million by volume, dry
SO_X = sulfur oxides
~~VOC~~ ROG = ~~volatile organic compounds~~reactive organic gases

3.2.2 Turbine Startup and Shutdown Emissions

The expected emissions and durations associated with CTG startup and shutdown events are summarized in Table 3-3. Because hours that include startup and shutdown events would have higher NO_X, CO, and ~~VOC~~ ROG emissions than the normal operating condition with fully functioning SCR and CO oxidation catalyst, one or more startup/shutdown cycles were incorporated (as applicable) into the worst-case short- and long-term emissions estimates in the air quality dispersion modeling simulations for these pollutants. Appendix B provides tables showing the estimated emissions for each minute of a typical turbine startup and shutdown sequence.

For NO_x during a startup event, the total emissions have been increased to account for increasing the startup event time from 20 minutes which was assumed in the previous version of the application to 35 minutes necessary to achieve compliance with the steady state emission limit. For NO_x during a shutdown event the values have been reduced from the values shown in the previous version of the application to account for the continued operation of the SCR for a portion of the shutdown event and have been revised to account for increasing the shutdown time from 8 to 10 minutes.

For CO during a startup event, although the emission concentration has been reduced from 6 ppm to 4 ppm, the total emissions have been revised to account for the increased startup time necessary to achieve compliance with steady state emission rates. For CO during a shutdown event, the total emissions have reduced from the values shown in the previous version of the application to account for the continued operation of the CO catalyst during a shutdown and have been revised to account for increasing the shutdown time from 8 to 10 minutes.

For ~~VOC~~ROGs during a startup event, the total emissions have been increased to account for increasing the startup event time from 20 minutes which was assumed in the previous version of the application to 35 minutes necessary to achieve compliance with the steady state emission limit and to revise an error in the original calculations. For ~~VOC~~ROGs during a shutdown event the values have been increased from values shown in the previous version of the application to correct an error in the original calculations and to account for increasing the shutdown time from 8 to 10 minutes.

For SO_2 during a startup event the values have been revised to account for increasing the startup event time from 20 minutes which was assumed in the previous version of the application to 35 minutes. For shutdown the total emissions have been revised to account for the increased shutdown time from 8 to 10 minutes. In addition the original application calculated startup emissions for SO_2 during startup and shutdown events using a sulfur content of 1 gr/100 dscf which is the tariff limit. The emission calculations for both startup and shutdown have been revised to reflect the lower expected sulfur content of 0.25 gr/100 dscf.

For PM_{10} the emission values have been increased for both startup and shutdown events to account for the event times increaseds, as described above and to reflect the GE guarantee.

Table 3-3 (Revised)
Criteria Pollutant Emission Rates During CTG Startup and Shutdown (per turbine)

Pollutant	Startup (~~20~~ 35 minutes duration)		Shutdown (~~8~~ 10 minutes duration)	
	Maximum Instantaneous Emission Rate (lb/hr)*	Total Emissions (lb/event)	Maximum Instantaneous Emissions Rate (lb/hr)*	Total Emissions (lb/event)
NO_X	~~20.87~~50.00	~~6.96~~10.09	~~21.36~~6.35	~~2.85~~0.69
CO	~~13.27~~22.00	~~4.42~~4.061	~~18.38~~4.8	~~2.45~~0.62
~~VOC~~ROG	~~0.75~~2.50	~~0.25~~0.79	~~0.39~~2.25	~~0.05~~0.27
SO_2	~~1.08~~1.32	~~0.360.1457~~	~~0.80~~1.32	~~0.110.0210~~
PM_{10}	~~2.01~~3.0	~~0.67~~1.29	~~1.14~~2.52	~~0.15~~0.18

Note:

CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns in diameter
SO_2 = sulfur dioxide
~~VOC~~ ROG = ~~volatile organic compounds~~reactive organic gases

*The Maximum Instantaneous Emission Rate is the highest instantaneous value shown on the respective startup or shutdown emission curves, as included Appendix E

3.2.3 Additional Emission Sources

The proposed project will include a black start generator engine powered by diesel fuel. The 750 kilowatt (kW) black start engine will be tested ~~one hour~~once per month to ensure its operability during an emergency outage of grid power. However, the applicant requests that the AQMD permit allow for up to 200 hours per year of total operating time. Annual emissions and stack parameters for the testing of the engine are provided in Table 3-4. Emission rates shown in this table are based on EPA Tier 2 diesel engine emission factors. Credit has been taken for a particulate emission control efficiency of 85% which will be achieved by installation of a particulate filter trap. fThe engine fuel will be ultra-low sulfur diesel containing a maximum of 15 ppm sulfur (weight basis). Table 3-4 emission calculations have been revised to reflect SCAQMD direction to increase the NO_x emission rate from 10.54 to 12.06 pounds/hour and to reflect the lower emission rates associated with the installation of the particulate filter trap.

The proposed project will also include a small mechanical draft evaporative chiller cooling tower with a total of four cells. The cooling tower will emit a small amount of particulate matter (see Table 4-2 and Appendix B).

Detailed emissions calculations for all equipment of the operation of the~~nal~~ proposed project, including estimated ROG and organic TACs due to an on-site oil water separator, are provided in Revised Appendix B.

Table 3-4 (Revised)
Black Start Generator Engine Emission Parameters

Pollutant	Black Start Engine Emissions	
	lb/hr	lb/yr
NO_x	~~10.58~~12.06	~~126.99~~2,412
CO	5.79	~~69.45~~1157.4
~~VOC~~ROG	~~1.65~~0.05	~~19.84~~10.00
SO_x	~~0.01~~0.006	~~0.07~~1.14
PM_{10}	~~0.33~~0.0496	~~3.97~~9.92

Source
Annual emissions based on ~~12~~ 200 hours of operation
Stack height: 20 feet
Stack diameter: 0.83 feet
Stack exhaust flow rate at full firing: 5,647 actual cubic feet per minute (ACFM)
Stack exhaust temperature at full firing: 949.8 °F

3.2.4 Turbine Commissioning Emissions

Commissioning of each new CTG will be performed in a defined series of tests that will be conducted following its installation at the proposed project facility. The specific tests to be run on each CTG include:

- First fire the unit and then shutdown to check for leaks, etc.
- Synch and check emergency stop (e-stop)
- Additional automatic voltage regulator (AVR) commissioning
- Break-in run
- Dynamic commissioning of AVR and commission water injection and SPRINT
- Base load AVR commissioning

The duration of all tests may be affected by unforeseen events and therefore can only be estimated in advance. Commissioning of each CTG with partially abated emissions is expected to require a maximum of ~~104~~ 156 hours of operation~~, during a period not to exceed 1 month~~. At least one CTG start would be needed for each test, and additional starts may be necessary. The annual frequency of CTG starts during the year when commissioning occurs is not expected to exceed the frequency of CTG starts during operation (refer to Table 3-1). Fuel flow monitoring would be conducted for all tests.

The CPP proposes a commissioning period of approximately 4 months during which all installed equipment would be run and tested. The CTG commissioning periods would begin when the CTGs first burn natural gas fuel. The applicant will make every effort to minimize emissions of CO, ~~VOC~~ROG, and NO_x during the commissioning period. However, not all of the equipment to abate these emissions would

be fully operational at the start of the commissioning period. The CPP requests a maximum of ~~104~~ 156 hours of partially abated emissions for each CTG.

When it has been installed, the oxidation catalyst in each train will abate CO and ~~VOC~~ ROG emissions from the CTG, because it is essentially a passive device. While in some cases it may be possible to install the oxidation catalyst prior to initial startup of the CTGs, it may not be installed until late in the commissioning period. The SCR catalyst may not be installed at the same time as the oxidation catalyst. NO_x emissions from the CTG may be only partially abated during times that the CTG burners are being tuned and the SCR system is being tested. Regardless of the fact that the oxidation catalyst and SCR may not be installed until late in the commissioning process, the inherent low emissions of NO_x, CO, and ~~VOC~~ ROG associated with water injection will ensure that the impacts of these emissions are kept to low levels. Dispersion modeling to evaluate the impacts of commissioning tests on local air quality is presented in Section 4.7.

Conservative, worst-case turbine commissioning emissions were estimated by assuming that the control efficiency of the applicable abatement systems will be zero during the commissioning tests. Emissions of SO_2 are estimated by assuming full ~~sulfur~~ conversion of the sulfur in the natural gas to SO_2, and may vary based on the amount of natural gas burned. Since the commissioning activities occur at low loads, SO_2 emissions will be higher from full-load normal operations and thus were not examined in the analysis of impacts during the turbine commissioning phase.

The durations and corresponding pollutant emission rates of individual commissioning tests for a single combustion turbine generator are summarized in Table 3-5. Table 3-5 has been revised to reflect the increase in the number of commissioning hours from 104 to 156. In addition, the original application ~~coaclucated~~calculated PM_{10} emissions during commissioning using a commissioning emission rate of 4 pounds/hour. After consultation with GE, the emission rate during commissioning would meet the GE guarantee of 3 pounds/hour, and the table has been revised to reflect this lower emission rate for PM_{10}. In addition, in order to address requests from SCAQMD, the table has been revised to add the fuel flow rate and estimated total fuel usage during commissioning.

Detailed information regarding the assumed sequence of individual CTG commissioning tests and the associated pollutant emissions is provided in Appendix B.

Detailed emissions calculations for all equipment of the operation of thenal proposed project, including estimated ROG and organic TACs due to an on-site oil water separator, are provided in Revised Appendix B.

Table 3-4 (Revised)
Black Start Generator Engine Emission Parameters

Pollutant	Black Start Engine Emissions	
	lb/hr	lb/yr
NO_X	~~10.58~~12.06	~~126.96~~2,412
CO	5.79	~~69.45~~1157.4
~~VOC~~ROG	~~1.65~~0.05	~~19.84~~10.00
SO_X	~~0.04~~0.006	~~0.07~~1.14
PM_{10}	~~0.33~~0.0496	~~3.97~~9.92

Source
Annual emissions based on ~~12~~ 200 hours of operation
Stack height: 20 feet
Stack diameter: 0.83 feet
Stack exhaust flow rate at full firing: 5,647 actual cubic feet per minute (ACFM)
Stack exhaust temperature at full firing: 949.8 °F

Table 3-5 (Revised)
Durations and Criteria Pollutant Emissions for Commissioning of a Single CTG

Activity	Duration (hours)	% Output at ISO	Fuel Gas Flow Rate (MMCF/hr)	Estimated Total Fuel Usage (MMCF)	Exhaust Temp (°F)	Exhaust Flow Rate (acfm)	Total Pollutant Estimated Emission per Event (lbs)				
							NO_X	CO	VOC/ROG	PM_{10}	SO_2
1. First fire the unit and then shutdown to check for leaks, etc.	24	CI	0.0833	1.9032	694	199,271	200	822	27	96	6
2. Synch and check e-stop	18	SI	0.0833	1.4355	694	199,271	150	617	20	72	4
3. Additional automatic voltage regulator (AVR) commissioning	18	5%	0.1031	1.8065	726	218,499	261	329	8	72	5
4. Break-in run	12	5%	0.1031	1.2097	726	218,499	174	219	5	48	4
5. Dynamic commissioning of AVR and commission water injection and SPRINT	60	10 – 100%	0.1194 – 0.4559	31.3871	713 – 843	239,475 – 513,911	1636	819	11	240	49
6. Base load AVR commissioning	24	100%	0.4559	5.1613	843	513,911	1023	409	30	96	32
Total emissions during commissioning	156			42.90			3443	3213	99	468	100

Notes:
After SCR catalyst installaton, the NOx emissions would be reduced by 82%. This applies to activities 2-6; thus NOx emissions presented in this table will be reduced by 82%

After SCR catalyst installaton, the NOx emissions would be reduced by 85%. This applies to activities 2-6; thus CO emissions presented in this table will be reduced by 85%

AVR = automatic voltage regulator
SCR = selective catalytic reduction
At ISO = ambient temperature of 59 °F, relative humidity of 60%, and sea level
CI = core idle mode of turbine operation, no load placed on unit
SI = synch idle mod of turbine operation, no load placed on unit

3.2.5 Combined Annual Project Emissions

The estimated total combined annual emissions from all criteria pollutants sources of the proposed project are shown in Table 3-6, including four CTG units, the black start engine, and the 4-cell chiller cooling tower. Annual emissions of all pollutants were calculated assuming the CTG hours per year of operation described previously in Table 3-1 and the corresponding hours of the 4-cell chiller cooling tower operation. Total operating time for ~~esting of~~ the blackstart engine was assumed to ~~occur~~ be ~~one hour per month (12~~ 200 hours per year). Table 3-6 has been revised to reflect the reduced operating hours of all equipment, the increase startup and shutdown times, and the revised emission rates as described in this revised application.

Table 3-6 (Revised)
Estimated Total Project Annual Emissions of Criteria Pollutants for Normal Operating Year

Pollutant	Emissions (tons/year)[1,2]
SO_2	~~2.84~~0.45
NO_x	~~10.69~~8.78
~~ROC~~ROG	~~2.49~~1.72
PM_{10}[3]	~~6.37~~3.99
CO	~~14.54~~6.89
Lead[4]	<0.6

Notes:
[1] Includes emissions from four new CTG units
[2] CTG emissions based on ~~1,001.5~~ 602 hours normal operation, plus ~~128.5~~129 starts and shutdowns for each turbine
[3] PM_{10} emissions includes both filterable (front-half) and condensable (back-half) particulates
[5] Annual SO_2 emissions calculated based on expected maximum natural gas sulfur content of 0.25 gr/100 dry standard cubic feet
[4] Lead emissions are 'non-detect' from AP-42 for CTGs firing natural gas
CO = carbon monoxide
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 micrometers in diameter
ROC = reactive organic compounds
SO_2 = sulfur dioxide

3.3 ESTIMATED TOXIC AIR CONTAMINANT EMISSIONS

Facility operations were evaluated to determine whether particular substances would be used or generated at the proposed project site that may have the potential to cause adverse health effects upon their release to the air. The primary sources of potential emissions from facility operations would be the four natural gas-fired CTGs, as well as the aqueous ammonia slip stream from the SCR control system on each turbine. Secondary sources of potential emissions include the evaporative cooling towers and diesel fuel combustion in the black start engine. The black start engine will normally be operated only for short periods in testing mode to ensure operability if needed. The cooling tower will employ a high-efficiency drift elimination system to minimize the release of drift droplets containing trace amounts of hazardous substances. The substances that would be emitted from facility operations (with potential toxicological impacts) are listed in Table 3-7. The table has revised to reflect toxicity values recommended by Cal-

EPA/OEHHA. These toxic air contaminants were identified from emission factors published by the United States Environmental Protection Agency AP-42 (USEPA, 1995), the California.

Table 3-7
Toxicity Values Used To Characterize Health Risks

Compound	Sources of Emissions	Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Chronic REL ($\mu g/m^3$)	Acute REL ($\mu g/m^3$)
Diesel particulate (PM_{10})	Black start engine	1.10E+00	5.00E+00	--
Ammonia	Gas turbine stacks	--	2.00E+02	3.20E+03
1,3-Butadiene	Gas turbine stacks	6.00E-01	2.00E+01	--
Acetaldehyde	Gas turbine stacks	1.00E-02	9.00E+00	--
Acrolein	Gas turbine stacks	--	6.00E-02	1.90E-01
Benzene	Gas turbine stacks	1.00E-01	6.00E+01	1.30E+03
Ethylbenzene	Gas turbine stacks	8.70E-03	2.00E+03	--
Formaldehyde	Gas turbine stacks	2.10E-02	3.00E+00	9.40E+01
Propylene oxide	Gas turbine stacks	1.30E-02	3.00E+01	3.10E+03
Toluene	Gas turbine stacks	--	3.00E+02	3.70E+04
Xylenes	Gas turbine stacks	--	7.00E+02	2.20E+04
Benzo(a)anthracene	Gas turbine stacks	3.90E-01	--	--
Benzo(a)pyrene	Gas turbine stacks	3.90E+00	--	--
Benzo(b)fluoranthene	Gas turbine stacks	3.90E-01	--	--
Benzo(k)fluoranthene	Gas turbine stacks	3.90E-01	--	--
Chrysene	Gas turbine stacks	3.90E-02	--	--
Dibenz(a,h)anthracene	Gas turbine stacks	4.10E+00	--	--
Indeno(1,2,3-cd)pyrene	Gas turbine stacks	3.90E-01	--	--
Naphthalene	Gas turbine stacks	1.20E-01	9.00E+00	--
~~Antimony~~	~~Cooling tower~~	--	~~2.00E-01~~	--
Arsenic	Cooling tower	1.20E+01	3.00E-02	1.90E-01
Beryllium	Cooling tower	8.40E+00	7.0E-03	--
Cadmium	Cooling tower	1.50E+01	2.00E-02	--
Chlorine	Cooling tower	--	2.00E-01	2.10E+02
Chromium	Cooling tower	5.10E+02	2.00E-01	--
Copper	Cooling tower	--	~~2.40E+00~~	1.00E+02
Cyanide	Cooling tower	--	9.0E+00	3.4E+02
Fluoride	Cooling tower	--	1.30E+01	2.40E+02
Lead	Cooling tower	4.20E-02	--	--

Table 3-7
Toxicity Values Used To Characterize Health Risks
(Continued)

Compound	Sources of Emissions	Inhalation Cancer Potency Factor (mg/kg-day)$^{-1}$	Chronic REL (µg/m^3)	Acute REL (µg/m^3)
Manganese	Cooling tower	--	2.0E-01	--
Mercury	Cooling tower	--	9.0E-02	1.8E+00
Nickel	Cooling tower	9.1E-01	5.00E-02	6.0E+00
Selenium	Cooling tower	--	2.00E+01	--
Silica	Cooling tower	--	3.00E+00	--
Sulfate	Cooling tower	--	--	1.20E+02
~~Zinc~~	~~Cooling tower~~	--	~~3.50E+01~~	--

Source: Cal-EPA/OEHHA, 2008

Notes:

-- = not applicable

mg/kg-day = milligrams per kilogram per day

µg/m^3 = micrograms per cubic meter

REL = reference exposure levels

Air Toxic Emission Factors database (CATEF) (CARB, 1996), and from analysis of the chiller cooling tower makeup water. In addition, potential emissions of ammonia slip from the SCR systems were included.

Worst-case estimates of hourly and annual turbine emissions were made by assuming that all turbines would operate simultaneously under full load conditions with a maximum higher heating value (HHV) fuel energy input rate of 480.6 million British thermal units per hour per turbine (MMBtu/hr/turbine) (100 percent load at 59 degrees Fahrenheit [°F]). The annual emission calculations are based on operation of each turbine for a maximum of ~~1,061~~698.75 hours per year (~~1,001.5~~602 hours of normal operations plus ~~128.5~~129 startups and shutdowns for an additional 96.75 hours).

Per SCAQMD recommendations, emission factors for natural gas-fired turbines were obtained from Table 3.1 3 of the AP-42 reference (USEPA, 1995). Speciated polyclyclic aromatic hydrocarbons (PAH) emission factors for natural gas-fired combustion turbines equipped with SCR and CO catalyst systems were provided from the CATEF database In addition, potential ammonia slip emissions from the SCR systems were included in the air toxics analysis. The emission factors and estimated maximum hourly and annual turbine emissions of toxic air contaminants (TAC) are summarized in Table 3-8. The annual turbine emissions have been revised to reflect the decreased hours of operation.

Table 3-8 (Revised)
Toxic Air Contaminant Emission Rates ~~From~~from Operation of the CPP Natural Gas Fired Combustion Turbines (Per Turbine)

Chemical Species	Emission Factor (lb/MMBtu)[1]	Maximum Hourly Emissions per Turbine (lb/hr)	Annual Emissions Per Turbine (lb/hr)
Ammonia[2]		3.64	2.54E+03~~3.86E+03~~
1,3-Butadiene	4.30E-07	2.07E-04	1.44E-01~~2.19E-01~~
Acetaldehyde	4.00E-05	1.92E-02	1.34E+01~~2.04E+01~~
Acrolein	3.62E-06	1.74E-03	1.22E+00~~1.85E+00~~
Benzene	3.26E-06	1.57E-03	1.09E+00~~1.66E+00~~
Ethylbenzene	3.20E-05	1.54E-02	1.07E+01~~1.63E+01~~
Formaldehyde	3.60E-04	1.73E-01	1.21E+02~~1.84E+02~~
Propylene Oxide	2.90E-05	1.39E-02	9.74E+00~~1.48E+01~~
Toluene	1.30E-04	6.25E-02	4.37E+01~~6.63E+02~~
Xylenes	6.40E-05	3.08E-02	2.15E+01~~3.26E+02~~
Polycyclic Aromatic Hydrocarbons (PAH)			
Benzo(a)anthracene	2.23E-08	1.07E-05	7.50E-03~~1.14E-02~~
Benzo(a)pyrene	1.37E-08	6.60E-06	1.32E-01~~1.32E-01~~
Benzo(b)fluoranthene	1.12E-08	5.37E-06	3.75E-03~~5.69E-03~~
Benzo(k)fluoranthene	1.09E-08	5.22E-06	3.65E-03~~5.54E-02~~
Chrysene	2.49E-08	1.20E-05	8.36E-03~~1.27E-02~~
Dibenz(a,h)anthracene	2.32E-08	1.12E-05	7.80E-03~~1.18E-02~~
Indeno(1,2,3-cd)pyrene	2.32E-08	1.12E-05	7.80E-03~~1.18E-02~~
Naphthalene	1.64E-06	7.88E-04	5.51E-01~~8.36E-01~~

Notes:

[1] See Appendix ~~B~~ C for detailed emission calculations. Emission factors obtained from USEPA AP-42 Table 3.1-3 for uncontrolled natural gas-fired stationary turbines. Formaldehyde, Benzene, and Acrolein emission factors are from the Background document for AP-42 Section 3.1, Table 3.4-1 for a natural gas-fired combustion turbine with a CO catalyst. Speciated PAH emission factors obtained from the CATEF database for natural gas-fired combustion turbines with SCR and CO catalyst. Ammonia emission rate based on an exhaust NH_3 limit of 5 ppmv @ 15% O2 guaranteed by the equipment vendor.

[2] Not a Clean Air Act Hazardous Air Pollutant (HAP).

lb/hr = pounds per hour

lb/yr = pounds per year

lb/MMBtu = pounds per million British thermal units

ppm = parts per million

Trace levels of inorganic particles were identified in the analysis of the source water for the 4-cell chiller cooling tower, and low-level emissions of these pollutants would therefore be contained in the particulate

matter emitted as drift from the chiller cooling tower. To calculate the cooling tower emissions, a water circulating rate of 7,740 gallons per minute with 10 cycles of concentration was used, with a drift elimination system capable of limiting drift to no more than 0.001 percent of the circulating water rate, as guaranteed by the equipment vendor. Water anticipated to be used for makeup to the cooling tower was sampled to determine the maximum concentrations of inorganic chemicals. These values were then used to determine the maximum TAC emissions from the cooling tower. For the annual emission calculations it was conservatively assumed that the chiller cooling tower would operate for a maximum of ~~4,006~~2,795 hours per year (i.e., 4 times the annual total operating time of any one turbine, including startups and shutdowns). Emission factors and estimated maximum hourly and annual TAC emissions from the entire cooling tower are summarized in Table 3-9.

Table 3-9 (Revised)
Toxic Air Contaminant Emission Rates from Operation of the Chiller Cooling Tower (Emission Totals for all Four Cells)

Chemical Species	TAC Concentration in Water (µg/L)[1]	Maximum Hourly Emissions (lb/hr)	Annual Emissions (lb/yr)
~~Antimony~~	~~0.6~~	~~2.33E-07~~	~~6.50E-04~~9.31E-04
Arsenic	4.8	1.86E-06	5.20E-03~~7.45E-03~~
Beryllium	0.1	3.88E-08	1.08E-04~~1.55E-04~~
Cadmium	0.1	3.88E-08	1.08E-04~~1.55E-04~~
Chlorine	9,300	3.60E-03	1.01E+01~~1.44E+01~~
Chromium	1.1	4.26E-07	1.19E-03~~1.71E-03~~
Copper[2]	28	1.09E-05	3.03E-02~~4.35E-02~~
Cyanide	46	1.78E-05	4.98E-02~~7.14E-02~~
Fluoride[2]	30	1.16E-05	3.25E-02~~4.66E-02~~
Lead	1.6	6.20E-07	1.73E-03~~2.48E-03~~
Manganese	9.2	3.57E-06	9.96E-03~~1.43E-02~~
Mercury	0.05	1.94E-08	5.42E-05~~7.76E-05~~
Nickel	0.1	3.88E-08	1.08E-04~~1.55E-04~~
Selenium	16	6.20E-06	1.73E-02~~2.48E-02~~
Silica[2]	970	3.76E-04	1.05E+00~~1.51E+00~~
Sulfate[2]	2,550	9.88E-04	2.76E+00~~3.96E+00~~
~~Zinc[2]~~	~~5~~	~~1.94E-06~~	~~5.42E-03~~7.76E-03

Notes:
[1]See Revised Appendix C for detailed emission calculations. The maximum concentration for each TAC as determined from water samples collected from the water for use with the CPP cooling tower.
[2]Not a Clean Air Act Hazardous Air Pollutant (HAP).
µg/L = micrograms per liter
lb/hr = pounds per hour
lb/yr = pounds per year

Fine particulate (PM_{10}) emission factors for the diesel-fired black start engine were obtained from the vendor, and are based on the USEPA Tier 2 emission limit for new diesel engines with an additional 85% PM_{10} control efficiency from use of a particulate trap. PM_{10} emissions from the diesel-fired black start engine were estimated assuming it would run at its full rated capacity of 750 kW ~~for one hour per month to test the engine~~no more than 200 hours per year for testing, maintenance and emergency generation duty. ~~Actual emergency use of the diesel engine was not included.~~ Emission factors and estimated maximum hourly and annual emissions from the black start engine are summarized in Table 3-10.

Table 3-10 (Revised)
Toxic Air Contaminant Emission Rates from Operation of the Diesel Black Start Engine

Engine	Chemical Species	Emission Factor[1]	Maximum Hourly Emissions per Engine (lb/hr)	Annual Emissions Per Engine (lb/yr)
Black Start	Diesel Particulate (PM_{10})[2]	0.20 03 g/kW-hr	0.3300.0496	3.9659.912

Notes:

[1] See Revised Appendix C for detailed emission calculations. Emission factors obtained from engine vendors for USEPA Tier 2 engines with an additional 85% control efficiency from the particulate trap.
[2] Not a Clean Air Act Hazardous Air Pollutant (HAP).
g/kW-hr = grams per kilowatt hour
~~g/hp-hr = grams per horsepower hour~~
lb/hr = pounds per hour
lb/yr = pounds per year

The emissions data in Tables 3-8 through 3-10 are used in the health risk assessment presented in Section 5 of this revised application.

SECTION FOUR

SECTION 4 AIR QUALITY IMPACT ANALYSIS

The purpose of the air quality impact analysis presented in this section is to evaluate whether criteria pollutant emissions resulting from operations of the proposed project, would cause or contribute significantly to a violation of a California or national ambient air quality standards. Potential impacts associated with toxic air contaminant emissions from the CPP are addressed in Section 5.

Mathematical models designed to simulate the atmospheric transport and dispersion of airborne pollutants were used to quantify the maximum expected impacts of project emissions on ambient air quality for comparison with applicable regulatory criteria. The air quality modeling methodology described in this section has been documented in a formal modeling protocol (URS, 2007), which has been submitted for comments to SCAQMD, as well as to the CEC. A copy of the modeling protocol is presented in Appendix D. Comments received on the protocol from SCAQMD have been considered in conducting the modeling analyses described in this revised application.

4.1 MODEL AND MODEL OPTION SELECTIONS

The impacts of project operational emissions on criteria pollutant concentrations in the area adjacent to the proposed project site were evaluated using the AERMOD dispersion model (Version 07026). AERMOD is an appropriate analysis tool for this revised application, because it has the ability to assess dispersion of emission plumes from multiple point, area, or volume sources in flat, simple, and complex terrain, and to use sequential hourly meteorological input data from representative meteorological monitoring stations. The regulatory default options were used, including building and stack tip downwash, default wind speed profiles, exclusion of deposition and gravitational settling, consideration of buoyant plume rise, and complex terrain.

For the AERMOD simulations to evaluate project operational impacts on local 1-hour NO_2 concentrations, the OLM option of the model was used to take into account the role of ambient ozone in limiting the conversion of emitted NO_x (which occurs mostly in the form of NO) to NO_2, the pollutant regulated by ambient standards. The input data to the AERMOD-OLM model includes representative hourly ozone monitoring data for the same years corresponding to the meteorological input record. These simulations used the ozone data from the SCAQMD Anaheim-Pampas Lane monitoring site for the years 2002 through 2006.

To evaluate whether urban or rural dispersion parameters should be used in the model simulations, an analysis of land uses adjacent to the proposed project site was conducted in accordance with Section 7.2.8 of the Guideline on Air Quality Models (USEPA-450/2 78 027R and Auer [1978]), USEPA AERMOD implementation guide (2004), and its addendum (2006). Based on the Auer land use classification procedure, more than 50 percent of the area within a 1.86 mile (3 kilometer) radius of the proposed project site is appropriately classified as urban. Thus, the model's urban option was selected, as specified by USEPA in the AERMOD Implementation Guide. Accordingly, the land use parameter values shown in Table 4-1 were used in processing the John Wayne Airport surface and Miramar Naval Air Station upper air meteorological data by means of the meteorological preprocessor program for AERMOD (AERMET).

Table 4-1
AERMET Land Use Characteristics

Land Use Characteristic	Spring	Summer	Autumn	Winter
Albedo	0.14	0.16	0.18	0.14
Bowen Ratio	2.0	4.0	4.0	2.0
Surface Roughness (m)	1.0	1.0	1.0	1.0

4.2 REPRESENTATION OF PROJECT EMISSIONS FOR MODELING

Reasonable worst-case project emissions scenarios were developed for each combination of pollutant and averaging time corresponding to an air quality standard or significance limit. Table 4-2 presents the worst-case modeling scenarios selected for each averaging time. These scenarios form the basis for the air dispersion modeling analyses, the results of which are presented in Section 4.6. Some notes regarding the selection of these scenarios and the resulting emission calculations are provided below. Detailed tables showing emissions data and stack parameters for all criteria pollutant modeling in this section, as well as the health risk assessment modeling in Section 5 are presented in Appendix E, which also provides additional tables summarizing both sets of modeling results.

Estimated annual emission totals for all pollutants incorporate the maximum requested numbers of startups and shutdowns, as well as the proposed maximum steady-state operating hours (see Table 3-1). For the purpose of developing annual emission estimates, the contributions associated with all normal CTG operating hours were calculated based on the maximum emission rates per pollutant which are projected to occur for the case of 100 percent turbine load and 59°F ambient temperature.

Short-term emissions were calculated for the pollutants and averaging times corresponding to the AAQS. The worst-case condition was assumed for purposes of estimating maximum 1 hour emission rates for all pollutants. A startup of all CTGs with normal operations for the remainder of the hour would produce the worst-case hourly NO_x and CO emissions. However, SO_2 emissions would be directly proportional to fuel usage, he highest value of which would occur when all four CTGs are running at 100 percent with an ambient temperature of 59°F. Thus, this condition was selected to represent maximum hourly SO_2 emissions. The 3 hour SO_2 emission rate was calculated based on a scenario with all CTGs running at 100 percent for the ambient temperature of 59°F. The 8 hour maximum CO emission rate was calculated assuming ~~all~~ a worst case scenario in which each CTG~~s~~ would undergo: (a) one 35-minute startup, experience a failure terminating the startup for 5 minutes, and finally a 32-minute restart process (72 minutes total); ~~, one shutdown, and operate for the balance of the period at 100 percent load~~ (b) one 10-minute shutdown; and (c) the remainder of the 8 hours at 100% load ~~with~~operations with the 59°F ambient temperature.

The PM_{10} and SO_2 worst-case 24-hour emission rates ~~was~~ were calculated assuming all CTGs are running at 100 percent of capacity for 24 hours at the emission rate corresponding to an ambient temperature of 59°F.

In each of these short-term scenarios, it was assumed that the black start engine was tested for one of the hours during the averaging period. Estimated annual emissions from the black start engine are based on ~~12 hours~~200 hours of operation per year at the maximum fuel input rate. For modeling purposes, the maximum chiller cooling tower emissions from all 4 cells were ~~conservatively assumed~~conservatively assumed to occur for all possible hours of CTG operation throughout the year (~~4,006~~2,795 hours), including startup and shutdown hours, although the cooling tower is actually anticipated to operate substantially fewer hours and with 1 to 4 cells operating at any given time, depending upon the number of turbines operating.

Note that CTG commissioning impacts are evaluated separately in the air quality impact modeling analysis, due to the temporary, one-time nature of this activity.

Table 4-2
Criteria Pollutant Sources and Emission Totals for the Worst-Case Project Emissions Scenarios for All Averaging Times

Averaging Time	Operating Equipment	Emissions in Pounds – Entire Period			
		Pollutant	Four CTGs	Black Start Engine	4-cell Chiller Cooling Tower
1-hour	NO_x and CO: One 35-minute startup (all CTGs) with remainder of period at normal operations (100% load, 59°F).	NO_x	~~38.63~~57.08	~~10.58~~12.06	-
	SO_2: 100% load operation (4 CTGs) at 59°F ambient temperature.	CO	~~34.65~~25.20	5.79	-
	All: includes one 38-minute test of black start engine.	SO_2	5.4~~3~~	0.006	-
3-hour	SO_2: Continuous 100% load operation (all CTGs) at 59°F ambient temperature, plus one ~~hour~~one 38-minute test of black start engine.	SO_2	16.28	0.006	-
8-hour	CO: One 35-miute startup, turbine trip with no operation for 5 minutes followed by a 32-minute restart; one shutdown ~~(all CTGs) with~~ and the remainder of the period at normal operations (100% load, 59°F) (all CTGs), plus one ~~hour~~ 38-minute test of black start engine.	CO	~~219.16~~143.74	5.79	-
24-hour	PM_{10}: Continuous full-load (all CTGs) at 59°F ambient temperature plus the emissions from 4-cell chillers cooling tower.	PM_{10}	~~291.48~~268.0	0.33	~~0.21~~0.86

Table 4-2
Criteria Pollutant Sources and Emission Totals for the Worst-Case Project Emissions Scenarios for All Averaging Times
(Continued)

Averaging Time	Operating Equipment	Emissions in Pounds – Entire Period			
		Pollutant	Four CTGs	Black Start Engine	4-cell Chiller Cooling Tower
	SO_2: Continuous full-load (all CTGs) at 59°F ambient temperature. All: includes one 38-minute test of black start engine for ~~one hour~~.	SO_2	~~130.26~~130.56	0.006	-
Annual	All: each CTGs operates at full load for ~~1,002~~602 hours at 49°F (cooler on), ~~128.5~~129 startups and shutdowns), plus ~~test~~ operation ~~of~~ black start engine ~~one hour per month~~ (~~12~~ 200 hours per year).	NO_X	~~21,259~~15,146	~~126.99~~2.412	-
	PM_{10}: include the emissions from 4-cell chiller cooling tower for all hours of CTG operation.	PM_{10}	~~12,585~~7,983	~~3.97~~10	~~35.78~~99.9
		SO_2	~~5,676~~899.0	~~0.07~~1.14	-

4.3 MODEL INPUT DATA

4.3.1 Building Wake Effects

The effects of building wakes (i.e., downwash) on the plumes from the proposed project's CTGs, black start engine and chiller cooling tower were evaluated in the modeling for operational emissions, in accordance with USEPA guidance (USEPA, 1985). Location coordinates and dimensions of the buildings within the proposed project site that could potentially cause plume downwash effects for the new stacks were determined for different wind directions using the USEPA Building Profile Input Program – Prime (BPIP-Prime) (Version 04274). The following structures were identified within the proposed project site to be included in the downwash analysis:

- CTGs-SCRs 1 through 4
- GSU and fire wall 1-4
- Cooling tower building
- Raw water tank
- DI water tank
- Seven buildings
- Water treatment building (sun shade roof)
- Main electrical equipment enclosure (EEE)

- Plant operations building and warehouse
- Black start diesel generator building

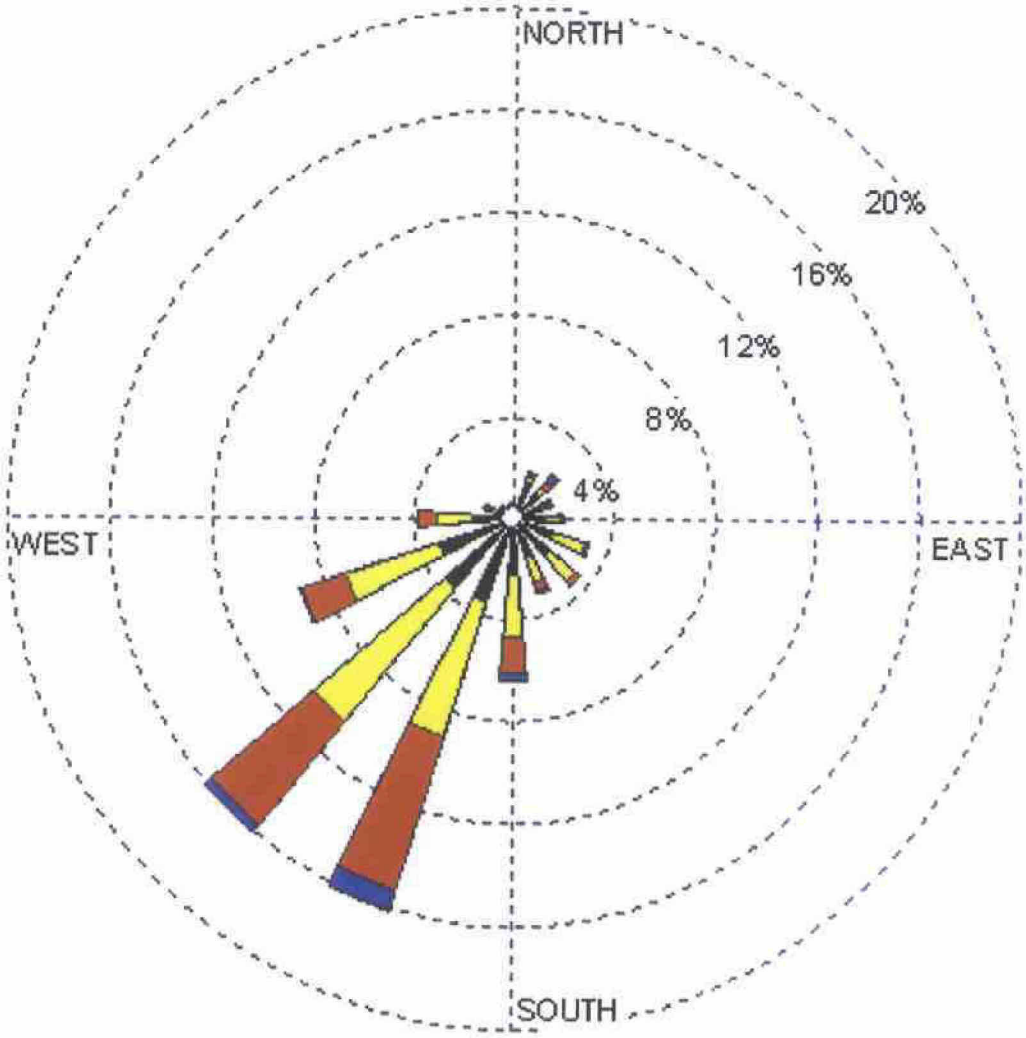
The results of the BPIP-Prime analysis were included in the AERMOD input data stream to enable simulation of downwash effects on the plumes of project emission sources. Input and output electronic files for the BPIP-Prime analysis are included with those from all dispersion modeling analyses on the digital versatile discs (DVDs) that are being submitted to accompany this ~~Application~~revised application.

4.3.2 Meteorological Data

Meteorological data suitable for direct input to AERMOD were purchased from the National Climatic Data Center (NCDC). Hourly surface data in TD-3505 format for calendar years 2002 through 2006 were obtained for the John Wayne Airport meteorological station located in Santa Ana, about 12 miles south of the proposed project site. The Fullerton Airport meteorological station is closer to the project site, but the data capture statistics for this station were insufficient to support modeling for regulatory permitting. John Wayne Airport is the next closest full-time meteorological monitoring station to the project site, and meteorological conditions at the two locations would be expected to be very similar. Data capture at John Wayne Airport for 2002 through 2006 was adequate to support regulatory modeling, so surface data for these years were selected for the current modeling analysis. Concurrent upper air sounding data collected at Miramar Naval Air Station near San Diego were used with the John Wayne surface data to run the AERMET preprocessor program to generate an AERMOD-ready meteorological input file for the selected 5 year period. The meteorological data recorded at John Wayne Airport are acceptable to represent dispersion conditions at the CPP facility for two reasons: proximity and terrain similarity. The terrain immediately surrounding the proposed project site can be categorized as a flat or gradually sloping urban area. The terrain around the John Wayne Airport is also a relatively flat or gradually sloping urban area; thus, the land use and the location with respect to near-field terrain features are similar. Additionally, there are no significant terrain features separating the John Wayne Airport from the project site that would cause differences in wind or temperature conditions between these respective areas. Therefore, the 5 years of meteorological data selected from the John Wayne International Airport were determined to be representative for purposes of evaluating the proposed project's air quality impacts.

The Miramar Naval Air upper air data monitoring station is located approximately 78 miles southeast of proposed project site. This is the closest upper air station with sufficient data collection for the same years represented in the selected surface data. Therefore data from Miramar were determined to be the most representative data available for use in this modeling analysis.

Figure 4-1 presents the annual windrose based on the 2002-2006 meteorological data from the John Wayne Airport. Seasonal windroses based on the 5 years of John Wayne Airport surface meteorological data are provided as Appendix ~~E~~F. Winds for all seasons and all years blow predominantly from the southwest, although the directional pattern is more variable during the winter.



WIND SPEED
(Knots)

- >= 22
- 17 - 21
- 11 - 17
- 7 - 11
- 4 - 7
- 1 - 4

Calms: 27.40%

Annual windrose for John Wayne Airport
Data taken from 2002-2006 for all months.
Displays wind speed, direction (blowing from)

ANNUAL WIND ROSE FOR 2002-2006

URS	CREATED BY CM	DATE: 12-04-07	FIG. NO:
	PM: CP	PROJ. NO: 28906973.01010	4-1

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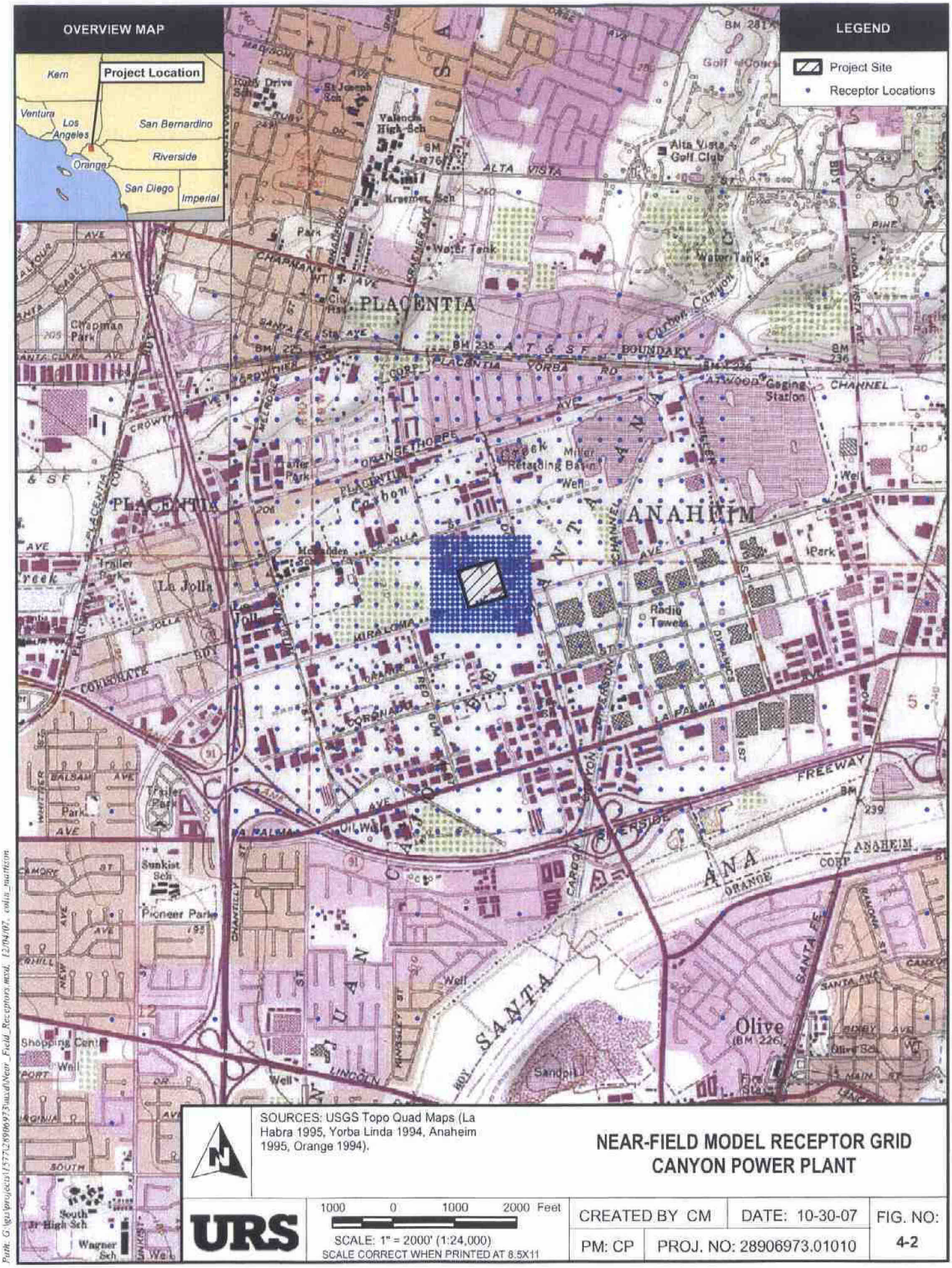
4.3.3 Receptor Locations

The receptor grids used in the AERMOD modeling analyses for operational emission sources were as follows:

- 25 meter (m) spacing along the fence line and extending from the fence line out to 100 meters beyond the property line.
- 100 meter spacing from 100 m to 1 kilometer (km) beyond the property line.
- 500 meter spacing within 1 to 5 km of property line.
- 1,000 meter spacing within 5 to 10 km of property line.

Figures 4-2 and 4-3 show the placement of near-field and far-field receptor grid points, respectively. Terrain heights at receptor grid points were determined from U.S. Geological Survey (USGS) digital elevation model (DEM) files. The refined modeling analysis for operational emissions of the proposed project incorporated the following convention: if a maximum predicted concentration for a particular pollutant and averaging time was located within the portion of the receptor grid with spacing greater than 25 meters, a supplemental dense receptor grid was placed around the original maximum concentration point and the model was rerun to ensure that the maximum concentration prediction would be captured. The dense grid uses 25 meter spacing and extends to the next grid point in all directions from the original point of maximum concentration.

Due to the large computation time required to run AERMOD, this receptor grid, with the additional nested grid of more densely spaced points, when necessary, was determined to best balance the need to predict maximum pollutant concentrations and allow the all operational modeling runs to be completed in a timely manner.



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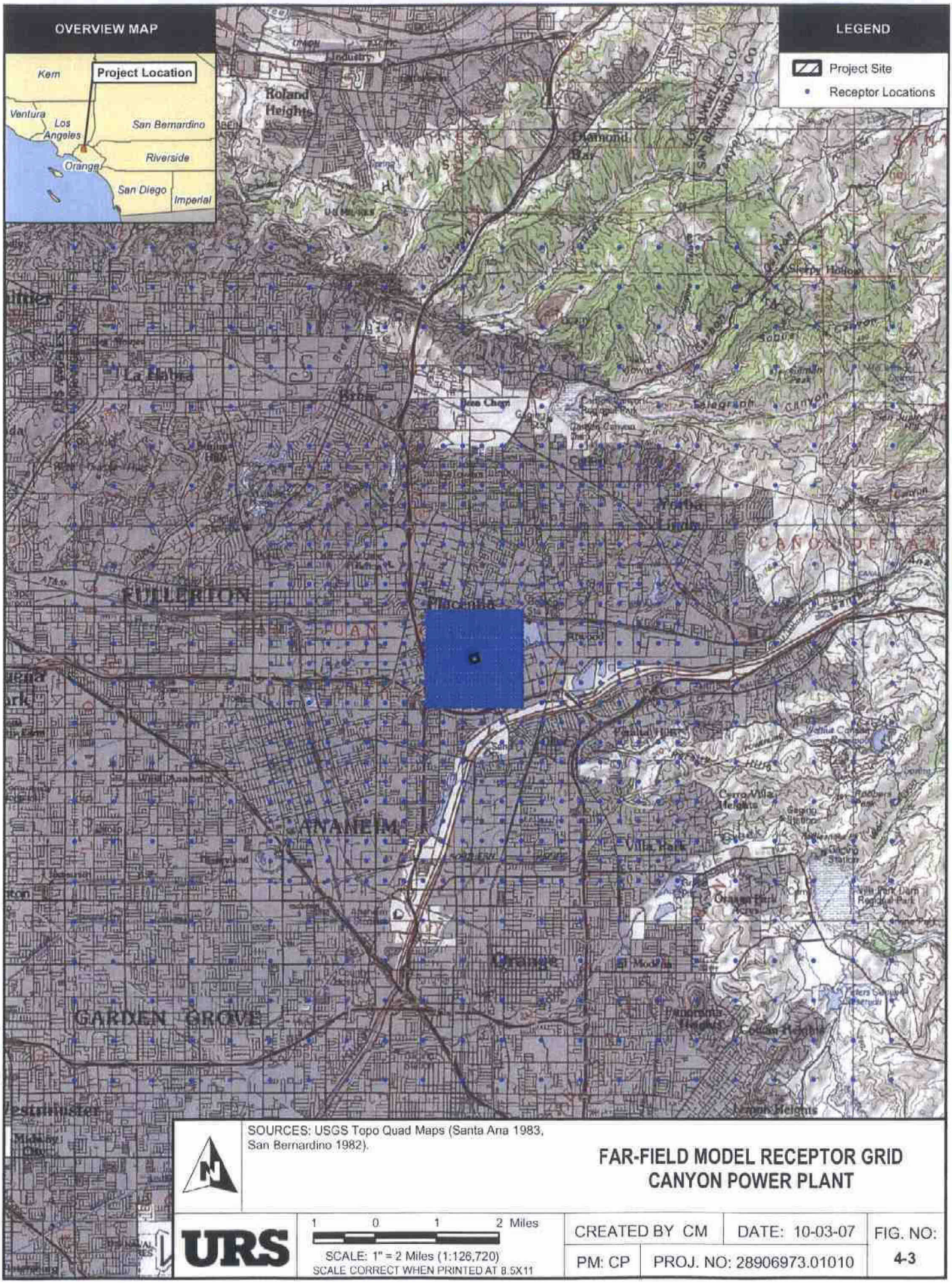

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4.4 BACKGROUND AIR QUALITY

The ambient air quality in Orange County is monitored at a number of permanent air quality monitoring stations operated by SCAQMD and the California Air Resources Board (CARB). The monitoring stations within Orange County that are closest to the proposed project site are the Anaheim-Pampas Lane station, located approximately 4.8 miles west-southwest of the proposed project site, and the La Habra station, located about 6.8 miles to the northwest of the proposed site. The Anaheim-Pampas Lane station measures concentrations of all criteria pollutants, except sulfur dioxide (SO_2) and lead (Pb). The La Habra station only measures ozone, carbon monoxide (CO), and nitrogen dioxide (NO_2). The closest station that measures SO_2 is the Costa Mesa station, located approximately 13.2 miles south southwest of the project site. This station also measures CO, NO_2, and O_3. The Mission Viejo station is the next closest station (after the Anaheim-Pampas Lane station) that measures PM_{10} and $PM_{2.5}$. The Mission Viejo station is about 19.1 miles south southeast of the CPP site. The closest station that measures lead is the Pico Rivera station, located approximately 15.8 miles northwest of the proposed project site.

Air quality measurements taken at these stations are summarized in the tables of Appendix ~~F~~G. For this air quality impact analysis, the maximum recorded concentration from the most recent 3 years (2004-2006) at any of these monitoring stations were used to represent background air quality levels (see Table 4-3). Use of these background values in all the criteria pollutant modeling simulations is very conservative, since it forces the peak impacts of the CPP to coincide in time and space with the single highest monitored value in the Project area over the last three years, which is highly unlikely to occur.

4.5 TURBINE SCREENING MODELING

As described previously, a screening modeling analysis was performed to determine which CTG operating mode and stack parameters would produce worst-case offsite impacts (i.e., maximum ground-level concentrations for each pollutant and averaging time). Only the emissions from the CTGs with and without inlet air cooling were considered in this preliminary modeling step. The screening modeling used AERMOD, as described in the previous sections. Building-wake information and the receptor grid described above were also used. All 5 years of meteorological data were used in the screening analysis.

The AERMOD model simulated the dispersion of natural gas combustion emissions from four stacks for the CTG units. Each stack has a diameter of 11.7 feet (3.56 meters) and a height of 86 feet (26.21 meters). The stacks were modeled as point sources at their proposed locations within the proposed project site. Table 4-4 summarizes the CTG screening results for the different CTG operating loads and over the range of local ambient temperature condition. First, the model was run with unit emissions (1 gram per second) from each stack to obtain normalized concentrations that are not specific to any pollutant. CTG and control equipment vendor data used to derive the stack parameters for the different operating conditions evaluated in this screening analysis are provided in Appendix B.

The maximum offsite χ/Q concentration predicted to occur ~~offsite~~ with unit turbine emission rates for each of the nine operating conditions shown in Table 4-4 were then multiplied by the corresponding turbine mass emission rates for specific pollutants to obtain ~~the~~ peak ground level concentrations. The highest resulting concentration value for each pollutant and averaging time was then identified (see bolded values in the bottom section of the table).

Table 4-3
Peak Background Pollutant Concentrations Used in Modeling

Pollutant	Averaging Period	Background[1] (µg/m³)
CO	1 hour	8,510
	8 hour	4,544
NO_2	1 hour	229.1
	Annual	46.7
PM_{10}	24 hour	104
	Annual	33.9
$PM_{2.5}$	24 hour	58.9
	Annual	19
SO_2	1 hour	8~~2.1~~1.2
	3 hour	52.0
	24 hour	21.0
	Annual	5.33

Notes:

1 Background represents the maximum values measured at the monitoring stations described in previous sections, for 2004-2006.

2 In February 2007, the CARB approved new, more stringent CAAQS for NO_2. In the units used in this table, the new standards, which are expected to take effect fully in late 2007, are 339 µg/m³ (1 hour) and 56 µg/m³ (annual).

µg/m³ = micrograms per cubic meter
AAQS = Most stringent ambient air quality standard for the averaging period
CO = carbon monoxide
NA = Not applicable
NO_2 = nitrogen dioxide
OLM = ozone limiting method
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

The principal purpose of the turbine screening modeling analysis is to select stack parameters for use in subsequent refined modeling. Specifically, the stack parameters associated with the maximum predicted impacts for each pollutant and averaging time were used in all simulations of the refined AERMOD analyses, which are described in the next subsection. Note that the lower exhaust temperatures and flow rates at reduced turbine loads correspond to reduced plume rise, and could in some cases result in higher offsite pollutant concentrations at ground level than the higher baseload emissions. However, the results shown in the bottom level of Table 4-4 indicate that maximum impacts from the CPP turbines for all pollutants and averaging times will occur with all turbines operating at 100 percent load for an ambient temperature condition of 59 °F. Model input and output files for the screening modeling analysis are included with those from all other modeling tasks on the Air Quality and Public Health Modeling DVDs that are provided separately with this revised a~~A~~pplication.

Table 4-4
Turbine Screening Modeling Results

[Note to SCAQMD: Screening modeling has not been redone, since its only purpose was to identify the stack parameters corresponding to maximum ground-level pollutant concentrations, which would not be changed by any of the project design changes that are the subject of this revised application.]

	Ambient Temperature 1099°F – 15% RH			Ambient Temperature 59°F – 60% RH			Ambient Temperature 38°F – 72% RH		
	Case 1	Case 2	Case 3	Case 4[1]	Case 5	Case 6	Case 7	Case 8	Case 9
CTG Load Level	100	75	50	100	75	50	100	75	50
Chiller and Cooler Status	ON	ON	NONE	ON	NONE	NONE	NONE	NONE	NONE
Stack Outlet Temperature (°F)	841.6	858.9	832.6	838.6	785.5	754.2	836.7	759.9	710.4
Stack Outlet Temperature (°K)	722.93	732.54	717.93	721.26	691.76	674.37	720.21	677.54	650.04
Stack Exit Velocity (m/s)	27.742	23.930	19.751	28.032	23.990	20.198	28.132	24.196	20.298
CTG Output (MW)	50.1	37.7	25.1	50.9	38.2	25.4	50.9	38.3	25.5
Emissions Per CTG									
NO_x (lb/hr)	3.99	3.19	2.40	4.05	3.20	2.38	4.03	3.18	2.39
CO (lb/hr)	6.28	5.01	3.78	6.36	5.01	3.75	6.34	5.00	3.76
SO_2 (lb/hr)	0.33	0.27	0.20	0.34	0.27	0.20	0.34	0.27	0.20
PM_{10} (lb/hr)	2.99	2.39	1.80	3.04	2.40	1.79	3.03	2.39	1.80
NO_x (g/s)	0.503	0.402	0.303	0.511	0.403	0.301	0.509	0.401	0.301
CO (g/s)	0.792	0.632	0.476	0.802	0.632	0.473	0.799	0.631	0.474
SO_2 (g/s)	0.042	0.034	0.025	0.043	0.034	0.025	0.043	0.034	0.025
PM_{10} (g/s)	0.377	0.302	0.227	0.383	0.302	0.226	0.382	0.301	0.227
Model Results - Maximum X/Q concentration (µg/m³) per (g/s per turbine) predicted from AERMOD									
1 hour	13.4694	15.1354	17.6433	13.357	15.2916	17.5854	13.3202	15.2574	17.6603
3 hour	10.715	12.1543	14.7253	10.6348	12.3698	14.693	10.6093	12.3385	14.7795

Table 4-4
Turbine Screening Modeling Results
(Continued)

		Ambient Temperature 1099°F – 15% RH			Ambient Temperature 59°F – 60% RH			Ambient Temperature 38°F – 72% RH		
		Case 1	Case 2	Case 3	Case 4[1]	Case 5	Case 6	Case 7	Case 8	Case 9
8 hour		10.0142	11.3547	13.7652	9.94393	11.56	13.7366	9.92183	11.5531	13.8616
24 hour		4.8488	5.46301	6.70723	4.8136	5.56745	6.7075	4.80273	5.56493	6.76731
Annual		0.64938	0.74141	0.89909	0.64388	0.76408	0.91302	0.64223	0.76732	0.9299
Maximum Concentration ($\mu g/m^3$) predicted per Pollutant Normal Operations										
NO_X	1 hour	6.778	6.090	5.346	6.820	6.162	5.286	6.778	6.123	5.320
	Annual	0.327	0.298	0.272	0.329	0.308	0.274	0.327	0.308	0.280
CO	1 hour	10.671	9.562	8.399	10.714	9.669	8.316	10.648	9.627	8.366
	8 hour	7.933	7.174	6.553	7.977	7.309	6.496	7.931	7.290	6.566
SO_2	1 hour	0.568	0.510	0.448	0.571	0.517	0.444	0.568	0.514	0.447
	3 hour	0.452	0.410	0.374	0.455	0.418	0.371	0.453	0.415	0.374
	24 hour	0.204	0.184	0.170	0.206	0.188	0.169	0.205	0.187	0.171
	Annual	0.027	0.025	0.023	0.028	0.026	0.023	0.027	0.026	0.024
PM_{10}	24 hour	1.830	1.648	1.525	1.843	1.684	1.516	1.833	1.677	1.533
	Annual	0.245	0.224	0.204	0.247	0.231	0.206	0.245	0.231	0.211

Notes:

~~[1]These data are based on ISO conditions per turbine and can be used to determine compliance with SCAQMD Rule 1309.1 pound per mW-hr limit for NO_x and PM_{10}.~~
SO_2 emission rates based on ~~average~~ a maximum natural gas sulfur content of 1 grain/100 dscf.
Bold = highest predicted concentration for that pollutant and averaging time
All particulate matter (PM) emissions from CTGs are assumed to be both PM_{10} and $PM_{2.5}$
CO = carbon monoxide
°F = degrees Fahrenheit
g/s = grams per second
$\mu g/m^3$ = micrograms per cubic meter
NO_X = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 microns in diameter
SO_2 = sulfur dioxide

4.6 PROJECT AIR QUALITY IMPACTS – NORMAL FACILITY OPERATIONS

Air dispersion modeling was performed according to the methodology described in the previous subsections to evaluate the maximum increases in ground-level pollutant concentrations resulting from all proposed project emissions, and to compare the maximum predicted impacts, including representative worst-case background pollutant levels, with applicable short-term and long-term CAAQS and NAAQS. The 5 year record of hourly meteorological data described in Section 4.3.2 was used in the AERMOD modeling to evaluate operational impacts.

As described in the previous subsection, the emissions and stack parameters used in the AERMOD simulations for the proposed project operations were selected to ensure that the maximum potential impacts would be addressed for each pollutant and averaging time corresponding to an AAQS. The emissions used for each pollutant and averaging time are explained and quantified in Table 4-2. This subsection describes the maximum predicted operational impacts of the proposed project for normal simple-cycle power plant operating conditions. Commissioning impacts, which would occur on a temporary, one-time basis and would not be representative of normal operations, thus were addressed separately and are discussed in Section 4.7.

Table 4-5 summarizes the maximum predicted criteria pollutant concentrations due to normal operations of all sources ~~at~~ of the proposed project. Table 4-5 also shows that these modeled impacts due to the proposed project emissions, in combination with conservative background concentrations, would not cause a violation of any NAAQS and would not significantly contribute to existing violations of the federal and state PM_{10} and $PM_{2.5}$ standards. In addition, as described later, all of the proposed project's operational emissions of ~~nonattainment pollutants and their precursors~~ NO_x would be offset to ensure a net air quality benefit.

Other important results of the operational modeling are summarized as follows:

- The locations of predicted maximum impacts vary by pollutant and averaging time, but in all cases were predicted to be within 1,600~~200~~ feet from the proposed southwest corner of the project facility fenceline.
- The peak impacts for all pollutants, excluding annual pollutants and NO_2 1 hour normal operations, were predicted to occur within 1000 ft southwest of the southwest fenceline.
- The peak impacts for annual SO_2, PM_{10} and $PM_{2.5}$, and NO_2 were predicted to occur within 1000 ft northeast of the northeast fenceline.
- The peak impact for NO_2 1 hour during normal operations was predicted to occur on the southern property boundary.

~~The peak annual PM_{10} and $PM_{2.5}$ impact are predicted to occur approximately 700 feet northeast of the property line of the proposed project opposite Unit 4.~~

~~The peak annual SO_2 and NO_2 impacts are predicted to occur approximately 1,000 feet northeast of the property line of the proposed project opposite Unit 4.~~

~~Maximum 24 hour SO_2, PM_{10}, and $PM_{2.5}$ impacts are predicted to occur approximately 570 feet southwest of the southwest fenceline.~~

~~Maximum hourly concentrations for NO_2, and CO and maximum 8 hour CO are predicted to occur in different locations on the fenceline south of the property boundary near Unit 1.~~

~~Maximum 1-hour and 3-hour concentrations for SO_2 are predicted to occur approximately 250 and 350 feet, respectively, west of the southwest corner of the site.~~

~~Figure 4-4 shows the locations of the maximum predicted operational impacts for all pollutants and averaging times.~~

SCAQMD Rule 1303 requires evaluation of the potential impacts from individual permit units, i.e. each of the four CTGs. Emergency engines are exempt from this rule; thus the impacts from the black start engine were not included in the analysis of individual permit units. Table 4-6a presents the maximum predicted concentrations due to the normal operations of each CTG and for all four CTGs combined. The same stack parameters and model assumptions as described above were used to calculate these concentrations. For the attainment pollutants, NO_2 and CO, the maximum predicted concentration due to each CTG was added to the background concentrations and compared with the corresponding Most Stringent Air Quality Standard. These values are all well below the Most Stringent Air Quality Standards listed in SCAQMD Rule 1303. For nonattainment pollutant (in this case, PM_{10}) the maximum concentrations due to each CTG were compared with the Significant Change thresholds outlined in SCAQMD Rule 1303 and these results are presented in Table 4-6a. These values are all well below the SCAQMD 24-hour and annual PM_{10} Significant Change thresholds.

~~In order to be permitted access to the emission reduction credits in the SCAQMD Priority Reserve (Rule 1309.1) projects within an Environmental Justice Area (EJA) with a generating capacity less than or equal to 500 MW must meet a facility-wide PM_{10} limit of 5 $\mu g/m^3$ for the 24-hour averaging time and 0.75 $\mu g/m^3$ for annual averages. The modeling results presented in Table 4-5 show that these limits would be easily met by the CPP, even though the applicant does not intend to use Priority Reserve Credits for PM_{10}.~~

Table 4.6b presents additional modeling results for the ~~1~~worst-case 1-hour and 8-hour averaging periods. Emissions during these periods were assumed to include the elevated NO_x and CO emissions associated with worst-case startup scenarios for all four turbines. In the 1-hour scenario, a turbine trip occurs at the end of a 35 minute startup, followed by 5 minutes of down time and then the first 20 minutes of a restart. A similar start/trip/restart is assumed to occur for the 8-hour startup scenario (CO only), except that the restart is completed 72 minutes (1.2 hours) after the initial fuel firing and full-load normal operations is assumed for the remaining 6.8 hours. For the 1-hour modeling scenario, ~~lower~~ the lowest turbine stack exhaust flow rates and temperature values among all cases listed in Table 3-2 were used to account for the fact that values for these parameters during a startup would average to lower levels than during normal full-load operations. Clearly, the simulations representing these scenarios for four turbines simultaneously are extremely conservative, ~~-~~and the corresponding predicted maximum concentrations will most likely never occur.

Table 4-5 (Revised)
AERMOD Modeling Results for Normal Project Operations (Impacts due to All Project Sources Combined)

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m³)	SCAQMD Significant Change[5] (µg/m³)	Background Concentration (µg/m³)[1]	Total Concentration (µg/m³)	NAAQS (µg/m³)	CAAQS (µg/m³)	Maximum UTMX NAD27 (m)	Maximum UTMY NAD27 (m)
NO_2	1-hour normal operaton[2]	~~106.2~~107.39	20	229.1	~~335~~336.49	NA	~~470~~[5]339	420,322~~420,322~~	3,746,505~~3,746,505~~
	Annual	~~0.1~~0.403	1	46.7	47.10	100	NA[5]	420,393~~420,600~~	3,746,697~~3,746,900~~
SO_2	1-hour	2.280~~2.3~~	NA	81.2	83.48	NA	655	420,175	3,746,475
	3-hour	1.81~~1.8~~	NA	52.0	53.81~~54~~	1300	NA	420,150	3,746,450
	24-hour	0.82	NA	21.0	~~22~~21.82	365	105	420,100	3,746,400
	Annual	~~0.01~~0.002	NA	5.3	5.302	80	NA	420,575~~420,600~~	3,746,925~~3,747,000~~
CO	1-hour	~~122.3~~77.37	1,100	8,510	~~86~~328,587.37	40,000	23,000	420,299~~420,299~~	3,746,498~~3,746,498~~
	8-hour	~~10.0~~6.36	500	4,544	~~455~~44,550.36	10,000	10,000	420,276	3,746,491
PM_{10}	24-hour[3,4]	~~1.9~~1.83	2.5	104.0	~~106~~105.83	150	50	420,100	3,746,400
	Annual[3,4]	~~0.035~~0.022	1	33.9	~~34~~33.92	NA	20	420,550~~420,500~~	3,746,925~~3,746,900~~
$PM_{2.5}$	24-hour	~~1.9~~1.83	NA	58.9	~~61~~60.73	35	NA	420,100	3,746,400
	Annual	~~0.035~~0.022	NA	19.0	19.02	15	12	420,550	3,746,925~~3,746,900~~

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m³)	SCAQMD Significant Change[5] (µg/m³)	Background Concentration (µg/m³)[1]	Total Concentration (µg/m³)	NAAQS (µg/m³)	CAAQS (µg/m³)	Maximum UTMX NAD27 (m)	Maximum UTMY NAD27 (m)

Notes:

[1] Background represents the maximum values measured at the monitoring stations described in the previous sections.

[2] Results for NO_2 during operations used ozone limiting method (OLM) with ambient ozone data collected at the Anaheim-Pampas Lane monitoring station for the years 2002 through 2006.

[3] PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

[4] All PM_{10} emissions from proposed project sources were also considered to be $PM_{2.5}$.

~~[5] In February 2007, the CARB approved new, more stringent CAAQS for NO_2. In the units used in this table, the new standards, which are expected to take effect fully in late 2007, are 338 µg/m³ (1-hour) and 56 µg/m³ (annual).~~

[5] Significant change value is applicable only for pollutants that exceed state or federal standards.

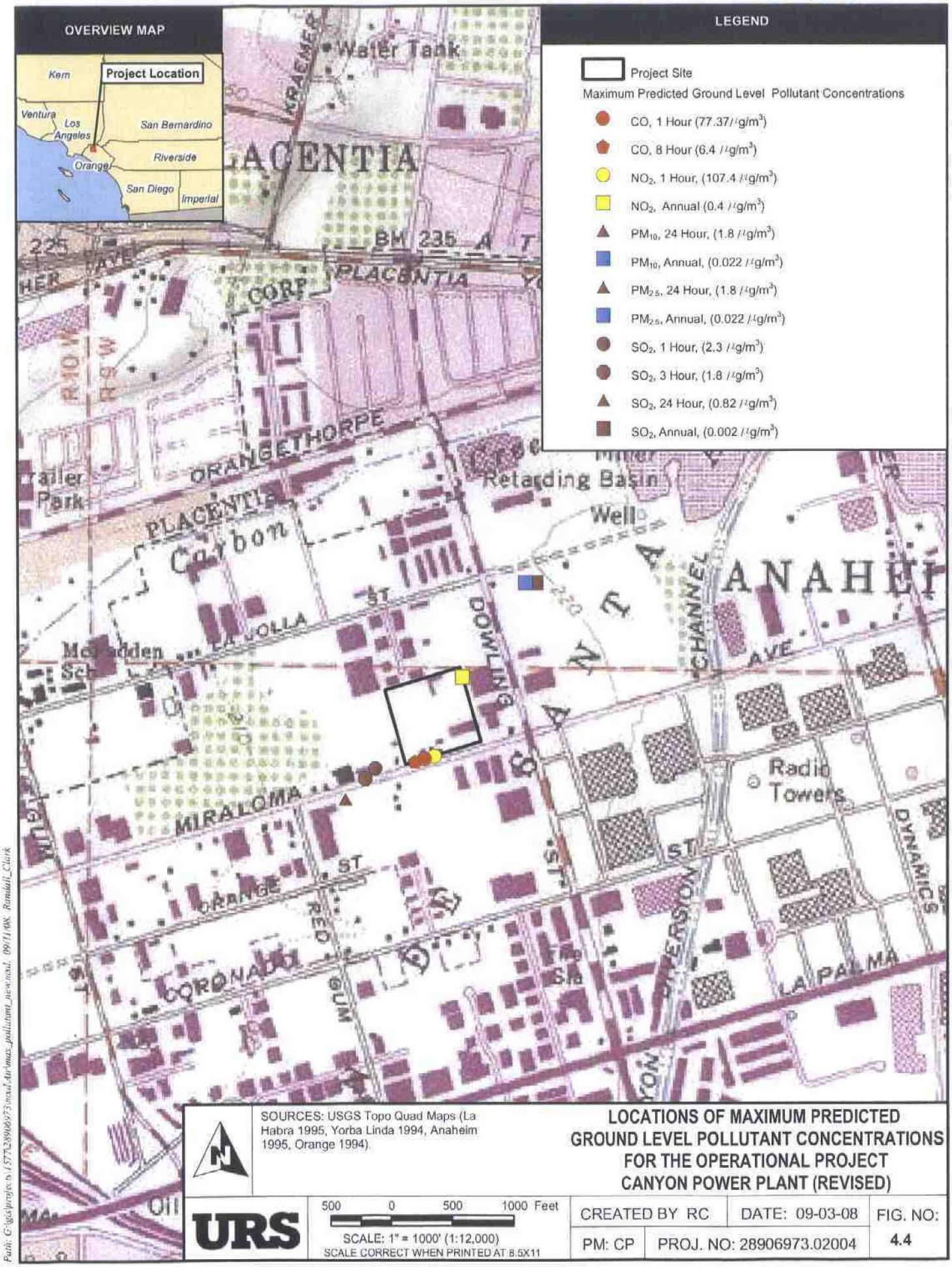

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Table 4-6a (Revised)
AERMOD Modeling Results for Normal Project Operations (Impacts due to Individual CTGs and All Four CTGs combined)

Pollutant	Averaging Period	Maximum Predicted Concentration (µg/m3)					Back-ground Concentration (µg/m3)	Most Stringent Air Quality Standard (µg/m3) 1	Significant Change in Air Quality Concentration (µg/m3) 2	Comply (Yes /No)
		CTG 1	CTG 2	CTG 3	CTG 4	All 4 CTGs				
NO2	1-hour2	1.87	1.87	1.86	1.88	6.69	229.1	339	20	Yes
	Annual	0.01	0.01	0.01	0.01	0.04	46.7	57	1	Yes
CO	1-hour	1.99	1.99	1.98	2.00	7.12	8,510	23,000	1,100	Yes
	8-hour	1.41	1.42	1.42	1.41	5.30	4,544	10,000	500	Yes
SO2	1-hour	0.64	0.64	0.63	0.64	2.28	81.2	655	n/a	Yes
	3-hour	0.48	0.49	0.49	0.49	1.81	52	1,300	n/a	Yes
	24-hour	0.21	0.21	0.21	0.21	0.82	21	105	n/a	Yes
	Annual	0.001	0.001	0.001	0.001	0.002	5.3	80	n/a	Yes
PM10	24-hour	0.47	0.47	0.47	0.47	1.81	104	50	2.5	Yes
	Annual	0.005	0.005	0.005	0.005	0.02	33.9	20	1	Yes
PM2.5	24-hour	0.47	0.47	0.47	0.47	1.81	58.9	35	n/a	Yes
	Annual	0.005	0.005	0.005	0.005	0.02	19	15	n/a	Yes

~~**Table 4-6**~~
~~**AERMOD Modeling Results for Normal Project Operations (Impacts due to Individual CTGs)**~~

~~Pollutant~~	~~Averaging Period~~	~~Maximum Predicted Concentration ($\mu g/m^3$)~~				~~Background Concentration ($\mu g/m^3$)~~ [4]	~~Most Stringent Air Quality Standard ($\mu g/m^3$)~~ [3]	~~Significant Change in Air Quality Concentration ($\mu g/m^3$)~~ [3]	~~Comply (Yes/No)~~
		~~CTG 1~~	~~CTG 2~~	~~CTG 3~~	~~CTG 4~~				
~~NO_2~~	~~1-hour[2]~~	~~4.08~~	~~3.95~~	~~3.84~~	~~3.59~~	~~229.1~~	~~500~~	~~20~~	~~Yes~~
	~~Annual~~	~~0.01~~	~~0.01~~	~~0.01~~	~~0.01~~	~~46.7~~	~~100~~	~~1~~	~~Yes~~
~~CO~~	~~1-hour~~	~~4.07~~	~~4.07~~	~~4.04~~	~~4.08~~	~~8,510~~	~~23,000~~	~~1,100~~	~~Yes~~
	~~8-hour~~	~~2.28~~	~~2.28~~	~~2.29~~	~~2.28~~	~~4,544~~	~~10,000~~	~~500~~	~~Yes~~
~~PM_{10}~~	~~24-hour~~	~~0.48~~	~~0.48~~	~~0.48~~	~~0.48~~	~~104~~	~~50~~	~~2.5~~	~~Yes~~

	Annual	0.01	0.01	0.01	0.01	33.9	30	1	Yes

Notes:

1 Background represents the maximum values measured at the monitoring stations described in the previous sections.

2 Results for NO_2 during operations used ozone limiting method (OLM) with ambient ozone data collected at the Anaheim-Pampas Lane monitoring station for the years 2002 through 2006.

3 From South Coast Air Quality Management District Rule 1303 Table A-2.

Table 4-6b (New)
AERMOD Modeling Results – Worst-Case Startup Scenarios for Turbine NO_x and CO Emissions

Pollutant	Averaging Period	Maximum Predicted Concentration (µg/m3)					Back-ground Concentration (µg/m3)	Most Stringent Air Quality Standard (µg/m3) 1	Significant Change in Air Quality Concentration (µg/m3) 2	Comply? (Yes /No)
		CTG 1	CTG 2	CTG 3	CTG 4	All 4 CTGs				
NO2	1-hour	7.80	7.87	7.85	7.77	27.57	229.1	339	20	Yes
CO	1-hour	2.95	2.95	2.93	2.95	10.53	8,510	23,000	1,100	Yes
	8-hour	1.51	1.51	1.51	1.51	5.65	4,544	10,000	500	Yes

4.7 PROJECT AIR QUALITY IMPACTS – TURBINE COMMISSIONING

Each of the proposed CTGs may need to be operated for up to ~~104~~ 156 hours with partially abated emissions for purposes of commissioning the new generating equipment. The expected sequence of commissioning tests and the associated emissions during each stage of CTG commissioning is presented in Section 3.2.4. Separate modeling was conducted using AERMOD to evaluate maximum short-term effects of these activities in terms of the impacts on offsite 1 hour NO_2 concentrations and 1 hour and 8 hour CO concentrations. These are the pollutants (along with ~~ROCs~~ROG, which ~~are~~ is not modeled) for which commissioning emissions would be expected to increase, compared with normal operations, because the SCR and oxidation catalyst emission control systems may not be operating during portions of the commissioning tests. Emissions of SO_2 and PM depend primarily on the rate of fuel combustion, and would not be affected by the availability of the SCR and oxidation catalyst. Thus, emissions of these pollutants during commissioning are not expected to exceed the levels that would occur during full-load normal operations of the CTGs, and separate modeling for commissioning impacts on SO_2 and PM levels is unnecessary.

Stack exhaust flow rates and temperatures for individual CTG commissioning tests were presented in Table 3-5, along with the corresponding NO_x and CO emission rates. Modeling was conducted for the tests that were expected to produce the highest offsite concentrations at ground level (i.e., the test with either the highest hourly emission rate and/or the test with the lowest exhaust flow and temperature). For NO_x, the emissions per hour are clearly highest for the "Baseload AVR Commissioning", while the

highest CO emission rate corresponds to the test described as "First fire the unit and then shutdown to check for leaks, etc."

Since the exhaust gas flow rate and temperature are both lowest and CO emissions are highest for the latter test, it clearly represents the worst-case commissioning scenario for 1-hour and 8-hour impacts of that pollutant. However, NO_x emissions for both tests were modeled to provide results for the highest emission case and the lowest plume rise case to ensure that maximum 1-hour ground-level impacts for NO_2 would be addressed.

The model was conservatively run to determine if whether all 4 CTGs could be tested simultaneously, and the results show that all four CTGs could undergo testing without causing the NO_2 or CO ambient standards to be exceeded. However, each CTG is expected to be tested individually. Tables 4-7a and 4.7b show the results of the simulations for worst-case CTG commissioning tests for four CTGs and for each CTG individually. The tabulated impacts are the highest concentrations for the indicated averaging periods that are predicted by AERMOD to occur for the selected worst-case emission conditions using 5 years of hourly meteorological input data.

The commissioning modeling results demonstrate that when the maximum incremental commissioning impacts are added to applicable background concentrations and compared with the most stringent state or national ambient standards, no violation of the applicable AAQS for CO and NO_2 is predicted to occur. Likewise, when the results from the individual CTG commissioning impacts are added to applicable background concentrations the total concentrations are well below the SCAQMD Rule 1303 Most Stringent Air Quality Standards.

~~Stack exhaust flow rates and temperatures for individual CTG commissioning tests were presented in Table 3-5, along with the corresponding NOx and CO emission rates. Modeling was conducted for the test that was expected to produce the highest offsite concentrations at ground level (i.e., the test with the highest emission rate in combination with the lowest stack exhaust flow rate and temperature). For both the CO and NOx modeling, the emissions and stack parameters for the first fire, labeled "First fire the unit and then shutdown to check for leaks, etc." in Table 3-5 were used to evaluated the maximum impacts from commissioning.~~

~~Since the other phases of commissioning have much lower NOx and CO emissions, only the first fire case was examined. The model was conservatively run to determine if all 4 CTGs could be tested in this mode simultaneously, and the results show that all four CTGs could in fact undergo testing without causing the NO2 or CO ambient standards to be exceeded. However, each CTG is expected to be tested individually. Table 4-7 shows the results of the simulations for worst-case CTG commissioning test for four CTGs and each CTG individually. The tabulated impacts are the highest concentrations for the indicated averaging periods that are predicted by AERMOD to occur for the worst-case emission condition during commissioning using 5 years of hourly meteorological input data.~~

~~The commissioning modeling results demonstrate that when the maximum incremental commissioning impacts are added to applicable background concentrations and compared with the most stringent state or national ambient standards, no violation of the applicable AAQS for CO and NO2 is predicted to occur. Likewise, when the results from the individual CTG commissioning impacts are added to applicable~~

~~background concentrations the total concentrations are well below the SCAQMD Rule 1303 Most Stringent Air Quality Standards~~

Table 4-7a (Revised)
AERMOD Modeling Results ~~for Commissioning~~ for Commissioning: All Turbines Combined

Pollutant	Averaging Period	Maximum Predicted Impact (ug/m³) All four turbines		Background Concentration (ug/m³)	Total Concentration (ug/m³) All four turbines	
		Baseload Test	First Fire Test		Baseload Test	First Fire Test
NO_2	1-hour	58.48	29.1	229.1	283.58	258.20
CO	1-hour	N/A	122.52	8,510	N/A	8,632.5
	8-hour	N/A	103.95	4,544	N/A	4,648.0

Table 4-7b (New)
AERMOD Modeling Results for Commissioning: Individual Turbines

Modeling Scenario	Pollutant	Averaging Period	Maximum Estimated Impact all 4 CTGs (µg/m³)	Maximum Estimated Impact per CTG (µg/m³)				Background[2]	Max Predicted Concentration for any one CTGs (µg/m³)
				CTG 1	CTG 2	CTG 3	CTG 4	(µg/m³)	
First Fire	CO	1 hour	123	35.66	35.2	35.65	35.67	8,510	8,546
		8 hour	104	28.58	29.19	31.87	31.63	4,544	4,576
	NO_2	1 hour	29.1	8.52	8.54	8.65	8.66	229.1	237.8
Base Load AVR	NO_2	1 hour	58.5	16.7	15.7	14.8	13.4	229.1	245.8

~~**Table 4-7**~~
~~**Proposed Project Commissioning Modeling Results**~~

~~Modeling Scenario~~	~~Pollutant~~	~~Averaging Period~~	~~Maximum Estimated Impact all 4 CTGs (µg/m³)~~	~~Maximum Estimated Impact per CTG (µg/m³)~~				~~Background[2]~~	~~Total Predicted Concentration all 4 CTGs (µg/m³)~~	~~Most Stringent Standard (µg/m³)~~
				~~CTG 1~~	~~CTG 2~~	~~CTG 3~~	~~CTG 4~~	~~(µg/m³)~~		
~~Worst-case CTG~~	~~CO~~	~~1 hour~~	~~123~~	~~35.66~~	~~35.20~~	~~35.65~~	~~35.67~~	~~8,510~~	~~8,633~~	~~23,000~~
		~~8 hour~~	~~104~~	~~28.58~~	~~29.19~~	~~31.87~~	~~31.63~~	~~4,544~~	~~4,648~~	~~10,000~~

commissioning tests[4]	NO_2	1 hour	29.1	8.52	8.54	8.65	8.66	229.1	258.2	4703

Notes:

[1] Indicated maximum impacts are the higher of the maxima obtained from separate simulations for worst-case commissioning emissions for four turbines.

[2] Background represents the maximum values measured at the monitoring stations presented in a previous section.

[3] In February 2007, the CARB approved new, more stringent CAAQS for NO2. In the units used in this table, the new 1-hour standard, which is expected to take effect fully in late 2007, is 338 µg/m3.

µg/m³ = micrograms per cubic meter

CO = carbon monoxide

NO_2 = nitrogen dioxide

SECTION 5 AIR TOXICS HEALTH RISK ASSESSMENT

5.1 PUBLIC HEALTH IMPACT ASSESSMENT APPROACH

The potential human health risks posed by the proposed project's emissions were assessed using procedures consistent with the SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (SCAQMD, 2005a), Supplemental Guidelines for Preparing Risk Assessments for the Toxics Hot Spots Information and Assessment Act (AB2588) (SCAQMD, 2005b), and Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Risk Assessment Guidelines (Cal-EPA/OEHHA, 2003). As recommended by the SCAQMD guideline, the CARB Hotspots Analysis and Reporting Program (HARP) (CARB, 2003) was used to perform a refined SCAQMD Tier 4 and OEHHA Tier 1 health risk assessment for the proposed project. The SCAQMD and OEHHA guidelines were developed to provide risk assessment procedures, as required under the Air Toxics Hot Spots Information and Assessment Act of 1987, Assembly Bill 2588 (Health and Safety Code Sections 44360 et seq.). The Hot Spots law established a statewide program to inventory air toxics emissions from individual facilities, as well as guidance for execution of risk assessments and requirements for public notification of potential health risks.

The HRA was conducted in four steps using the HARP model:

- Hazard identification and emission quantification.
- Exposure assessment.
- Dose-response assessment.
- Risk characterization.

First, hazard identification was performed to determine the potential health effects that could be associated with the proposed project emissions. The purpose was to identify whether pollutants that would be emitted from the proposed project during plant operation have been identified as potential human carcinogens, or associated with other types of adverse health effects. From the SCAQMD and OEHHA guidelines, lists were prepared of pollutants with potential cancer and non-cancer health effects that may be emitted from the proposed project. These lists were presented in Section 3, Tables 3-7 thru 3-10 of this revised application.

Second, an exposure assessment was conducted to estimate the extent of public exposure to the proposed project emissions. Public exposure is dependent on the short- and long-term ground-level concentrations resulting from emissions, the route of exposure, and the duration of exposure to those emissions. Dispersion modeling was performed using the ISCST3 model within HARP to estimate the ground-level concentrations near the proposed project site. The methods used in the dispersion modeling were consistent with the approach described in Section 4 for criteria pollutant modeling and with the modeling protocol submitted to SCAQMD and CEC and comments on the protocol received from SCAQMD (Appendix D).

Third, a dose-response assessment was performed in HARP to characterize the relationship between pollutant exposure and the incidence of an adverse health effect in exposed populations. The dose-

response relationship is expressed in terms of potency factors for cancer risk and reference exposure levels (RELs) for acute and chronic non-cancer risks. The OEHHA guidelines provide potency factors and RELs for an extensive list of TACs. Potency factors and RELs are constantly being revised by the OEHHA, and the most recent values were applied in this HRA (Cal EPA/OEHHA, 2005). All exposure pathways were included in this analysis, except the dairy milk, local meat, eggs, and fish ingestion, and drinking water consumption pathways, because the site is in an urban area and no water sources are near the proposed project site. For the calculation of cancer risk, all receptors were treated as residential receptors except the offsite worker receptors, the duration of exposure to project emissions was assumed to be 24 hours per day, ~~365~~ 350 days per year, for 70 years, and the ~~, at all receptors. The~~ cancer risk was calculated in HARP using the Derived (Adjusted) Method~~.~~. The offsite worker cancer risk assessment used the default HARP ground level concentration (GLC) and exposure assumption of GLC equal to 1 for 40 years, 245 days per year. ~~and~~ The chronic THI at all receptors, residential and offsite workers, was calculated in HARP using the Derived (OEHHA) Method.

Fourth, risk characterization was performed to integrate the health effects and public exposure information and provide qualitative estimates of health risks from project emissions. Risk modeling was performed using HARP to estimate cancer and non-cancer health risks for the project. The HARP model uses OEHHA equations and algorithms to calculate health risks based on input parameters such as emissions, "unit" ground-level concentrations, and toxicological data.

5.2 MODEL INPUT PARAMETERS

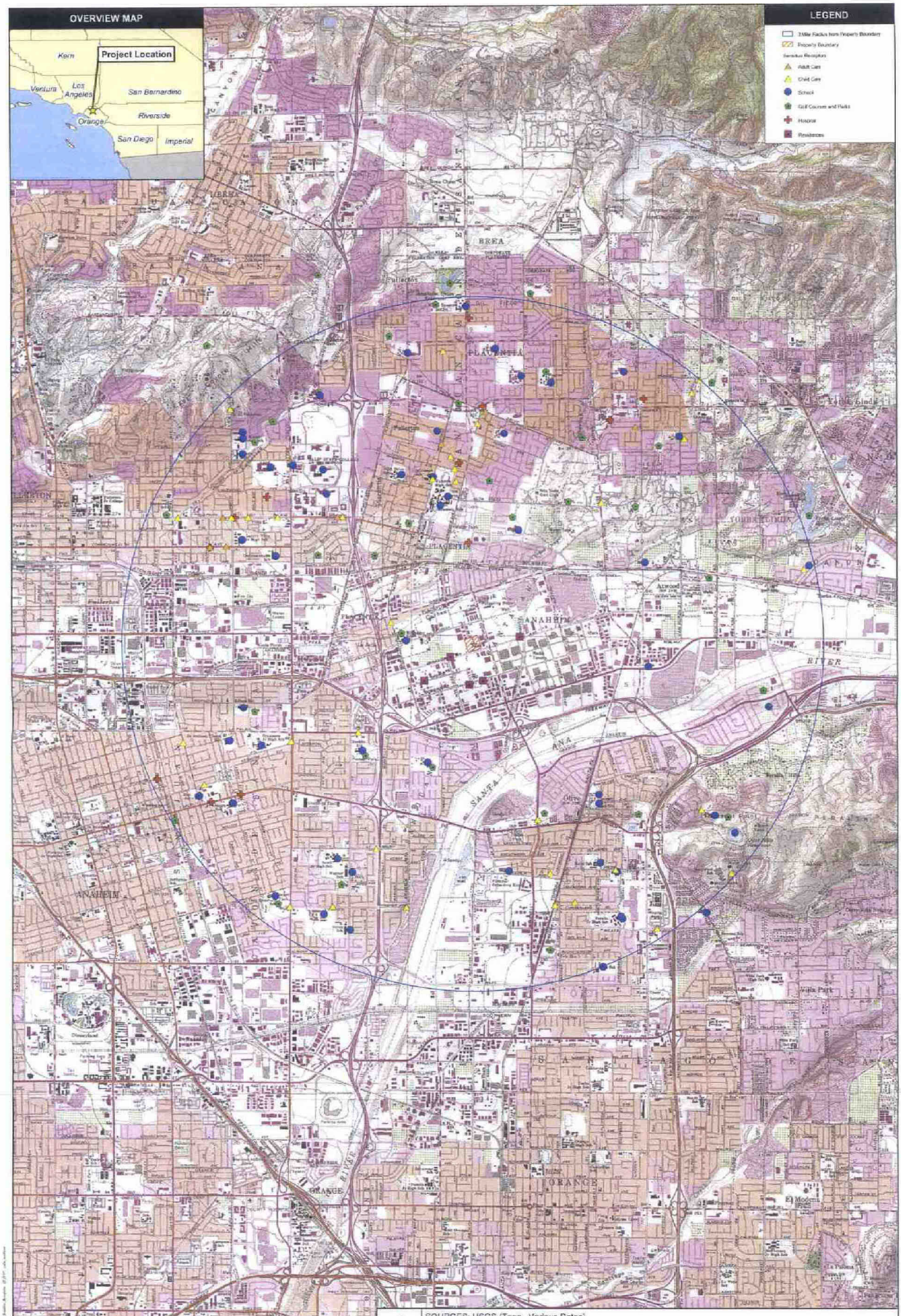
The HRA was conducted using worst-case emissions for each source (short- and long-term) as described above. Cancer and chronic non-cancer health effects were evaluated using the HARP model with annual emission estimates. Acute non-cancer health effects were analyzed based on the worst-case maximum hourly emissions for all sources.

Dispersion modeling was performed using the ISCST3 model in HARP and methods consistent with the approach described in Section 4, and the modeling protocol submitted for the proposed project. The HARP modeling analysis used similar source parameters except that the ISCST3 control parameter NOCALMS was selected per SCAQMD requirements for HRAs. The ISCST3 model was run with turbine stack parameters for the 100 percent load 59°F case to calculate the concentration of TACs per unit emission rate. HARP then uses this information along with the emission rates for specific TAC compounds (provided in the input file as described above) to calculate ground-level concentrations for each chemical species. Appendix E presents stack parameters and TAC emission rates for all project sources that were used in the HRA.

The meteorological input data used in the HARP/ISC modeling came from SCAQMD. The data are from the SCAQMD Anaheim station for 1981, were processed by SCAQMD and are ISCST3 model ready.

Certain groups of individuals may be more susceptible to health risks due to chemical exposure, including children, pregnant women, the elderly, and people with chronic illnesses who could have higher sensitivity to toxic pollutants. Consequently, sensitive receptors, such as schools (public and private), day care facilities, convalescent homes, parks, and hospitals receive particular attention in the health risk analysis. All sensitive receptors located within a 3-mile radius of the site were included in the HRA. Additional receptors were placed at nearby residents. The sensitive receptors and nearby residents

included in the HRA modeling are shown on Figure 5-1, and presented in Appendix ~~G~~H. The current and future residential areas surrounding the CPP site are presented in Figure 5-2 which shows the areas currently zoned for residential use.



SOURCES: USGS (Topo, Various Dates).

SENSITIVE RECEPTORS WITHIN 3 MILES OF THE PROJECT SITE

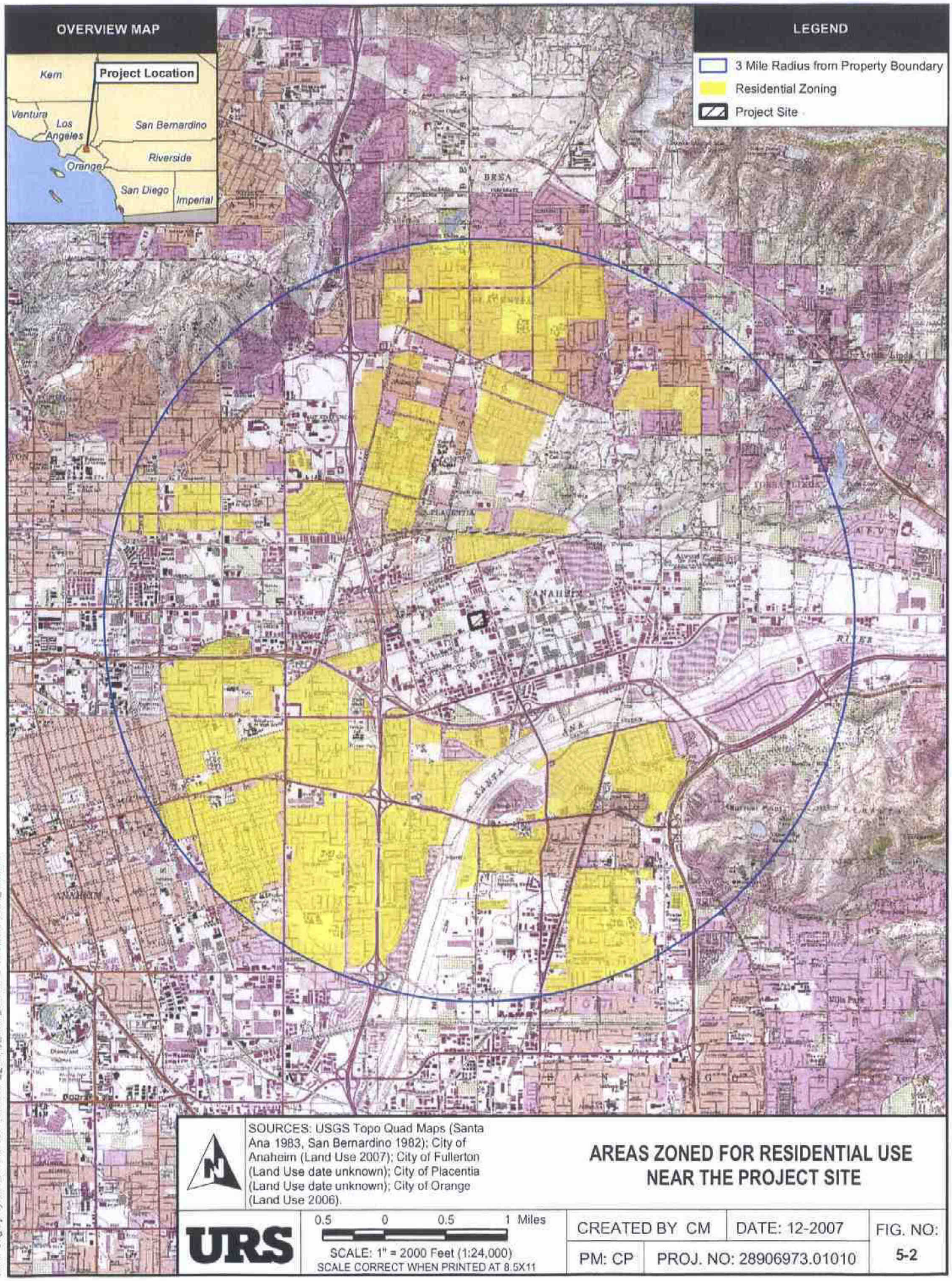
URS

1500 0 1500 3000 4500 Feet

SCALE: 1" = 2000' (1:24,000)

SCALE CORRECT WHEN PRINTED AT 22X34

CREATED BY: CM	DATE: 12-2007	FIG. NO:
PM: CP	PROJ. NO: 28906973.01010	5-1



AREAS ZONED FOR RESIDENTIAL USE NEAR THE PROJECT SITE

Path: G:\gis\projects\1577\28906973\mxd\Air_Quality_Land_Use.mxd, 12/10/07, colin_mattison

All census receptors within 10 kilometers of the project site were included in the HARP analysis. Boundary receptors were placed every 82 feet (25 meters) along the property fence line. Grid receptors were spaced every 328 feet (100 meters) out to 6 miles (10 kilometers) from the site in every direction. Any risks calculated by the HARP model at onsite receptor locations were ignored. To ensure that the maximum potential risks resulting from proposed project emissions would be addressed, all receptors were treated as sensitive receptors, except the offsite worker receptors. Receptors were placed at the nearest nine offsite worker locations.

Toxicological data, cancer potency factors and RELs for specific chemicals are built into the CARB's HARP model. The pollutant-specific cancer potency factors and RELs used in the HRA are listed in Table 3-7. The HARP model uses the toxicological data in conjunction with the other input data described above to perform health risk estimates based on OEHHA equations and algorithms.

5.3 CALCULATION OF HEALTH EFFECTS

Adverse health effects are expressed in terms of cancer or non-cancer health risks. Cancer risk is typically reported as "lifetime cancer risk," which is the estimated maximum increase of risk of developing cancer caused by long-term exposure to a pollutant suspected of being a carcinogen. The calculation of cancer risk conservatively assumes an individual is exposed continuously to the maximum pollutant concentrations 24 hours per day for 70 years. Although such continuous lifetime exposure to maximum TAC levels is unlikely, the goal of the approach is to produce a conservative worst-case estimate of potential cancer risk. All receptors except the worker receptors were treated as sensitive and the cancer risk was estimated as described above. The cancer risk at the worker locations was calculated based on a 40 year exposure, lower breathing rate, and the assumption that the offsite workers worked ~~8 hours per day, 5 days per week~~245 days per year.

Cancer burden was estimated ~~two ways~~ to comply with SCAQMD Rule~~Rules 1309.1 and~~ 1401. ~~For Rule 1401,~~ Under this rule, w~~W~~hen a cancer risk of greater than one in one million is predicted, then cancer burden is calculated. Cancer burden is the estimated increase in the occurrence of cancer cases within the portion of the population subject to a cancer risk greater than or equal to one in one million (1.0×10^{-6}) resulting from exposure to TACs. ~~For Rule 1309.1 cancer burden is calculated when a cancer risk of greater than one in ten million is predicted.~~

Non-cancer risk is typically reported as a THI. The THI is calculated for each target organ as a fraction of the maximum acceptable exposure level to a pollutant. The acceptable exposure level is generally the level at (or below) which no adverse health effects are expected. The THIs are calculated for both short-term (acute) and long-term (chronic) non-carcinogenic exposures.

Both cancer and non-cancer risk estimates produced by the HRA represent incremental risks (i.e., risks due to proposed project sources only) and do not include potential health risks posed by existing background concentrations. The HARP model performs all of the necessary calculations to estimate the potential lifetime cancer risk and the acute and chronic non-cancer THIs posed by proposed project emissions.

Various state and local agencies provide different significance criteria for cancer and non-cancer health effects. For the proposed project, the SCAQMD and California Energy Commission (CEC) guidelines provide the significance criteria for potential cancer and non-cancer health effects from project-related emissions. For carcinogenic health effects, an exposure is considered potentially significant when the predicted increase in lifetime cancer risk exceeds 10 in 1 million (1.0×10^{-5}). For non-carcinogenic health effects, an exposure that affects each target organ is considered potentially significant when the THI exceeds a value of 1.0. ~~In order to have access to the emission reduction credits in the SCAQMD Priority Reserve (Rule 1309.1) projects within an Environmental Justice Area that are less than or equal to 500 MW must meet the cancer risk threshold of 1 in a million, cancer burden of 0.1 (based on a 1 in 10 million risk level) and acute and chronic non-cancer hazard indices of 0.5~~

5.4 ESTIMATED LIFETIME CANCER RISK

The maximum incremental cancer risk resulting from all project emissions was estimated to be ~~0.266~~0.622 in 1 million, at a location on the northern property boundary near the east edge of the site (receptor located at 420,~~287~~263 m east, 3,746,~~910~~903 m north[1]). The maximum incremental cancer risk predicted at a sensitive receptor was estimated to be ~~0.045~~0.097 in 1 million, which is a residence located approximately ~~3,000~~2300 feet (~~600~~700 meters) southwest of the property edge (~~419,563~~ 419,563 m east, ~~3,746,289~~3,746,289 m north). The maximum incremental cancer risk at an offsite worker receptor was estimated to be ~~0.164~~0.089 in 1 million, at a business (Woodridge Press) near the northern edge of the site (at 420,292 m east, 3,746,942 m north). Table 5-1 presents the detailed cancer risk results of the HRA for the proposed project operations. The cancer burden is predicted to be 0 for the entire project, for all four turbines, for each turbine individually, for ~~and~~ the cooling tower, and for ~~7.4E-070 for~~ the black start engine, based on a cancer risk of 1 in 10 million. These values have been revised to reflect the increased of operation of the black start engine from 12 to 200 hours.

To satisfy SCAQMD Rule 1401, the maximum cancer risk and non-cancer chronic and acute hazard indices from each permitted unit must be below the significance thresholds of 10 in a million and 1, respectively. The contributions of individual power plant emission sources to the maximum predicted cancer risk and additional information on the locations of the predicted maximum impacts are provided in Table 5-2. Although the chiller cooling tower is not a permit unit and the black start engine is an exempt permit unit, the risks from these sources were also included in Table 5-2 for informational purposes. These results show that nearly the entire incremental risk is predicted to result from emissions of diesel particulate matter from the blackstart engine. Contributions of individual turbines to the maximum predicted cancer risks are comparatively much lower. Table 5-3 shows the cancer risk predicted for the entire project and each emission source at the residential and offsite worker receptors. Finally, the predicted maximum cancer risks due to emissions of the four proposed turbines combined are provided in Table 5-43.

The estimated incremental cancer risks at all locations are well below the significance criterion of 10 in 1 million, ~~and the Priority Reserve threshold of 1 in a million~~. Thus, the proposed project emissions are expected to pose a less-than-significant increase in carcinogenic health risk. All HARP model files and all

[1] Coordinates are provided in accordance with the Universal Transverse Mercator and North American Datum, 1983, Zone 11.

air quality modeling files are provided electronically on a DVD that is supplied separately with this revised application.

~~Table 5-1~~
~~Maximum Modeled Incremental Cancer Risks and Locations of Impact due to the Emissions of the Canyon Power Plant (All Sources)~~

~~Receptor~~	~~Cancer Risk (per million)~~			
	~~MICR~~	~~UTM Easting (m)~~	~~UTM Northing (m)~~	~~Description of location of impact~~
~~Point of Maximum Impact~~	~~0.622~~	~~420,263~~	~~3,746,903~~	~~northern property boundary near east edge of site~~
~~Residential/ Sensitive~~	~~0.097~~	~~419,563~~	~~3,746,289~~	~~Resident about 700 m southwest of fence~~
~~Off-site worker/ Commercial~~	~~0.0885~~	~~420,292~~	~~3,746,942~~	~~Woodridge Press~~

Table 5-1 (Revised)
Maximum Modeled Incremental Cancer Risks and Locations of Impact due to the Emissions of the Canyon Power Plant (All Sources)

Receptor	Cancer Risk (per million)				
	MICR	UTM Easting (m)	UTM Northing (m)	Description of location of impact	Cancer Burden (based on a 1 in 1 million risk)
Point of Maximum Impact	0.622	420,263	3,746,903	northern property boundary near east edge of site	0
Residential/ Sensitive	0.097	419,563	3,746,289	Resident about 700 m southwest of fence	0
Off-site worker/ Commercial	0.0885	420,292	3,746,942	Woodridge Press	0

~~Table 5-2~~
~~Maximum Modeled Cancer Risks at Residential and Commercial Impacts due to Individual Permit Units~~

~~Source~~	~~Cancer Risk (in 1 million)~~							
	~~Residential~~				~~Commercial~~			
	~~MICR~~	~~UTM Easting (m)~~	~~UTM Northing (m)~~	~~Description of location of impact~~	~~MICR~~	~~UTM Easting (m)~~	~~UTM Northing (m)~~	~~Description of location of impact~~
~~Gas Turbine No. 1~~	~~0.0045~~	~~422484~~	~~3749818~~	~~Harmony Home (~3.5 km NE)~~	~~2.51E-05~~	~~420292~~	~~3746942~~	~~Woodridge Press (~25m N of fence)~~
~~Gas Turbine No. 2~~	~~0.0046~~	~~422484~~	~~3749818~~	~~Harmony Home (~3.5 km NE)~~	~~2.49E-05~~	~~420183~~	~~3746896~~	~~Euro Sport Accessories Inc (~35m N of fence)~~
~~Gas Turbine No. 3~~	~~0.0046~~	~~422484~~	~~3749818~~	~~Harmony Home (~3.5 km NE)~~	~~2.41E-05~~	~~420374~~	~~3746698~~	~~Reel lumber service warehouse(~15m E of fence)~~
~~Gas Turbine No. 4~~	~~0.0046~~	~~422484~~	~~3749818~~	~~Harmony Home (~3.5 km NE)~~	~~2.38E-05~~	~~420374~~	~~3746808~~	~~Reel lumber service warehouse(~15m E of fence)~~
~~Black start Engine~~	~~0.0910~~	~~419925~~	~~3746623~~	~~Resident about 250 m west of fence~~	~~0.083~~	~~420292~~	~~3746942~~	~~Woodridge Press (~25m N of fence)~~
~~Cooling Tower~~	~~0.0036~~	~~420886~~	~~3746890~~	~~Resident about 500 m east of fence~~	~~0.006~~	~~420292~~	~~3746942~~	~~Woodridge Press (~25m N of fence)~~

Total Project	0.0969	419563	3746289	Resident about 700 m southwest of fence	0.0885	420292	3746942	Woodridge Press (~25m N of fence)

Note the CPP operates continuously and thus the default GLC and exposure assumptions were used to estimate the offsite worker cancer risk.

Table 5-2
Maximum Modeled Cancer Risks at Any Receptor due to Individual Emission Sources

Permit Unit	Cancer Risk (per million)				Cancer burden (based on a 1 in 1 million risk)
	MICR	UTM Easting (m)	UTM Northing (m)	Description of location of impact	
Turbine 1	0.0053	422268	3748871	grid ~2.7 km northeast	0
Turbine 2	0.0052	422268	3748871	grid ~2.9 km northeast	0
Turbine 3	0.0052	422268	3748871	grid ~2.9 km northeast	0
Turbine 4	0.0053	422268	3748871	grid ~2.9 km northeast	0
Cooling Tower	0.0203	420287	3746910	northern property boundary	0
Black Start Engine	0.6090	420263	3746903	northern property boundary	0

Note: The following East package receptors are onsite, and thus the predicted risk is ignored at : receptors 12322 and 12444-5.

Note: Only the east receptor package was examined since all of the peak impacts occurred there.

Note: Cancer burden based on a 1 in 1 million risk level. If the peak cancer risk is < 1 in a million then the cancer burden is 0.

Table 5-3
Maximum Predicted Incremental Cancer Risk Impacts due to Four Turbines Only

Permit Unit	Cancer Risk – (excess risk in 1 million)			Chronic Hazard Index			Acute Risk Hazard Index			Cancer burden
	MICR	UTM Easting (m)	UTM Northing (m)	HIC	UTM Easting (m)	UTM Northing (m)	HIA	UTM Easting (m)	UTM Northing (m)	
Turbines 1-4	0.0210	422268	3748871	0.0003	422268	3748871	0.0164	422572	3744781	0

Ignore receptors that are inside the property 12322 and 12444-5

Note: Impacts from receptors that are inside the property are not included, these are grid receptor numbers 12322 and 12444-5. East receptor packet is where all peak impacts occurred.

Note: Cancer burden based on a 1 in 10 million risk level. If the peak cancer risk is < 0.1 in a million then the cancer burden is 0. If the cancer burden based on a 1 in 10 million risk level is 0, then the cancer burden based on a 1 in 1 million risk level will also be 0.

Table 5-3 (New)
Maximum Modeled Cancer Risk at Residential and Commercial Receptors due to Individual Emission Sources

Cancer Risk (in 1 million)								
Source	Residential				Commercial			
	MICR	UTM Easting (m)	UTM Northing (m)	Description of location of impact	MICR	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Gas Turbine No. 1	0.0045	422484	3749818	Harmony Home (~3.5 km NE)	2.51E-05	420292	3746942	Woodridge Press (~25m N of fence)
Gas Turbine No. 2	0.0046	422484	3749818	Harmony Home (~3.5 km NE)	2.49E-05	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)
Gas Turbine No. 3	0.0046	422484	3749818	Harmony Home (~3.5 km NE)	2.41E-05	420374	3746808	Reel lumber service warehouse(~ 15m E of fence)
Gas Turbine No. 4	0.0046	422484	3749818	Harmony Home (~3.5 km NE)	2.38E-05	420374	3746808	Reel lumber service warehouse(~ 15m E of fence)
Black start Engine	0.0910	419925	3746623	Resident about 250 m west of fence	0.083	420292	3746942	Woodridge Press (~25m N of fence)
Cooling Tower	0.0036	420880	3746899	Resident about 500 m east of fence	0.006	420292	3746942	Woodridge Press (~25m N of fence)
Total Project	0.0969	419563	3746289	Resident about 700 m southwest of fence	0.0885	420292	3746942	Woodridge Press (~25m N of fence)

Note the CPP operates continuously and thus the default GLC and exposure assumptions were used to estimate the offsite worker cancer risk.

Table 5-4 (New)
Maximum Predicted Incremental Cancer Risk Impacts due to Four Turbines Only

Permit Unit	Cancer Risk (excess risk in 1 million)			Chronic Hazard Index			Acute Risk Hazard Index			Cancer burden
	MICR	UTM Easting (m)	UTM Northing (m)	HIC	UTM Easting (m)	UTM Northing (m)	HIA	UTM Easting (m)	UTM Northing (m)	(based on a 1 in 1 million risk)
Turbines 1-4	0.0210	422268	3748871	0.0003	422268	3748871	0.0164	422572	3744781	0

Note: Impacts from receptors that are inside the property are not included, these are grid receptor numbers 12322 and 12444-5. East receptor packet is where all peak impacts occurred.

Note: Cancer burden based on a 1 in 1 million risk level. If the peak cancer risk is < 1 in a million then the cancer burden is 0.

SCAQMD Rule 1401.1 provides additional health based criteria for projects that are within 1,000 feet of a school. The closest school to the CPP is the Melrose Elementary School (formerly known as the McFadden School) located approximately 3,000 feet from the stacks. While this distance is sufficient such that the SCAQMD does not require the HRA to estimate the potential public health effects at the school, the HRA performed for the CPP did perform the modeling. The maximum incremental cancer risk predicted at Melrose Elementary was estimated to be 0.05 in 1 million, cancer burden of 0, chronic hazard index of 0.0003, and acute risk hazard index of 0.003. ~~and the results shown in Table 5-1~~ These results demonstrate that the potential public health impacts at the school are significantly less than the maximum public health impacts identified above, and are well below acceptable standards. Therefore the CPP will not cause public health impacts at the Melrose Elementary School.

5.5 ESTIMATED CHRONIC AND ACUTE TOTAL HAZARD INDICES

Table 5-45 ~~-~~presents the maximum predicted chronic and acute hazard indices associated with CPP operational emissions. The maximum chronic THI resulting from proposed project's operational emissions was estimated to be 0.0051 at a ~~location on the northern property boundary near east edge of site~~business (Woodbridge Press) north of the CPP site (receptor located at ~~420,287~~420,292 m east, 3,746,942 m north). The maximum predicted chronic THI at a sensitive receptor due to TAC emissions of the proposed project was 0.0008. This receptor is a residence located approximately 1,640 feet (500 meters) east of the power plant fenceline (at 420,880 m east, 3,746,899 m north). The maximum incremental chronic THI at an offsite worker receptor was ~~estimated to be 0.03, at a business near the northern edge of the site (at 420,292 m east, 3,746,942 m north),~~the value at the Woodbridge Press described above.

The maximum acute THI resulting from the proposed project emissions was estimated to be 0.0165 at a grid receptor located approximately 1.86 miles (3 kilometers) southeast of the project (at 422,572 m east, 3,744,781 m north). The maximum acute THI at a sensitive receptor was estimated to be 0.016 at Placentia Veterinary Clinic, which is approximately 2.05 miles (3.3 kilometers) north of the proposed project site (at 420,384m east, 3,750,118 m north). The maximum acute THI at an offsite worker receptor was estimated to be 0.0006 at a business (Eurosport) ~~near the~~ about 100 feet (35 meters) ~~northern edge~~ of the CPP site (at 420,183 m east, 3,746,896 m north).

Table 5-6 presents the chronic and acute THI predicted at any receptor due to each emission source. Tables 5-7 and 5-8 present the predicted chronic and acute THI, respectively, due to each CPP emission source. The estimated chronic and acute THIs due to the entire project or individual emission sources are well below the significance criterion of 1.0. Thus, the proposed project emissions of non-carcinogenic TACs would not be expected to pose a significant risk.

~~Tables 5-1 5-5 and 5-6 presents the detailed results of the HRA for the proposed project operations~~information on the contributions of each project emission unit to the predicted maximum chronic and acute THIs, respectively. The estimated maximum chronic and acute THIs are both well below the significance criterion of 1.0. Thus, the proposed project emissions of non-carcinogenic TACs would not be expected to pose a significant human health risk.

Table 5-5~~4~~ (Revised)
Maximum Modeled Chronic and Acute Non-Cancer Health Risks and Locations of Impacts due to Emissions of the Canyon Power Plant (All Sources)

Receptor	Chronic Hazard Index			
	HIC	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Point of Maximum Impact	0.0051	420,292	3,746,942	Woodridge Press
Residential/ Sensitive	0.0008	420,880	3,746,899	Resident about 500 m east of fence
Off-site worker/ Commercial	0.0051	420,292	3,746,942	Woodridge Press
Receptor	**Acute Hazard Index**			
	HIA	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Point of Maximum Impact	0.0165	422,572	3,744,781	grid approximately 3 km southeast
Residential/ Sensitive	0.0162	420,384	3,750,118	Placentia Veterinary Clinic about 3.3km north
Off-site worker/ Commercial	0.0006	420,183	3,746,896	Euro Sport Accessories Inc

Table 5-6 (New)
Maximum Modeled Chronic THI at Any Receptor due to Individual Emission Sources

Permit Unit	Chronic Hazard Index			
	HIC	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Turbine 1	0.0001	422268	3748871	grid ~2.7 km northeast
Turbine 2	0.0001	422268	3748871	grid ~2.7 km northeast
Turbine 3	0.0001	422268	3748871	grid ~2.7 km northeast
Turbine 4	0.0001	422268	3748871	grid ~2.7 km northeast
Cooling Tower	0.0039	420287	3746910	northern property boundary
Black Start Engine	0.0004	420263	3746903	northern property boundary
Permit Unit	**Acute Hazard Index**			
	HIA	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Turbine 1	0.0041	422672	3744681	grid ~3.1 km southeast
Turbine 2	0.0041	422572	3744781	grid ~3 km southeast
Turbine 3	0.0041	422572	3744781	grid ~3 km southeast
Turbine 4	0.0041	422519	3744925	grid ~2.8 km southeast
Cooling Tower	0.0004	420287	3746910	northern property boundary
Black Start Engine	NA	NA	NA	NA

Note: The following East package receptors are onsite, and thus the predicted risk is ignored at receptors 12322 and 12444-5.

Note: Only the east receptor package was examined since all of the peak impacts occurred there.

Table 5-7~~5~~ (New)
Maximum Modeled Chronic ~~and Acute~~ THI at Residential and Commercial Receptors due to Individual Emission Sources

Chronic Non-cancer Hazard Index								
Source	Residential				Commercial			
	HIC	UTM Easting (m)	UTM Northing (m)	Description of location of impact	HIC	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Gas Turbine No. 1	0.0001	422484	3749818	Harmony Home (~3.5 km NE)	1.89E-06	420292	3746942	Woodridge Press (~25m N of fence)
Gas Turbine No. 2	0.0001	422484	3749818	Harmony Home (~3.5 km NE)	1.87E-06	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)
Gas Turbine No. 3	0.0001	422484	3749818	Harmony Home (~3.5 km NE)	1.81E-06	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)
Gas Turbine No. 4	0.0001	422484	3749818	Harmony Home (~3.5 km NE)	1.79E-06	420374	3746808	Reel lumber service warehouse(~ 15m E of fence)
Black start Engine	0.0001	419925	3746623	Resident about 250 m west of fence	2.63E-04	420292	3746942	Woodridge Press (~25m N of fence)
Cooling Tower	0.0007	420880	3746899	Resident about 500 m east of fence	4.81E-03	420292	3746942	Woodridge Press (~25m N of fence)
Total Project	0.0008	420880	3746899	Resident about 500 m east of fence	0.0051	420292	3746942	Woodridge Press (~25m N of fence)

Table 5-8 (New)
Maximum Modeled Acute THI at Residential and Commercial Receptors due to Individual Emission Sources

Acute Non-cancer Hazard Index								
Source	Residential				Commercial			
	HIA	UTM Easting (m)	UTM Northing (m)	Description of location of impact	HIA	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Gas Turbine No. 1	0.0040	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	7.02E-05	420344	3746992	Kraemer Auto Collision Center (~85m NE of fence)
Gas Turbine No. 2	0.0040	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	6.44E-05	420344	3746992	Kraemer Auto Collision Center (~85m NE of fence)
Gas Turbine No. 3	0.0040	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	5.94E-05	420344	3746992	Kraemer Auto Collision Center (~85m NE of fence)
Gas Turbine No. 4	0.0040	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	5.52E-05	420344	3746992	Kraemer Auto Collision Center (~85m NE of fence)
Black start Engine	0	NA	NA	NA	0	NA	NA	NA
Cooling Tower	0.0001	420186	3750043	Resident about 450 m south of fence	3.76E-04	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)
Total Project	0.0161	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	0.00057	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)

~~Note the CPP operates continuously and thus the default GLC and exposure assumptions were used to estimate the cancer risk~~ ~~To satisfy SCAQMD Rule 1401, the maximum cancer risk and non-cancer chronic and acute hazard indices from each permitted unit must be below the significance thresholds of 10 in a million and 1, respectively. The detailed results of the HRA for each permit unit shown in Table 5-2 demonstrate that each permit unit will individually be below the significance thresholds.~~

~~Table 5-2~~
~~Estimated Cancer Risk and Acute and Chronic Non-cancer Total Hazard Indices For Each Individual Permit Unit~~

~~Location~~	~~Cancer Risk (excess risk in 1 million)~~	~~Chronic Hazard Index~~	~~Acute Risk Hazard Index~~
~~Turbine 1~~	~~0.0058~~	~~0.0001~~	~~0.0041~~
~~Turbine 2~~	~~0.0057~~	~~0.0001~~	~~0.0041~~
~~Turbine 3~~	~~0.0057~~	~~0.0001~~	~~0.0041~~
~~Turbine 4~~	~~0.0058~~	~~0.0001~~	~~0.0041~~
~~Cooling Tower~~	~~0.0290~~	~~0.0056~~	~~0.0004~~
~~Black Start Engine~~	~~0.2440~~	~~0.0002~~	~~0.0000~~

5.6 UNCERTAINTY IN THE PUBLIC HEALTH IMPACT ASSESSMENT

Sources of uncertainty in the results of HRAs include emissions estimates, dispersion modeling, exposure characteristics, and extrapolation of toxicity data in animals to humans. For this reason, assumptions used in HRAs are typically designed to provide sufficient health protection to avoid underestimation of risk to the public. Some sources of uncertainty applicable to this HRA are discussed below.

The turbine emission rates were derived using vendor data for ammonia slip and from emission factors from AP 42 (USEPA, 1995) and CATEF (CARB, 1996) for the other air toxics. Both the short- and long-term turbine emissions estimates were developed assuming all turbines would operate at full load and continuously at the same time. Under actual operating conditions, the turbines would operate less hours per year and at a lower load. Consequently, the emissions used for this HRA are likely to be higher than what would be experienced under normal plant operation.

Dispersion models approved for regulatory applications contain assumptions that tend to overpredict ground-level concentrations. For example, the modeling performed in the HRA assumed a conservation of mass (i.e., all of the pollutants emitted from the sources remained in the atmosphere while being transported downwind). During the transport of pollutants from sources toward receptors, none of the emitted material was assumed to be removed from the source plumes through chemical reaction or lost at the ground surface through reaction, gravitational settling, or turbulent impaction. In reality, these mechanisms work to reduce the level of pollutants remaining in the atmosphere during plume travel.

The exposure characteristics assessed in the HRA included the assumption that residents would be exposed to turbine emissions continuously at the same location for 24 hours per day, 365 days per year, for 70 years. It is extremely unlikely that any resident would meet this condition. The conservative exposure assumption tends to overpredict risk estimates in the HRA process.

The toxicity data used in the HRA contain uncertainties due to the extrapolation of data from animals to humans. Typically, safety factors are applied when doing the extrapolation. Furthermore, the human

population is much more diverse, both genetically and culturally, than bred experimental animals. The interspecies variability among humans is expected to be much greater than in laboratory animals. With all of the uncertainty in the assumptions used to extrapolate toxicity data, significant measures are taken to ensure that sufficient health protection is built into the available health effects data.

Conservative measures to compensate for all of these uncertainties and ensure that potential health risks are not underestimated are compounded in the final HRA predictions. Therefore, the actual risk numbers are expected to be well below the values presented in this analysis.

SECTIONSIX

SECTION 6 BEST AVAILABLE CONTROL TECHNOLOGY

In accordance with the requirements of SCAQMD rules, the proposed project will be required to use BACT to minimize emissions from the proposed combustion turbines and the black start engine. The BACT analysis presented in this section was conducted to evaluate available control options for the proposed project. A summary of the proposed BACT is provided below.

Table 6-1 presents the proposed BACT emission levels for the proposed project, based on the assessment described below. In response to a request from SCAQMD, an ECM white paper and ~~a more detailed supplemental~~ BACT analysis has been prepared for the proposed combustion turbine generators, and the results of this study are provided in Appendix I to this revised application.

Table 6-1
Summary of Proposed BACT

Pollutant	Control Technology	Concentration
CTGs		
NO_X	Water injection and SCR with ammonia injection	2.5 ppmvd at 15 percent O_2 (1-hour average)[1]
CO	Catalytic oxidation	~~6~~4.0 ppmvd at 15 percent O_2 (1-hour average)
~~VOC~~ROG	Catalytic oxidation	2.0 ppmvd at 15 percent O_2 (1-hour average)
SO_2	Pipeline quality natural gas	NA
PM_{10}	Pipeline quality natural gas	NA
Ammonia slip	Operational limitation	5.0 ppmvd at 15 percent O_2
Black Start Engine (1,141 horsepower)		
NO_X	EPA Tier II	6.4 g/ kW-hour (4.8 g/hp-hr)
CO	EPA Tier II	3.5 g/kW-hour (2.63 g/hp-hr)
~~VOC~~ROG	EPA Tier II	1.0 g/kW-hour (0.75 g/hp-hr)
SO_2	EPA Tier II	Diesel fuel with sulfur content no greater than 0.0015% by weight
PM_{10}	EPA Tier II, plus particulate trap for an additional 85% control	0.03~~20~~ g/kW-hour (0.~~1~~0225 g/hp-hr)

Notes:
[1] Current BACT for simple cycle combustion turbines is 2.5 ppmvd at 15% O_2. ~~The CTG and control equipment vendors for the CPP have indicated that they will meet 2.3 ppmvd at 15% O_2 for the LM6000 turbines, as required to achieve a NO_x emission rate of 0.06 lb/MW-hour at 59 °F, 60% relative humidity and 14.7 psia ambient pressure. Compliance with this emission limit at these specific ISO conditions is required for this project to be eligible to purchase Priority Reserve emission credits pursuant to SCAQMD Rule 1309.1. The applicant is not proposing 2.3 ppmvd as BACT for all operating conditions.~~

BACT = Best Available Control Technology
CO = carbon monoxide
NA = not applicable
NO_X = nitrogen oxides
O_2 = oxygen
PM_{10} = particulate matter less than or equal to 10 microns in diameter
ppm = parts per million
SCR = Selective catalytic reduction
~~VOC~~ ROG = ~~volatile~~ reactive organic ~~compounds~~gases
SO_2 = sulfur dioxide

6.1 COMBUSTION TURBINE GENERATORS

A BACT assessment was conducted for the proposed CPP which considered all NO_x and CO control technologies currently proposed or in use on natural gas-fired combustion turbines with more than 40 MMBtu per hour fuel energy input. To identify feasible emission limits for comparable turbine units, several information sources were consulted, including the following:

- USEPA RACT/BACT/LAER Clearinghouse (USEPA 1985) and updates.
- CARB BACT Clearinghouse database and CARB BACT Guidelines for Power Plants (Adopted 7/22/99).
- Recent California Energy Commission (CEC) Applications for Certification.
- Research conducted by Anaheim Municipal Power Station design engineers.

Table 6-2 lists selected recent NO_x BACT proposals and determinations for natural gas-fired advanced technology combustion turbines in California. All recent simple-cycle gas turbine projects in California had a NO_x BACT level of 2.5 ppm dry volume basis (ppmvd) at 15 percent oxygen (O_2), to be achieved at all times, except during startups and maintenance activities, by means of either water injection or dry low-NO_x burners in combination with SCR and ammonia injection. For the CPP the applicant has committed to achieving combustion turbine NO_x emissions at or below a stack concentration of 2.3 ppmvd at 15 percent O_2 at ISO conditions. ~~in order to satisfy the applicable requirement in Rule 1309.1 to maintain NO_x emissions of 0.080 lb/MW-hour or lower. This emission rate is a criterion for eligibility to use Priority Reserve emission credits for a new in-District generating facility with a capacity of less than 500 MW in an Environmental Justice Area within Zone 1, as defined in the Rule, by using water injection and SCR. The applicant does not wish to accept 2.3 ppmvd at 15% O2 as BACT for all operating conditions, since it is only required by Rule 1309.1at ISO conditions (59 °F, 60% relative humidity and 14.7 psia ambient pressure).~~

Table 6-2
Summary of Recent NO_x BACT Determinations for Combustion Turbine Generators Rated at Greater Than 40 MW in Peaking Service

Name	Location	Rating	Vendor, Model	Emission Limit	Control(s)	Permit Date
Kings River Conservation District Peaking Plant	CA	40+ each, 2 turbines, 97 MW total	GE LM6000 Sprint PC	3.0 ppm	Water injection and SCR	5/04
Modesto Electric Generation Project	CA	40+ each, 2 turbines, 95	GE LM6000 Sprint	2.5 ppm	Water injection and SCR	2/04

Table 6-2
Summary of Recent NO_x BACT Determinations for Combustion Turbine Generators Rated at Greater Than 40 MW in Peaking Service (Continued)

Name	Location	Rating	Vendor, Model	Emission Limit	Control(s)	Permit Date
		MW total				
Riverside Energy Resource Center	CA	40+ each, 2 turbines, 96 MW total	GE LM6000 Sprint PC NxGen	2.5 ppm	Water injection and SCR	12/04
Niland Gas Turbine Plant	CA		GE LM6000 PD Sprint NxGen	2.5 ppm	Dry Low-NOx burners and SCR	12/06

GE = General Electric
MW = megawatt
ppm = Parts per million by volume, dry basis, at 15 percent oxygen
SCR = Selective catalytic reduction

Similarly, nearly all recent simple-cycle turbine projects have been approved with a CO emissions limit of 6 ppmvd and a ~~VOC~~ ROG emissions limit of 2 ppmvd (both at 15 percent O_2), based on the use of an oxidation catalyst. The CPP natural gas turbines will achieve these same BACT concentrations for CO and ~~VOC~~ ROG by application of oxidation catalysts. Exclusive use of natural gas fuel has been determined to be BACT for SO_X and PM_{10} in all other comparable projects for several years.

6.1.1 Assessment of NO_x Control Technologies

Based on a review of the materials described above, the following NO_x control technologies were evaluated to determine whether they are able to achieve BACT NO_x levels in practice:

- Dry low-emission burner system (DLE) and Goal Line EMx™.
- Water injection and SCR.

6.1.1.1 EMx™

EMx™ is a NO_x reduction system produced by Goal Line Environmental Technologies (now distributed by EmeraChem) for natural gas turbine applications within an exhaust temperature range significantly below the design operating parameters of the simple-cycle LM 6000 turbines that will be employed at the CPP. This system uses a coated catalyst to oxidize both NO_x and CO, and thereby reduce plant emissions. As demonstrated by an initial installation on several gas turbines in co-generation (combined cycle) applications, EMx™ is capable of achieving NO_x emission concentrations of 2 ppm based on a maximum inlet concentration of 25 ppm, and 90 percent CO reduction based on a maximum inlet concentration of 50 ppm. A two-step process reduces NO_x emissions. First, NO_X emissions are oxidized to NO_2 and then adsorbed onto the catalyst. In the second step, a proprietary regenerative natural gas is passed through the catalyst periodically. This natural gas desorbs the NO_2 from the catalyst and reduces it

to N_2. The system does not use ammonia as a reagent; rather, it uses natural gas as the basis for a proprietary catalyst regeneration process. CO emissions are reduced in EMx™ by the catalytic oxidation of CO to CO_2.

However, the EMx™ technology has not been sufficiently demonstrated on higher exhaust temperature simple-cycle peaking natural gas turbines such as those proposed for the CPP project. The system consists of a catalyst that is installed in the flue gas at a point where the temperature is between 280°F and 650°F. The CPP CTGs operate between 710 to 859 °F; therefore, the EMx™ technology is not appropriate for application to the high temperature turbine exhaust conditions of the proposed project.

Potential advantages of the EMx™ process include:

- **No Ammonia.** The EMx™ process does not use ammonia. This eliminates any ammonia storage and transportation safety issues and the potential for ammonia slip or ammonia-based particulate formation.
- **Carbon Monoxide Reduction.** EMx™ will reduce CO and ~~VOC~~ ROG emissions, as well as NO_x emissions.

Potential disadvantages of the EMx™ process include:

- **High Capital and Operating Cost.** EMx™ is significantly more expensive than SCR with ammonia injection, primarily due to the higher cost of initial and replacement catalyst. The EMx™ catalyst is a precious metal catalyst, which is very expensive.
- **Not Suitable for Exhaust Temperatures of Simple-Cycle Natural Gas Turbine Peaking Applications**. EMx™ has been primarily installed on small co-generation systems. The CPP facility will be a simple-cycle peaking operation. Peaking units require more rapid startup and more frequent load changes than typical co-generation systems. The main concerns are the damper systems that would be required with EMx™ for the units and assuring proper regeneration gas distribution. The effectiveness and longevity of these damper systems have not been demonstrated on simple-cycle natural gas turbines, and their cost of replacement would be substantial. In addition, steam is required to produce the EMx™ regeneration gas. The CPP facility will have no steam production.
- **Catalyst "Washing."** A proprietary catalyst washing system must be used and an on-line catalyst washing system design has not yet been fully developed. If an on-line catalyst washing system is not used, then the facility must be shut down for cleaning.

Because the low NO_x emission rates attainable on natural gas turbines in co-generation systems with EMx™ have not been sufficiently demonstrated as "achieved in practice" on simple-cycle natural gas turbine applications and the other factors discussed above, EMx™ does not represent current, technically feasible BACT for the CPP facility. Accordingly, a comparative cost analysis with the proposed NO_x control technologies is not required. However, SCAQMD staff has agreed with previous BACT evaluations that determined the use of EMx™ for simple-cycle CTGs is not a cost effective option. These findings reinforce the elimination of EMx™ on grounds of technical infeasibility.

6.1.1.2 SCR with Water Injection

SCR is a technology that achieves post-combustion reduction of NO_x from flue gas within a catalytic reactor. The SCR process involves the injection of ammonia (NH_3) into the exhaust gas upstream of a specialized catalyst module, promoting conversion of NO_x to molecular nitrogen. SCR with ammonia injection systems for reduction of NO_x emissions have been widely used in simple-cycle natural gas turbine applications for many years, and are considered a proven technology. SCR systems are commercially available from several vendors, unlike EMx™, which is only available from a single vendor. The SCR process involves the injection of ammonia into the flue gas stream by means of an ammonia injection grid upstream of the catalyst. The ammonia reacts with NO_x in the presence of the catalyst. The catalyst is not regenerated and requires periodic replacement. SCR vendors typically offer a 3-year guarantee on catalyst life. SCR with ammonia injection systems have been used in numerous simple-cycle applications in California and throughout the world.

Water or steam injection has been a proven NO_x control technique for many years. Injection of water or steam into the primary combustion zone of advanced combustors of a CTG reduces the formation of thermal NO_x by decreasing the peak combustion temperature. Water injection decreases the peak flame temperature by diluting the combustion gas stream and acting as a heat sink that absorbs the heat necessary to: (a) vaporize the water (latent heat of vaporization), and (b) raise the vaporized water temperature to the combustion temperature. High purity water must be employed to prevent turbine corrosion and deposition of solids on the turbine blades. The use of water or steam injection in diffusion flame combustors firing natural gas can typically achieve gas turbine NO_x exhaust concentrations of 25 ppmvd, corrected to 15 percent O_2.

The Project will use water injection and SCR with ammonia injection designed to achieve a NO_x emission limit of 2.3 ppm (at 15 percent O_2). As noted in Table 1, water injection and SCR have recently been permitted at a NO_x emission level of 2.5 ppmvd (at 15 percent O_2) for numerous California turbines that are similar in capacity to the proposed CPP turbines. Accordingly, water injection with SCR with ammonia injection is considered to be BACT for the CPP facility.

6.1.1.3 Other Technologies

Technologies that cannot achieve a NO_x emissions limit of 2.5 ppmvd (at 15 percent O_2) in practice were not considered as BACT candidates for the CPP facility. These technologies include SCR without DLE, DLE without SCR, and water/steam injection without SCR.

6.1.2 Assessment of CO Control Technologies

The CPP facility CTGs are guaranteed to emit no more than ~~6~~ 4 ppm of CO (at 15 percent O_2), with natural gas fuel and use of a CO oxidation catalyst (except during startup and shutdown). In discussions with the applicant, SCAQMD has approved the use of a CO oxidation catalyst to achieve a stack concentration of 6 ppmvd @15% O_2 as BACT for several other simple cycle gas turbine projects over the last few years. However, SCAQMD has recently determined that 4 ppmvd CO @15% O_2 ~~has been~~is now sufficiently well demonstrated to be ~~technically feasible~~achieved in ~~for~~practice for simple cycle gas turbines.

The following CO control technologies are evaluated:

- Combustion design/control
- Oxidizing catalyst

6.1.2.1 Combustion Design/Control

Natural gas turbine combustion technology has significantly improved over recent years with regard to lowering CO emissions. CPP proposes to operate four LM 6000 turbines at the CPP facility. For other installations, turbines have been guaranteed by the manufacturer to achieve a CO rate of 9 ppm (at 15 percent O_2) without post-combustion control technologies over a wide range of operating conditions (50 percent to 100 percent load) and ambient conditions (38°F to 109°F).

6.1.2.2 Oxidizing Catalyst

CO oxidizing catalyst systems have been used with natural gas-fired turbines for over a decade when uncontrolled CO emission levels are unacceptably high. CO catalysts operate at elevated temperatures within the turbine exhaust stream. CO-oxidizing catalysts are considered technically feasible for use in simple-cycle peaking applications. Thus, installation of a CO-oxidizing catalyst on the natural gas turbines is considered to be BACT for the CPP facility.

6.1.3 Assessment of ~~VOC~~ ROG Control Technologies

The proposed BACT level of 2 ppmvd (at 15 percent O_2) for ~~VOC~~ ROG control with water injection, SCR, and an oxidation catalyst is consistent with the most stringent level found among recent BACT determinations for simple-cycle natural gas turbines in California, and is therefore considered to be BACT for the CPP facility.

6.1.4 Assessment of SO_2 and PM_{10} Control Technologies

Sulfur dioxide and PM_{10} emissions will be controlled through the exclusive use of clean-burning pipeline quality natural gas. This control technology has been widely and uniformly implemented for control of SO_2 and PM_{10} emissions from combustion turbines in California and throughout the United States, and is considered to be BACT for the CPP facility.

6.1.5 Assessment of Ammonia Slip Control Technologies

Ammonia emissions will be limited to 5 ppmvd (at 15 percent O_2). This proposed BACT is consistent with SCAQMD policy to control NO_x.

6.2 BLACK START ENGINE

The Project will include a diesel fuel driven engine for the black start generator. 40CFR part 89 and CCR Title 13 and Title 17 require certified EPA TEIR III emission rates for emergency internal combustion

engines, which currently are commercially unavailable. The equipment proposed for the CPP black start engine satisfies the EPA's emission requirements for TIER II engines rated at greater than 750 kW:

- NO_X ~~+ NMHC~~: 4.8 g/hp-hr
- ROG: 0.1 g/hp-hr
- CO: 2.6 g/hp-hr
- PM: 0.~~1~~0225 g/hp-hr (includes 85% additional control using a particulate trap)

A summary of recent SCAQMD BACT determinations for compression ignition emergency engines greater than 750kW is shown in Table 6-3.

Table 6-3
Summary of Recent BACT Determinations in the SCAQMD for Diesel Internal Combustion Engines

Name	Location	Application Date	Rating (Hp)	Control Technology	Emission Limit (g/bhp-hr)			
					VOCROG	NO_x	CO	PM_{10}
Walt Disney Pictures and Television	Glendale, CA	5/2000	1109	combustion modifications (turbocharged and aftercooled)	1.0	6.9	8.5	0.38
Homegrocer.com	Carson, CA	5/2000	1480	combustion modifications (turbocharged and aftercooled)	1.0	6.9	8.5	0.38
Homegrocer.com	Carson, CA	5/2000	883	turbocharged and aftercooled	1.0	6.9	8.5	0.38
Cucamonga County Water District	Rancho Cucamonga, CA	5/2000	890	turbocharged and aftercooled	1.0	6.9	8.5	0.38

Hp = horsepower
g/bhp-hr = grams per brake horsepower - hour

SECTION SEVEN

SECTION 7 EMISSIONS OFFSET AND PROJECT MITIGATION STRATEGIES

~~The Applicant~~A new facility proposing to locate in the SCAQMD is required to provide emissions offsets for maximum potential increases in emissions of nonattainment pollutants in excess of specified thresholds that would result from the operation of the proposed facility. Estimated annual emissions of these pollutants due to project operations are summarized in Table 3-6. Calculations confirming the annual emissions in Table 3-6 that were used to determine the applicability of offset requirements for different pollutants are provided in Appendix JJ.

~~Under~~ Pursuant to SCAQMD ~~rules~~Rule 1304, offsets are required for the project's annual emissions of NO_x, ~~VOC~~ROG, PM_{10} or SO_2 in excess of four tons per year. Thus, based on the CPP annual emissions estimates in Table 3-6 and Appendix JJ, offsets are not required for ~~either SO_2 or VOC~~ any of the latter three pollutants to meet SCAQMD requirements. Offsets also will not be required for CO, because of the recent redesignation of the South Coast Air Basin to attainment for this pollutant, and in any case, annual emissions of this pollutant are projected to be only about one-third of the 29 ton per year offset threshold specified in Rule 1304~~.~~. ~~The~~ The CPP is exploring CEQA mitigation for its proposed ~~VOC~~ROG, PM_{10} and SO_2 emissions, which may take the form of traditional ERCs or other mitigation programs~~.~~

The ability to remain below an annual facility emission total of 4 tons per year each for ROG, PM_{10} and SO_2 is a result of the applicant's decision to accept an annual limit on turbine operating hours. The facility's emissions of PM_{10} are at 3.99 tons per year for an operating profile of 602 hours per year plus 129 startups and shutdowns. This profile results in annual emissions of ROG and SO_2 that are considerably lower than 4 tons.

The calculations in Appendix JJ also show that in order to remain below the offset threshold for PM_{10} during the initial year of operation, which includes a series of commissioning activities that may involve up to 156 hours of operation per turbine, normal operations after commissioning must be limited to no more than 446 hours per turbine. Accordingly, the applicant will accept this limitation for the commissioning year.

~~Under SCAQMD rules, the proposed project's offset requirements for PM_{10} will be determined based on the maximum expected monthly emissions (in pounds) divided by 30 (i.e., essentially the average daily emissions of the worst-case month). The offset ratio for emission reduction credits (ERCs) or Priority Reserve Credits is 1.2 to 1. The Regional Clean Air Incentives Market (RECLAIM) NO_x credit requirements are calculated based on the expected annual project emissions of this pollutant using a one-to-one ratio. Because the proposed project site is located in the South Coast Air Basin, it is automatically a NO_x RECLAIM source.~~

Offsets will be required for the CPP emissions of NO_x. The proposed project will be a RECLAIM facility and will purchase RECLAIM Trading Credits (RTCs) to offset annual NO_x emissions increases on a one-to-one basis. Based on the calculations presented in Table 3-Appendix JJ, the annual emissions in pounds, and thus the required number of RTCs will be ~~27,939~~ 28,847~~28,767~~ during the commissioning year, reducing to ~~17,439~~ 17,558 pounds in subsequent years. These totals represent the same operating scenarios described above for the commissioning year and non-commissioning years (446 hours and 602

hours of normal operation plus 129 startups and shutdowns per turbine, respectively.) No other offsets will be required to comply with SCAQMD regulations.

Table 7-1 shows the operating parameters used to estimate emission offset requirements for the proposed project. Based on ~~these assumptions~~ the indicated facility operating profiles and the proposed project equipment emissions data presented previously for CTG normal operations and ~~CTG~~ startup/shutdown conditions, as well as the blackstart engine, the expected offset requirements for the proposed project are shown in Table 7-2. The requirements for NO_x have been calculated in the form of annual RECLAIM credits. ~~One-to-one offsets for the annual emissions of VOC and SO_x are also assumed to meet CEC requirements, as explained above. SCAQMD does not require offsets for PM_{10} emissions from evaporative cooling towers of the type that would be used for the proposed project.~~

~~The proposed project will purchase RECLAIM Trading Credits to offset annual NOx emissions increases. The actual mix of emission credits that will be used to offset proposed project emissions for other pollutants will be determined based on availability and market conditions. One option is to create or purchase ERCs. SCAQMD regulations allow the use of interpollutant offsets in situations where one pollutant is a precursor to another. For example, since NOX and SO2 contribute to the formation of PM10, extra NOx and/or SO2 ERCs could be used to offset some of the proposed project's PM10 emissions.~~

Table 7-1
Basis for Estimating Emission Credit Requirements to Offset Proposed Project Emissions

Emission Source	Combined Annual Operating Hours at 100% Capacity	Combined Annual Startups and Shutdowns (CTGs only)
CTGs 1-4	~~4,000~~2408	~~514~~516
~~Cooling Tower for CTGs 1-4~~	~~4,000~~	
Black Start Engine	~~12~~200	

Table 7-2

Estimated NO_x RECLAIM ~~Requirements~~Credit Requirements for the Proposed Project Emissions (lb/year)

Pollutant	CTGs	Black Start Engine	Total Emission Credits Required	Offset Requirement (offset ratio)
~~NO_x (lbs/year)~~	~~21,259~~	~~126.90~~	~~21,386~~	~~By SCAQMD RECLAIM (1:1)~~
NO_x Commissioning Year	26,435	2,412	28,847	By SCAQMD RECLAIM (1:1)
NOx Non-Commissioning Year	15,146	2,412	17,558	By SCAQMD RECLAIM (1:1)
~~ROG (lbs/year)~~	~~4,962~~	~~19.84~~	~~4,982~~	~~By CEC requirement (1:1)~~
~~SOx (lbs/year)~~	~~5,676~~	~~0.07~~	~~5,676~~	~~By CEC requirement (1:1)~~
~~PM_{10} (lbs/day)~~	~~112.6~~	~~0.33~~	~~136~~	~~By SCAQMD - Priority Reserve (1.2:1)~~

~~Notes:~~
~~CTG = combustion turbine generator~~
~~ERCs = emission reduction credits~~
~~Lbs/day = pounds per day~~
~~NO_x = oxides of nitrogen~~
~~PM_{10} = particulate matter less than or equal to 10 microns in diameter~~
~~SOx = oxides of sulfur~~
~~VOC = volatile organic compound~~

SECTIONEIGHT

SECTION 8 APPLICABLE REGULATORY REQUIREMENTS

The applicable laws, ordinances, regulations, and standards (LORS) related to the potential air quality impacts from the CPP are described below. These LORS are administered (either independently or cooperatively) by the SCAQMD, U.S. EPA Region IX, the CEC, and the CARB.

8.1 FEDERAL

The federal Clean Air Act (CAA) of 1970, 42 United States Code 7401 et seq., as amended in 1977 and 1990, is the basic federal statute governing air pollution. The provisions of the CAA that are potentially relevant to this project are listed below and discussed in the following sections:

- Air Quality Control Regions
- National Ambient Air Quality Standards
- Prevention of Significant Deterioration
- Acid Rain Program
- New Source Review
- New Source Performance Standards
- Maximum Achievable Control Technology Standards
- Title V Operating Permits
- Risk Management Program

Applicable requirements of the State of California and the SCAQMD are discussed in Section 8.2 and 8.3, respectively, including regulations that apply to both construction and operation of the CPP.

8.1.1 Air Quality Control Regions

Because air pollution is a regional problem and not limited to political or state boundaries, the CAA established Air Quality Control Regions (AQCR). This is a method of dividing the country into regional air basins. The proposed project site is located in the Metropolitan Los Angeles AQCR (40 CFR Part 81.17).

8.1.2 National Ambient Air Quality Standards

U.S. EPA, in response to the federal CAA of 1970, established federal NAAQS in 40 CFR Part 50. The federal NAAQS include both primary and secondary standards for six "criteria" pollutants, including O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$ and lead (Pb).

Primary standards were established to protect human health, and secondary standards were designed to protect property and natural ecosystems from the effects of air pollution.

The state and federal AAQS relevant to the proposed project are summarized in Table 8-1.

Table 8-1
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3,4]	Secondary[3,5]	Concentration[3]
Ozone (O_3)	1-Hour	Revoked [6]	Same as Primary Standard	0.09 ppm (180 µg/m³)
	8-Hour	0.08 ppm		0.07 ppm (137 µg/m³)
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m³)	None	9.0 ppm (10 mg/m³)
	1-Hour	35 ppm (40 mg/m³)		20 ppm (23 mg/m³)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m³)	Same as Primary Standard	-
	1-Hour	-		0.25 ppm (470 µg/m³)
Sulfur Oxides (SO_2)	Annual Average	0.03 ppm (80 µg/m³)	-	-
	24-Hour	0.14 ppm (365 µg/m³)	-	0.04 ppm (105 µg/m³)
	3-Hour	-	0.5 ppm (1300 µg/m³)	-
	1-Hour	-	-	0.25 ppm (655 µg/m³)
Suspended Particulate Matter (PM_{10})	24-Hour	150 µg/m³	Same as Primary Standard	50 µg/m³
	Annual Arithmetic Mean	Revoked [7]		20 µg/m³
Fine Particulate Matter ($PM_{2.5}$) [8]	24-Hour	35 µg/m³	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m³		12 µg/m³
Lead (Pb)	30-Day Average	-	-	1.5 µg/m³
	Quarterly Average	1.5 µg/m³	Same as Primary Standard	-
Hydrogen Sulfide (HS)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m³)
Sulfates (SO_4)	24-Hour			25 µg/m³
Visibility Reducing Particles	8-Hour (10 am-6 pm, Pacific Standard Time)			Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

Table 8-1
National and California Ambient Air Quality Standards
(Continued)

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3,4]	Secondary[3,5]	Concentration[3]

Notes:
[1] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
[2] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
[4] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
[5] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
[6] On June 15, 2005, the 1-hour ozone standard (0.12 ppm) was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact Areas.
[7] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).
[8] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (effective December 17, 2006).
$\mu g/m^3$ = micrograms per cubic meter; mg/m^3 = milligram per cubic meter; ppm = parts per million
Source: U.S. EPA-NAAQS (http://www.epa.gov/air/criteria.html); CARB-CAAQS (http://www.arb.ca.gov/aqs/aaqs2.pdf)

The U.S. EPA, CARB, and the local air pollution control districts determine air quality attainment status by comparing local ambient air quality measurements from the state or local ambient air monitoring stations with the federal and state AAQS. Those areas that meet ambient air quality standards are classified as "attainment" areas; areas that do not meet the standards are classified as "nonattainment" areas. Areas that have insufficient air quality data may be identified as unclassifiable areas. These attainment designations are determined on a pollutant-by-pollutant basis. The proposed project site is designated a federal nonattainment area for O_3, PM_{10} and $PM_{2.5}$, based on air quality monitoring data showing exceedances of the federal standards. The proposed project vicinity is also a nonattainment area with respect to the California ambient standards O_3, PM_{10} and $PM_{2.5}$, based on air quality monitoring data showing exceedances of the threshold concentrations for these pollutants. Table 8-2 presents the attainment status (both federal and state) for the Orange County portion of the SCAQMD.

Table 8-2
Attainment Status for Orange County
with respect to Federal and California Ambient Air Quality Standards

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

Notes:
Source: National Area Designations and Proposed 2006 State Area Designations, CARB (http://www.arb.ca.gov/desig/adm/adm.htm)

Notes:

CO	=	carbon monoxide
NO_2	=	nitrogen dioxide
SO_2	=	sulfur dioxide
PM_{10}	=	particulate matter less than 10 microns in diameter
$PM_{2.5}$	=	particulate matter less than 2.5 microns in diameter

As mentioned above, both USEPA and CARB are involved with air quality management in the South Coast Air Basin, along with SCAQMD. The respective areas of responsibility for these agencies are described below.

USEPA has ultimate responsibility for ensuring, pursuant to the CAAA, that all areas of the United States meet, or are making progress toward meeting, the federal NAAQS. The State of California falls under the jurisdiction of USEPA Region IX, which is headquartered in San Francisco. USEPA requires that all states submit state implementation plans (SIPs) for nonattainment areas that describe how the federal NAAQS will be achieved and maintained. Attainment plans must be approved by CARB before they are submitted to USEPA.

Regional or local air quality management districts (or air districts) such as SCAQMD are responsible for preparation of plans for attainment of federal and state standards. CARB is responsible for overseeing attainment of the CAAQS, implementation of nearly all phases of California's motor vehicle emissions program, and oversight of the operations and programs of the regional air districts. Each air district is responsible for establishing and implementing rules and control measures to achieve air quality attainment within its jurisdictional boundaries. The air district also prepares an air quality management plan (AQMP) that includes an inventory of all emission sources within the district (both manmade and natural), a projection of future emissions growth, an evaluation of current air quality trends, and an assessment of any additional rules or control measures that are needed to attain the federal and state AAQS. This AQMP is submitted to CARB, which then compiles the plans from all air districts within the state into the SIP. The responsibility of the air districts is to maintain an effective permitting system for

existing, new, and modified stationary sources, to monitor local air quality trends, and to adopt and enforce such rules and regulations as may be necessary to achieve the federal and state AAQS.

8.1.3 Prevention of Significant Deterioration Requirements

In addition to the ambient air quality standards described above (NAAQS), the federal Prevention of Significant Deterioration (PSD) program has been established to protect deterioration of air quality in those areas that already meet the NAAQS. Specifically, the PSD program establishes allowable concentration increases for attainment pollutants due to new emission sources that are classified as major sources. These increases allow economic growth, while preserving the existing air quality, protecting public health and welfare, and protecting Class I areas (national parks and wilderness areas).

The PSD regulations define a "major stationary source" as any source type belonging to a list of 28 source categories that emits, or has the "potential to emit" 100 tons per year or more of any pollutant regulated under the CAA, or any other source type that has the potential to emit such pollutants in amounts equal to or greater than 250 tons per year. The 250 tpy trigger is applicable to the CPP because, as a simple cycle gas turbine project, it is not one of the 28 source categories subject to the 100 tpy trigger. If a source is considered major for PSD purposes because of one pollutant, then PSD review is applicable for those other pollutants emitted from the source in amounts greater than the PSD significance levels. The PSD regulations require major stationary sources to undergo a preconstruction review that includes an analysis and implementation of BACT, a PSD increment consumption analysis, an ambient air quality impact analysis, and analysis of air quality-related values (AQRVs) (i.e., impacts on soils, visibility and vegetation).

The projected incremental annual operational emissions of the CPP for CO, SO_2, NO_X, PM_{10}, and ~~VOC~~ ROG are as shown in Table 8-3 and compared with the PSD thresholds. The project's emissions of all pollutants would be far below these PSD significant thresholds. Thus, the project would not trigger PSD.

Table 8-3
PSD Emission Threshold Triggers for New Stationary Sources

Pollutant	Significant Thresholds (tpy)	Project Emissions (tpy)	PSD Triggered by Project?
CO	250	~~14.54~~6.89	No
SO_2	250	~~2.84~~0.45	No
NO_x	250	~~10.69~~8.78	No
PM_{10}	250	~~6.37~~3.99	No
VOCs	250	~~2.49~~1.72	No

Notes:
Source: SCAQMD rule 1702 (http://www.aqmd.gov/rules/reg/reg17/r1702.pdf)

Pollutant	Significant Thresholds (tpy)	Project Emissions (tpy)	PSD Triggered by Project?

tpy = tons per year
CO = carbon monoxide
SO_2 = sulfur dioxide
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 microns in diameter
~~VOCs~~ ROGs = ~~volatile organic compounds~~ reactive organic gases

8.1.4 Acid Rain Program Requirements

Title IV of the CAAA applies to sources of air pollutants that contribute to acid rain formation, including certain sources of SO_2 and NO_X emissions. Title IV is implemented by the USEPA under 40 CFR 72, 73, and 75. Allowances of SO_2 emissions are set aside in 40 CFR 73. Sources subject to Title IV are required to obtain SO_2 allowances, to monitor their emissions, and obtain SO_2 allowances when a new source is permitted. Sources such as the proposed project that use pipeline-quality natural gas are exempt from many of the acid rain program requirements. However, these sources must still estimate SO_2 and carbon dioxide (CO_2) emissions, and monitor NO_x emissions with certified CEMS. All subject facilities must submit an acid rain permit application to USEPA within 24 months of commencing operation.

8.1.5 New Source Review Requirements

The federal CAA, USEPA regulations, and the California CAA establish the criteria for siting new and modified emission sources. The federally mandated process for permitting new or modified sources in federal nonattainment areas is referred to as Nonattainment New Source Review (NNSR). SCAQMD is responsible for NNSR rule development and enforcement for sources in the South Coast Air Basin. The SCAQMD NNSR rules are contained in Regulation XIII, Rules 1301 1313. The rules require that BACT must be applied to any new source with emissions above the levels specified in Regulation XIII or Rule 2005. Second, all potential emission increases from the sources above specified thresholds must be offset by real, quantifiable, surplus, permanent, and enforceable emission decreases in the form of ERCs, per Rule 1309. Third, an ambient air quality impact assessment must be conducted to confirm that the proposed project does not cause or contribute to a violation of a federal or state AAQS (see Section 4.6) or jeopardize public health (see Section 5). Finally, the CPP must certify that all major sources owned or operated in the State of California are either in compliance or on an approved schedule for compliance with applicable air quality regulations.

8.1.6 New Source Performance Standards

New source performance standards (NSPS) have been established by USEPA to limit air pollutant emissions from certain categories of new and modified stationary sources. The NSPS regulations are contained in 40 CFR Part 60, and cover many different industrial source categories. Stationary gas turbines are regulated under Subpart KKKK. The enforcement of NSPS has been delegated to the SCAQMD, and the NSPS regulations are incorporated by reference into the SCAQMD's Regulation IX. In general, local emission limitation rules or BACT requirements in California are far more restrictive than the NSPS requirements. For example, the controlled NO_x emission rate from the proposed project's CTGs of less than 0.08 pound (lb) of NO_x per megawatt (MW)-hour will be well below the Subpart KKKK requirement of 0.39 lb of NO_X per MW-hour. ~~Similarly,~~ The projected maximum SO_2 emissions

from the proposed CTGs will be about 0.0007~~3~~ lb of SO_2 per MMBtu~~MW-hour~~, which is substantially less than the Subpart KKKK requirement of 0.06~~58~~ lb of SO_2 per ~~MW-hour~~MMBtu.

NSPS fuel requirements for SO_2 will be satisfied by the use of natural gas, and the emissions and fuel monitoring that will be performed to meet BACT requirements will comply with NSPS, acid rain, and other regulatory requirements.

8.1.7 Maximum Achievable Control Technology

The CAAA of 1990, under revisions to Section 112, require a proposed project to list and promulgate national emission standards for hazardous air pollutants (NESHAPS) in order to control, reduce, or otherwise limit the emissions of hazardous air pollutants (HAPs) from major source categories and area sources. As these standards are promulgated for different source categories, they are incorporated in 40 CFR 63. A major source of HAPs is one with the potential to emit 10 tons per year or more of a single HAP or 25 tons per year of all HAPS combined. As shown in Section 3.3, the CPP will not be a major source of HAPs.

Stationary gas turbines are on the list of 174 categories of major and area sources that are subject to emission standards. The specific Maximum Achievable Control Technology (MACT) standard potentially applicable to new stationary gas turbines is 40 CFR 63 Subpart YYYY. However, since the proposed facility will not be a major source of HAPs, no additional controls under the NESHAPS are required.

8.1.8 Federally Mandated Operating Permits

Title V of the CAA requires USEPA to develop a federal operating permit program that is implemented under Part 70 of 40 CFR. This program is administered by SCAQMD under Regulation XXX, Rules 3000 3008. Permits must identify all facility emission sources and controls, and contain information on maximum potential emissions, a compliance plan, and a statement indicating each source's compliance status. The permits must also incorporate all applicable federal, state, or air quality control district orders, rules and regulations. Because the CPP will be a new proposed stationary source, the applicant is seeking a new Title V permit concurrently with submittal this revised application for a Permit to Construct/Permit to Operate.

8.1.9 Consistency with Federal Requirements

The SCAQMD has authority to implement and enforce most applicable federal requirements, including the NSPS, NESHAPS, Title IV Acid Rain, and Title V Federal Operating Permit requirements. With this revised application the CPP is hereby applying for the Title V permit that will include Title IV Acid Rain provisions.

8.1.10 Risk Management Plan

Pursuant to the CAA, the regulations under 40 CFR 68 are designed to prevent accidental releases of hazardous materials and to require development of plans for mitigation should such releases occur. The regulations require facilities that store more than a threshold quantity of a listed regulated substance to develop a Risk Management Plan (RMP), including an offsite-consequence analysis for the worst-case

accidental release of the hazardous substance, hazard assessments, and programs to prevent accidental releases of listed chemicals and to establish response procedures in the event of a release. Section 112(r)(5) of the CAA identifies the regulated substances, which are listed in 40 CFR 68.130. Aqueous ammonia, which will be used as a reagent for the proposed project SCR NO_x control system, is a listed substance and its Threshold Quantity for solutions of 20 percent and greater is 20,000 pounds of solution.

8.2 STATE

The CARB was created by the Mulford-Carrell Air Resources Act in 1968. The primary responsibilities of the CARB include: 1) development, adoption, implementation, and enforcement of the state's motor vehicle pollution control program; 2) administration and coordination of the state's air pollution research program; 3) adoption and updating of the state's ambient air quality standards; 4) review of the local air pollution control districts' operations throughout the state; and 5) review and coordination of the state implementation plans for achieving federal ambient air quality standards.

8.2.1 State Implementation Plan

The federal CAA requires each state to prepare a SIP to demonstrate how it will attain the NAAQS before the federally imposed deadlines. In California, local districts adopt new rules that will help achieve attainment of the NAAQS by reducing emissions over time. CARB reviews the SIP. The relevant SCAQMD Rules and Regulations that have been incorporated into the SIP are presented in Section 8.3 under the local LORS.

8.2.2 California Clean Air Act

In 1989, California established state ambient air quality standards, including stringent enforcement of the NAAQS and additional standards for visibility-reducing particles, sulfates, and hydrogen sulfide. Local districts prepare and submit to CARB air quality plans demonstrating how the state's ambient air quality standards will be attained.

8.2.3 Toxic Air Contaminant Program

The Toxic Air Contaminant Identification and Control Act of 1983 created a state process to identify toxic air contaminants and to control their emissions. CARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants. CARB assesses the potential for human exposure to a substance, while the Office of Environmental Health Hazard Assessment (OEHHA) evaluates the corresponding health effects. These agencies prepare a risk assessment report to determine whether the substance poses a significant health risk and warrants designation as a toxic air contaminant. This program includes the 189 HAPs already named by the CAAA of 1990. If necessary, CARB develops air toxics control measures to reduce emissions of specific compounds. Section 5 presents a health risk assessment that has been conducted to evaluate the potential health risks from exposure to toxic air contaminants that will be emitted by the operational CPP project.

8.2.4 Air Toxics Hot Spots Program

As required by the California Health and Safety Code Section 44300 (originally Assembly Bill 2588 – Air Toxics "Hot Spots" Information and Assessment Act), this program was created in 1987 to develop a statewide inventory of air toxics emissions from stationary sources. Applicable facilities must prepare: 1) an emissions inventory plan identifying air toxics; 2) an emission inventory report quantifying air toxics emissions; and 3) a health risk assessment, if air toxics emissions are at sufficiently high levels. Facilities with air toxics emissions that are considered to pose a significant health risk must prepare and implement risk reduction plans. This requirement is applicable only after the start of operations. The air toxics health risk assessment presented in Section 5 indicates that air toxics impacts due to emissions from the proposed project would be well below a level of significance.

8.2.5 Permit to Construct and Permit to Operate

Under Regulation II, SCAQMD administers the air quality regulatory program for the construction, alteration, replacement, and operation of new power plants within its jurisdiction. Regulation II, Rules 201 and 203, incorporate other SCAQMD rules that pertain to sources that may emit air contaminants through the issuance of air permits (i.e., Permit to Construct [PTC] and Permit to Operate [PTO]). This permitting process allows the SCAQMD to adequately review new and modified air pollution sources to ensure compliance with all applicable prohibitory rules and to ensure that appropriate emission controls are used. A PTC allows for the construction of the air pollution source and remains in effect until the PTO application is granted, denied, or canceled. For power plants under the siting jurisdiction of the CEC, the SCAQMD issues Preliminary and a Final Determination of Compliance (DOC) to support the CEC Siting Process. The DOC is incorporated into the CEC license. After issuance of the CEC License, the SCAQMD will issue a PTC. Once the project commences operations and demonstrates compliance with the PTC, SCAQMD will issue a PTO. The PTO specifies conditions that the air pollution source must meet to comply with other air quality standards and will incorporate applicable PTC requirements.

8.2.6 Power Plant Siting Requirements

Under the Warren Alquist Act, the , the CEC has been charged with assessing the environmental impacts of each new power plant and considering the implementation of feasible mitigation measures to prevent potential significant impacts. The Secretary of Resources has certified that compliance with the CEC Power Plant Siting Process satisfies, or is the functional equivalent of, the California Environmental Quality Act (CEQA). CEQA Guidelines [Title 14, California Administrative Code, Section 15002(a)(3)] state that the basic purpose of CEQA is to "prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible."

The CEC siting regulations require that, unless certain conditions justifying an override are demonstrated, a new power plant can only be approved if it complies with all federal, state, and local air quality rules, regulations, standards, guidelines, and ordinances that govern its construction and operation. A project must demonstrate that facility emissions will be appropriately controlled to mitigate significant impacts, and that it will not jeopardize attainment and maintenance of the state and federal AAQS. Cumulative

impacts, impacts due to pollutant interaction, and impacts from non-criteria pollutants must also be considered.

8.2.7 CEC and CARB Memorandum of Understanding

This Memorandum of Understanding establishes requirements of the CEC to assure protection of environmental quality during AFC review.

8.2.8 Consistency with State Requirements

State law invests local air pollution control districts and air quality management districts with the responsibility for regulating emissions from stationary sources. As discussed previously in this section, the proposed project is under the local jurisdiction of the SCAQMD. Compliance with SCAQMD rules and regulations will ensure compliance with state air quality requirements.

8.3 LOCAL

The SCAQMD is the local air district with authority to implement and enforce air quality regulations at the site of the proposed power project. The SCAQMD periodically prepares an Air Quality Plan to define its strategies for attaining the state and federal ambient air quality standards, including relevant control measures for implementing those strategies (Health and Safety Code Section 40914).

The SCAQMD Rules and Regulations are authorized by Health and Safety Code (H&SC) Section 4000 et seq., and Section 40200 et seq. This section presents the SCAQMD requirements that are applicable to the proposed project. The SCAQMD has the delegated authority for implementing local, state, and federal air quality regulations in Los Angeles, Orange, and the non-desert portions of Riverside and San Bernardino counties. The proposed project is subject to SCAQMD regulations pertaining to new source review of emissions, prohibitory regulations, and protection against toxic air pollutants. This section evaluates the proposed project's compliance with the applicable SCAQMD requirements.

The proposed project is required to secure a preconstruction Determination of Compliance from the SCAQMD, and to demonstrate continued compliance with regulatory requirements. The preconstruction review includes BACT and offsetting of emissions.

8.3.1 SCAQMD Rules and Regulations

The following paragraphs outline the SCAQMD rules and regulations that are potentially applicable to the CPP.

Regulation II – Permits. This regulation establishes the framework of the application for construction and operating permits for new or modified equipment that emits air pollutants.

Rule 201 – Permit to Construct. A project shall not construct or modify any nonexempt equipment that emits or controls air pollution without first obtaining a Permit to Construct. The District will issue a PTC after it issues its Preliminary and its Final Determination of Compliance and the CEC issues its License (Note: for projects undergoing the California Energy Commission licensing process, the Determination of Compliance process substitutes for the Permit to Construct).

Rule 202 – Temporary Permit to Operate. This rule allows for new equipment that was issued a PTC to be operated temporarily, upon notification of the Air Pollution Control Officer, until the final PTO is issued.

Rule 203 – Permit to Operate. This rule prohibits operation of any equipment that emits or controls air pollutants without first obtaining a PTO, except as provided in Rule 202. The CPP will need to obtain all the required permits prior to operation of the proposed project.

Rule 212 – Standards for Approving Permits. Rule 212 specifies the standard requirements for a PTC and a PTO, including public notification requirements for projects located within 1,000 feet from a school boundary, projects that pose a potential risk of nuisance, or facilities that pose a cancer risk of 10 in a million or higher during a 70 year lifetime. Additionally, RECLAIM facilities that exceed the daily emission thresholds specified in the rule must conduct public notification to the broadest possible scope of interested parties, including federal, state, and local interested agencies, for a 30 day public comment period. Public notification must include all applicable provisions of 40 CFR Part 51.161(b) and 40 CFR Part 124.10. The CPP will not be located within 1,000 feet from the outer boundary of a school, but daily estimated emissions will exceed those stated in Rule 212(g). As required by Rule 212, the proposed project will not expose any individual to a cancer risk greater than or equal to 10 in a million (1×10^{-5}) during a lifetime (70 years) as presented in Section 5. The CPP will be in compliance with Rule 212 by conducting public notification if triggered under the rule, including the 30 day notification and public comment requirements of 40 CFR Part 124.10 and 40 CFR Part 51.161(b).

Rule 218 – Continuous Emission Monitoring. This rule describes the installation, quality control and assurance, and reporting requirements for continuous emission monitoring systems (CEMS) to measure in-stack pollutant concentrations or mass emissions of a source. This rule does not apply to the CEMS required under RECLAIM Regulation XX for NO_x monitoring.

Regulation III – Fees

Rule 301 – Permit Fees. This rule identifies the fees that are applicable to permit modifications, new facilities, and permitted emissions. The applicant ~~is~~ has already ~~submitting~~ submitted the required permit review fees with ~~this~~ the original application in compliance with this rule.

Regulation IV – Prohibitions This regulation restricts visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, startup/shutdown exemptions, and breakdown events.

Rule 401 – Visible Emissions. This rule prohibits the discharge of any air contaminant from a single source for more than three minutes in any one hour that produces visible emissions of specified opacity or shade (designated on the Ringlemann Chart). No visible emissions are expected with proper, normal operation of the proposed CPP turbines and engines using natural gas and diesel fuels and the emissions control equipment specified in this revised application.

Rule 402 – Nuisance. This rule implements Section 41700 of the Health and Safety Code to prohibit the discharge from any source of any air contaminant that may cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public, or which endangers such persons or the public, or which may cause injury or damage to business or property. No such nuisance is expected to results from operation of the proposed turbines and engines utilizing natural gas and diesel fuels with the control equipment specified in this revised application.

Rule 403 – Fugitive Dust. Under this rule, the CPP must prevent, reduce, or mitigate fugitive dust emissions from the proposed project site and must use best available control measures to implement the dust mitigation measures required by the rule. Mitigation may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, or using chemical stabilizers on roads or dirt areas, or temporarily ceasing construction activities. A contingency plan may be required by the USEPA. The CPP will submit a fugitive dust plan to both the SCAQMD and the CEC prior to the commencement of construction. The CPP will also implement appropriate measures to control fugitive dust emissions during construction, which may include: 1) use of water or chemical dust suppressants on unpaved surfaces; 2) use of vacuum or water flushing on paved surfaces; 3) covering or maintaining freeboard on haul vehicles; 4) limiting traffic speed on unpaved areas to 15 mph; 5) installing erosion control measures; 6) replanting disturbed areas as soon as possible; 7) using gravel pads and wheel washers as needed; and 8) using wind breaks and dust suppression as needed to control wind erosion.

Rule 407 – Liquid and Gaseous Air Contaminants. This rule prohibits the discharge of CO and sulfur compounds into the atmosphere at concentrations, averaged over 15 minutes, above 2,000 ppm, and 500 ppm respectively. The proposed project turbines will meet the CO emission limit of 2,000 ppm with (or without) the installation of control systems, as substantiated by the emission estimates presented in Table 3-2 and Appendix B. The sulfur emission requirement does not apply per Rule 407 (c)(2), since the fuel complies with the gaseous fuel sulfur content limits of Rule 431.1 (see below). The proposed project will be in compliance with this rule.

Rule 408 – Circumvention. This rule prohibits the concealment of emissions released to the atmosphere, except in cases where the only violation involved is of Section 48700 of the H&SC or SCAQMD Rule 402. The CPP will not knowingly circumvent any SCAQMD rules or regulations.

Rule 431.1 – Sulfur Content of Gaseous Fuels. This rule specifies fuel sulfur content limits applicable to any person who burns gaseous fuels containing sulfur compounds. The rule's limit requirements are based on fuel type. The rule also provides test methods, monitoring, recordkeeping, and reporting requirements. Compliance with this rule is expected with usage of pipeline-grade natural gas. The total sulfur compounds in the natural gas supply for the CPP will normally be limited to a maximum of 0.20 grains/100 dscf (4 ppmv as hydrogen sulfide [H_2S]), which is less than the rule's 16 ppmv limit for natural gas (calculated as H_2S). The proposed project will therefore be in compliance with this rule.

Rule 475 – Electric Power Generating Equipment. This rule applies to power generating equipment greater than 10 MW installed after May 7, 1976 and establishes a limit for combustion contaminants (particulate matter) of 11 lbs/hr per unit or 0.01 grains/scf. Compliance is achieved if either the mass limit or the concentration limit is met. Composite emissions calculations for all turbine operations (cold startup, hot startup, base load, and planned shutdown) indicate that the average rate of PM_{10} emissions per turbine will be less than 11 lb/hr. The proposed project will, therefore, be in compliance with this rule.

Regulation VII – Emergencies

Rule 701 – Air Pollution Emergency Contingency Actions. This rule requires facilities employing 100 or more people or emitting 100 tons per year or more of air pollutants (NO_x, SO_x, or ROCs) to reduce those pollutants by at least 20 percent upon declaration or prediction of a Stage 2 or 3 episode. Upon

declaration of a state of emergency by the Governor, a facility must comply with the Governor's requirements. A power plant may be exempt if it is determined to be an essential service responding to public emergency or utility outage. The CPP will employ less than 100 people and will emit less than 100 tons of any pollutant, and is thus exempt from this rule.

Regulation IX – Standards of Performance for New Stationary Sources. Stationary gas turbines at the CPP facility will be subject to the federal NSPS, which are incorporated by reference in this rule. Specifically, 40 CFR Subpart KKKK is applicable. This subpart establishes limits for particulate matter, SO_2 and NO_x emissions from the gas turbines, as well as corresponding monitoring and testing requirements. Emissions from the proposed project are expected to be well below the Subpart KKKK limits with water injection and SCR controls to limit NO_x emissions and exclusive use of low-sulfur natural gas fuel to limit SO_2 emissions.

Regulation XI – Source Specific Standards

Rule 1110.1 – Emissions from Stationary Internal Combustion Engines. This rule generally applies to engines larger than 50 brake-horsepower (bhp) and restricts NO_x and CO emissions from rich-burn or lean-burn engines. Emergency standby engines operating ~~less~~ no more than 200 hours per year are exempt. The proposed project will include a 750kW (1,141 bhp) diesel black start generator engine~~, but this engine is expected to operate substantially less than 200 hours per year and is thus not subject to this rule~~ that will operate no more than 200 hours per year.

Rule 1110.2 – Emissions from Gas and Liquid Fueled Engines. This rule establishes NO_x, VOC, and CO emission limits from stationary and portable engines rated at more than 50 bhp. Emergency standby engines operating less than or equal to 200 hours per year are exempt. The proposed project will operate a 750kW (1,141 bhp) diesel black start generator engine, but this engine ~~is expected to~~will accept a permit limit to operate ~~substantially~~ ~~less~~ no more than 200 hours per year~~, and is thus not subject to this rule~~.

Rule 1134 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines. This rule applies to stationary gas turbines and provides guidelines/requirements for controlling turbine NO_x emissions. The proposed project will be exempt from this rule, since it will be covered by the RECLAIM program (Regulation XX).

Rule 1135 – Emissions of Oxides of Nitrogen from Electric Power Generating Systems. Rule 1135 applies to electric power generating systems and provides guidelines/requirements for controlling NO_x emissions. The proposed project will be exempt from this rule, since it will be covered by the RECLAIM program (Regulation XX).

Regulation XIII – New Source Review

Rule 1301 – General. This regulation requires preconstruction review for new, modified, or relocated facilities to ensure that the facility does not interfere with progress toward attainment of the NAAQS, and that future economic growth in the SCAQMD is not unnecessarily restricted. Regulation XIII limits the emissions of non-attainment contaminants and their precursors and ozone depleting

compounds and ammonia, by requiring the use of BACT. The CPP has been designed to comply with all requirements of Regulation XIII.

Within the South Coast Air Basin, Orange County is a nonattainment region for ozone, PM_{10}, and $PM_{2.5}$. Precursors to nonattainment pollutants are also considered nonattainment for purposes of SCAQMD review. Therefore, SCAQMD considers the following pollutants to be nonattainment:

- ~~Reactive organic gases~~ (ROG) as a precursor to ozone and the organic fraction of suspended particulate matter.
- NO_X as a precursor to ozone, NO_2 and the nitrate fraction of suspended particulate matter.
- SO_X as a precursor to SO_2, SO_4, and the sulfate fraction of suspended particulate matter.
- Inorganic gases such as ammonia (NH_3), hydrogen fluoride (HF), and hydrogen chloride (HCl), as precursors to particulate matter.

Rule 1303 – Requirements. This rule identifies four specific requirements that apply to an affected permit unit:

(a) Installation of BACT (1303(a)).

(b)(1) Modeling to substantiate that there will be no significant increase in the concentration of any regulated pollutant (1303(b)(1)).

(b)(2) Obtaining emission offsets for any proposed increase in emissions above specified thresholds (1303(b)(2)).

(c) Facility compliance verification (1303 (b)(3)).

This regulation applies to all new or modified existing permit units that may cause the issuance of any nonattainment air contaminant (or precursor), halogenated hydrocarbon, or ammonia. The proposed project is expected to have emissions of NO_x, CO, SO_x, ROG, and PM_{10}. For RECLAIM facilities, this rule only applies to those nonattainment pollutants, or their precursors, not regulated under the RECLAIM program. The Regulation XIII requirements for CO, SO_x, ROG, PM_{10}, and NH_3 will apply.

Since CO and PM_{10} emissions are below BACT limits, the proposed project should not cause a significant increase in ambient air concentrations of CO, PM_{10}, or sulfates. However, a detailed air quality modeling analysis for CO, PM_{10}, $PM_{2.5}$, SO_2, and NO_2 has been conducted for the CPP project and is documented in Section 4 of this revised application. Modeling results per permit unit were compared to the Rule 1303 Significance Increase thresholds in Table 4-6. Modeling for ROG is not required by this rule.

Pursuant to Rule 1303 (b)(4) and Regulation II (Permits), the applicant must certify that the CPP will comply with all applicable SCAQMD rules and regulations. The new CTGs will be considered a Major Polluting Facility, as defined by Rule 1302, since potential annual emissions of NOx are projected to be over the 10-ton threshold. The applicant will also be required to certify that the other sources operated by

the applicant are in compliance with applicable federal emissions standards. Statewide compliance certification will also be required.

Rule 1304 – Exemptions. Under Rule 1304 (d)(1), emission offsets will be required if a new facility has the potential-to-emit (PTE) 4 tons per year or more of VOC, NO_x, SO_x, or PM_{10}, or 29 tons per year or more of CO, and must offset the total amount of emission increase pursuant to Rule 1303 (b)(2). Any new facility that has a PTE less than these amounts will be exempt from Rule 1303 (b)(2). The CPP will provide emissions offsets for NO_x ~~and PM_{10}~~, since potential annual emissions of these pollutants will be above the four-ton exemption threshold.

Rule 1306 – Emission Offsets. This rule is used as the basis for calculating daily emission increases and decreases used for determining project offset requirements and ERCs. The CPP will comply with this rule by providing emissions offsets as described in Section 7.

Rule 1309 – Emission Reduction Credits (ERCs) and Short Term Credits (STCs). This rule addresses the application for eligibility, registration, use, and transfer of ERCs and STCs. These credits shall be used as offsets for emission increases at new or modified facilities that are subject to Rule 1303(b)(2). An application for ERCs for a new emission reduction that includes supporting data and documents must be submitted no more than 180 days after the emission reduction occurs.

ERC requirements include demonstration that all source reductions are real, quantifiable, permanent, federally enforceable, and not greater than the equipment would have achieved if operating with current BACT.

~~Rule 1309.1 – Priority Reserve. This rule regulates access to the SCAQMD's Priority Reserve emission credit bank. An amendment to this rule was approved by the SCAQMD Board on August 3, 2007. The principal changes to the previous version of the rule concern the requirements for new electrical generating facilities (EGFs) within the SCAQMD. Specifically, access to Priority Reserve credits for SO_x, PM_{10}, and CO is allowed for thermal power plant facilities that generates 50 MW or greater of electricity for distribution in the state or municipality owned grid system (net generator); provided that a complete AFC has been submitted to the CEC or SCAQMD permit to construct application during calendar years 2005 through 2008.~~

~~The CPP is an EGF within the SCAQMD under Rule 1309.1(4)(A) because it will be a thermal power plant facility that will generate 50 MW or more of electricity. The CPP will generate up to approximately 200 MW for distribution in the state or municipality owned grid system. However, the project will accept permit limitations on operating hours that will prevent annual emissions of all pollutants except NO_x from exceeding the 4 tons/year threshold that triggers emissions offset requirements. For this reason and because these NO_x emissions will be offset using RECLAIM Trading Credits (RTCs), the applicant does not intend to use Priority Reserve Credits and the detailed requirements for new power plants under Rule 309.1 are not applicable.~~

~~Strict criteria regarding the allowable emissions and impacts on criteria pollutants and air toxics health risks were established in the Rule 1309.1 revisions in order for an EGF to qualify for Priority Reserve credits. The CPP is considered an In-SCAQMD EGF under 1309.1(b)(5)(A)(iii), because the site is~~

designated by SCAQMD as an EJA and has a maximum capacity of 500 MW or less. Therefore, in order to draw credits from the Priority Reserve, the CPP must demonstrate the following:

a. The cancer risk from the combined new or modified electrical generating units is less than one in one million.

b. The non-cancer risk (acute and chronic) Hazard Index from the combined new or modified electrical generating units is less than 0.5.

c. The cancer burden from the combined new or modified electrical generating units is less than 0.1, based on a cancer risk of one in ten million.

d. The rate of PM_{10} emissions from each new or modified electrical generating unit at full load does not exceed 0.060 lb/MW-hr, corrected to 59 °F, 60 percent relative humidity, and 14.7 pounds per square inch, absolute (psia), except during startups and shutdowns as specified in the permit.

e. The rate of NO_x emissions from each new or modified electrical generating unit at full load does not exceed 0.080 lb/MW-hr, corrected to 59 °F, 60 percent relative humidity, and 14.7 psia, except during startups and shutdowns as specified in the permit.

f. The applicant must substantiate with modeling that the 24-hour impact of the total combined PM_{10} emissions from the new or modified electrical generating units will not exceed 5.0 $\mu g/m^3$.

g. The applicant must substantiate with modeling that the annual impact of the total combined PM_{10} emissions from the new or modified electrical generating units shall not exceed 0.75 $\mu g/m^3$.

h. For simple cycle electric generating units, the unit shall operate a maximum of 4000 hours per year or less.

Table 8-4 shows that the CPP will meet the applicable eligibility requirements of Rule 1309.1 for access to Priority Reserve credits.

Table 8-4
CPP Compliance with Rule 1309.1 Eligibility Requirements for Access to Priority Reserve Credits

	Parameter	Rule 1309.1 Requirements For Power Plant < 500 Mw In An Environmental Justice Area	Compliance
	Toxics Requirements		
	Cancer Risk	<1 in a million	Maximum incremental cancer risk was modeled at 0.266 in a million (see Section 5 of this application).
	Hazard index	<0.5	- Maximum Acute Hazard Index was modeled at 0.016 - Maximum Chronic Hazard Index was modeled at 0.006 (see Section 5 of this application)

	Parameter	Rule 1309.1 Requirements For Power Plant < 500 Mw In An Environmental Justice Area	Compliance
	Cancer Burden	<0.1 calculated based on one in ten million risk level	Maximum predicted cancer burden value is zero, based on a one in ten million risk level (see Section 5 of this application).
	Criteria Pollutant Requirements		
	PM_{10} Emission Controls	Natural gas fuel only and ≤ 0.060 lb/MW-hr, corrected to 59 °F, 60 percent relative humidity, and 14.7 pounds per square inch, absolute (psia), except during startups and shutdowns as specified in the permit.	The vendor-guaranteed, full-load PM_{10} emission rate at ISO conditions is 2.93 lb/hour per turbine, and the corresponding generating rate is 49.169 MW. In the units specified in Rule 1309.1, these values correspond to an emission rate of 0.060 lb/MW-hour.
	NO_x Emission Controls	≤ 080 lb/MW-hr, corrected to 59 °F, 60 percent relative humidity, and 14.7 psia, except during startups and shutdowns as specified in the permit.	The full-load hourly NO_x emission rate per turbine at ISO conditions is 3.98 lb/hour and the corresponding generating rate is 49.169 MW. In the units specified in Rule 1309.1, these values correspond to an emission rate of 0.080 lb/MW-hour.
	Total Combined Gas Turbine PM_{10} Hourly Emissions	NSR BACT	PM_{10} emissions will be controlled through the exclusive use of clean-burning pipeline quality natural gas. This control technology has been widely and uniformly implemented for control of SO_2 and PM_{10} emissions from combustion turbines in California and throughout the United States, and is considered to be BACT for the CPP facility.
	Total PM_{10} 24-hour Impact due to proposed generating units	5 µg/m3	The maximum predicted impact of the entire facility, including four simple cycle turbines, black start engine and cooling tower, on 24-hour PM_{10} concentrations is 1.9 µg/m³. (see Table 4-6)
	Total PM_{10} Annual Impact due to proposed generating units	0.75 µg/m3	The maximum predicted impact of the entire facility, including four simple cycle turbines, black start engine and cooling tower, on annual PM_{10} concentrations is 0.035 µg/m³. (see Table 4-6).
	Other Requirements		
	Limit on Annual Hours of Operation	4,000 hours per year per unit	Four CPP generating units will operate a combined total of 4006 turbine hours
	Timing of PTC Application submittal (Rule 1309.1(d)(12))	Submit PTC Application in calendar years 2005 – 2008	This AFC and CPP PTC application are being submitted to AQMD in December 2007.
	EGF Located in a EJA (Rule 1309.1(d)(13))	Governing Board must first approve a plan to invest mitigation fees.	CPP will comply with required mitigation measures

In addition to the above requirements, an In-District EGF is not qualified to draw credits from the Priority Reserve unless it meets all applicable conditions included in 1309.1(c). Applicable requirements include:

- The applicant must accept a permit condition requiring the facility to meet BARCT for pollutants received from the Priority Reserve for all existing sources located in the District prior to the operation of the new source, or at a schedule approved by the Executive Officer and no later than three years following the issuance of the Permit to Construct (in this case, the CEC license); and all sources under common ownership within the District are in compliance with all applicable District rules, variances, orders and settlement agreements.

- The applicant must conduct a due diligence effort to secure available ERCs from sources outside the Priority Reserve.

- The applicant must pay the mitigation fees for electrical generating facilities set forth in Rule 1309.1(g)(1)(D).

- Sufficient credits from the Priority Reserve must be purchased to offset project emissions for the pollutants in question at a ratio of 1.2 to 1.

- The applicant must demonstrate to the satisfaction of the Executive Officer that renewable/alternative energy in lieu of natural gas fired EGF is not a viable option for the power to be generated at CPP site.

- The applicant must agree to a permit condition requiring the EGF to be fully and legally operational at the rated capacity within 3 years of issuance of the Permit to Construct (in this case, the CEC license). An applicant that is a municipality may have an additional year if the EFG includes a renewable component with a capacity of at least 50 MW of renewable/alternative energy. Additional time may be granted, if necessary due to circumstances beyond the applicant's control.

Additional applicable provisions of the Priority Reserve rule are contained in 1309.1(d), as listed below.

> Section 1Except for specific priority sources identified in 1309.1(b), access to Priority Reserve credits will be prioritized based on the earliest date than an application is approved for final Permit to Construct (in this case, the CEC license).
>
> Section 2The District Governing Board may determine that a specific project shall be given priority for access to Priority Reserve credits based on public health or safety, regardless of the date of application submittal.
>
> Section 3If a subject facility holds an ERC for a pollutant, then that ERC must be used before access to the Priority Reserve is allowed for that pollutant.
>
> Section 4Allocations from the Priority Reserve may not be banked or transferred and may not be used for interpollutant trading.
>
> Section 5Offset credits obtained from the Priority Reserve by an EGF may not exceed the allowable emission level for the newly permitted unit(s) after application of the appropriate offset ratios.

~~Section 6The Executive Officer shall authorize the release of Priority Reserve credits for the first 2,700 MW requested by EGFs, provided such EGFs have submitted complete applications for Permit to Construct to the District in calendar years 2005 through 2008 and complied with all applicable provisions of Rule 1309.1. Requests by EGFs for Priority Reserve credits in excess of the first 2,700 MW may only be approved by the Governing Board at a public meeting applying the criteria in this rule.~~

~~Section 7An EGF seeking Priority Reserve credits must obtain certification from CEC and entered into a long-term contract with the Southern California Edison Company, San Diego Gas and Electric Company or the State of California to provide electricity in Southern California. However, a municipal-owned EGF need not enter into a long-term contract, provided such EGF is designed and constructed to not exceed its native demand load, based upon future year projections to 2016 or earlier. A municipal-owned EGF obtaining Priority Reserve credits to exclusively serve its native load may not sell electricity to the state grid unless it is directed to do so by the State of California or its agencies, including Cal-ISO.~~

~~The following describes the circumstances of the CPP as it relates to the requirements of Rule 1309.1(d) and describes the need that will be filled by the proposed power plant, the manner in which the plant will operate to meet the City's needs and satisfy Cal-ISO obligations, as well as the relationship of the proposed facility to other generating capacity, including renewable/alternative energy sources.:~~

~~The Southern California Public Power Authority (SCPPA) is a consortium of municipalities and an irrigation district established by a Joint Powers Agreement to develop, construct, and operate electric generation and transmission projects. SCPPA is the proponent and the owner of the Canyon Power Project (CPP). The City of Anaheim is the sole participating member city. The City will be the Project Manager and Operator, and the output of the plant will be used to serve native load within the City and to meet resource adequacy requirements.~~

~~The Canyon Power Project (CPP) is strictly dedicated for generating power to serve Anaheim's retail customers. For the last several years, the City has been significantly short of power during the summer period due to its resources being less than its summer peak demand. Those deficiencies were met by acquisition of purchased power through various markets, thus subjecting Anaheim ratepayers to uncertainty in pricing conditions. This deficiency will continue until the CPP is completed and in service.~~

~~The City's current resource portfolio is comprised of a mix of coal-fired, gas-fired, renewable energy and hydro-power, the total of which is approximately 500 MW. There are several long-term contracts for renewable energy resources, including 36 MW of wind energy, 8 MW of geothermal, and 5 MW of landfill gas (expected to expand to 25 MW by 2010). However, most of this renewable energy is treated as non-firm energy and as such cannot be counted towards the City's resource adequacy requirements.~~

~~For example, Anaheim receives 30 MW from a long-term wind contract which is an as-available resource. As such, the resource cannot count it towards Anaheim's resource adequacy due to its intermittent attributes. The energy produced from wind is received as an as-available energy resource, not capacity for meeting peak demand. One of the benefits the CPP provides to utility operations is as a back-up resource to as-available resources. If the wind stops or is unavailable, customers are still using electricity~~

and the City must have resources available to meet customer demand. That requires having resources with quick-start capability and load-following characteristics to support demand in the event wind is suddenly unavailable. Anaheim currently has limited ability to provide that backup service and the CPP will benefit the City by enhancing this capability.

Under normal weather conditions, Anaheim's peak requirements from its retail customers is projected to be 560 MW for the summer of 2008, with expected growth to reach 579 MW by the summer of 2010. Therefore, the deficiency in meeting peak load is 60 to 75 MW over the next several years. It should be noted that under adverse conditions, such as experienced during the summer of 2006, Anaheim reached an all-time peak demand of 593 MW. During the hot conditions witnessed at the end of last summer, Anaheim's peak reached 581 MW. These conditions exaggerate the current deficiency in meeting peak requirements.

In addition to current deficiencies in meeting retail demands with its current portfolio, the City is required to carry 15% above its peak demand as capacity reserves by both AB 380 (Resource Adequacy) and by the California Independent System Operator (Cal-ISO). The Anaheim City Council approved the reliability targets for the Public Utilities Department in the spring of 2005 to comport with both State and Grid operator requirements. With a summer peak demand reaching 600 MW, Anaheim would need an additional 75 MW in its resource portfolio in order to maintain its reliability requirements. Combining this element with the deficiency in meeting peak load cited above, the City's need for additional capacity is about 150 MW. The capacity provided by the CPP will assist the City in meeting its reliability mandates for load serving entities in California.

While the CPP is the focus for this application, the City of Anaheim continues to pursue cost effective renewable energy resources. Based on existing contracts, renewable resources will provide enough energy to serve 14% of the City energy needs by 2010. Anaheim is currently negotiating long-term contracts for local hydro energy as well as additional geothermal power outside of California that, when added with it's existing contracts, would provide enough energy to serve 23% of its retail energy requirements by 2010.

With the addition of these renewable resources and based on the City's current projection of customer demand, coupled with the 15% reserve margin requirements, the CPP will provide sufficient capacity for the next several years. It is expected that without any additional resources to the mix, there will not be a shortfall of capacity until 2017.

In addition to these considerations, the Cal-ISO requires considerable generation to be provided in the Los Angeles Basin for local reliability purposes. Based on the 2008 Local Capacity technical assessment study by the Cal-ISO, the City is obligated to have 350 MW of Basin generation. Currently Anaheim has only one peaking unit in the Basin with a capacity of 46 MW, and therefore currently relies on other generating resources outside California to meet load. Building the CPP within Anaheim helps offset that obligation.

Per Cal-ISO tariff (both existing and those filed under MRTU operations planned next year) the City is required to bid the resources designated for resource adequacy (15% above peak) into the Cal-ISO's day-ahead market. Section 40.4 of the tariff addresses the Cal-ISO's requirements, so the City expects that a portion of the new turbines will be bid into the Cal-ISO's market; the remainder will be idle capacity.

Regulation XIV – Toxics

Rule 1401 – New Source Review of Carcinogenic Air Contaminants. The SCAQMD regulates toxic air contaminants from new, modified, or relocated permit units by specifying limits for the maximum individual cancer risk and excess cancer cases that may result from exposure to carcinogenic air contaminants from these sources.

Requirements for BACT for toxics, maximum individual cancer risk (MICR), and risk assessment guidelines for toxic pollutants are the primary topics addressed in 1401. The new CPP facility will be subject to Rule 1401 toxic pollutants. Emissions of organic hazardous air pollutants will be reduced by the CO oxidation catalyst. The CO oxidation catalyst is proposed as BACT for toxics for compliance with this rule. In addition, the proposed project would not cause an incremental cancer risk of 10 in 1 million.

Regulation XVII – Prevention of Significant Deterioration

This regulation establishes preconstruction requirements for stationary sources to ensure the air quality in attainment areas does not significantly deteriorate while maintaining a margin for future growth. It establishes maximum allowable increases over ambient baseline concentrations for each pollutant.

Rule 1703 – PSD Analysis - The SCAQMD Rule 1703(a)(2) requires that each permit unit is constructed using BACT for each criteria air contaminant for which there is federally significant net emission increase. Since the proposed project will not trigger the federal Major Source emission threshold of 250 tons per year for any pollutant, this project will not be subject to the PSD rule.

Regulation XX – Regional Clean Air Incentives Market

RECLAIM is a program designed to distribute emission allocations (or credits) for two primary non-attainment pollutants: NO_x and SO_X. A facility under the program may emit NO_x and/or SO_x only in accordance with the amount of RECLAIM credits in the facility's possession. Facilities in the South Coast Air Basin that emit more than 4 tons per year of NO_X or SO_2 are automatically included in the program. Regulation XX sets specific NO_x and/or SO_x requirements for RECLAIM facilities and exempts covered facilities from other NO_x and/or SO_x requirements in a number of command and control rules according to Tables 1 and 2 in Rule 2001. Since the CPP will have NO_x emissions in excess of 4 tons per year, it will automatically be included in the RECLAIM program and will purchase RECLAIM Trading Credit sufficient to offset facility NOx emissions on a one-to-one basis. The CPP will comply with the CEMS, record-keeping, and reporting requirements pertaining to RECLAIM facilities, as required by Rule 2012.

SECTIONNINE

SECTION 9 COMPLIANCE MONITORING

The proposed project will be in compliance with the applicable regulations, as identified in the preceding section of this revised application. Monitoring will be performed as required by the permit conditions. Continuous testing for the ammonia feed rate to the SCR, and continuous emissions monitoring for NO_x, CO, O_2, temperature and exhaust flow gas in the turbine stacks will be implemented.

SECTION 10 REFERENCES

This section lists the references used to conduct the air quality and toxic air contaminant assessments.

Auer, August H. Jr. 1978. Journal of Applied Meteorology, 17(5): 636-643. American Meteorological Society. "Correlation of Land Use and Cover with Meteorological Anomalies," May 1978.

Cal EPA/OEHHA (California Environmental Protection Agency and Office of Environmental Health Hazard Assessment). 1999. Air Toxics Hot Spots Risk Assessment Guidelines, Part I. Technical Support Document for the Determination of Acute Reference Exposure Levels for Airborne Toxicants.

2000.Air Toxics Hot Spots Program Risk Assessment Guidelines – The Air Toxics Hot Spots Program Guidance Manual for EPA Preparation of Health Risk Assessments; Air Toxics Hot Spots Risk Assessment Guidelines, Part III: Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels.

2005. Air Toxics Hot Spots Risk Assessment Guidelines, Part II: Technical Support Document for Describing Available Cancer Potency Factors.

2008. Consolidated Table Of OEHHA/ARB Approved Risk Assessment Health Values. May 22, 2008.

Cal-EPA/CARB (California Air Resources Board). 2003. HARP User Guide – Software for Emission Inventory Database Management, Air Dispersion Modeling Analyses, and Health Risk Assessment version 1.3, Air Resources, Board, California Environmental Protection Agency. December 2003.

California Air Pollution Control Officers Association (CAPCOA). 1993. Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines.

CARB (California Air Resource Board). 1996. California Air Toxics Emission Factor (CATEF) Database, Version 1.2. http://www.arb.ca.gov/app/emsinv/catef_form.html

2000. Risk Management Guidance for the Permitting of New Stationery Source Diesel-Fueled Engines. October.

2007. Off-road Mobile Source Emission Factors, Off-Road Emissions Inventory Program.

CEC (California Energy Commission). 1997. "Regulations Pertaining to the Rules of Practice and Procedure and Plant Site Certification." Title 20, California Code of Regulations. Chapters 1, 2, 5.

2006. Rules of Practice and Procedure and Power Plant Site Certification Regulations Revisions, 04-SIT-2, December 14.

SCAQMD (South Coast Air Quality Management), 1993. CEQA Air Quality Handbook. April.

2000. Multiple Air Toxics Exposure Study in the South Coast Air Basin MATES-II. March.

2005a. Risk Assessment Procedure for Rules 1401 and 212, Version 7. July.

2005b. Supplemental Guidelines for Preparing Risk Assessments for the Toxics "Hot Spots" Information and Assessment Act (AB2588). July.

2006. Fact Sheet Locomotive Operations and Air Pollution in Southern California, February. http://aqmd.gov/news1/2006/LocomotiveFactSheet2.html.

URS Corporation. 2007. Air Quality Modeling Protocol for the Anaheim Municipal Power Station Project, Anaheim, California. Prepared by URS for South Coast Air Quality Management District and California Energy Commission.

USEPA (U.S. Environmental Protection Agency). 1985. Guideline for Determination of Good Engineering Stack Height (Technical Support Document for the Stack Height Regulation) (Revised), USEPA-450/4-80-023R. Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina. June.

1986. Guideline on Air Quality Models (Revised), USEPA 450/2-78-027R, July.

1993. User's Guide to the Building Profile Input Program (USEPA454/R-93-038). October.

1995. AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources Edition, January. (http://www.epa.gov/ttn/chief/ap42/index.htm)

2004. User's Guide for the AMS/USEPA Regulatory Model-AERMOD. (USEPA-454/B-03-001). September.

2005. AERMOD Implementation Guide. September.

2006a. Addendum to User's Guide for the AMS/USEPA Regulatory Model-AERMOD. December.

2006b. USEPA AirData. URL: http://www.epa.gov/airdata/index.html.

Western Regional Climate Center, 2007. Desert Research Institute, Las Vegas, NV. URL: http://www.wrcc.dri.edu/.

APPENDIX A

LIST OF AQMD FORMS

Overall Project:

- Form 400-A, Application for Permit to Construct and Permit to Operate
- Form 400-CEQA, CEQA Applicability, plus attachment
- Form 500-A2, TITLE V Application Certification
- Form 500-B, TITLE V Exempt Equipment
- Form 500-C1, TITLE V Compliance Status Certification
- Form 500-F1, TITLE IV Summary

CTG 1:

- Form 400-A, Application for Permit to Construct and Permit to Operate
- Form 400-E-12, Gas Turbine

CTG 1 SCR:

- Form 400-A, Application for Permit to Construct and Permit to Operate
- Form 400-E-5, SCR System, Oxidation Catalyst, and Ammonia Catalyst, plus attachment
- Form 400-PS, Plot Plan and Stack Information Form, plus attachment

CTG 2:

- Form 400-A, Application for Permit to Construct and Permit to Operate
- Form 400-E-12, Gas Turbine

CTG 2 SCR:

- Form 400-A, Application for Permit to Construct and Permit to Operate
- Form 400-E-5, SCR System, Oxidation Catalyst, and Ammonia Catalyst, plus attachment
- Form 400-PS, Plot Plan and Stack Information Form, plus attachment

CTG 3:

- Form 400-A, Application for Permit to Construct and Permit to Operate
- Form 400-E-12, Gas Turbine

CTG 3 SCR:

- Form 400-A, Application for Permit to Construct and Permit to Operate
- Form 400-E-5, SCR System, Oxidation Catalyst, and Ammonia Catalyst, plus attachment
- Form 400-PS, Plot Plan and Stack Information Form, plus attachment

CTG 4:

- Form 400-A, Application for Permit to Construct and Permit to Operate
- Form 400-E-12, Gas Turbine

CTG 4 SCR:

Form 400-A, Application for Permit to Construct and Permit to Operate
Form 400-E-5, SCR System, Oxidation Catalyst, and Ammonia Catalyst, plus attachment
Form 400-PS, Plot Plan and Stack Information Form, plus attachment

Ammonia Storage Tank

Form 400-A, Application for Permit to Construct and Permit to Operate
Form 400-E-18, Storage Tank, plus attachment

Black Start Diesel Generator

Form 400-A, Application for Permit to Construct and Permit to Operate
Form 400-E-13a, Internal Combustion Engine: Black Start Diesel Generator
Form 400-PS, Plot Plan and Stack Information Form, plus attachment

Oil Water Separator

Form 400-A, Application for Permit to Construct and Permit to Operate
Form 400-CEQA, CEQA Applicability, plus attachment
Form 400-E-18, Storage Tank, plus attachment

South Coast Air Quality Management District

Form 400-A

Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit:
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator):
Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim — CA, 92806
City — State — Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim — CA, 92805
City — State — Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY):
09/01/2009

8. Description of Equipment:
Canyon Power Plant (CPP) consists of 4 natural gas-fired combustion turbine generators (CTGs) operating in simple cycle mode to supply peaking electrical power as needed. Additional units include 4 SCRs, 1 ammonia storage tank 1 oil water separator, and 1 black start engine.

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 0

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location?
Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:
Stephen Sciortino

18. Title:
Integrated Resources Mgr.

19. Print Name:
Steve Sciortino

20. Date:
9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

© South Coast Air Quality Management District, Form 400-A (2006.02)

South Coast Air Quality Management District

Form 400-CEQA

California Environmental Quality Act (CEQA) Applicability

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385

www.aqmd.gov

The SCAQMD is required by state law, the California Environmental Quality Act (CEQA), to review discretionary permit project applications for potential air quality and other environmental impacts. This form is a screening tool to assist the SCAQMD in clarifying whether or not the project[1] has the potential to generate significant adverse environmental impacts that might require preparation of a CEQA document [CEQA Guidelines §15060(a)].[2] Refer to the attached instructions for guidance in completing this form.[3] For each Form 400-A application, also complete and submit one Form 400-CEQA. If submitting multiple Form 400-A applications for the same project at the same time, only one 400-CEQA form is necessary for the entire project. If you need assistance completing this form, contact Lori Inga at (909) 396-3109.

FACILITY INFORMATION

Business Name of Operator to Appear on the Permit:	Facility ID (6-Digit):
Canyon Power Plant	

Project Description:

Canyon Power Plant consists of 4 natural gas-fired combustion turbine generators (CTGs) operating in simple cycle mode to supply peaking electrical power as needed.

REVIEW FOR EXEMPTION FROM FURTHER CEQA ACTION

Check "Yes" or "No" as applicable

	Yes	No	Is this application for:
A.	◉	○	**A CEQA and/or NEPA document previously or currently prepared that specifically evaluates this project?** If yes, a permit cannot be issued until a Final CEQA document and Notice of Determination is submitted.
B.	○	◉	**A request for a change of permittee only (without equipment modifications)?**
C.	○	◉	**Equipment certification or equipment registration** (qualifies for Rule 222)?
D.	○	◉	**A functionally identical permit unit replacement with no increase in rating or emissions?**
E.	○	◉	**A change of daily VOC permit limit to a monthly VOC permit limit?**
F.	○	◉	**Equipment damaged as a result of a disaster during state of emergency?**
G.	○	◉	**A Title V** (i.e., Regulation XXX) **permit renewal (without equipment modifications)?**
H.	○	◉	**A Title V administrative permit revision?**
I.	○	◉	**The conversion of an existing permit into an initial Title V permit?**

If **"Yes"** is checked for any question above, your application does not require additional evaluation for CEQA applicability. Skip to page 2, "SIGNATURES" and sign and date this form.

REVIEW OF IMPACTS WHICH MAY TRIGGER CEQA

Complete Sections I-VI by checking "Yes" or "No" as applicable. To avoid delays in processing your application(s), explain all "Yes" responses on a separate sheet and attach it to this form.

	Yes	No	Section I – General
1.	○	●	**Has this project generated any known public controversy regarding potential adverse impacts that may be generated by the project?** Controversy may be construed as concerns raised by local groups at public meetings; adverse media attention such as negative articles in newspapers or other periodical publications, local news programs, environmental justice issues, etc.
2.	○	●	**Is this project part of a larger project?**
			Section II – Air Quality
3.	●	○	**Will there be any demolition, excavating, and/or grading construction activities that encompass an area exceeding 20,000 square feet?**
4.	○	●	**Does this project include the open outdoor storage of dry bulk solid materials that could generate dust?** If Yes, include a plot plan with the application package.

[1] A "project" means the whole of an action which has a potential for resulting in physical change to the environment, including construction activities, clearing or grading of land, improvements to existing structures, and activities or equipment involving the issuance of a permit. For example, a project might include installation of a new, or modification of an existing internal combustion engine, dry-cleaning facility, boiler, gas turbine, spray coating booth, solvent cleaning tank, etc.

[2] To download the CEQA guidelines, visit http://ceres.ca.gov/env_law/state.html.

[3] To download this form and the instructions, visit http://www.aqmd.gov/ceqa or http://www.aqmd.gov/permit

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	Yes	No	
5.	○	●	**Would this project result in noticeable off-site odors from activities that may not be subject to SCAQMD permit requirements?** For example, compost materials or other types of greenwaste (i.e., lawn clippings, tree trimmings, etc.) have the potential to generate odor complaints subject to Rule 402 – Nuisance.
6.	○	●	**Does this project cause an increase of emissions from marine vessels, trains and/or airplanes?**
7.	●	○	**Will the proposed project increase the QUANTITY of hazardous materials stored aboveground onsite or transported by mobile vehicle to or from the site by greater than or equal to the amounts associated with each compound on the attached Table 1?[4]**
			Section III – Water Resources
8.	○	●	**Will the project increase demand for water at the facility by more than 5,000,000 gallons per day?** The following examples identify some, but not all, types of projects that may result in a "yes" answer to this question: 1) projects that generate steam; 2) projects that use water as part of the air pollution control equipment; 3) projects that require water as part of the production process; 4) projects that require new or expansion of existing sewage treatment facilities; 5) projects where water demand exceeds the capacity of the local water purveyor to supply sufficient water for the project; and 6) projects that require new or expansion of existing water supply facilities.
9.	●	○	**Will the project require construction of new water conveyance infrastructure?** Examples of such projects are when water demands exceed the capacity of the local water purveyor to supply sufficient water for the project, or require new or modified sewage treatment facilities such that the project requires new water lines, sewage lines, sewage hook-ups, etc.
			Section IV – Transportation/Circulation
10.			**Will the project result in** (Check all that apply):
	○	●	**a. the need for more than 350 new employees?**
	○	●	**b. an increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round-trips per day?**
	○	●	**c. increase customer traffic by more than 700 visits per day?**
			Section V – Noise
11.	○	●	**Will the project include equipment that will generate noise GREATER THAN 90 decibels (dB) at the property line?**
			Section VI – Public Services
12.			**Will the project create a permanent need for new or additional public services in any of the following areas** (Check all that apply):
	○	●	**a. Solid waste disposal?** Check "No" if the projected potential amount of wastes generated by the project is less than five tons per day.
	○	●	**b. Hazardous waste disposal?** Check "No" if the projected potential amount of hazardous wastes generated by the project is less than 42 cubic yards per day (or equivalent in pounds).

"REMINDER: For each "Yes" checked in the sections above, attach all pertinent information including but not limited to estimated quantities, volumes, weights, etc."

SIGNATURES

I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. I UNDERSTAND THAT THIS FORM IS A SCREENING TOOL AND THAT THE SCAQMD RESERVES THE RIGHT TO CONSIDER OTHER PERTINENT INFORMATION IN DETERMINING CEQA APPLICABILITY.

SIGNATURE OF RESPONSIBLE OFFICIAL OF FIRM:	TITLE OF RESPONSIBLE OFFICIAL OF FIRM:	
Stephen Sciortino	Integrated Resources Manager	
TYPE OR PRINT NAME OF RESPONSIBLE OFFICIAL OF FIRM: Steve Sciortino	**RESPONSIBLE OFFICIAL'S TELEPHONE NUMBER:** (714) 765-5177	**DATE Signed:** 9/10/08
SIGNATURE OF PREPARER, IF PREPARED BY PERSON OTHER THAN RESPONSIBLE OFFICIAL OF FIRM:	**TITLE OF PREPARER:** Senior AQ Consultant	
TYPE OR PRINT NAME OF PREPARER: John Lague	**PREPARER'S TELEPHONE NUMBER:** (619) 2432-823	**DATE Signed:** 09/05/08

THIS CONCLUDES FORM 400-CEQA. INCLUDE THIS FORM AND THE ATTACHMENTS WITH FORM 400-A.

[4] Table 1 – Regulated Substances List and Threshold Quantities for Accidental Release Prevention can be found in the Instructions for Form 400-CEQA.

REVIEW OF IMPACTS WHICH MAY TRIGGER CEQA

3. Summary of Disturbance Areas

It is expected that the entire 10-acre CPP site will be disturbed during the construction and construction laydown process. Construction of the CPP will involve demolition of the existing buildings and some of the associated pavement. These materials will be characterized and disposed of appropriately. Construction of the CPP will generate wastes typical for the construction of simple-cycle, natural gas-fired combustion turbine power generation plants. Typical wastes will include packing materials and dunnage, surplus excavated materials, excess materials trimmed from standard-dimension materials whether wood, metal, wire, or other basic building materials, concrete spoil, temporary weather covers, consumable abrasive and cutting tools, broken tools, parts and electrical and electronic components, construction equipment maintenance materials, empty containers, and other solid wastes, including the typical refuse generated by workers.

Solid waste will be segregated, where practical, for recycling. Non-recyclable waste will be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III landfill.

Some hazardous solid waste, such as welding materials and dried paint, may also be generated. The hazardous waste will be collected in satellite accumulation containers near the points of generation. This waste will be moved daily to the contractor's 90-day hazardous waste storage area. The waste will be delivered to an authorized hazardous waste management facility, before the expiration of the 90-day storage limit.

Hazardous wastes generated during construction and operation will be handled and disposed of in accordance with applicable laws, ordinances, regulations, and standards (LORS). Hazardous wastes will be either recycled or disposed of in a licensed Class I disposal facility, as appropriate.

Startup will generate wastes typical of normal operation plus initial cleaning wastes such as rags, consumable materials, and failed components. See Table 1 for a list of solid waste expected to be generated during construction.

TABLE 1
SOLID WASTE GENERATED DURING CONSTRUCTION

Waste Stream	Waste Classification	Amount	Treatment
Paper, wood, glass, and plastics from packing material, waste	Non-hazardous	50 tons	Onsite dumpsters; Waste disposal facility (Class III

Waste Stream	Waste Classification	Amount	Treatment
lumber, insulation, and empty non-hazardous chemical containers			landfill)
Excess concrete	Non-hazardous	34 tons	Recycle or Waste disposal facility (Class III landfill)
Metal, including steel from welding/cutting operations, packing materials, empty non-hazardous chemical containers, aluminum waste from packing material, and electrical wiring	Non-hazardous	13 tons	Recycle or Waste disposal facility (Class III landfill)
Existing concrete structures, asphalt pavement, demolition of existing structures	Non-hazardous	3,000 tons	Recycle or Waste disposal facility (Class III landfill)
Oily Rags	Hazardous	2 to 3 55-gal drums	Recycled or disposed by certified oil recycler
Empty hazardous material containers-drums	Hazardous, Recyclable	2 cu. yard/week	Recondition, recycle, or Waste disposal facility (Class I)

7. Hazardous Material and Hazardous Waste Management and Disposal

There will be a variety of chemicals stored and used during construction and operation of the CPP. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards (LORS). Chemicals will be stored in appropriate chemical storage facilities, bulk chemicals will be stored in storage tanks, and most other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to contain leaks and spills. Berms will allow a full-tank-capacity spill without overflowing the berms. For multiple tanks located within the same bermed area, the capacity of the largest single tank will determine the volume of the bermed area and drain piping. Berm and drain piping design will allow a full-tank-capacity spill without overflowing the berms. Drain piping for volatile chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors.

The aqueous ammonia storage and unloading area will have spill containment and ammonia vapor detection equipment. Aqueous ammonia will be transported and stored in a 10,000-gallon tank onsite, as a 19 percent solution, by weight. The tank will be surrounded by a secondary containment berm to contain any release from the tank, and will be partially enclosed with a drain-like cover to minimize evaporation should there be a release.

Safety shower and eyewash stations will be provided adjacent to the aqueous ammonia storage tank area, chilled water system cooling tower chemical storage area, water treatment system chemical storage area, and CTG water wash chemical storage areas. Maintenance personnel will use state-approved, personal protective equipment (PPE) during chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material will be stored onsite for spill cleanup.

Electric equipment insulating materials will be specified to be free of PCBs.

A list of the chemicals anticipated for use at the facility is provided in Table 2. Table 2 identifies each chemical by type and intended use and estimates the quantity to be stored onsite.

TABLE 2
SUMMARY OF HAZARDOUS MATERIALS
APPLICATION AND STORAGE TYPE

Hazardous Material	Primary Application	Storage Type
Acetylene	Welding	Cylinder
Paint	Painting	Can
Aqueous Ammonia (19 percent)	NO_x reduction in SCR	Aboveground Tank
Sodium Hypochlorite (12.5%, Trade)	Biocide/Biofilm Control (Raw Water Tank, Cooling Tower Circulating Water)	Aboveground Tote
Sulfuric Acid (93%)	pH Control (Cooling Tower Circulating Water, RO System)	Aboveground Tote
Dispersant/Corrosion Inhibitor (neat)	Scale/Corrosion Control (Cooling Tower Circulating Water)	Aboveground Tote
Natural gas	Fuel for power plant	Pipeline
Mineral Oil	Transformers	Steel Drum
Sulfur Hexafluoride	Switchyard breakers	Cylinders
Turbine & Generator Lube Oil	Rotating equipment	Steel Drum
Hydraulic Oil	Rotating equipment	Steel Drum
Hydraulic Fluid	Construction vehicles and equipment	Steel Drums
Transmission Fluid	Construction vehicles and equipment	Steel Drums
Unleaded gasoline	Construction vehicles	Aboveground Tank
Motor Oil	Construction vehicles and equipment	Steel Drums
Propane	Miscellaneous Heating Activities	Cylinder
Non-oxidizing biocide	Biocide for cooling system	Aboveground Tote
Dryer Desiccant	Instrument air	Instrument air dryer

Hazardous Material	Primary Application	Storage Type
Various detergents	Combustion turbine cleaning	Manufacturer Container
Diesel fuel	Black Start Generator	Tank
Antiscalant (neat)	RO System	Aboveground Tote
Sodium Bisulfite (38%)	Dechlorination (RO System)	Aboveground Tote
RO Membrane Cleaners (neat)	RO System	Aboveground Tote
Various Hazardous Wastes	Waste	Steel Drums

[1] Expected based on presumed operation conditions. Usage and storage will be optimized during final design.

The aqueous ammonia storage and unloading area will have spill containment and ammonia vapor detection equipment. Aqueous ammonia will be transported and stored in a 10,000-gallon tank onsite, as a 19 percent solution, by weight. The tank will be surrounded by a secondary containment berm to contain any release from the tank, and will be partially enclosed with a drain-like cover to minimize evaporation should there be a release.

Safety showers and eyewashes will be provided in the vicinity of all chemical storage and use areas. Hose connections will be provided near the chemical storage and feed areas to flush spills and leaks to the plant wastewater collection system.

Plant personnel will use approved PPE during chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material will be stored onsite for spill cleanup.

Hazardous materials will be stored and used at the CPP during both construction and operation. Design and construction of hazardous materials storage and dispensing systems will be in accordance with applicable codes, regulations, and standards. Hazardous materials storage areas will be curbed or diked to contain spills or leaks.

Potential hazards that are associated with hazardous materials will be further mitigated by implementing a hazards communication (HAZCOM) program. This program involves thorough training of employees on proper identification, handling, and emergency response to spills or accidental releases.

Emergency eyewashes and showers will be provided at appropriate locations. Appropriate PPE will be provided during both construction and operation of the facility.

9. Water Balance and Supply Requirements

The CPP will require the use of water primarily for the production of high purity demineralized (DI, also deionized) water for CTG NO_X injection, for chilled water

system cooling tower makeup, and for miscellaneous plant domestic services. The expected peak recycled water consumption is approximately 430 gallons per minute (gpm) based on full load operation on a typical hot day. At this rate, total daily peak water use is approximately 413,000 gallons per day (gpd), based on 16 hours of operation at the sustained peak hourly temperature. Annual maximum recycled water consumption is expected to be approximately 74 acre-feet of groundwater replenishment system (GWRS) water. The City of Anaheim (COA) has contracted with Orange County Water District (OCWD) for the capacity to deliver up to 200 acre-feet of GWRS water per year. For purposes of this AFC, the environmental evaluation has conservatively been based on 200 acre-feet of recycled water consumption.

High quality DI water is required to operate the CTG water injection system, for CTG water wash, and CTG Sprint systems. Water filtration and demineralization equipment will be used to make DI water for distribution to the turbines as required.

A summary of the plant water processes and expected water use for the CPP project is shown on the plant water balance diagram.

A summary of the plant water usage for both the GWRS water and COA potable water is shown in Table 3.

TABLE 3
PLANT WATER USAGE SUMMARY

	Maximum Daily (gal/day)	Average Daily (gal/day)	Maximum Annual (acre-ft/year)	Average Annual (acre-ft/year)
Process Water Usage				
Chiller system cooling tower makeup	167,074	142,000		
RO/Demineralizer system	246,720	241,920		
Process Water Supply				
GWRS recycled water	414,720	384,000	74	37
Domestic Water Usage				
Potable water usage	9,600	3,480		
Domestic Water Supply				
COA Municipal water	9,600	3,480	3.0	1.5
Total Water Usage	424,320	387,480	77	38.5
Wastewater				
Cooling tower blowdown	16,320	14,400		
RO system rejects	61,440	60,480		

Facilities (sanitary, etc.)	9,600	3,840		
Total	87.360	78,720	15.0	7.5

Notes:
The maximum daily use is based on 16 hours of full load operation 89°F / 36 percent relative humidity.
The average daily use is 16 hours of the average of the full load use at 82°F / 47 percent relative humidity.
The average annual use of 37 acre-ft is based on the COA's expected annual operating hours.
The maximum annual use of 74 acre-ft of GWRS water is based on COA'a expected maximum annual operating hours.
Ft = feet
Gal = gallon(s)
RO = reverse osmosis

Plant raw water for process needs will come from recycled water via a new underground pumping station to be installed by the COA as part of the CPP project. The GWRS water system consists of recycled water that is directed to existing groundwater recharge ponds near the CPP site. The GWRS water meets State of California Title 22 water quality requirements. The pumping station will include redundant 500 gpm capacity pumps and supply water via a new 14-inch pipeline routed along East Miraloma Avenue to the plant site. This line will be installed utilizing standard open trench construction practices. The trench is expected to be 3 feet wide and 5 feet deep. Electric power supply for the new pumps will be provided locally from a new pole-mounted power transformer from the COA's local power distribution system. The operation of the new pumping station will be controlled from the CPP site in response to plant water needs. The raw water will be stored onsite in a 350,000-gallon storage tank.

Domestic water services and fire water will use COA potable water. COA potable water is currently available along East Miraloma Avenue as a normally available utility. The potable water system will also serve as backup to the GWRS supply in the event the GWRS line is unavailable.

South Coast Air Quality Management District

Form 500-A2
TITLE V Application Certification

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765
Tel: (909) 396-3385
www.aqmd.gov

Section I - Facility Information

1. Permit to be issued to (Business name of operator to appear on permit): Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice Issued by AQMD):

3. This Certification is submitted with a (Check one):
   a. (•) Title V Application (Initial, Revision or Renewal)
   b. ( ) Supplement/Correction to a Title V Application
   c. ( ) MACT Part 2

4. Is Form 500-C2 included with this Certification? ( ) Yes (•) No

Section II - Responsible Official Certification Statement

I certify under penalty of law that I am the responsible official for this facility as defined in AQMD Regulation XXX and that based on information and belief formed after reasonable inquiry, the statements and information in this document and in all attached application forms and other materials are true, accurate, and complete.

Read each statement carefully and check each that applies – ***You must check 3a or 3b.***

1. For Initial, Permit Renewal, and Administrative Application Certifications:

a. ( ) The facility, including equipment that are exempt from written permit per Rule 219, is currently operating and will continue to operate in compliance with all applicable requirement(s) identified in Section II and Section III of Form 500-C1,

   i. ( ) except for those requirements that do not specifically pertain to such devices or equipment and that have been identified as "Remove" on Section III of Form 500-C1.

   ii. ( ) except for those devices or equipment that have been identified on the completed and attached Form 500-C2 that will not be operating in compliance with the specified applicable requirement(s).

b. (•) The facility, including equipment that are exempt from written permit per Rule 219, will meet in a timely manner, all applicable requirements with future effective dates.

2. For Permit Revision Application Certifications:

a. ( ) The equipment or devices to which this permit revision applies, will in a timely manner comply with all applicable requirements identified in Section II and Section III of Form 500-C1.

3. For MACT Hammer Certifications:

a. ( ) The facility is subject to Section 112(j) of the Clean Air Act (Subpart B of 40 CFR part 63), also known as the MACT "hammer." The following information is submitted with a Title V application to comply with the Part 1 requirements of Section 112(j). (If Part 2 has not been submitted, you must submit 500-MACT Part 2 with this form.)

b. ( ) The facility is not subject to Section 112(j) of the Clean Air Act (Subpart B of 40 CFR part 63).

Signature of Responsible Official — Date: 12/19/07

Steve Sciortino — Type or Print Name of Responsible Official — Phone: (714) 765-5177

Integrated Resources Manager — Title of Responsible Official — Fax: (714) 765-4140

201 South Anaheim Blvd, Suite 802	Anaheim	CA	92805
Address of Responsible Official	City	State	Zip Code

Acid Rain Facilities Only: Turn page over & complete Section III

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Acid Rain facilities must certify their compliance status of the devices subject to applicable requirements under Title IV by an individual who meets the definition of Designated (or Alternate) Representative in 40 CFR Part 72.

Section III - Designated Representative Certification Statement

1. *For Acid Rain Facilities Only*: I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Signature of Designated Representative or Alternate			Date 12/19/07
Steve Sciortino			(714) 765-5177
Type or Print Name of Designated Representative or Alternate			Phone
Integrated Resources Manager			(714) 765-4140
Title of Designated Representative or Alternate			Fax
201 South Anaheim Blvd, Suite 802	Anaheim	CA	92805
Address of Designated Representative or Alternate	City	State	Zip Code

South Coast Air Quality Management District

Form 500-B
Title V List of Exempt Equipment

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765
Tel: (909) 396-3385
www.aqmd.gov

Use this form for all application submittals requesting an initial Title V permit or permit renewal. If you are applying for a permit revision, you may also use this form to have your exempt equipment listing updated prior to renewing your permit.

This form is designed to summarize all of the equipment at a facility that is exempt from AQMD permit requirements (e.g., I.C. Engines ≤ 50 BHP, Boilers < 2 MM BTU/hr etc.). This equipment can be listed according to category. However, if there is a specific device that is vented to control equipment, then the equipment must be listed separately. Trivial activities listed on the back of this form or the Technical Guidance Document do not have to be listed on this form. Note: If your facility is in the RECLAIM program, it is not necessary to repeat any equipment currently listed in Appendix A of the RECLAIM permit.

Permit to be issued to (Business name of operator to appear on permit):

Canyon Power Plant

Check box if facility is in RECLAIM program: ☒

Valid AQMD Facility ID (Available on Permit or Invoice Issued by AQMD):

Provide Current Permit Issue Date (mo/day/yr):

Permit Revision No.:

Section I - Summary of Equipment Exempt from Permit Requirements (Including Portable)

Exempt Equipment Description [e.g., Small Boilers (75,000 BTU/hr-2,000,000 BTU/hr)]	Venting to Control Device Number	Control Device Description	Basis for Exemption [e.g., Rule 219 (b)(2), 05/19/00]	Source Specific Rule [e.g. Rule 1146.2]
4-cell chiller cooling tower		no control device	Rule 219 (d)(3), 06/01/2007	Rule 219

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Trivial Activities	
• Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources	• Fugitive emission related to movement of passenger vehicles, provided any required fugitive dust control plan or its equivalent is submitted
• Air-conditioning units used for human comfort that do not have applicable requirements under Title VI of the Act	• Process water filtration systems and demineralizers
• Ventilating units used for human comfort that do not exhaust air pollutants into the ambient air from any manufacturing/industrial or commercial process	• Demineralized water tanks and demineralizer vents Air compressors and pneumatically operated equipment, including hand tools
• Non-commercial food preparation	• Batteries and battery charging stations, except at battery manufacturing plants
• Consumer use of office equipment and products, not including printers or businesses primarily involved in photographic reproduction	• Storage tanks, vessels and containers holding or storing liquid substances that will not emit any VOC or HAP[5]
• Janitorial services and consumer use of janitorial products	• Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized
• Internal combustion engines used for landscaping purposes	• Equipment used to mix and package soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized
• Laundry activities, except for dry-cleaning and steam boilers	• Drop hammers or hydraulic presses for forging or metalworking
• Bathroom/toilet vent emissions	• Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment
• Emergency (backup) electrical generators at residential locations	• Vents from continuous emissions monitors and other analyzers
• Tobacco smoking rooms and areas	• Natural gas pressure regulator vents, excluding venting at oil and gas production facilities
• Blacksmith forges	• Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation
• Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification[1]	• Equipment used for surface coating, painting, dipping or spraying operations, except those that will emit VOC or HAP
• Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification	• CO_2 lasers, used only on metals and other materials which do not emit HAP in the process
• Portable electrical generators that can be moved by hand from one location to another[2]	• Consumer use of paper trimmers/binders
• Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic	• Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substance being processed in the ovens or autoclaves or the boilers delivering the steam
• Brazing, soldering and welding equipment, and cutting torches related to manufacturing and construction activities that do not result in emission of HAP metals[3]	• Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants
• Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents[4]	• Laser trimmers using dust collection to prevent fugitive emissions
• Routine calibration and maintenance of laboratory equipment or other analytical instruments	• Boiler water treatment operations, not including cooling towers
• Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis	• Oxygen scavenging (de-aeration) of water
• Hydraulic and hydrostatic testing equipment	• Ozone generators
• Environmental chambers not using hazardous air pollutant (HAP) gasses	• Fire suppression systems
• Shock chambers	• Emergency road flares
• Humidity chambers	• Steam vents and safety relief valves
• Solar simulators	• Steam leaks
	• Steam cleaning operations
	• Steam sterilizers

[1] Cleaning and painting activities qualify as trivial if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise required.

[2] "Moved by hand" means it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance or device.

[3] Brazing, soldering and welding equipment, and cutting torches related to manufacturing and construction activities that emit HAP metals are more appropriate for treatment as unpermitted equipment. Brazing, soldering, welding and cutting torches directly related to plant maintenance and upkeep and repair or maintenance shop activities that emit HAP metals are treated as trivial and listed separately in this appendix.

[4] Many lab fume hoods or vents might qualify for treatment as unpermitted equipment.

[5] Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list.

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Title V
Form 500-C1

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Compliance Status Report

To provide the compliance status of your facility with applicable federally enforceable requirements and identify other local-only requirements, complete this form and attach it to a completed compliance certification Form 500-A2. As appropriate, all submittals of Form 500-C2 as appropriate should also be attached to this form.

Section I - General Information

1. Facility Name: Canyon Power Plant Facility ID (6-Digit): _____

PROCEDURES FOR DETERMINING COMPLIANCE STATUS

1. **Equipment verification:** Review the list of pending applications, and either the preliminary Title V facility permit or the list of current permits to operate that the AQMD provided you, to determine if they completely and accurately describe all equipment operating at the facility. Attach a statement to describe any discrepancies.
2. **Identify applicable requirements*:** Use the checklist in Section II to identify all applicable and federally-enforceable local, state, and federal rules and regulations, test methods, and monitoring, recordkeeping and reporting (MRR) requirements that apply to any equipment or process (including equipment exempt from a permit by Rule 219) at your facility.

   The potential applicable requirements, test methods and MRR requirements are identified and listed adjacent to each given equipment/process description. Check off each box adjacent to the corresponding requirement as it applies to your particular equipment/process.

   Note: Even if there is only one piece of equipment that is subject to a particular requirement, the appropriate box should be checked.
3. **Identify additional applicable requirements*:** Use Section III to identify any additional requirements not found in Section II. Section II is not a complete list of all applicable requirements. It does not include recently adopted NESHAP regulations by EPA or recent amendments to AQMD rules. Do not add rules listed in Section V here.
4. **Identify any requirements that do not apply to a specific piece of equipment or process:** Also use Section III to identify any requirements that are listed in Section II but that do <u>not</u> apply to a specific piece of equipment or process. Fill out Section III of this form and attach a separate sheet to explain the reason(s) why the identified rules do not apply. Note: Listing any requirement that does not apply to a specific piece of equipment will not provide the facility with a permit shield unless one is specifically requested by completing Form 500-D and is approved by AQMD.
5. **Identify SIP-approved rules that are not current AQMD rules:** Use Section IV to identify older versions of current AQMD rules that are the EPA-approved versions in the State Implementation Plan (SIP), and that are still applicable requirements as defined by EPA. The facility is <u>not</u> required to certify compliance with the items checked in Section IV provided that the non-SIP approved rule in Section II is at least as stringent as the older SIP-approved version in Section IV. **
6. **Identify Local-Only Enforceable Regulatory Requirements:** Use Section V to identify AQMD rules that are not SIP-approved and are not federally enforceable.
7. **Determine compliance:** Determine if all equipment and processes are complying with all requirements identified in Sections II and III. If each piece of equipment complies with all applicable requirements, complete and attach Form 500-A2 to certify the compliance status of the facility. If any piece of equipment is <u>not</u> in compliance with any of the applicable requirements, complete and attach Form 500-C2 in addition to Form 500-A2.

* The following AQMD rules and regulations are not required to be included in Section II and do not have to be added to Section III: Regulation I, List and Criteria in Regulation II, Rule 201, Rule 201.1, Rule 202, Rule 203, Rule 205, Rule 206, Rule 207, Rule 208, Rule 209, Rule 210, Rule 212, Rule 214, Rule 215, Rule 216, Rule 217, Rule 219, Rule 220, Rule 221, Regulation III, Regulation V, Regulation VIII, Regulation XII, Regulation XV, Regulation XVI, Regulation XIX, Regulation XXI, Regulation XXII, and Regulation XXX.

** Emission units adversely affected by the gap between current and SIP-approved versions of rules may initially be placed in a non-Title V portion of the permit

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
☒ All Air Pollution Control Equipment Using Combustion (RECLAIM & non-RECLAIM sources)	☐ Rule 480 (10/07/77)	N/A	N/A
☐ All Coating Operations	☐ Rule 442 (12/15/00)	☐ Rule 442(f)	☐ Rule 442(g)
☒ All Combustion Equipment, ≥ 555 Mmbtu/Hr (except for NOx RECLAIM sources)	☐ Rule 474 (12/04/81)	☐ AQMD TM 7.1 or 100.1	
☒ All Combustion Equipment Except Internal Combustion Engines (RECLAIM & non-RECLAIM sources)	☒ Rule 407 (04/02/82) ☐ Rule 409 (08/07/81)	☐ AQMD TM 100.1 or 10.1, 307-91 ☐ AQMD TM 5.1, 5.2, or 5.3	
☒ All Combustion Equipment Using Gaseous Fuel (except SOx RECLAIM sources)	☐ Rule 431.1 (06/12/98)	☐ Rule 431.1(f)	☐ Rule 431.1(d) & (e)
☒ All Combustion Equipment Using Liquid Fuel (except SOx RECLAIM sources)	☐ Rule 431.2 (09/15/00)	☐ Rule 431.2(g)	☐ Rule 431.2(f)
☒ All Combustion Equipment Using Fossil Fuel (except SOx RECLAIM sources)	☐ Rule 431.3 (05/07/76)		
☒ All Equipment	☒ Rule 401 (11/09/01) ☐ Rule 405 (02/07/86) ☒ Rule 408 (05/07/76) ☐ Rule 430 (07/12/96) ☒ Rule 701 (06/13/97) ☒ New Source Review, BACT ☐ Rule 1703 (10/07/88) ☐ 40 CFR68 - Accidental Release Prevention	☐ California Air Resources Board Visible Emission Evaluation ☐ AQMD TM 5.1, 5.2, or 5.3 N/A See Applicable Subpart	☐ Rule 430(b) See Applicable Subpart
☐ All Equipment Processing Solid Materials	☐ Rule 403 (04/02/04)	☐ Rule 403(d)(4)	☐ Rule 403(f)
☒ All Equipment With Exhaust Stack (except cement kilns subject to Rule 1112.1)	☐ Rule 404 (02/07/86)	☐ AQMD TM 5.1, 5.2, or 5.3	
☐ All Facilities Using Solvents to Clean Various Items or Equipment	☐ Rule 109 (05/02/03) ☐ Rule 1171 (11/07/03) ☐ 40 CFR63 SUBPART T	☐ Rule 109(g) ☐ Rule 1171(f) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1171(c)(6) See Applicable Subpart
☒ All RECLAIM Equipment (NOx & SOx)	☐ Reg. XX - RECLAIM	☐ Rule 2011, App. A (12/05/03) ☐ Rule 2012, App. A (12/05/03)	☐ Rule 2011, App. A (12/05/03) ☐ Rule 2012, App. A (12/05/03)
☐ Abrasive Blasting	☐ Rule 1140 (08/02/85)	☐ Rule 1140(d) & (e), AQMD Visible Emission Method	
☐ Aggregate and Related Operations	☐ Rule 1157 (01/07/05)	☐ Rule 1157(f)	☐ Rule 1157(e)
☐ Appliances Containing Ozone Depleting Substances (except Motor Vehicle Air Conditioners): Manufacturing, Repair, Maintenance, Service, & Disposal	☐ 40 CFR82 SUBPART F	See Applicable Subpart	See Applicable Subpart

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
☐ Asphalt	See Manufacturing, Asphalt Processing & Asphalt Roofing		
☐ Asphalt Concrete/Batch Plants	☐ 40 CFR60 SUBPART I	See Applicable Subpart	See Applicable Subpart
☐ Benzene Emissions, Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, & Coke By-Product Recovery Plants	☐ Rule 1173 (12/06/02) ☐ Rule 1176 (09/13/96) ☐ 40 CFR61 SUBPART L ☐ 40 CFR61 SUBPART Y ☐ 40 CFR63 SUBPART R ☐ 40 CFR63 SUBPART CC	☐ Rule 1173(j) ☐ Rule 1176(h) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 1173(i) ☐ Rule 1176(f) & (g) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Benzene Transfer Operations	☐ Rule 1142 (07/19/91) ☐ 40 CFR61 SUBPART BB ☐ 40 CFR63 SUBPART Y	☐ Rule 1142(e) See Applicable Subpart See Applicable Subpart	☐ Rule 1142(h) See Applicable Subpart See Applicable Subpart
☐ Benzene Waste Operations	☐ Rule 1176 (09/13/96) ☐ 40 CFR61 SUBPART FF ☐ 40 CFR63 SUBPART CC	☐ Rule 1176(h) See Applicable Subpart See Applicable Subpart	☐ Rule 1176(f) & (g) See Applicable Subpart See Applicable Subpart
☐ Beryllium Emissions	☐ 40 CFR61 SUBPART C	See Applicable Subpart	See Applicable Subpart
☐ Beryllium Emissions, Rocket Motor Firing	☐ 40 CFR61 SUBPART D	See Applicable Subpart	See Applicable Subpart
☐ Boiler, < 5 Mmbtu/Hr (non-RECLAIM sources)	☐ Rule 1146.1 (05/13/94) ☐ Rule 1146.2 (01/07/05) ☐ 40 CFR63 SUBPART DDDDD	☐ Rule 1146.1(d) N/A See Applicable Subpart	☐ Rule 1146.1(c)(2) & (c)(3) N/A See Applicable Subpart
☐ Boiler, < 5 Mmbtu/Hr (RECLAIM sources)	☐ Rule 1146.1 (05/13/94) - excluding NOx requirements ☐ 40 CFR63 SUBPART DDDDD	☐ Rule 1146.1(d) See Applicable Subpart	☐ Rule 1146.1(c)(2) & (c)(3) See Applicable Subpart
☐ Boiler, ≥ 5 Mmbtu/Hr (non-RECLAIM sources)	☐ Rule 218 (05/14/99) ☐ Rule 429 (12/21/90) ☐ Rule 475 (08/07/78) ☐ Rule 476 (10/08/76) ☐ Rule 1146 (11/17/00) ☐ 40 CFR60 SUBPART D ☐ 40 CFR60 SUBPART Da ☐ 40 CFR60 SUBPART Dc ☐ 40 CFR63 SUBPART DDDDD	☐ AQMD TM 100.1 N/A ☐ AQMD TM 5.1, 5.2, or 5.3 ☐ AQMD TM 7.1, 100.1, 5.1, 5.2, or 5.3 ☐ Rule 1146(d) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 218(e) & (f) ☐ Rule 429(d) ☐ Rule 1146(c)(6) & (c)(7) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Boiler, ≥ 5 Mmbtu/Hr (RECLAIM sources)	☐ Rule 475 (08/07/78) ☐ Rule 476 (10/08/76) - excluding NOx requirements ☐ Rule 1146 (11/17/00) - excluding NOx requirements ☐ Rule 2011 (12/05/03) or Rule 2012 (12/05/03) ☐ 40 CFR60 SUBPART D ☐ 40 CFR60 SUBPART Da ☐ 40 CFR60 SUBPART Dc ☐ 40 CFR63 SUBPART DDDDD	☐ AQMD TM 5.1, 5.2, or 5.3 ☐ AQMD TM 7.1, 100.1, 5.1, 5.2, or 5.3 ☐ Rule 1146(d) ☐ Rule 2011, App. A (12/05/03) or Rule 2012, App. A (12/05/03) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 1146(c)(6) & (c)(7) ☐ Rule 2011, App. A (12/05/03) or Rule 2012, App. A (12/05/03) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
			See Applicable Subpart
☐ Boiler, Petroleum Refining (non-RECLAIM sources)	☐ Rule 218 (05/14/99) ☐ Rule 429 (12/21/90) ☐ Rule 431.1 (06/12/98) ☐ Rule 475 (08/07/78) ☐ Rule 1146 (11/17/00) ☐ 40 CFR60 SUBBPART J ☐ 40 CFR63 SUBPART DDDDD	☐ AQMD TM 100.1 N/A ☐ Rule 431.1(f) ☐ AQMD TM 5.1, 5.2, or 5.3 ☐ Rule 1146(d) See Applicable Subpart See Applicable Subpart	☐ Rule 218(e) & (f) ☐ Rule 429(d) ☐ Rule 431.1(d) & (e) ☐ Rule 1146(c)(6) & (c)(7) See Applicable Subpart See Applicable Subpart
☐ Boiler, Petroleum Refining (RECLAIM sources)	☐ Rule 1146 (11/17/00) - excluding NOx requirements ☐ Rule 2011 (12/05/03) or Rule 2012 (12/05/03) ☐ 40 CFR60 SUBPART J ☐ 40 CFR63 SUBPART DDDDD	☐ Rule 1146(d) ☐ Rule 2011, App. A (12/05/03) or Rule 2012, App. A (12/05/03) See Applicable Subpart See Applicable Subpart	☐ Rule 1146(c)(6) & (c)(7) ☐ Rule 2011, App. A (12/05/03) or Rule 2012, App. A (12/05/03) See Applicable Subpart See Applicable Subpart
☐ Boilers, Electric Utility (non-RECLAIM sources)	☐ Rule 218 (05/14/99) ☐ Rule 429 (12/21/90) ☐ Rule 1135 (07/19/91) ☐ 40 CFR60 SUBPART Db ☐ 40 CFR63 SUBPART DDDDD	☐ AQMD TM 100.1 N/A ☐ Rule 1135(e) See Applicable Subpart See Applicable Subpart	☐ Rule 218(e) & (f) ☐ Rule 429(d) ☐ Rule 1135(e) See Applicable Subpart See Applicable Subpart
☐ Boilers, Electric Utility (RECLAIM sources)	☐ Rule 2012 (12/05/03) ☐ 40 CFR60 SUBPART Db ☐ 40 CFR63 SUBPART DDDDD	☐ Rule 2012, App. A (12/05/03) See Applicable Subpart See Applicable Subpart	☐ Rule 2012, App. A (12/05/03) See Applicable Subpart See Applicable Subpart
☐ Bulk Loading Of Organic Liquids	☐ Rule 462 (05/14/99) ☐ 40 CFR60 SUBPART XX ☐ 40 CFR63 SUBPART R ☐ 40 CFR63 SUBPART EEEE ☐ 40 CFR63 SUBPART GGGGG	☐ Rule 462(f) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 462(g) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Cadmium Electroplating Operation	☐ Rule 1426 (05/02/03)		☐ Rule 1426(e)
☐ Calciner, Mineral Industries	☐ 40 CFR60 SUBPART UUU	See Applicable Subpart	See Applicable Subpart
☐ Calciner, Petroleum Coke	☐ Rule 477 (04/03/81) ☐ Rule 1119 (03/02/79) ☐ 40 CFR63 SUBPART L	☐ AQMD Visible Emissions, AQMD TM 5.1, 5.2, or 5.3 ☐ AQMD TM 6.1 or 100.1 See Applicable Subpart	 See Applicable Subpart
☐ Charbroilers	☐ Rule 1174 (10/05/90) ☐ Rule 1138 (11/14/97)	☐ AQMD Test Protocol ☐ Rule 1138(g)	☐ Rule 1138(d)
☐ Chrome Plating & Chromic Acid Anodizing Operation	☐ Rule 1426 (05/02/03) ☐ Rule 1469 (05/02/03)	☐ Rule 1469(e)	☐ Rule 1426(e) ☐ Rule 1469(g), (j) & (k)
☐ Coating Operation, Adhesive Application Operation	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1132 (05/07/04) ☐ Rule 1168 (01/07/05)	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1132(f) ☐ Rule 1168(f) & (g)	☐ Rule 109(c) ☐ Rule 1132(g) ☐ Rule 1168(e)

KEY ABBREVIATIONS:	Reg.= AQMD Regulation Rule = AQMD Rule	App. = Appendix AQMD TM = AQMD Test Method	CFR = Code of Federal Regulations CCR = California Code of Regulations	AQMD Form 500-C1	Rev. 05/05 Page 4 of 4

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
	☐ Rule 1171 (11/07/03) ☐ 40 CFR60 SUBPART RR	☐ Rule 1171(f) See Applicable Subpart	☐ Rule 1171(c)(6) See Applicable Subpart
☐ Coating Operation, Aerospace Assembly & Component Manufacturing	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1124 (09/21/01) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR63 SUBPART GG	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1124(e) & (f) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1124(j) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart
☐ Coating Operation, Graphic Arts (Gravure, Letter Press, Flexographic & Lithographic Printing Process, Etc.)	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1130 (10/08/99) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR60 SUBPART QQ ☐ 40 CFR60 SUBPART RR ☐ 40 CFR60 SUBPART FFF ☐ 40 CFR60 SUBPART VVV ☐ 40 CFR63 SUBPART KK ☐ 40 CFR63 SUBPART JJJJ	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1130(h) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1130(e) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Coating Operation, Magnet Wire Coating	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1126 (01/13/95) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03)	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1126(d) ☐ Rule 1132(f) ☐ Rule 1171(f)	☐ Rule 109(c) ☐ Rule 1126(c)(4) ☐ Rule 1132(g) ☐ Rule 1171(c)(6)
☐ Coating Operation, Marine Coating (Except for recreational equipment)	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1106 (01/13/95) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR63 SUBPART II	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1106(e) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1106(c)(5) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart
☐ Coating Operation, Metal Coating	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1107 (11/09/01) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR60 SUBPART EE ☐ 40 CFR60 SUBPART SS ☐ 40 CFR63 SUBPART NNNN ☐ 40 CFR63 SUBPART MMMM ☐ 40 CFR63 SUBPART RRRR	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1107(f) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1107(k) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Coating Operation, Metal Containers, Closure, & Coil Coating Operations	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1125 (01/13/95)	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1125(e)	☐ Rule 109(c) ☐ Rule 1125(c)(6)

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
	☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR60 SUBPART TT ☐ 40 CFR60 SUBPART WW ☐ 40 CFR63 SUBPART SSSS	☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Coating Operation, Motor Vehicle & Mobile Equipment Non-Assembly Line Coating Operation	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1132 (05/07/04) ☐ Rule 1151 (12/11/98) ☐ Rule 1171 (11/07/03)	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1132(f) ☐ Rule 1151(g) ☐ Rule 1171(f)	☐ Rule 109(c) ☐ Rule 1132(g) ☐ Rule 1151(f) ☐ Rule 1171(c)(6)
☐ Coating Operation, Motor Vehicle Assembly Line	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1115 (05/12/95) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR60 SUBPART MM ☐ 40 CFR63 SUBPART IIII	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1115(e) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1115(g) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart See Applicable Subpart
☐ Coating Operation, Paper, Fabric, & Film Coating Operations	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1128 (03/08/96) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR60 SUBPART VVV ☐ 40 CFR63 SUBPART OOOO	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1128(f) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1128(e) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart See Applicable Subpart
☐ Coating Operation, Plastic, Rubber, & Glass	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1145 (12/03/04) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR60 SUBPART TTT ☐ 40 CFR63 SUBPART NNNN ☐ 40 CFR63 SUBPART PPPP	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1145(e) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1145(d) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Coating Operation, Pleasure Craft	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1106.1 (02/12/99) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR63 SUBPART II	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1106.1(e) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1106.1(d) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart
☐ Coating Operation, Screen Printing	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1130.1 (12/13/96) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03)	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1130.1(g) ☐ Rule 1132(f) ☐ Rule 1171(f)	☐ Rule 109(c) ☐ Rule 1130.1(c)(5) ☐ Rule 1132(g) ☐ Rule 1171(c)(6)

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
	☐ 40 CFR63 SUBPART KK	See Applicable Subpart	See Applicable Subpart
☐ Coating Operation, Use Of Architectural Coating (Stationary Structures)	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1113 (07/09/04) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03)	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1113(e) ☐ Rule 1132(f) ☐ Rule 1171(f)	☐ Rule 109(c) ☐ Rule 1132(g) ☐ Rule 1171(c)(6)
☐ Coating Operation, Wood Flat Stock	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1104 (08/13/99) ☐ Rule 1132 (05/07/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR63 SUBPART II	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1104(e) ☐ Rule 1132(f) ☐ Rule 1171(f) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1104(d) ☐ Rule 1132(g) ☐ Rule 1171(c)(6) See Applicable Subpart
☐ Coating Operation, Wood Products (Commercial Furniture, Cabinets, Shutters, Frames, Toys)	☐ Rule 109 (05/02/03) ☐ Rule 481 (01/11/02) ☐ Rule 1132 (05/07/04) ☐ Rule 1136 (06/14/96) ☐ Rule 1171 (11/07/03) ☐ 40 CFR63 SUBPART JJ	☐ Rule 109(g) ☐ Rule 481(d) ☐ Rule 1132(f) ☐ Rule 1136(f) ☐ Rule 1171(f) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1132(g) ☐ Rule 1136(d) & (g) ☐ Rule 1171(c)(6) See Applicable Subpart
☐ Coater	See Coating Operations		
☐ Columns	See Petroleum Refineries, Fugitive Emissions		
☐ Composting Operation	☐ Rule 1133 (01/10/03) ☐ Rule 1133.1 (01/10/03) ☐ Rule 1133.2 (01/10/03)	 ☐ Rule 1133.1(e) ☐ Rule 1133.2(g)	 ☐ Rule 1133.1(d) ☐ Rule 1133.2(h)
☐ Compressors	See Fugitive Emissions or Petroleum Refineries, Fugitive Emissions		
☐ Concrete Batch Plants	See Nonmetallic Mineral Processing Plants		
☐ Consumer Product Manufacturing	See Manufacturing, Consumer Product		
☐ Cooling Tower, Hexavalent Chromium	☐ 40 CFR63 SUBPART Q	See Applicable Subpart	See Applicable Subpart
☐ Copper Electroplating Operation	☐ Rule 1426 (05/02/03)		☐ Rule 1426(e)
☐ Crude Oil Production	See Oil Well Operations		
☐ Crusher	See Nonmetallic Mineral Processing Plants		
☐ Dairy Farms and Related Operations	☐ Rule 1127	☐ Rule 1127(h)	☐ Rule 1127(g)
☐ Degreasers	☐ Rule 109 (05/02/03) ☐ Rule 1122 (10/01/04) ☐ Rule 1171 (11/07/03) ☐ 40 CFR63 SUBPART T	☐ Rule 109(g) ☐ Rule 1122(h) ☐ Rule 1171(f) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1122(i) ☐ Rule 1171(c)(6) See Applicable Subpart
☐ Dry Cleaning, Perchloroethlyene	☐ Rule 1421 (12/06/02)	☐ Rule 1421(e) & (i)	☐ Rule 1421(g) & (h)
☐ Dry Cleaning, Petroleum Solvent	☐ Rule 109 (05/02/03) ☐ Rule 1102 (11/17/00) ☐ 40 CFR60 SUBPART JJJ	☐ Rule 109(g) ☐ Rule 1102(g) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1102(f) See Applicable Subpart
☐ Dryers, Mineral Industries	☐ 40 CFR60 SUBPART UUU	See Applicable Subpart	See Applicable Subpart
☐ Ethylene Oxide Sterilizer	See Sterilizer, Ethylene Oxide		
☐ Flanges	See Fugitive Emissions or Petroleum Refineries, Fugitive Emissions		

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
☐ Fluid Catalytic Cracking Unit	☐ Rule 218 (05/14/99) ☐ Rule 1105 (09/01/84) ☐ Rule 1105.1 (11/07/03)	☐ AQMD TM 100.1 ☐ Rule 1105(c)(1) ☐ Rule 1105.1(f)	☐ Rule 218(e) & (f) ☐ Rule 1105(c)(2) ☐ Rule 1105.1(e)
☐ Foundries, Iron and Steel	☐ 40 CFR63 SUBPART EEEEE	See Applicable Subpart	See Applicable Subpart
☐ Friction Materials Manufacturing	See Manufacturing, Friction Materials		
☐ Fugitive Emissions, Benzene	☐ Rule 1173 (12/06/02) ☐ 40 CFR61 SUBPART L ☐ 40 CFR61 SUBPART V ☐ 40 CFR63 SUBPART R ☐ 40 CFR63 SUBPART CC	☐ Rule 1173(j) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 1173(i) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Fugitive Emissions, Chemical Plant	☐ Rule 466 (10/07/83) ☐ Rule 466.1 (03/16/84) ☐ Rule 467 (03/05/82) ☐ Rule 1173 (12/06/02) ☐ 40 CFR60 SUBPART VV ☐ 40 CFR61 SUBPART V ☐ 40 CFR63 SUBPART F ☐ 40 CFR63 SUBPART G ☐ 40 CFR63 SUBPART H ☐ 40 CFR63 SUBPART I ☐ 40 CFR63 SUBPART R ☐ 40 CFR63 SUBPART CC	☐ Rule 466(f) ☐ Rule 466.1(g) ☐ Rule 467(f) ☐ Rule 1173(j) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 466(e) ☐ Rule 466.1(h) ☐ Rule 467(e) ☐ Rule 1173(i) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Fugitive Emissions, Natural Gas Processing Plant	☐ Rule 466 (10/07/83) ☐ Rule 466.1 (03/16/84) ☐ Rule 467 (03/05/82) ☐ Rule (12/06/02) ☐ 40 CFR60 SUBPART KKK ☐ 40 CFR61 SUBPART V ☐ 40 CFR63 SUBPART F ☐ 40 CFR63 SUBPART G ☐ 40 CFR63 SUBPART H ☐ 40 CFR63 SUBPART I ☐ 40 CFR63 SUBPART R ☐ 40 CFR63 SUBPART CC	☐ Rule 466(f) ☐ Rule 466.1(g) ☐ Rule 467(f) ☐ Rule 1173(j) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 466(e) ☐ Rule 466.1(h) ☐ Rule 467(e) ☐ Rule 1173(i) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Fugitive Emissions, Oil & Gas Production Facility	☐ Rule 466 (10/07/83) ☐ Rule 466.1 (03/16/84) ☐ Rule 467 (03/05/82) ☐ Rule 1173 (12/06/02) ☐ 40 CFR61 SUBPART V ☐ 40 CFR63 SUBPART F ☐ 40 CFR63 SUBPART G ☐ 40 CFR63 SUBPART H ☐ 40 CFR63 SUBPART I	☐ Rule 466(f) ☐ Rule 466.1(g) ☐ Rule 467(f) ☐ Rule 1173(j) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 466(e) ☐ Rule 466.1(h) ☐ Rule 467(e) ☐ Rule 1173(i) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart

Section II - Applicable Requirements, Test Methods, & MRR Requirements			
EQUIPMENT/PROCESS	**APPLICABLE REQUIREMENT**	**TEST METHOD**	**MRR REQUIREMENT**
	☐ 40 CFR63 SUBPART R ☐ 40 CFR63 SUBPART CC	See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Fugitive Emissions, Pipeline Transfer Station	☐ Rule 466 (10/07/83) ☐ Rule 466.1 (03/16/84) ☐ Rule 467 (03/05/82) ☐ Rule 1173 (12/06/02) ☐ 40 CFR61 SUBPART V ☐ 40 CFR63 SUBPART F ☐ 40 CFR63 SUBPART G ☐ 40 CFR63 SUBPART H ☐ 40 CFR63 SUBPART I ☐ 40 CFR63 SUBPART R ☐ 40 CFR63 SUBPART CC	☐ Rule 466(f) ☐ Rule 466.1(g) ☐ Rule 467(f) ☐ Rule 1173(j) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart	☐ Rule 466(e) ☐ Rule 466.1(h) ☐ Rule 467(e) ☐ Rule 1173(i) See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart See Applicable Subpart
☐ Furnace, Basic Oxygen Process	☐ 40 CFR60 SUBPART Na	See Applicable Subpart	See Applicable Subpart
☐ Furnace, Electric Arc, For Steel Plants Constructed After August 17, 1983	☐ 40 CFR60 SUBPART AAa	See Applicable Subpart	See Applicable Subpart
☐ Furnace, Electric Arc, For Steel Plants: Constructed After Oct. 21, 1974, & On Or Before Aug. 17, 1983	☐ 40 CFR60 SUBPART AA	See Applicable Subpart	See Applicable Subpart
☐ Furnace, Glass Melting	☐ Rule 1117 (01/06/84) ☐ 40 CFR60 SUBPART CC	☐ Rule 1117(c), AQMD TM 7.1 or 100.1 See Applicable Subpart	See Applicable Subpart
☐ Furnace, Lead Melting, Automotive Batteries	☐ Rule 1101 (10/07/77) ☐ 40 CFR63 SUBPART X	☐ AQMD TM 6.1 See Applicable Subpart	See Applicable Subpart
☐ Gasoline Transfer & Dispensing Operation	☐ Rule 461 (01/09/04)	☐ Rule 461(f)	☐ Rule 461(e)(6) & (e)(7)
☐ Glass Manufacturing	See Manufacturing, Glass		
☐ Grain Elevators	☐ 40 CFR60 SUBPART DD	See Applicable Subpart	See Applicable Subpart
☐ Halon-containing Equipment, Use for Technician Training, Testing, Maintenance, Service, Repair, or Disposal	☐ 40 CFR82 SUBPART H	See Applicable Subpart	See Applicable Subpart
☐ Heater, Asphalt Pavement	☐ Rule 1120 (08/04/78)	☐ AQMD Visible Emissions, AQMD TM 6.2	☐ Rule 1120(f)
☐ Heaters, Petroleum Refinery Process	☐ Rule 429 (12/21/90) ☐ Rule 431.1 (06/12/98) ☐ Rule 1146 (11/17/00) ☐ 40 CFR60 SUBPART J ☐ 40 CFR63 SUBPART DDDDD	N/A ☐ Rule 431.1(f) ☐ Rule 1146(d) See Applicable Subpart See Applicable Subpart	☐ Rule 429(d) ☐ Rule 431.1(d) & (e) ☐ Rule 1146(c)(6) & (c)(7) See Applicable Subpart See Applicable Subpart
☐ Heaters, Process	See Boilers		
☐ Incinerators	☐ 40 CFR60 SUBPART E	See Applicable Subpart	See Applicable Subpart
☐ Inorganic Arsenic Emissions, Arsenic Trioxide & Metallic Arsenic Production Facilities	☐ 40 CFR61 SUBPART P	See Applicable Subpart	See Applicable Subpart

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
☒ Internal Combustion Engines, Reciprocating	☐ 40 CFR63 SUBPART ZZZZ	See Applicable Subpart	See Applicable Subpart
☐ Kiln, Cement Plant	☐ Rule 1112 (01/06/86) ☐ Rule 1112.1 (02/07/86) ☐ 40 CFR60 SUBPART F	N/A N/A See Applicable Subpart	N/A N/A See Applicable Subpart
☐ Landfills	☐ Rule 1150 (10/15/82) ☐ Rule 1150.1 (03/17/00) ☐ 40 CFR60 SUBPART WWW ☐ 40 CFR63 SUBPART AAAA	 ☐ Rule 1150.1(j) See Applicable Subpart See Applicable Subpart	 ☐ Rule 1150.1(e) & (f) See Applicable Subpart See Applicable Subpart
☐ Lead Acid Battery Manufacturing Plants	See Manufacturing, Lead Acid Battery		
☐ Lead Electroplating Operation	☐ Rule 1426 (05/02/03)		☐ Rule 1426(e)
☐ Manufacturing, Asphalt Processing & Asphalt Roofing	☐ Rule 470 (05/07/76) ☐ Rule 1108 (02/01/85) ☐ Rule 1108.1 (11/04/83) ☐ 40 CFR60 SUBPART UU ☐ 40 CFR63 SUBPART LLLLL	N/A ☐ Rule 1108(b) ☐ Rule 1108.1 (b) See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Manufacturing, Brick & Structural Clay Products	☐ 40 CFR63 SUBPART JJJJJ	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Clay Ceramics	☐ 40 CFR63 SUBPART KKKKK	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Coatings & Ink (SIC Code 2851)	☐ Rule 1141.1 (11/17/00) ☐ 40 CFR63 SUBPART HHHHH	N/A See Applicable Subpart	☐ Rule 1141.1(c) See Applicable Subpart
☐ Manufacturing, Consumer Product	☐ Title 17 CCR 94500		
☐ Manufacturing, Food Product	☐ Rule 1131 (06/06/03)	☐ Rule 1131(e)	☐ Rule 1131(d)
☐ Manufacturing, Friction Materials	☐ 40 CFR63 SUBPART QQQQQ	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Glass	☐ Rule 1117 (01/06/84) ☐ 40 CFR60 SUBPART CC ☐ 40 CFR61 SUBPART N	☐ Rule 1117(c), AQMD TM 7.1 or 100.1 See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Manufacturing, Hydrochloric Acid	☐ 40 CFR63 SUBPART NNNNN	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Lead-Acid Battery	☐ 40 CFR60 SUBPART KK	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Lime	☐ 40 CFR63 SUBPART AAAAA	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Magnetic Tape Industry	☐ 40 CFR60 SUBPART SSS ☐ 40 CFR63 SUBPART EE	See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Manufacturing, Miscellaneous Organic Chemical	☐ 40 CFR63 SUBPART FFFF	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Nitric Acid	☐ Rule 218 (05/14/99) ☐ Rule 1159 (12/06/85) ☐ 40 CFR60 SUBPART G	☐ AQMD TM 100.1 ☐ AQMD TM 7.1 or 100.1 See Applicable Subpart	☐ Rule 218(e) & (f) See Applicable Subpart
☐ Manufacturing, Plywood & Composite Wood Products	☐ Rule 1137 (02/01/02) ☐ 40 CFR63 SUBPART DDDD	N/A See Applicable Subpart	☐ Rule 1137(e) See Applicable Subpart
☐ Manufacturing, Polymer Industry	☐ 40 CFR60 SUBPART DDD ☐ 40 CFR63 SUBPART W ☐ 40 CFR63 SUBPART J	See Applicable Subpart See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart See Applicable Subpart

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
☐ Manufacturing, Polymeric Cellular Foam	☐ Rule 1175 (05/13/94) ☐ 40 CFR63 SUBPART UUUU	☐ Rule 1175(f) See Applicable Subpart	☐ Rule 1175(e) See Applicable Subpart
☐ Manufacturing, Products Containing Halon Blends	☐ 40 CFR82 SUBPART H	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Products Containing Organic Solvents	☐ Rule 443.1 (12/05/86)	N/A	N/A
☐ Manufacturing, Products Containing Ozone Depleting Substances (ODS)	☐ 40 CFR82 SUBPART A ☐ 40 CFR82 SUBPART E	See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Manufacturing, Reinforced Plastic Composites	☐ 40 CFR63 SUBPART WWWW	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Refractory Products	☐ 40 CFR63 SUBPART SSSSS	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Resin	☐ Rule 1141 (11/17/00) ☐ 40 CFR63 SUBPART W	☐ Rule 1141(d) See Applicable Subpart	☐ Rule 1141(c) See Applicable Subpart
☐ Manufacturing, Rubber Tire	☐ 40 CFR63 SUBPART XXXX	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Semiconductors	☐ Rule 109 (05/02/03) ☐ Rule 1164 (01/13/95) ☐ Rule 1171 (11/07/03) ☐ 40 CFR63 SUBPART BBBBB	☐ Rule 109(g) ☐ Rule 1164(e) ☐ Rule 1171(f) See Applicable Subpart	☐ Rule 109(c) ☐ Rule 1164(c)(5) ☐ Rule 1171(c)(6) See Applicable Subpart
☐ Manufacturing, Solvent	☐ Rule 443 (05/07/76)	N/A	N/A
☐ Manufacturing, Sulfuric Acid	☐ Rule 469 (02/13/81) ☐ 40 CFR60 SUBPART H ☐ 40 CFR60 SUBPART Cd	☐ AQMD TM 6.1 or 6.2 See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Manufacturing, Surfactant	☐ Rule 1141.2 (01/11/02)	☐ AQMD TM 25.1	
☐ Manufacturing, Synthetic Organic Chemical Manufacturing Industry (SOCMI) Air Oxidation Unit Processes	☐ 40 CFR60 SUBPART III ☐ 40 CFR60 SUBPART NNN	See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Manufacturing, Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes	☐ 40 CFR60 SUBPART RRR	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Vinyl Chloride	☐ 40 CFR61 SUBPART F	See Applicable Subpart	See Applicable Subpart
☐ Manufacturing, Water Heaters	☐ Rule 1121 (09/03/04)	N/A	N/A
☐ Manufacturing, Wool Fiberglass Insulation	☐ 40 CFR60 SUBPART PPP	See Applicable Subpart	See Applicable Subpart
☐ Manure Processing Operations	☐ Rule 1127	☐ Rule 1127(h)	☐ Rule 1127(g)
☐ Marine Tank Vessel Operations	☐ Rule 1142 (07/19/91) ☐ 40 CFR63 SUBPART Y	☐ Rule 1142(e) See Applicable Subpart	☐ Rule 1142(h) See Applicable Subpart
☐ Mercury Emissions	☐ 40 CFR61 SUBPART E ☐ 40 CFR63 SUBPART IIII	See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Motor Vehicle Air Conditioners with Ozone Depleting Substances (ODS): Repair, Service, Manufacturing, Maintenance, or Disposal	☐ 40 CFR82 SUBPART B ☐ 40 CFR82 SUBPART F	See Applicable Subpart See Applicable Subpart	See Applicable Subpart See Applicable Subpart
☐ Municipal Waste Combustors	☐ 40 CFR60 SUBPART Cb	See Applicable Subpart	See Applicable Subpart

Section II - Applicable Requirements, Test Methods, & MRR Requirements

EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
	☐ 40 CFR60 SUBPART Ea	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR60 SUBPART Eb	See Applicable Subpart	See Applicable Subpart
☐ Negative Air Machines/HEPA, Asbestos	☐ 40 CFR61 SUBPART M	See Applicable Subpart	See Applicable Subpart
☐ Nickel Electroplating Operation	☐ Rule 1426 (05/02/03)		☐ Rule 1426(e)
☐ Nonmetallic Mineral Processing Plants	☐ Rule 404 (02/07/86)	☐ AQMD TM 5.1, 5.2, or 5.3	
	☐ Rule 405 (02/07/86)	☐ AQMD TM 5.1, 5.2, or 5.3	
	☐ 40 CFR60 SUBPART OOO	See Applicable Subpart	See Applicable Subpart
☐ Off-site Waste and Recovery Operation	☐ 40 CFR63 SUBPART DD	See Applicable Subpart	See Applicable Subpart
☐ Oil and Gas Well Operation	☐ Rule 1148 (11/05/82)	☐ AQMD TM 25.1	
	☐ Rule 1148.1 (03/05/04)	☐ Rule 1148.1 (g)	☐ Rule 1148.1 (f)
☐ Onshore Natural Gas Processing, SO_2 Emissions	☐ 40 CFR60 SUBPART LLL	See Applicable Subpart	See Applicable Subpart
☐ Open Fires	☐ Rule 444 (12/21/01)		
☐ Open Storage, Petroleum Coke	☐ Rule 403 (04/02/04)	☐ Rule 403(d)(4)	☐ Rule 403(f)
	☐ Rule 403.1 (04/02/04)		☐ Rule 403.1(f)
	☐ Rule 1158 (06/11/99)	☐ Rule 1158(h)	☐ Rule 1158(j)
☐ Open Storage	☐ Rule 403 (04/02/04)	☐ Rule 403(d)(4)	☐ Rule 403(f)
	☐ Rule 403.1 (04/02/04)		☐ Rule 403.1(f)
☐ Outer Continental Shelf Platform	☐ Rule 1183 (03/12/93)	☐ 40 CFR55	☐ 40 CFR55
	☐ 40 CFR55	See Applicable Subpart	See Applicable Subpart
☐ Oven, Commercial Bakery	☐ Rule 1153 (01/13/95)	☐ Rule 1153(h)	☐ Rule 1153(g)
☐ Oven, Petroleum Coke	☐ Rule 477 (04/03/81)	☐ AQMD Visible Emissions, AQMD TM 5.1, 5.2, or 5.3	
	☐ 40 CFR63 SUBPART L	See Applicable Subpart	See Applicable Subpart
☐ Ozone Depleting Substances (ODS) or Alternative ODS, Use	☐ 40 CFR82 Subpart G	See Applicable Subpart	See Applicable Subpart
☐ Petroleum Refineries	☐ Rule 218 (05/14/99)	☐ AQMD TM 100.1	☐ Rule 218(e) & (f)
	☐ Rule 465 (08/13/99)		
	☐ Rule 468 (10/08/76)	☐ AQMD TM 6.1 or 6.2	
	☐ Rule 469 (02/13/81)	☐ AQMD TM 6.1 or 6.2	
	☐ Rule 1123 (12/07/90)	N/A	☐ Rule 1123(c)
	☐ Rule 1189 (01/21/00)	☐ Rule 1189(f)	☐ Rule 1189(e)
	☐ 40 CFR60 SUBPART J	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART F	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART G	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART H	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART I	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART CC	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART EEEE	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART GGGGG	See Applicable Subpart	See Applicable Subpart
	☐ Title 13 CCR 2250		
☐ Petroleum Refineries, Fugitive Emissions	☐ Rule 1173 (12/06/02)	☐ Rule 1173(j)	☐ Rule 1173(i)

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EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
	☐ Rule 466 (10/07/83)	☐ Rule 466(f)	☐ Rule 466(e)
	☐ Rule 466.1 (03/16/84)	☐ Rule 466.1(g)	☐ Rule 466.1(h)
	☐ Rule 467 (03/05/82)	☐ Rule 467(f)	☐ Rule 467(e)
	☐ 40 CFR60 SUBPART GGG	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR61 SUBPART V	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART F	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART G	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART H	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART I	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART R	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART CC	See Applicable Subpart	See Applicable Subpart
☐ Petroleum Refineries, Storage Tanks	☐ Rule 463 (05/06/05)	☐ Rule 463(g)	☐ Rule 463(e)(5)
	☐ Rule 1178 (12/11/01)	☐ Rule 1178(i)	☐ Rule 1178(f) & (h)
	☐ 40 CFR60 SUBPART K	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR60 SUBPART Ka	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR60 SUBPART Kb	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART F	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART G	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART H	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART I	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART R	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART CC	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART EEEE	See Applicable Subpart	See Applicable Subpart
☐ Petroleum Refineries, Wastewater Systems	☐ Rule 1176 (09/13/96)	☐ Rule 1176(h)	☐ Rule 1176(f) & (g)
	☐ Rule 464 (12/07/90)	N/A	
	☐ 40 CFR60 SUBPART QQQ	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART CC	See Applicable Subpart	See Applicable Subpart
☐ Pharmaceuticals & Cosmetics Manufacturing	☐ Rule 1103 (03/12/99)	☐ Rule 1103(f)	☐ Rule 1103(e)
☐ Polyester Resin Operation	☐ Rule 109 (05/02/03)	☐ Rule 109(g)	☐ Rule 109(c)
	☐ Rule 1162 (07/09/04)	☐ Rule 1162(f)	☐ Rule 1162(e)
	☐ Rule 1171 (11/07/03)	☐ Rule 1171(f)	☐ Rule 1171(c)(6)
☐ Primary Magnesium Refining	☐ 40 CFR63 SUBPART TTTTT	See Applicable Subpart	See Applicable Subpart
☐ Printing Press	See Coating Operations		
☐ Publicly Owned Treatment Works Operations	☐ Rule 1179 (03/06/92)	☐ Rule 1179(e)	☐ Rule 1179(c) & (d)
	☐ 40 CFR60 SUBPART O	See Applicable Subpart	See Applicable Subpart
☐ Pumps	See Fugitive Emissions or Petroleum Refineries, Fugitive Emissions		
☐ Recycling & Recovery Equipment for Ozone Depleting Substances (ODS),	☐ 40 CFR82 SUBPART F	See Applicable Subpart	See Applicable Subpart
☐ Refrigerant Reclaimers for Ozone Depleting Substances (ODS)	☐ 40 CFR82 SUBPART F	See Applicable Subpart	See Applicable Subpart
☐ Rendering Plant	☐ Rule 472 (05/07/76)	N/A	☐ Rule 472(b)
☐ Rock Crushing	See Nonmetallic Mineral Processing Plants		

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EQUIPMENT/PROCESS	APPLICABLE REQUIREMENT	TEST METHOD	MRR REQUIREMENT
☐ Semiconductor Manufacturing	See Manufacturing, Semiconductors		
☐ Sewage Treatment Plants	See Publicly Owned Treatment Works Operation		
☐ Site Remediation	☐ 40 CFR63 SUBPART GGGGG	See Applicable Subpart	See Applicable Subpart
☐ Smelting, Primary Copper	☐ 40 CFR63 SUBPART QQQ	See Applicable Subpart	See Applicable Subpart
☐ Smelting, Secondary Lead	☐ 40 CFR60 SUBPART L	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART X	See Applicable Subpart	See Applicable Subpart
☐ Soil Decontamination	☐ Rule 1166 (05/11/01)	☐ Rule 1166(e)	☐ Rule 1166(c)(1)(C)
	☐ 40 CFR63 SUBPART GGGGG	See Applicable Subpart	See Applicable Subpart
☐ Spray Booth	See Coating Operations		
☐ Sterilizer, Ethylene Oxide	☐ 40 CFR63 SUBPART O	See Applicable Subpart	See Applicable Subpart
☐ Storage Tank, Degassing Operation	☐ Rule 1149 (07/14/95)		
	☐ 40 CFR63 SUBPART CC	See Applicable Subpart	See Applicable Subpart
☒ Storage Tank, Greater Than 19,815 Gallon Capacity	☐ Rule 463 (05/06/05)	☐ Rule 463(g)	☐ Rule 463(e)(5)
	☐ 40 CFR63 SUBPART F	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART G	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART H	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART I	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR60 SUBPART K	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR60 SUBPART Ka	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR60 SUBPART Kb	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART R	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART CC	See Applicable Subpart	See Applicable Subpart
☐ Synthetic Fiber Production Facilities	☐ 40 CFR60 SUBPART HHH	See Applicable Subpart	See Applicable Subpart
☐ Taconite Iron Ore Processing Facilities	☐ 40 CFR63 SUBPART RRRRR	See Applicable Subpart	See Applicable Subpart
☒ Turbine, Stationary Gas-Fired	☐ Rule 1134 (08/08/97)	☐ CEMS Rule 1134(e) & (g)	☐ Rule 1134(d) & (f)
	☒ Rule 475 (08/07/78)	☐ AQMD TM 5.1, 5.2, or 5.3	
	☐ 40 CFR60 SUBPART GG	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART YYYY	See Applicable Subpart	See Applicable Subpart
☐ Turbine, Stationary Oil-Fired	☐ 40 CFR63 SUBPART YYYY	See Applicable Subpart	See Applicable Subpart
☐ Valves	See Fugitive Emissions or Petroleum Refineries, Fugitive Emissions		
☐ Vessel, Refinery Process	☐ Rule 1123 (12/07/90)	N/A	☐ Rule 1123(c)
☐ Vessels	See Petroleum Refineries, Fugitive Emissions		
☐ Wastewater, Chemical Plant	☐ Rule 464 (12/07/90)	N/A	
	☐ Rule 1176 (09/13/96)	☐ Rule 1176(h)	☐ Rule 1176(f) & (g)
	☐ 40 CFR63 SUBPART F	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART G	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART H	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART I	See Applicable Subpart	See Applicable Subpart
	☐ 40 CFR63 SUBPART CC	See Applicable Subpart	See Applicable Subpart
☐ Wastewater Treatment, Other	☐ Rule 464 (12/07/90)	N/A	
	☐ Rule 1176 (09/13/96)	☐ Rule 1176(h)	☐ Rule 1176(f) & (g)
☐ Woodworking Operations	☐ Rule 1137 (02/01/02)	N/A	☐ Rule 1137(e)

KEY ABBREVIATIONS:	Reg.= AQMD Regulation	App. = Appendix	CFR = Code of Federal Regulations
	Rule = AQMD Rule	AQMD TM = AQMD Test Method	CCR = California Code of Regulations

Section III – Supplemental Identification of Specific Requirements

Complete this section only if there is a specific requirement (i.e., rule reference, test method, or MRR requirement) that is:

1. Listed for a specific type of equipment or process in Section II of this form & **DOES NOT** pertain to a specific device at your facility*; OR,
2. Is **NOT** Listed for a specific type of equipment or process in Section II of this form but it **IS** applicable to a specific device at your facility.

NOTES:

1. For any specific requirement, test method, or MRR requirement that is identified as "Remove," attach additional sheets to explain the reasons why the specific requirement does not pertain to the device listed.
2. All boxes that are checked in Section II and any additional requirements identified in this section as "Add" will be used to determine the facility's compliance status. This information will be used to verify the certification statements made on Form 500-A2.
3. Do not use this section to identify equipment that is exempt from specific rule requirements. Your equipment is automatically considered to be in compliance with the rule that specifically exempts the equipment from those requirements.
4. Listing any requirement that does not apply to a specific piece of equipment in this section will not provide the facility with a permit shield unless one is specifically requested by completing Form 500-D and approved by the AQMD.

* If this section is completed as part of the initial Title V application & there is no device number assigned, refer to the existing permit or application number in this column.

Device No.*	Specific Requirement (Rule Number & Date)	Add (A) or Remove (R) (Check one)	Test Method	Add (A) or Remove (R) (Check one)	MRR Requirement	Add (A) or Remove (R) (Check one)
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R
		☐A ☐R		☐A ☐R		☐A ☐R

Section IV – SIP-Approved Rules That Are Not The Most Current AQMD Rules

Check off each SIP-Approved Rule as it applies to the facility. Use the blanks at the end of this form to fill-in new items.

SIP-Approved Rule	Adoption/ Amendment Date	Check (✓) if Applies	SIP-Approved Rule	Adoption/ Amendment Date	Check (✓) if Applies
218	08/07/81	☐	1146.2	01/09/98	☐
401	03/02/84	☐	1162	11/17/00	☐
403	12/11/98	☐	1166	07/14/95	☐
403.1	01/15/93	☐	1168	10/03/03	☐
431.2	05/04/90	☐	1171	11/07/03	☐
463	03/11/94	☐	1173	05/13/94	☐
466.1	05/02/80	☐	1186	09/10/99	☐
469	05/07/76	☐	2000	05/11/01	☐
475	10/08/76	☐	2001	05/11/01	☐
1112	01/06/84	☐	2002	05/11/01	☐
1113	11/08/96	☐	2005	04/20/01	☐
1121	12/10/99	☐	2007	12/05/03	☐
1122	07/11/97	☐	2010	05/11/01	☐
1132	03/05/04	☐	2011	12/05/03	☐
1140	02/01/80	☐	2012	12/05/03	☐
1145	02/14/97	☐			☐
		☐			☐
		☐			☐
		☐			☐
		☐			☐
		☐			☐

Section V – AQMD Rules That Are Not SIP-Approved (Continued on Following Page)

Check off each AQMD Rule as it applies to the facility. Use the blanks at the end of this form to fill-in new items.

Non SIP-Approved Rule	Adoption/ Amendment Date	Check (✓) if Applies	Non SIP-Approved Rule	Adoption/ Amendment Date	Check (✓) if Applies
53 Los Angeles Co.	N/A	☐	1170	05/06/88	☐
53 Orange Co.	N/A	☐	1183	03/12/93	☐
53 Riverside Co.	N/A	☐	1186.1	06/04/04	☐
53 San Bernardino Co.	N/A	☐	1191	06/16/00	☐
53A San Bernardino Co.	N/A	☐	1192	06/16/00	☐
218.1	05/14/99	☐	1193	06/06/03	☐
402	05/07/76	☐	1194	10/20/00	☐
429	12/21/90	☐	1195	04/20/01	☐
430	07/12/96	☐	1196	06/04/04	☐
441	05/07/76	☐	1401	03/04/05	☐
473	05/07/76	☐	1402	03/04/05	☐
477	04/03/81	☐	1403	04/08/94	☐
480	10/07/77	☐	1404	04/06/90	☐
1105.1	11/07/03	☐	1405	01/04/91	☐
1109	08/05/88	☐	1406	07/08/94	☐
1110.1	10/04/85	☐	1407	07/08/94	☐
1110.2	11/14/97	☐	1411	03/01/91	☐
1116.1	10/20/78	☐	1414	05/03/91	☐
1118	02/13/98	☐	1415	10/14/94	☐
1127	08/06/04	☐	1418	09/10/99	☐
1148.1	03/05/04	☐	1420	09/11/92	☐
1150	10/15/82	☐	1421	12/06/02	☐
1157	01/07/05	☐	1425	03/16/01	☐
1163	06/07/85	☐	1426	05/02/03	☐

Section V – AQMD Rules That Are Not SIP-Approved (Continued on Following Page)					
1469	05/02/03	☐	2009.1	05/11/01	☐
1469.1	03/04/05	☐	2020	05/11/01	☐
1470	03/04/05	☐	2501	05/09/97	☐
2009	01/07/05	☐	2506	12/10/99	☐
		☐			☐
		☐			☐
		☐			☐
		☐			☐
		☐			☐
		☐			☐

South Coast Air Quality Management District

Form 500-F1 (Title V)

Title IV- Acid Rain Phase II Facility Information Summary

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form shall be completed by Acid Rain facilities ONLY and shall accompany all requests for Phase II permit actions unique to Acid Rain facilities. Also attach a completed Form 500-A2. In addition, if an initial Title V permit, permit renewal, or permit revision is requested, attach Form 500-A1 and any supplemental Acid Rain forms (Forms 500-F2, 500-F3, and 500-F4), as appropriate.

Section I - General Information

1. Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice Issued by AQMD):

3. ORIS Code:(5-Digit):

4. This is an application for a (Check all that apply to the facility):

a. [X] Phase II Acid Rain Permit or Revision (Complete Section II of this form)

b. [ ] Repowering Extension Plan or Revision (Complete Form 500-F2)

c. [ ] New Unit Exemption or Revision (Complete Form 500-F3)

d. [ ] Retired Unit Exemption or Revision (Complete Form 500-F4)

5. The requested permit action involves a(n) (Check one):

a. ( ) Administrative Permit Revision

b. ( ) Significant Permit Revision

c. ( ) Fast Track Permit Revision

d. ( ) Automatic Permit Revision

e. (•) Other (specify): initial permit application

6. For all applications requesting a permit revision, provide a general description of the proposed changes (Attach additional sheets as necessary):

Section II - Phase II Acid Rain Device Summary

1. The following information is (Check one): a. (•) New b. ( ) Revised

AQMD Device #	EPA Unit #	Will device need a Repowering Extension Plan?	Has device started operations on or after 11/15/90?	Device Operations Start Date (mo/day/yr)	For Devices starting-up after 11/15/90, provide date when Monitoring Certification will begin (mo/day/yr)
		( ) Yes (•) No	(•) Yes ( ) No	08/01/2010	08/01/2010
		( ) Yes ( ) No	( ) Yes ( ) No		
		( ) Yes ( ) No	( ) Yes ( ) No		
		( ) Yes ( ) No	( ) Yes ( ) No		
		( ) Yes ( ) No	( ) Yes ( ) No		

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To complete this application, type or print the information in the appropriate blanks.

Section I - General Information

1. **Facility Name:** Provide the name of the legal entity that operates the facility.

   AQMD Facility ID: Complete only if the facility has been issued a 6-digit identification or ID number by AQMD. If not, leave these boxes blank. An ID number will be assigned when the application is submitted.

   ORIS Code: Provide the 5-digit code that has been assigned to facility by Department of Energy.

2. Check all applicable boxes to indicate the type of Acid Rain application filed. If box 1a. is checked, complete Section II of this form. If box 1b. is checked, complete and attach Form 500-F2 - Title IV Phase II Acid Rain Repowering Extension Plan. If box 1c. is checked, complete and attach Form 500-F3 - Title IV Phase II Acid Rain New Unit Exemption Request. If box 1d. is checked, complete and attach Form 500-F4 - Title IV Phase II Acid Rain Retired Unit Exemption Request.

3. Check one box that best represents the type of permit action requested. If box 1e. is checked, in the space provided identify any additional elements regarding the application or the facility that need to be considered during the processing of this application (i.e., Initial Title V Permit Application).

4. If the application is a revision request, describe in general terms the changes that are proposed in the application revision request. Attach additional sheets as necessary.

Section II - Phase II Acid Rain Device Summary

1. Before completing this section, check one box to indicate whether this is a new application or a revision.

AQMD Device #:	Provide the identification number for each AQMD-assigned device subject to Phase II requirements.
EPA Unit #:	Provide the identification number for each EPA-assigned device subject to Phase II requirements.
Will device need a Repowering Extension Plan?:	Indicate with a "yes" or "no" if the device is or will be participating under a Repowering Extension Plan.
Has device started operations on or after 11/15/90?:	Indicate with a "yes" or "no" if the device was source tested or started operating on or after November 15, 1990.
Device Operations Start Date:	Complete this column only if the device was source tested or started operating on or after November 15, 1990. Provide the date (mo/day/yr) when the device started or will start operating. Note: If the date of beginning operations changes, an administrative permit revision application will be required.
For Devices starting-up after 11/15/90, provide date when Monitoring Certification will begin:	Complete this column only if the device was source tested or started operating on or after November 15, 1990. Provide the date (mo/day/yr) when compliance with the monitoring procedures for the device will begin. Refer to 40 CFR Part 75.4 to determine this date. Note: If the monitoring certification date changes, an administrative permit revision application will be required.

South Coast Air Quality Management District

Form 400-A
Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit: Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator): Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim, CA, 92806
City, State, Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim, CA, 92805
City, State, Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY): 09/01/2009

8. Description of Equipment:
Natural gas-fired General Electric (GE) LM 6000PC Sprint Combustion Turbine Generator 1 (CTG1) operating in simple cycle mode

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 3

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location? Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title: Integrated Resources Mgr.

19. Print Name: Steve Sciortino

20. Date: 9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-12
GAS TURBINE

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave, Anaheim, CA 92806 (●) Fixed Location ( ) Various Locations

SECTION A: EQUIPMENT INFORMATION

Turbine

Manufacturer: General Electric

Model No.: LM6000PC Sprint

Serial No.:

Size (based on Higher Heating Value - HHV):

Manufacturer Maximum Input Rating: 479.200 MMBTU/hr 140400.00 kWh

Manufacturer Maximum Output Rating: MMBTU/hr 50950.00 kWh

Function (Check all that apply)

[x] Electrical Generation [ ] Driving Pump/Compressor [ ] Emergency Peaking Unit
[ ] Steam Generation [ ] Exhaust Gas Recovery [ ] Other (specify):

Cycle Type

(●) Simple Cycle ( ) Regenerative Cycle
( ) Combined Cycle ( ) Other (specify):

Combustion Type

( ) Tubular ( ) Can-Annular (●) Annular

Fuel (Turbine)

(●) Natural Gas ( ) LPG ( ) Digester Gas*
( ) Landfill Gas* ( ) Propane ( ) Refinery Gas* ( ) Other* :
* (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

Heat Recovery Steam Generator (HRSG)

Steam Turbine Capacity MW

Low Pressure Steam Output Capacity: lb/hr @ °F

High Pressure Steam Output Capacity: lb/hr @ °F

Superheated Steam Output Capacity: lb/hr @ °F

Duct Burner

Manufacturer:

Model:

Number of burners:

Rating of each burner (HHV):

Type: ( ) Low NOx (please attach manufacturer's specifications)
( ) Other:
Show all heat transfer surface locations with the HRSG and temperature profile

Fuel (Duct Burner)

(●) Natural Gas ( ) LPG ( ) Digester Gas*
( ) Refinery Gas* ( ) Landfill Gas* ( ) Propane ( ) Other* :
*(If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

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Air Pollution Control	(•) Selective Catalytic Reduction (SCR)* ( ) Selective Non-catalytic Reduction (SNCR)* (•) Oxidation Catalyst* ( ) Other (specify)* (•) Steam/Water Injection: Injection Rate: 1.060 lbs. water/lbs. fuel, or mole water/mole fuel * Separate application is required.
	Capital Cost: $3000000.00 — **Installation Cost:** — **Annual Operating Cost:**
Oxidation Catalyst Data (If Applicable)	**Manufacturer:** BASF (formally Englehard) — **Model:** None
	Catalyst Dimensions: ~~Length~~ Depth: ft. 3.400 in. **Width:** 18 ft. in. **Height:** 25 ft. 0.000 in.
	Catalyst Cell Density: 145.000 cells/sq. in. — **Pressure Drop Across Catalyst:** 1.500
	Manufacturer's Guarantee — **CO Control Efficiency:** 75.00 % **Catalyst Life:** 5 yrs. — **VOC Control Efficiency:** 35.00 % **Operating Temp. Range:** 700.00 °F (500~1200°F)
	Space Velocity (gas flow rate/catalyst volume): 210000.000 per hour — **Area Velocity (gas flow/wetted catalyst surface area):** 42120.000 ft/hr
	VOC Concentration into Catalyst: 3.000 PPMVD @ 15 % O_2 — **CO Concentration into Catalyst:** 53.000 PPMVD @ 15 % O_2

SECTION B: OPERATION INFORMATION

in normal operation

	Pollutants	Maximum Emissions Before Control*		Maximum Emissions After Control	
		PPM@15% O_2 dry	lb/Hour	PPM@15% O_2 dry	lb/Hour
On-line Emissions Data	ROG			2.000	1.200
	NOx		44.000	2.300	3.980
	CO		31.270	4.000	4.240
	PM10				3.000
	SOx				1.360
	NH3			5.000	3.640

* Based on temperature, fuel consumption, and MW output

Reference (attach data):
[x] Manufacturer Emission Data [ ] EPA Emission Factors [ ] AQMD Emission Factors [ ] Source Test

Stack or Vent Data	**Stack Height:** 86 ft. in. **Stack Diameter:** 11 ft. 8.000 in. **Exhaust Temperature:** 840.00 °F **Exhaust Pressure:** inches water column **Exhaust Flow Rate:** 590234 CFM **OxygenLevel:** 14.35 %
Operating Schedule	**Normal:** hours/day days/week weeks/yr **Maximum:** hours/day days/week weeks/yr

Please see the revised AQMD Application

GAS TURBINE

35 minutes startup and the 25 minutes for trip and part of restart

10 minutes shutdown and normal operation for the remaining 50 minutes

Startup Data	No. of Startups per day:		No. of Startups per year: 129	Duration of each startup: 0.6 hours	
Shutdown Data	No. of Shutdowns per day:		No. of Shutdowns per year: 129	Duration of each shutdown: 0.2 hours	
Startup and Shutdown Emissions Data	**Pollutants**	**Startup Emissions**		**Shutdown Emissions**	
		PPM@15% O_2, dry	lb/Hour	PPM@15% O_2, dry	lb/Hour
	ROG		1.290		1.270
	NOx		14.270		4.010
	CO		6.280		4.160
	PM10		1.840		2.680
	SOx		0.810		1.150
	NH3				

Monitoring and Reporting

Continuous Emission Monitoring System (CEMS)

CEMS Make: GE Energy Systems

CEMS Model:

Will the CEMS be used to measure both on-line and startup/shutdown emissions? (•) Yes ( ) No

The following parameters will be continuously monitored:

[X] NOx [X] CO [X] O_2

[X] Fuel Flow Rate [X] Ammonia Injection Rate [ ] Other (specify)

[X] Ammonia Stack Concentration: Ammonia CEMS Model

Ammonia CEMS Make

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	09-04-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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South Coast Air Quality Management District

Form 400-A

Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit: Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator): Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim, CA, 92806
City, State, Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim, CA, 92805
City, State, Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY): 09/01/2009

8. Description of Equipment:
SCR1: aqueous ammonia-type selective catalytic reduction (SCR) and oxidation catalyst systems for oxides of nitrogen (NOx) and carbon monoxide (CO) emissions control.

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 3

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location? Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title: Integrated Resources Mgr.

19. Print Name: Steve Sciortino

20. Date: 5/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-5
SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM, OXIDATION CATALYST, AND AMMONIA CATALYST

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, CA 92806 (•) Fixed Location ( ) Various Locations

SECTION A: EQUIPMENT INFORMATION

SELECTIVE CATALYTIC REDUCTION (SCR)

SCR Catalyst	**Manufacturer:** Cormatech	**Catalyst Active Material:** vanadium / tungsten / titanium
	Model Number: CMHT - 21	**Type:** Homogeneous / extruded honeycomb
	Size of Each Layer or Module: Length: 2 ft. 2.00 in. Width: 9 ft. 11.60 in. Height: 6 ft. 5.00 in.	
	No. of Layers or Modules: 8 **Total Volume:** 1012.000 cu.ft. **Total Weight:** lbs.	
Reducing Agent	( ) Urea ( ) Anhydrous Ammonia (•) Aqueous Ammonia 19.00 %	**Injection Rate:** 124.000 lb/hr.
Reducing Agent Storage	**Diameter:** 7 ft. Length in. ~~Height~~ 42 ft. in. **Capacity:** 10000.00 gal **Pressure Setting:** 40.000 psia	
Space Velocity	**Gas Flow Rate/Catalyst Volume:** 720000 hr^{-1}	
Area Velocity	**Gas Flow Rate/Wetted Catalyst Surface Area:** 39600.00 ft/hr	
Manufacturer's Guarantee	**NOx:** 2.300 ppm $\%O_2$: 15.00 **NOx:** gm/bhp-hr **Ammonia Slip:** 5.000 ppm @ 15.00 $\%O_2$	
Catalyst Life	5 years (expected)	
Cost	**Capital Cost:** $3000000.00 **Installation Cost:** **Catalyst Replacement Cost:** $400000.00	

OXIDATION CATALYST

Oxidation Catalyst	**Manufacturer:** BASF (formally Englehard)	**Catalyst Active Material:** Platinum
	Model Number: None	**Type:** SS foil substrate & platinum
	Size of Each Layer or Module: ~~Length~~ Depth: ft. 3.400 in. **Width:** 2 ft. in. **Height:** 2 ft. 4.450 in.	
	No. of Layers or Modules: 80 **Total Volume:** 109.500 cu.ft. **Total Weight:** lbs.	
Space Velocity	**Gas flow rate/Catalyst Volume:** 210000 hr^{-1}	
Manufacturer's Guarantee	**VOC** 2.000 ppm **VOC** gm/bhp-hr **CO** 4.000 ppm **CO** gm/bhp-hr $\%O_2$ 15.00 $\%O_2$ 15.00	
Catalyst Life	5 years (expected)	
Cost	**Capital Cost:** $315000.00 **Installation Cost:** **Catalyst Replacement Cost:** $250000.00	

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SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM, OXIDATION CATALYST, AND AMMONIA CATALYST

AMMONIA CATALYST		
Ammonia Catalyst	Manufacturer:	Catalyst Active Material:
	Model Number: N/A - not used	Type:
	Size of Each Layer or Module: Length: ft. in. Width: ft. in. Height: ft. in.	
	No. of Layers or Modules: Total Volume: cu.ft. Total Weight: lbs.	
Space Velocity	Gas flow rate/Catalyst Volume: hr^{-1}	
Manufacturer's Guarantee	NH3 ppm % O_2	
Catalyst Life	years (expected)	
Cost	Capital Cost: Installation Cost: Catalyst Replacement Cost:	

SECTION B: OPERATION INFORMATION

Operating Temperature	Minimum Inlet Temperature: 540.00 °F (from cold start) Maximum Temperature: 840.00 °F			
	Warm-up Time: hr. 12 min. (maximum)			
Operating Schedule Please see the revised AQMD Application	Normal:	hours/day	days/week	weeks/yr.
	Maximum:	hours/day	days/week	weeks/yr.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	04-09-07
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Attachment to Form 400-E-5

Note: Information provided is typical, preliminary design. Final design will be determined during equipment purchase.

Simple Cycle Catalyst System for General Electric LM 6000PC Sprint – Requested NO_X Catalyst Data

COA CPP Project Emissions Control Module (ECM) provider Project number: ECM = SCR and CO catalyst, catalyst ducting, Stack, ammonia injection grid and skid, tempering air fans and distribution screen.	Express Integrated Technologies (EIT) 8032
Catalyst Model No.	CMHT-21
1. Catalyst manufacturer	Cormetech
2. Catalyst Drawings include catalyst dimensions (SCR)	There are 8 modules per unit (2 rows stacked 4 high) and each module is approximately 107.625" W x 77" H x 26.375 D.
3. Ammonia grid details	8 rows, 2 x 4 Matrix - Details are Proprietary
4. Ammonia injection rate	Nominally 124 lbhr - for 19% Aqueous Ammonia
5. Ammonia emission rate	5 ppmvd corrected to 15% O2
6. Pressure drop across SCR unit including injection grid	6.0 inches w.c.
7. Controls for ammonia injection	feedforward from fuel / feedback from CEMS
8. Type of catalyst	Homogeneuous extruded material containing Ti-V-W
9. Catalyst volume	1,012 cubic feet
10. Space velocity (gas flow rate/catalyst volume)	200 1/sec
11. Area velocity (gas flow rate/wetted catalyst surface area)	nominally 11 ft /sec
12. Manufacturer's Guarantee for Efficiency and Catalyst Life Warranty terms: Commences as of the Power Block achieves Substantial Completion date	First occurrence of: 10,000 hours of operations or Five Consecutive years or

Power Block = gas turbine, emissions control module and CEMS	Five years and six months from catalyst delivery
13. NOx concentration in and out of SCR unit	25 in / 2.3 out ppmvd @ 15% O2
14. SCR unit total cost	$3,000,000.00
15. Catalyst replacement cost	$400,000.00
16. Percent decrease in prime mover output	nominally 500 kW for an LM 6000PC @ 12 inches w.c. (nominally 300 kW for NOx Catalyst delta P alone)
17. Percent increase in HRSG output	N/A
18. SO2 oxidation rate/SO3 emissions	ranges from 40% to 75% based on gas flow & temp
19. Stack temperature after HRSG	840°F max
20. HRSG and turbine modifications	N/A
21. Temperature at which ammonia injection will begin	540°F at backface of NOx Catalyst

(d) In the event the CO Catalyst fails to perform as described above during the second through fifth years of operation after the Substantial Completion Date of the Power Block containing such Catalyst, then Seller shall either:

(i) replace the non-performing CO Catalyst, in which event Seller will be responsible to bear that proportion of the replacement catalyst price equal to ten thousand (10,000) operating hours minus the number of operating hours on the CO Catalyst since the Substantial Completion Date of the Power Block, divided by ten thousand operating hours (10,000) (i.e., (10,000 hrs-N)/10,000 hrs.); and Purchaser will be responsible for the balance. (For example, if the Catalyst fails to perform during its 6,000th hour of operation, then Seller would be responsible for ((10,000 hrs -6,000 hrs.)/10,000 hours = .40) of the replacement price); or

(ii) reactivate the non-performing CO Catalyst, in which event Seller will be responsible to bear that proportion of the reactivation expense equal to ten thousand (10,000) operating hours on the CO Catalyst minus the number of operating hours on the CO Catalyst since the Substantial Completion Date of the Power Block, divided by ten thousand operating hours (10,000); and Purchaser will be responsible for the balance.

(e) Warranty remedies include the cost of the replacement catalyst or reactivation and shipping costs to and from the jobsite only. The cost of labor and lifting equipment, if required, to perform the removal and installation of catalyst covered by warranty is not included and is to be provided by the Purchaser.

14.2 *NOx Catalyst Warranty*

Subject to the provisions below, as with respect to each Power Block, as the "**NOx Catalyst Warranty**," Seller warrants that the NOx Catalyst will, during the NOx Catalyst Warranty Term, cause the Power Block to meet the Warranted Values. The "**NOx Warranted Values**" are the emissions levels guaranteed under the Emissions Guarantees.

14.2.1 *NOx Catalyst Warranty Term*

The "**NOx Catalyst Warranty Term**" as with respect to a Power Block shall commence as of the Substantial Completion Date thereof and shall conclude upon the first occurrence of the following:

Total cumulative fired hours of operation after the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the NOx Catalyst	10,000
Consecutive years from the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the NOx Catalyst	5
Consecutive years from Catalyst Delivery	5.5

Attachment to Form 400-E-5

Note: Information provided is typical, preliminary design. Final design will be determined during equipment purchase.

Simple Cycle Catalyst System for General Electric LM 6000PC Sprint – Requested CO Catalyst Data

COA CPP Project Emissions Control Module provider Project number: ECM = SCR and CO catalyst, catalyst ducting, Stack, ammonia injection grid and skid, tempering air fans and distribution screen.	Express Integrated Technologies (EIT) 8032
1. Type of Catalyst	stainless foil substrate with alumina washcoat that is impregnated with platinum group metals
2. Catalyst Volume	109.5 ft3
3. Space Velocity	210,000 1/hr
4. Linear Velocity	11.7 ft/sec
5. Pressure Drop Across Catalyst	1.5 inches w.c.
6. Manufacturer's Guarantee for Efficiency and Catalyst Life Warranty terms: Commences as of the Power Block achieves Substantial Completion date Power Block = gas turbine, emissions control module and CEMS	First occurrence of: 10,000 hours of operations or Five Consecutive years or Five years and six months from CO catalyst delivery
7. Operating temperature Range of Catalyst	500° to 1200°F
8. Effect of Temperature on Efficiency	Efficiency decreases outside of operating range specified above
9. CO Conversion Efficiency	75% or greater - depending on operating case
10. Unsaturated Hydrocarbon Conversion Efficiency	35%
11. Saturated (Non-Methane) Hydrocarbon Conversion Efficiency	0%
12. Methane Conversion Efficiency	0%

13. CO Catalyst Total Cost	Catalyst + Frame = $315,000.00
14. Catalyst Replacement Cost	$250,000.00
15. Catalyst and Heat Recovery Steam Generator (HRSG) Drawings Including Catalyst Dimensions	CO Catalyst dimensions are nominally 18 ft W x 25 ft H x 3.4 inches Deep
16. Catalyst Manufacturer	BASF (formally Englehard)
17. CO and HC Concentration In and Out of CO Catalyst	CO - 53 In / 4.0 Out ppmvd @ 15% O2 VOC's NMNEHC - 3 In / 2 Out ppmd @ 15% O2
18. Catalyst Depth	nominally 3.4 inches
19. Catalyst Cell Density (Cells Per Square Inch)	145

Article 14 Catalyst Warranties

14.1 *CO Catalyst Warranty*

Subject to the provisions below, as with respect to each Power Block, as the "**CO Catalyst Warranty**," Seller warrants that the CO Catalyst will, during the CO Catalyst Warranty Term, cause the Power Block to meet the Warranted Values. The "**CO Warranted Values**" are the CO emissions levels guaranteed under the Emissions Guarantees.

14.1.1 CO Catalyst Warranty Term

The "**CO Catalyst Warranty Term**" as with respect to a Power Block shall commence as of the Substantial Completion Date of such Power Block and shall conclude upon the first occurrence of the following:

Total cumulative fired hours of operation after the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the CO Catalyst	10,000
Consecutive years from the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the CO Catalyst	5
Consecutive years from Catalyst Delivery	5.5

14.1.2 *Warranty Guidelines*

The CO Catalyst Warranty is conditioned upon the assumption that the Purchaser will:

(a) operate and maintain the CO Catalyst material within the design specifications set forth in Attachment 2-A and 2-B and the parameters of the Emissions Guarantees as set forth in Attachment 9; and

(b) have handled and installed the CO Catalyst according to Seller's operation and maintenance manual(s); and

(c) give Seller access to the relevant process operating logs in the event that Seller requires such access in order to perform their obligations hereunder.

14.1.3 *CO Catalyst Operating Guidelines*

(a) The following contaminants are known catalyst deactivators and contribute to shortened catalyst life. The Parties acknowledge that the CO Catalyst vendor will keep a sample of the CO Catalyst provided to Purchaser hereunder. This sample will, as necessary, be used to benchmark the original level of contaminants as contained in the CO Catalyst as originally provided to Purchaser, for purposes hereof. In the event that Seller (or the CO Catalyst vendor on behalf of Seller) can demonstrate that the CO Catalyst, as a result of operation of the CTG Unit, contains, either singularly or collectively levels of the contaminants listed below in excess

South Coast Air Quality Management District

FORM 400-PS
PLOT PLAN AND STACK INFORMATION FORM

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A and Form 400-CEQA

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, California 92806 ◉ Fixed Location ○ Various Locations

SECTION A: LOCATION DATA

Plot Plan
Please attach a site map for the project. Identify and locate the proposed equipment on the property. A copy of the appropriate Thomas Brothers page that shows the location, or a drawing or sketch that show the major street and identifies the location of the equipment is acceptable.

Location of School Nearby
Is the facility located within a 1/4 mile radius (1,320 feet) of the outer boundary of a school?
○ Yes ◉ No. If yes, please provide name(s) of school(s) below.

School Name	School Address	Distance from stack or equipment vent to the outer boundary of the school.

Note: Per Section 42301.9 of the California Health and Safety Code, a "school" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in

Population Density
◉ Urban (area of dense population) ○ Rural (area of sparse population)

Zoning Classification
○ Mixed Use Residential Commercial Zone (M-U) ○ Service and Professional Zone (C-S) ○ Medium Commercial (C-3)
○ Heavy Commercial (C-4) ◉ Commercial Manufacturing (C-M)

SECTION B: EMISSION RELEASE PARAMETERS -STACKS, VENTS

Stack Data
Stack Height: 86.00 feet (height above ground level)* What is the height of the closest building nearest the stack ? 43.50 feet
Stack Inside Diameter: 140.000 inches Stack Flow: 590234 acfm Stack Temperature: 840.00 °F
Rain Cap Present: ○ Yes ◉ No Stack Orientation: ◉ Vertical ○ Horizontal
* If the stack height is less than 2.5 times the closest building height (H), please provide information on any building within 5xH distance from the stack(attach additional sheet if necessary

Building #/name:	Building #/name:
(see attachment)	
Building Height: ____ feet	Building Height: ____ feet
Building Width: ____ feet	Building Width: ____ feet
Building Length: ____ feet	Building Length: ____ feet

Receptor Distance from equipment stack or roof vents/openings
Distance to nearest residence 887.00 feet or 270.36 meters | Distance to nearest business 61.00 feet or 18.59 meters

Building Information
Are the emissions released from vents and/or openings from the building? ○ Yes ◉ No
If yes, please provide:
Building height above ground level: ____ ft. Building dimensions: ____ length ft. ____ width ft. or ____ Total square footage of building where the source of the emissions is located.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER:
	Sen. AQ Consultant	(619) 243-2823
		PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	09-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION
Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:
(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Canyon Power Plant

AQMD Form 400-PS Attachment

Building data for buildings near SCR Exhaust Stacks:

Building Name	Height*	Width*	Length*
CTG-SCR 1	34	27	135
CTG-SCR 2	34	27	135
CTG-SCR 3	34	27	135
CTG-SCR 4	34	27	135
4-cell Chiller Cooling Tower	38.5	52.7	43.3
Water Treatment System With Sun Shade Roof	21.5	52.7	60.7
Black Start Diesel Generator	10	20.0	7.9
Main Electrical Equipment Enclosure (EEE)	17	31.3	71.3
Plant Operation Building And Warehouse	36.73	155.1	68.3
DI Water Storage Tank	36.7	Dia-34	
Raw Water Storage Tank	43.5	Dia-40	

*All dimensions given are in feet.

South Coast Air Quality Management District

Form 400-A
Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit:
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator):
Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim — CA, — 92806
City — State — Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim — CA — 92805
City — State — Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY):
09/01/2009

8. Description of Equipment:
Natural gas-fired General Electric (GE) LM 6000PC Sprint Combustion Turbine Generator 2 (CTG2) operating in simple cycle mode

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 3

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location?
Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:
Stephen Sciortino

18. Title:
Integrated Resources Mgr.

19. Print Name:
Steve Sciortino

20. Date:
9/20/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-12
GAS TURBINE

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave, Anaheim, CA 92806 (●) Fixed Location ( ) Various Locations

SECTION A: EQUIPMENT INFORMATION

Turbine

Manufacturer: General Electric

Model No.: LM6000PC Sprint

Serial No.:

Size (based on Higher Heating Value - HHV):

Manufacturer Maximum Input Rating: 479.200 MMBTU/hr 140400.00 kWh

Manufacturer Maximum Output Rating: ____ MMBTU/hr 50950.000 kWh

Function (Check all that apply)

[X] Electrical Generation [ ] Driving Pump/Compressor [ ] Emergency Peaking Unit
[ ] Steam Generation [ ] Exhaust Gas Recovery [ ] Other (specify):

Cycle Type

(●) Simple Cycle ( ) Regenerative Cycle
( ) Combined Cycle ( ) Other (specify):

Combustion Type

( ) Tubular ( ) Can-Annular (●) Annular

Fuel (Turbine)

(●) Natural Gas ( ) LPG ( ) Digester Gas*
( ) Landfill Gas* ( ) Propane ( ) Refinery Gas* ( ) Other*:
* (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

Heat Recovery Steam Generator (HRSG)

Steam Turbine Capacity ____ MW
Low Pressure Steam Output Capacity: ____ lb/hr @ ____ °F
High Pressure Steam Output Capacity: ____ lb/hr @ ____ °F
Superheated Steam Output Capacity: ____ lb/hr @ ____ °F

Duct Burner

Manufacturer: Model:

Number of burners: Rating of each burner (HHV):

( ) Low NOx (please attach manufacturer's specifications)
Type: ( ) Other:
Show all heat transfer surface locations with the HRSG and temperature profile

Fuel (Duct Burner)

(●) Natural Gas ( ) LPG ( ) Digester Gas*
( ) Refinery Gas* ( ) Landfill Gas* ( ) Propane ( ) Other*:
*(If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

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Air Pollution Control	(●) Selective Catalytic Reduction (SCR)* ( ) Selective Non-catalytic Reduction (SNCR)* (●) Oxidation Catalyst* ( ) Other (specify)* (●) Steam/Water Injection: Injection Rate: 1.060 lbs. water/lbs. fuel, or mole water/mole fuel * Separate application is required. **Capital Cost:** $3000000.00 **Installation Cost:** **Annual Operating Cost:**
Oxidation Catalyst Data (If Applicable)	**Manufacturer:** BASF (formally Englehard) **Model:** None **Catalyst Dimensions:** ~~Length~~ Depth: ft. 3.400 in. **Width:** 18 ft. in. **Height:** 25 ft. 0.000 in. **Catalyst Cell Density:** 145.000 cells/sq. in. **Pressure Drop Across Catalyst:** 1.500 **Manufacturer's Guarantee** **CO Control Efficiency:** 75.00 % **Catalyst Life:** 5 yrs. **VOC Control Efficiency:** 35.00 % **Operating Temp. Range:** 700.00 °F (500~1200°F) **Space Velocity (gas flow rate/catalyst volume):** 210000.000 per hour **Area Velocity (gas flow/wetted catalyst surface area):** 42120.000 ft/hr **VOC Concentration into Catalyst:** 3.000 PPMVD @ 15 % O_2 **CO Concentration into Catalyst:** 53.000 PPMVD @ 15 % O_2

SECTION B: OPERATION INFORMATION

in normal operation

On-line Emissions Data

Pollutants	Maximum Emissions Before Control*		Maximum Emissions After Control	
	PPM@15% O_2 dry	lb/Hour	PPM@15% O_2 dry	lb/Hour
ROG			2.000	1.200
NOx		44.000	2.300	3.980
CO		31.270	4.000	4.240
PM10				3.000
SOx				1.360
NH3			5.000	3.640

* Based on temperature, fuel consumption, and MW output

Reference (attach data):
[X] Manufacturer Emission Data [ ] EPA Emission Factors [ ] AQMD Emission Factors [ ] Source Test

Stack or Vent Data

Stack Height: 86 ft. in. Stack Diameter: 11 ft. 8.000 in.
Exhaust Temperature: 840.00 °F Exhaust Pressure: inches water column
Exhaust Flow Rate: 590234.[illegible] CFM Oxygen Level: 14.35 %

Operating Schedule

Please see the revised AQMD Application

Normal: hours/day days/week weeks/yr
Maximum: hours/day days/week weeks/yr

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Serial Number

GAS TURBINE

35 minutes startup and the 25 minutes for trip and part of restart

10 minutes shutdown and normal operation for the remaining 50 minutes

Startup Data	No. of Startups per day:	No. of Startups per year: 129	Duration of each startup: 0.6 hours		
Shutdown Data	No. of Shutdowns per day:	No. of Shutdowns per year: 129	Duration of each shutdown: 0.2 hours		
Startup and Shutdown Emissions Data	Pollutants	Startup Emissions		Shutdown Emissions	
		PPM@15% O_2 dry	lb/Hour	PPM@15% O_2 dry	lb/Hour
	ROG		1.290		1.270
	NOx		14.270		4.010
	CO		6.280		4.160
	PM10		1.840		2.680
	SOx		0.810		1.150
	NH3				

Monitoring and Reporting

Continuous Emission Monitoring System (CEMS)

CEMS Make: GE Energy Systems

CEMS Model:

Will the CEMS be used to measure both on-line and startup/shutdown emissions? (•) Yes ( ) No

The following parameters will be continuously monitored:

[X] NOx [X] CO [X] O_2

[X] Fuel Flow Rate [X] Ammonia Injection Rate [ ] Other (specify)

[X] Ammonia Stack Concentration: Ammonia CEMS Model

Ammonia CEMS Make

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com
CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT: Steve Sciortino	CONTACT PERSON'S TELEPHONE NUMBER: (714) 765-5177	DATE SIGNED: 09-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."

(b) Label the original page "confidential." Circle all confidential items on the page.

(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Serial Number

South Coast Air Quality Management District

Form 400-A

Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit:
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator):
Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim, CA, 92806
City, State, Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim, CA, 92805
City, State, Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY):
09/01/2009

8. Description of Equipment:
SCR2: aqueous ammonia-type selective catalytic reduction (SCR) and oxidation catalyst systems for oxides of nitrogen (NOx) and carbon monoxide (CO) emissions control.

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 3

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location?
Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title:
Integrated Resources Mgr.

19. Print Name:
Steve Sciortino

20. Date:
9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-5
SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM, OXIDATION CATALYST, AND AMMONIA CATALYST

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, CA 92806 (•) Fixed Location ( ) Various Locations

SECTION A: EQUIPMENT INFORMATION

SELECTIVE CATALYTIC REDUCTION (SCR)

SCR Catalyst

Manufacturer: Cormatech
Catalyst Active Material: vanadium / tungsten / titanium
Model Number: CMHT - 21
Type: Homogeneous / extruded honeycomb
Size of Each Layer or Module: Length: 2 ft. 2.00 in. Width: 9 ft. 11.60 in. Height: 6 ft. 5.00 in.
No. of Layers or Modules: 8 Total Volume: 1012.000 cu.ft. Total Weight: lbs.

Reducing Agent

( ) Urea ( ) Anhydrous Ammonia (•) Aqueous Ammonia 19.00 % Injection Rate: 124.000 lb/hr.

Reducing Agent Storage

Diameter: 7 ft. in. ~~Height~~ Length 42 ft. in. Capacity: 10000.00 gal Pressure Setting: 40.000 psia

Space Velocity

Gas Flow Rate/Catalyst Volume: 720000 hr^{-1}

Area Velocity

Gas Flow Rate/Wetted Catalyst Surface Area: 39600.00 ft/hr

Manufacturer's Guarantee

NOx: 2.300 ppm $\%O_2$: 15.00 NOx: gm/bhp-hr Ammonia Slip: 5.000 ppm @ 15.00 $\%O_2$

Catalyst Life

5 years (expected)

Cost

Capital Cost: $3000000.00 Installation Cost: Catalyst Replacement Cost: $400000.00

OXIDATION CATALYST

Oxidation Catalyst

Manufacturer: BASF (formally Englehard)
Catalyst Active Material: Platinum
Model Number: None
Type: SS foil substrate & platinum
Size of Each Layer or Module: ~~Length~~ Depth: ft. 3.400 in. Width: 2 ft. in. Height: 2 ft. 4.450 in.
No. of Layers or Modules: 80 Total Volume: 109.500 cu.ft. Total Weight: lbs.

Space Velocity

Gas flow rate/Catalyst Volume: 210000 hr^{-1}

Manufacturer's Guarantee

VOC 2.000 ppm VOC gm/bhp-hr CO 4.000 ppm CO gm/bhp-hr
$\%O_2$ 15.00 $\%O_2$ 15.00

Catalyst Life

5 years (expected)

Cost

Capital Cost: $315000.00 Installation Cost: Catalyst Replacement Cost: $250000.00

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AMMONIA CATALYST		
Ammonia Catalyst	Manufacturer:	Catalyst Active Material:
	Model Number: N/A - not used	Type:
	Size of Each Layer or Module: Length: ft. in. Width: ft. in. Height: ft. in.	
	No. of Layers or Modules: Total Volume: cu.ft. Total Weight: lbs.	
Space Velocity	Gas flow rate/Catalyst Volume: hr^{-1}	
Manufacturer's Guarantee	NH3 ppm % O_2	
Catalyst Life	years (expected)	
Cost	Capital Cost: Installation Cost: Catalyst Replacement Cost:	

SECTION B: OPERATION INFORMATION				
Operating Temperature	Minimum Inlet Temperature: 540.00 °F (from cold start) Maximum Temperature: 840.00 °F			
	Warm-up Time: hr. 12 min. (maximum)			
Operating Schedule Please see the revised AQMD Application	Normal:	hours/day	days/week	weeks/yr.
	Maximum:	hours/day	days/week	weeks/yr.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER: Sen. AQ Consultant	PREPARER'S TELEPHONE NUMBER: (619) 243-2823 PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com	
CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT: Steve Sciortino E-MAIL ADDRESS: SSciortino@anaheim.net	CONTACT PERSON'S TELEPHONE NUMBER: (714) 765-5177 FAX NUMBER: (714) 765-4140		DATE SIGNED: 09-09-08

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Attachment to Form 400-E-5

Note: Information provided is typical, preliminary design. Final design will be determined during equipment purchase.

Simple Cycle Catalyst System for General Electric LM 6000PC Sprint – Requested NO_X Catalyst Data

COA CPP Project Emissions Control Module (ECM) provider Project number: ECM = SCR and CO catalyst, catalyst ducting, Stack, ammonia injection grid and skid, tempering air fans and distribution screen.	Express Integrated Technologies (EIT) 8032
Catalyst Model No.	CMHT-21
1. Catalyst manufacturer	Cormetech
2. Catalyst Drawings include catalyst dimensions (SCR)	There are 8 modules per unit (2 rows stacked 4 high) and each module is approximately 107.625" W x 77" H x 26.375 D.
3. Ammonia grid details	8 rows, 2 x 4 Matrix - Details are Proprietary
4. Ammonia injection rate	Nominally 124 lbhr - for 19% Aqueous Ammonia
5. Ammonia emission rate	5 ppmvd corrected to 15% O2
6. Pressure drop across SCR unit including injection grid	6.0 inches w.c.
7. Controls for ammonia injection	feedforward from fuel / feedback from CEMS
8. Type of catalyst	Homogeneuous extruded material containing Ti-V-W
9. Catalyst volume	1,012 cubic feet
10. Space velocity (gas flow rate/catalyst volume)	200 1/sec
11. Area velocity (gas flow rate/wetted catalyst surface area)	nominally 11 ft /sec
12. Manufacturer's Guarantee for Efficiency and Catalyst Life Warranty terms: Commences as of the Power Block achieves Substantial Completion date	First occurrence of: 10,000 hours of operations or Five Consecutive years or

Power Block = gas turbine, emissions control module and CEMS	Five years and six months from catalyst delivery
13. NOx concentration in and out of SCR unit	25 in / 2.3 out ppmvd @ 15% O2
14. SCR unit total cost	$3,000,000.00
15. Catalyst replacement cost	$400,000.00
16. Percent decrease in prime mover output	nominally 500 kW for an LM 6000PC @ 12 inches w.c. (nominally 300 kW for NOx Catalyst delta P alone)
17. Percent increase in HRSG output	N/A
18. SO2 oxidation rate/SO3 emissions	ranges from 40% to 75% based on gas flow & temp
19. Stack temperature after HRSG	840°F max
20. HRSG and turbine modifications	N/A
21. Temperature at which ammonia injection will begin	540°F at backface of NOx Catalyst

(d) In the event the CO Catalyst fails to perform as described above during the second through fifth years of operation after the Substantial Completion Date of the Power Block containing such Catalyst, then Seller shall either:

(i) replace the non-performing CO Catalyst, in which event Seller will be responsible to bear that proportion of the replacement catalyst price equal to ten thousand (10,000) operating hours minus the number of operating hours on the CO Catalyst since the Substantial Completion Date of the Power Block, divided by ten thousand operating hours (10,000) (i.e., (10,000 hrs-N)/10,000 hrs.); and Purchaser will be responsible for the balance. (For example, if the Catalyst fails to perform during its 6,000th hour of operation, then Seller would be responsible for ((10,000 hrs -6,000 hrs.)/10,000 hours = .40) of the replacement price); or

(ii) reactivate the non-performing CO Catalyst, in which event Seller will be responsible to bear that proportion of the reactivation expense equal to ten thousand (10,000) operating hours on the CO Catalyst minus the number of operating hours on the CO Catalyst since the Substantial Completion Date of the Power Block, divided by ten thousand operating hours (10,000); and Purchaser will be responsible for the balance.

(e) Warranty remedies include the cost of the replacement catalyst or reactivation and shipping costs to and from the jobsite only. The cost of labor and lifting equipment, if required, to perform the removal and installation of catalyst covered by warranty is not included and is to be provided by the Purchaser.

14.2 *NOx Catalyst Warranty*

Subject to the provisions below, as with respect to each Power Block, as the "**NOx Catalyst Warranty**," Seller warrants that the NOx Catalyst will, during the NOx Catalyst Warranty Term, cause the Power Block to meet the Warranted Values. The "**NOx Warranted Values**" are the emissions levels guaranteed under the Emissions Guarantees.

14.2.1 *NOx Catalyst Warranty Term*

The "**NOx Catalyst Warranty Term**" as with respect to a Power Block shall commence as of the Substantial Completion Date thereof and shall conclude upon the first occurrence of the following:

Total cumulative fired hours of operation after the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the NOx Catalyst	10,000
Consecutive years from the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the NOx Catalyst	5
Consecutive years from Catalyst Delivery	5.5

Attachment to Form 400-E-5

Note: Information provided is typical, preliminary design. Final design will be determined during equipment purchase.

Simple Cycle Catalyst System for General Electric LM 6000PC Sprint – Requested CO Catalyst Data

COA CPP Project Emissions Control Module provider Project number: ECM = SCR and CO catalyst, catalyst ducting, Stack, ammonia injection grid and skid, tempering air fans and distribution screen.	Express Integrated Technologies (EIT) 8032
1. Type of Catalyst	stainless foil substrate with alumina washcoat that is impregnated with platinum group metals
2. Catalyst Volume	109.5 ft3
3. Space Velocity	210,000 1/hr
4. Linear Velocity	11.7 ft/sec
5. Pressure Drop Across Catalyst	1.5 inches w.c.
6. Manufacturer's Guarantee for Efficiency and Catalyst Life Warranty terms: Commences as of the Power Block achieves Substantial Completion date Power Block = gas turbine, emissions control module and CEMS	First occurrence of: 10,000 hours of operations or Five Consecutive years or Five years and six months from CO catalyst delivery
7. Operating temperature Range of Catalyst	500° to 1200°F
8. Effect of Temperature on Efficiency	Efficiency decreases outside of operating range specified above
9. CO Conversion Efficiency	75% or greater - depending on operating case
10. Unsaturated Hydrocarbon Conversion Efficiency	35%
11. Saturated (Non-Methane) Hydrocarbon Conversion Efficiency	0%
12. Methane Conversion Efficiency	0%

13. CO Catalyst Total Cost	Catalyst + Frame = $315,000.00
14. Catalyst Replacement Cost	$250,000.00
15. Catalyst and Heat Recovery Steam Generator (HRSG) Drawings Including Catalyst Dimensions	CO Catalyst dimensions are nominally 18 ft W x 25 ft H x 3.4 inches Deep
16. Catalyst Manufacturer	BASF (formally Englehard)
17. CO and HC Concentration In and Out of CO Catalyst	CO - 53 In / 4.0 Out ppmvd @ 15% O2 VOC's NMNEHC - 3 In / 2 Out ppmd @ 15% O2
18. Catalyst Depth	nominally 3.4 inches
19. Catalyst Cell Density (Cells Per Square Inch)	145

Article 14 Catalyst Warranties

14.1 *CO Catalyst Warranty*

Subject to the provisions below, as with respect to each Power Block, as the "**CO Catalyst Warranty**," Seller warrants that the CO Catalyst will, during the CO Catalyst Warranty Term, cause the Power Block to meet the Warranted Values. The "**CO Warranted Values**" are the CO emissions levels guaranteed under the Emissions Guarantees.

14.1.1 CO Catalyst Warranty Term

The "**CO Catalyst Warranty Term**" as with respect to a Power Block shall commence as of the Substantial Completion Date of such Power Block and shall conclude upon the first occurrence of the following:

Total cumulative fired hours of operation after the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the CO Catalyst	10,000
Consecutive years from the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the CO Catalyst	5
Consecutive years from Catalyst Delivery	5.5

14.1.2 *Warranty Guidelines*

The CO Catalyst Warranty is conditioned upon the assumption that the Purchaser will:

(a) operate and maintain the CO Catalyst material within the design specifications set forth in Attachment 2-A and 2-B and the parameters of the Emissions Guarantees as set forth in Attachment 9; and

(b) have handled and installed the CO Catalyst according to Seller's operation and maintenance manual(s); and

(c) give Seller access to the relevant process operating logs in the event that Seller requires such access in order to perform their obligations hereunder.

14.1.3 *CO Catalyst Operating Guidelines*

(a) The following contaminants are known catalyst deactivators and contribute to shortened catalyst life. The Parties acknowledge that the CO Catalyst vendor will keep a sample of the CO Catalyst provided to Purchaser hereunder. This sample will, as necessary, be used to benchmark the original level of contaminants as contained in the CO Catalyst as originally provided to Purchaser, for purposes hereof. In the event that Seller (or the CO Catalyst vendor on behalf of Seller) can demonstrate that the CO Catalyst, as a result of operation of the CTG Unit, contains, either singularly or collectively levels of the contaminants listed below in excess

South Coast Air Quality Management District

FORM 400-PS
PLOT PLAN AND STACK INFORMATION FORM

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765
Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A and Form 400-CEQA

Permit to be issued to (Business name of operator to appear on permit):

Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):

3071 East Miraloma Ave., Anaheim, California 92806 (•) Fixed Location ( ) Various Locations

SECTION A: LOCATION DATA

Plot Plan

Please attach a site map for the project. Identify and locate the proposed equipment on the property. A copy of the appropriate Thomas Brothers page that shows the location, or a drawing or sketch that show the major street and identifies the location of the equipment is acceptable.

Location of School Nearby

Is the facility located within a 1/4 mile radius (1,320 feet) of the outer boundary of a school?

( ) Yes (•) No. If yes, please provide name(s) of school(s) below.

School Name	School Address	Distance from stack or equipment vent to the outer boundary of the school.

Note: Per Section 42301.9 of the California Health and Safety Code, a "school" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in

Population Density

(•) Urban (area of dense population) ( ) Rural (area of sparse population)

Zoning Classification

( ) Mixed Use Residential Commercial Zone (M-U) ( ) Service and Professional Zone (C-S) ( ) Medium Commercial (C-3)
( ) Heavy Commercial (C-4) (•) Commercial Manufacturing (C-M)

SECTION B: EMISSION RELEASE PARAMETERS -STACKS, VENTS

Stack Data

Stack Height: 86.00 feet (height above ground level)* What is the height of the closest building nearest the stack ? 43.50 feet

Stack Inside Diameter: 140.000 inches Stack Flow: 590234 acfm Stack Temperature: 840.00 °F

Rain Cap Present: ( ) Yes (•) No Stack Orientation: (•) Vertical ( ) Horizontal

* If the stack height is less than 2.5 times the closest building height (H), please provide information on any building within 5xH distance from the stack(attach additional sheet if necessary

Building #/name:	Building #/name:
(see attachment)	
Building Height: feet	Building Height: feet
Building Width: feet	Building Width: feet
Building Length: feet	Building Length: feet

Receptor Distance from equipment stack or roof vents/openings

Distance to nearest residence 887.00 feet or 270.36 meters | Distance to nearest business 61.00 feet or 18.59 meters

Building Information

Are the emissions released from vents and/or openings from the building? ( ) Yes (•) No

If yes, please provide:

Building height above ground level: ft. | Building dimensions: length ft. or width ft. | Total square footage of building where the source of the emissions is located.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	09-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

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(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Canyon Power Plant

AQMD Form 400-PS Attachment

Building data for buildings near SCR Exhaust Stacks:

Building Name	Height*	Width*	Length*
CTG-SCR 1	34	27	135
CTG-SCR 2	34	27	135
CTG-SCR 3	34	27	135
CTG-SCR 4	34	27	135
4-cell Chiller Cooling Tower	38.5	52.7	43.3
Water Treatment System With Sun Shade Roof	21.5	52.7	60.7
Black Start Diesel Generator	10	20.0	7.9
Main Electrical Equipment Enclosure (EEE)	17	31.3	71.3
Plant Operation Building And Warehouse	36.73	155.1	68.3
DI Water Storage Tank	36.7	Dia-34	
Raw Water Storage Tank	43.5	Dia-40	

*All dimensions given are in feet.

South Coast Air Quality Management District

Form 400-A
Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit: Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator): Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim, CA, 92806
City, State, Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim, CA, 92805
City, State, Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY): 09/01/2009

8. Description of Equipment:
Natural gas-fired General Electric (GE) LM 6000PC Sprint Combustion Turbine Generator 3 (CTG3) operating in simple cycle mode

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 3

11. Are you a Small Business as per AQMD's Rule 102 definition?
(10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location? Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title: Integrated Resources Mgr.

19. Print Name: Steve Sciortino

20. Date: 9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-12
GAS TURBINE

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave, Anaheim, CA 92806 (◉ Fixed Location ○ Various Locations)

SECTION A: EQUIPMENT INFORMATION

Turbine

Manufacturer: General Electric

Model No.: LM6000PC Sprint

Serial No.:

Size (based on Higher Heating Value - HHV):

Manufacturer Maximum Input Rating: 479.200 MMBTU/hr 140400.00 kWh

Manufacturer Maximum Output Rating: ____ MMBTU/hr 50950.00 kWh

Function (Check all that apply)

☒ Electrical Generation ☐ Driving Pump/Compressor ☐ Emergency Peaking Unit
☐ Steam Generation ☐ Exhaust Gas Recovery ☐ Other (specify):

Cycle Type

◉ Simple Cycle ○ Regenerative Cycle
○ Combined Cycle ○ Other (specify):

Combustion Type

○ Tubular ○ Can-Annular ◉ Annular

Fuel (Turbine)

◉ Natural Gas ○ LPG ○ Digester Gas*
○ Landfill Gas* ○ Propane ○ Refinery Gas* ○ Other* :
* (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

Heat Recovery Steam Generator (HRSG)

Steam Turbine Capacity ____ MW

Low Pressure Steam Output Capacity: ____ lb/hr @ ____ °F

High Pressure Steam Output Capacity: ____ lb/hr @ ____ °F

Superheated Steam Output Capacity: ____ lb/hr @ ____ °F

Duct Burner

Manufacturer: Model:

Number of burners: Rating of each burner (HHV):

Type: ○ Low NOx (please attach manufacturer's specifications) ○ Other:

Show all heat transfer surface locations with the HRSG and temperature profile

Fuel (Duct Burner)

◉ Natural Gas ○ LPG ○ Digester Gas*
○ Refinery Gas* ○ Landfill Gas* ○ Propane ○ Other* :
*(If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

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Air Pollution Control	(●) Selective Catalytic Reduction (SCR)* ( ) Selective Non-catalytic Reduction (SNCR)* (●) Oxidation Catalyst* ( ) Other (specify)* (●) Steam/Water Injection: Injection Rate: 1.060 lbs. water/lbs. fuel, or mole water/mole fuel * Separate application is required.
	Capital Cost: $3000000.00 **Installation Cost:** **Annual Operating Cost:**
Oxidation Catalyst Data (If Applicable)	**Manufacturer:** BASF (formally Englehard) **Model:** None
	Catalyst Dimensions: ~~Length~~ Depth: ft. 3.400 in. **Width:** 18 ft. in. **Height:** 25 ft. 0.000 in.
	Catalyst Cell Density: 145.000 cells/sq. in. **Pressure Drop Across Catalyst:** 1.500
	Manufacturer's Guarantee CO Control Efficiency: 75.00 % Catalyst Life: 5 yrs. VOC Control Efficiency: 35.00 % Operating Temp. Range: 700.00 °F (500~1200°F)
	Space Velocity (gas flow rate/catalyst volume): 210000.000 per hour **Area Velocity (gas flow/wetted catalyst surface area):** 42120.000 ft/hr
	VOC Concentration into Catalyst: 3.000 PPMVD @ 15 % O_2 **CO Concentration into Catalyst:** 53.000 PPMVD @ 15 % O_2

SECTION B: OPERATION INFORMATION

in normal operation

On-line Emissions Data

Pollutants	Maximum Emissions Before Control*		Maximum Emissions After Control	
	PPM@15% O_2 dry	lb/Hour	PPM@15% O_2 dry	lb/Hour
ROG			2.000	1.200
NOx		44.000	2.300	3.980
CO		31.270	4.000	4.240
PM10				3.000
SOx				1.360
NH3			5.000	3.640

* Based on temperature, fuel consumption, and MW output

Reference (attach data):
[X] Manufacturer Emission Data [ ] EPA Emission Factors [ ] AQMD Emission Factors [ ] Source Test

Stack or Vent Data

Stack Height: 86 ft. in. Stack Diameter: 11 ft. 8.000 in.
Exhaust Temperature: 840.00 °F Exhaust Pressure: inches water column
Exhaust Flow Rate: 590234.00 CFM Oxygen Level: 14.35 %

Operating Schedule

Please see the revised AQMD Application

Normal: hours/day days/week weeks/yr
Maximum: hours/day days/week weeks/yr

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Serial Number

GAS TURBINE

35 minutes startup and the 25 minutes for trip and part of restart

10 minutes shutdown and normal operation for the remaining 50 minutes

Startup Data	No. of Startups per day:	No. of Startups per year: 129		Duration of each startup: 0.6 hours	
Shutdown Data	No. of Shutdowns per day:	No. of Shutdowns per year: 129		Duration of each shutdown: 0.2 hours	
Startup and Shutdown Emissions Data	**Pollutants**	**Startup Emissions**		**Shutdown Emissions**	
		PPM@15% O_2 dry	lb/Hour	PPM@15% O_2 dry	lb/Hour
	ROG		1.290		1.270
	NOx		14.270		4.010
	CO		6.280		4.160
	PM10		1.840		2.680
	SOx		0.810		1.150
	NH3				

Monitoring and Reporting

Continuous Emission Monitoring System (CEMS)

CEMS Make: GE Energy Systems

CEMS Model:

Will the CEMS be used to measure both on-line and startup/shutdown emissions? (•) Yes ( ) No

The following parameters will be continuously monitored:

[X] NOx [X] CO [X] O_2

[X] Fuel Flow Rate [X] Ammonia Injection Rate [ ] Other (specify)

[X] Ammonia Stack Concentration: Ammonia CEMS Model

Ammonia CEMS Make

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	09-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."

(b) Label the original page "confidential." Circle all confidential items on the page.

(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Serial Number

South Coast Air Quality Management District

Form 400-A

Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit:
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator):
Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim — CA, — 92806
City — State — Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim — CA — 92805
City — State — Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Administrative Change
- ○ Change of Condition For Permit To Operate
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Change of Condition For Permit To Construct
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Change of Location—Moving to New Site
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY):
09/01/2009

8. Description of Equipment:
SCR3: aqueous ammonia-type selective catalytic reduction (SCR) and oxidation catalyst systems for oxides of nitrogen (NOx) and carbon monoxide (CO) emissions control.

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 3

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location?
Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title:
Integrated Resources Mgr.

19. Print Name:
Steve Sciortino

20. Date:
9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-5
SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM, OXIDATION CATALYST, AND AMMONIA CATALYST

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, CA 92806 (●) Fixed Location ( ) Various Locations

SECTION A: EQUIPMENT INFORMATION

SELECTIVE CATALYTIC REDUCTION (SCR)

SCR Catalyst

Manufacturer: Cormatech
Catalyst Active Material: vanadium / tungsten / titanium
Model Number: CMHT - 21
Type: Homogeneous / extruded honeycomb
Size of Each Layer or Module: Length: 2 ft. 2.00 in. Width: 9 ft. 11.60 in. Height: 6 ft. 5.00 in.
No. of Layers or Modules: 8 Total Volume: 1012.000 cu.ft. Total Weight: ____ lbs.

Reducing Agent

( ) Urea ( ) Anhydrous Ammonia (●) Aqueous Ammonia 19.00 % Injection Rate: 124.000 lb/hr.

Reducing Agent Storage

Diameter: 7 ft ____ in. ~~Height~~ Length 42 ft. ____ in. Capacity: 10000.00 gal Pressure Setting: 40.000 psia

Space Velocity

Gas Flow Rate/Catalyst Volume: 720000 hr^{-1}

Area Velocity

Gas Flow Rate/Wetted Catalyst Surface Area: 39600.00 ft/hr

Manufacturer's Guarantee

NOx: 2.300 ppm $\%O_2$: 15.00 NOx: ____ gm/bhp-hr Ammonia Slip: 5.000 ppm @ 15.00 $\%O_2$

Catalyst Life

5 years (expected)

Cost

Capital Cost: $3000000.00 Installation Cost: ____ Catalyst Replacement Cost: $400000.00

OXIDATION CATALYST

Oxidation Catalyst

Manufacturer: BASF (formally Englehard)
Catalyst Active Material: Platinum
Model Number: None
Type: SS foil substrate & platinum
Size of Each Layer or Module: ~~Length~~ Depth: ____ ft. 3.400 in. Width: 2 ft. ____ in. Height: 2 ft. 4.450 in.
No. of Layers or Modules: 80 Total Volume: 109.500 cu.ft. Total Weight: ____ lbs.

Space Velocity

Gas flow rate/Catalyst Volume: 210000 hr^{-1}

Manufacturer's Guarantee

VOC 2.000 ppm VOC ____ gm/bhp-hr CO 4.000 ppm CO ____ gm/bhp-hr
$\%O_2$ 15.00 $\%O_2$ 15.00

Catalyst Life

5 years (expected)

Cost

Capital Cost: $315000.00 Installation Cost: ____ Catalyst Replacement Cost: $250000.00

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SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM, OXIDATION CATALYST, AND AMMONIA CATALYST

AMMONIA CATALYST		
Ammonia Catalyst	Manufacturer:	Catalyst Active Material:
	Model Number: N/A - not used	Type:
	Size of Each Layer or Module: Length: ft. in. Width: ft. in. Height: ft. in.	
	No. of Layers or Modules: Total Volume: cu.ft. Total Weight: lbs.	
Space Velocity	Gas flow rate/Catalyst Volume: hr^{-1}	
Manufacturer's Guarantee	NH3 ppm % O_2	
Catalyst Life	years (expected)	
Cost	Capital Cost: Installation Cost: Catalyst Replacement Cost:	

SECTION B: OPERATION INFORMATION

Operating Temperature	Minimum Inlet Temperature: 540.00 °F (from cold start)		Maximum Temperature: 840.00 °F	
	Warm-up Time: hr. 12 min. (maximum)			
Operating Schedule Please see the revised AQMD Application	Normal:	hours/day	days/week	weeks/yr.
	Maximum:	hours/day	days/week	weeks/yr.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER: Sen. AQ Consultant	PREPARER'S TELEPHONE NUMBER: (619) 243-2823	
		PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com	
CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT: Steve Sciortino	CONTACT PERSON'S TELEPHONE NUMBER: (714) 765-5177		DATE SIGNED: 09-09-04
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140		

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Attachment to Form 400-E-5

Note: Information provided is typical, preliminary design. Final design will be determined during equipment purchase.

Simple Cycle Catalyst System for General Electric LM 6000PC Sprint – Requested NO_X Catalyst Data

COA CPP Project Emissions Control Module (ECM) provider Project number: ECM = SCR and CO catalyst, catalyst ducting, Stack, ammonia injection grid and skid, tempering air fans and distribution screen.	Express Integrated Technologies (EIT) 8032
Catalyst Model No.	CMHT-21
1. Catalyst manufacturer	Cormetech
2. Catalyst Drawings include catalyst dimensions (SCR)	There are 8 modules per unit (2 rows stacked 4 high) and each module is approximately 107.625" W x 77" H x 26.375 D.
3. Ammonia grid details	8 rows, 2 x 4 Matrix - Details are Proprietary
4. Ammonia injection rate	Nominally 124 lbhr - for 19% Aqueous Ammonia
5. Ammonia emission rate	5 ppmvd corrected to 15% O2
6. Pressure drop across SCR unit including injection grid	6.0 inches w.c.
7. Controls for ammonia injection	feedforward from fuel / feedback from CEMS
8. Type of catalyst	Homogeneuous extruded material containing Ti-V-W
9. Catalyst volume	1,012 cubic feet
10. Space velocity (gas flow rate/catalyst volume)	200 1/sec
11. Area velocity (gas flow rate/wetted catalyst surface area)	nominally 11 ft /sec
12. Manufacturer's Guarantee for Efficiency and Catalyst Life Warranty terms: Commences as of the Power Block achieves Substantial Completion date	First occurrence of: 10,000 hours of operations or Five Consecutive years or

Power Block = gas turbine, emissions control module and CEMS	Five years and six months from catalyst delivery
13. NOx concentration in and out of SCR unit	25 in / 2.3 out ppmvd @ 15% O2
14. SCR unit total cost	$3,000,000.00
15. Catalyst replacement cost	$400,000.00
16. Percent decrease in prime mover output	nominally 500 kW for an LM 6000PC @ 12 inches w.c. (nominally 300 kW for NOx Catalyst delta P alone)
17. Percent increase in HRSG output	N/A
18. SO2 oxidation rate/SO3 emissions	ranges from 40% to 75% based on gas flow & temp
19. Stack temperature after HRSG	840°F max
20. HRSG and turbine modifications	N/A
21. Temperature at which ammonia injection will begin	540°F at backface of NOx Catalyst

(d) In the event the CO Catalyst fails to perform as described above during the second through fifth years of operation after the Substantial Completion Date of the Power Block containing such Catalyst, then Seller shall either:

(i) replace the non-performing CO Catalyst, in which event Seller will be responsible to bear that proportion of the replacement catalyst price equal to ten thousand (10,000) operating hours minus the number of operating hours on the CO Catalyst since the Substantial Completion Date of the Power Block, divided by ten thousand operating hours (10,000) (i.e., (10,000 hrs-N)/10,000 hrs.); and Purchaser will be responsible for the balance. (For example, if the Catalyst fails to perform during its 6,000th hour of operation, then Seller would be responsible for ((10,000 hrs -6,000 hrs.)/10,000 hours = .40) of the replacement price); or

(ii) reactivate the non-performing CO Catalyst, in which event Seller will be responsible to bear that proportion of the reactivation expense equal to ten thousand (10,000) operating hours on the CO Catalyst minus the number of operating hours on the CO Catalyst since the Substantial Completion Date of the Power Block, divided by ten thousand operating hours (10,000); and Purchaser will be responsible for the balance.

(e) Warranty remedies include the cost of the replacement catalyst or reactivation and shipping costs to and from the jobsite only. The cost of labor and lifting equipment, if required, to perform the removal and installation of catalyst covered by warranty is not included and is to be provided by the Purchaser.

14.2 *NOx Catalyst Warranty*

Subject to the provisions below, as with respect to each Power Block, as the "**NOx Catalyst Warranty**," Seller warrants that the NOx Catalyst will, during the NOx Catalyst Warranty Term, cause the Power Block to meet the Warranted Values. The "**NOx Warranted Values**" are the emissions levels guaranteed under the Emissions Guarantees.

14.2.1 *NOx Catalyst Warranty Term*

The "**NOx Catalyst Warranty Term**" as with respect to a Power Block shall commence as of the Substantial Completion Date thereof and shall conclude upon the first occurrence of the following:

Total cumulative fired hours of operation after the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the NOx Catalyst	10,000
Consecutive years from the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the NOx Catalyst	5
Consecutive years from Catalyst Delivery	5.5

Attachment to Form 400-E-5

Note: Information provided is typical, preliminary design. Final design will be determined during equipment purchase.

Simple Cycle Catalyst System for General Electric LM 6000PC Sprint – Requested CO Catalyst Data

COA CPP Project Emissions Control Module provider Project number: ECM = SCR and CO catalyst, catalyst ducting, Stack, ammonia injection grid and skid, tempering air fans and distribution screen.	Express Integrated Technologies (EIT) 8032
1. Type of Catalyst	stainless foil substrate with alumina washcoat that is impregnated with platinum group metals
2. Catalyst Volume	109.5 ft3
3. Space Velocity	210,000 1/hr
4. Linear Velocity	11.7 ft/sec
5. Pressure Drop Across Catalyst	1.5 inches w.c.
6. Manufacturer's Guarantee for Efficiency and Catalyst Life Warranty terms: Commences as of the Power Block achieves Substantial Completion date Power Block = gas turbine, emissions control module and CEMS	First occurrence of: 10,000 hours of operations or Five Consecutive years or Five years and six months from CO catalyst delivery
7. Operating temperature Range of Catalyst	500° to 1200°F
8. Effect of Temperature on Efficiency	Efficiency decreases outside of operating range specified above
9. CO Conversion Efficiency	75% or greater - depending on operating case
10. Unsaturated Hydrocarbon Conversion Efficiency	35%
11. Saturated (Non-Methane) Hydrocarbon Conversion Efficiency	0%
12. Methane Conversion Efficiency	0%

13. CO Catalyst Total Cost	Catalyst + Frame = $315,000.00
14. Catalyst Replacement Cost	$250,000.00
15. Catalyst and Heat Recovery Steam Generator (HRSG) Drawings Including Catalyst Dimensions	CO Catalyst dimensions are nominally 18 ft W x 25 ft H x 3.4 inches Deep
16. Catalyst Manufacturer	BASF (formally Englehard)
17. CO and HC Concentration In and Out of CO Catalyst	CO - 53 In / 4.0 Out ppmvd @ 15% O2 VOC's NMNEHC - 3 In / 2 Out ppmd @ 15% O2
18. Catalyst Depth	nominally 3.4 inches
19. Catalyst Cell Density (Cells Per Square Inch)	145

Article 14 Catalyst Warranties

14.1 *CO Catalyst Warranty*

Subject to the provisions below, as with respect to each Power Block, as the "**CO Catalyst Warranty**," Seller warrants that the CO Catalyst will, during the CO Catalyst Warranty Term, cause the Power Block to meet the Warranted Values. The "**CO Warranted Values**" are the CO emissions levels guaranteed under the Emissions Guarantees.

14.1.1 CO Catalyst Warranty Term

The "**CO Catalyst Warranty Term**" as with respect to a Power Block shall commence as of the Substantial Completion Date of such Power Block and shall conclude upon the first occurrence of the following:

Total cumulative fired hours of operation after the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the CO Catalyst	10,000
Consecutive years from the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the CO Catalyst	5
Consecutive years from Catalyst Delivery	5.5

14.1.2 *Warranty Guidelines*

The CO Catalyst Warranty is conditioned upon the assumption that the Purchaser will:

(a) operate and maintain the CO Catalyst material within the design specifications set forth in Attachment 2-A and 2-B and the parameters of the Emissions Guarantees as set forth in Attachment 9; and

(b) have handled and installed the CO Catalyst according to Seller's operation and maintenance manual(s); and

(c) give Seller access to the relevant process operating logs in the event that Seller requires such access in order to perform their obligations hereunder.

14.1.3 *CO Catalyst Operating Guidelines*

(a) The following contaminants are known catalyst deactivators and contribute to shortened catalyst life. The Parties acknowledge that the CO Catalyst vendor will keep a sample of the CO Catalyst provided to Purchaser hereunder. This sample will, as necessary, be used to benchmark the original level of contaminants as contained in the CO Catalyst as originally provided to Purchaser, for purposes hereof. In the event that Seller (or the CO Catalyst vendor on behalf of Seller) can demonstrate that the CO Catalyst, as a result of operation of the CTG Unit, contains, either singularly or collectively levels of the contaminants listed below in excess

South Coast Air Quality Management District

FORM 400-PS
PLOT PLAN AND STACK INFORMATION FORM

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765
Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A and Form 400-CEQA

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, California 92806 (•) Fixed Location ( ) Various Locations

SECTION A: LOCATION DATA

Plot Plan
Please attach a site map for the project. Identify and locate the proposed equipment on the property. A copy of the appropriate Thomas Brothers page that shows the location, or a drawing or sketch that show the major street and identifies the location of the equipment is acceptable.

Location of School Nearby
Is the facility located within a 1/4 mile radius (1,320 feet) of the outer boundary of a school?
( ) Yes (•) No. If yes, please provide name(s) of school(s) below.

School Name	School Address	Distance from stack or equipment vent to the outer boundary of the school.

Note: Per Section 42301.9 of the California Health and Safety Code, a "school" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in

Population Density
(•) Urban (area of dense population) ( ) Rural (area of sparse population)

Zoning Classification
( ) Mixed Use Residential Commercial Zone (M-U) ( ) Service and Professional Zone (C-S) ( ) Medium Commercial (C-3)
( ) Heavy Commercial (C-4) (•) Commercial Manufacturing (C-M)

SECTION B: EMISSION RELEASE PARAMETERS -STACKS, VENTS

Stack Data
Stack Height: 86.00 feet (height above ground level)* What is the height of the closest building nearest the stack ? 43.50 feet
Stack Inside Diameter: 140.000 inches Stack Flow: 590234 acfm Stack Temperature: 840.00 oF
Rain Cap Present: ( ) Yes (•) No Stack Orientation: (•) Vertical ( ) Horizontal
* If the stack height is less than 2.5 times the closest building height (H), please provide information on any building within 5xH distance from the stack(attach additional sheet if necessary

Building #/name:	Building #/name:
(see attachment)	
Building Height: feet	Building Height: feet
Building Width: feet	Building Width: feet
Building Length: feet	Building Length: feet

Receptor Distance from equipment stack or roof vents/openings
Distance to nearest residence 887.00 feet or 270.36 meters | Distance to nearest business 61.00 feet or 18.59 meters

Building Information
Are the emissions released from vents and/or openings from the building? ( ) Yes (•) No
If yes, please provide:

Building height above ground level: ft.	Building dimensions: length ft. or width ft.	Total square footage of building where the source of the emissions is located.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	09-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:
(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Canyon Power Plant

AQMD Form 400-PS Attachment

Building data for buildings near SCR Exhaust Stacks:

Building Name	Height*	Width*	Length*
CTG-SCR 1	34	27	135
CTG-SCR 2	34	27	135
CTG-SCR 3	34	27	135
CTG-SCR 4	34	27	135
4-cell Chiller Cooling Tower	38.5	52.7	43.3
Water Treatment System With Sun Shade Roof	21.5	52.7	60.7
Black Start Diesel Generator	10	20.0	7.9
Main Electrical Equipment Enclosure (EEE)	17	31.3	71.3
Plant Operation Building And Warehouse	36.73	155.1	68.3
DI Water Storage Tank	36.7	Dia-34	
Raw Water Storage Tank	43.5	Dia-40	

*All dimensions given are in feet.

South Coast Air Quality Management District

Form 400-A

Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit:
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator):
Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim, CA, 92806
City, State, Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim, CA, 92805
City, State, Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Administrative Change
- ○ Change of Condition For Permit To Operate
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Change of Condition For Permit To Construct
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Change of Location—Moving to New Site
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY):
09/01/2009

8. Description of Equipment:
Natural gas-fired General Electric (GE) LM 6000PC Sprint Combustion Turbine Generator 4 (CTG4) operating in simple cycle mode

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 3

11. Are you a Small Business as per AQMD's Rule 102 definition?
(10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location?
Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title:
Integrated Resources Mgr.

19. Print Name:
Steve Sciortino

20. Date:
9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-12
GAS TURBINE

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave, Anaheim, CA 92806 — (•) Fixed Location ( ) Various Locations

SECTION A: EQUIPMENT INFORMATION

Turbine

Manufacturer: General Electric

Model No.: LM6000PC Sprint

Serial No.:

Size (based on Higher Heating Value - HHV):

Manufacturer Maximum Input Rating: 479.200 MMBTU/hr 140400.00 kWh

Manufacturer Maximum Output Rating: MMBTU/hr 50950.00 kWh

Function (Check all that apply)

[X] Electrical Generation [ ] Driving Pump/Compressor [ ] Emergency Peaking Unit
[ ] Steam Generation [ ] Exhaust Gas Recovery [ ] Other (specify):

Cycle Type

(•) Simple Cycle ( ) Regenerative Cycle
( ) Combined Cycle ( ) Other (specify):

Combustion Type

( ) Tubular ( ) Can-Annular (•) Annular

Fuel (Turbine)

(•) Natural Gas ( ) LPG ( ) Digester Gas*
( ) Landfill Gas* ( ) Propane ( ) Refinery Gas* ( ) Other* :

* (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

Heat Recovery Steam Generator (HRSG)

Steam Turbine Capacity MW

Low Pressure Steam Output Capacity: lb/hr @ °F

High Pressure Steam Output Capacity: lb/hr @ °F

Superheated Steam Output Capacity: lb/hr @ °F

Duct Burner

Manufacturer:

Model:

Number of burners:

Rating of each burner (HHV):

( ) Low NOx (please attach manufacturer's specifications)

Type: ( ) Other:

Show all heat transfer surface locations with the HRSG and temperature profile

Fuel (Duct Burner)

(•) Natural Gas ( ) LPG ( ) Digester Gas*
( ) Refinery Gas* ( ) Landfill Gas* ( ) Propane ( ) Other* :

*(If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

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Air Pollution Control

- (●) Selective Catalytic Reduction (SCR)*
- ( ) Selective Non-catalytic Reduction (SNCR)*
- (●) Oxidation Catalyst*
- ( ) Other (specify)*
- (●) Steam/Water Injection: Injection Rate: 1.060 lbs. water/lbs. fuel, or ____ mole water/mole fuel

* Separate application is required.

Capital Cost:	Installation Cost:	Annual Operating Cost:
$3000000.00		

Oxidation Catalyst Data (If Applicable)

Manufacturer: BASF (formally Englehard) | Model: None

Catalyst Dimensions: Depth (Length): ____ ft. 3.400 in. Width: 18 ft. ____ in. Height: 25 ft. 0.000 in.

Catalyst Cell Density: 145.000 cells/sq. in. | Pressure Drop Across Catalyst: 1.500

Manufacturer's Guarantee: CO Control Efficiency: 75.00 % Catalyst Life: 5 yrs. VOC Control Efficiency: 35.00 % Operating Temp. Range: 700.00 °F (500~1200°F)

Space Velocity (gas flow rate/catalyst volume): 210000.000 per hour | Area Velocity (gas flow/wetted catalyst surface area): 42120.000 ft/hr

VOC Concentration into Catalyst: 3.000 PPMVD @ 15 % O_2 | CO Concentration into Catalyst: 53.000 PPMVD @ 15 % O_2

SECTION B: OPERATION INFORMATION

in normal operation

On-line Emissions Data

Pollutants	Maximum Emissions Before Control*		Maximum Emissions After Control	
	PPM@15% O_2 dry	lb/Hour	PPM@15% O_2 dry	lb/Hour
ROG			2.000	1.200
NOx		44.000	2.300	3.980
CO		31.270	4.000	4.240
PM10				3.000
SOx				1.360
NH3			5.000	3.640

* Based on temperature, fuel consumption, and MW output

Reference (attach data):
- [x] Manufacturer Emission Data
- [ ] EPA Emission Factors
- [ ] AQMD Emission Factors
- [ ] Source Test

Stack or Vent Data

Stack Height: 86 ft. ____ in. Stack Diameter: 11 ft. 8.000 in.

Exhaust Temperature: 840.00 °F Exhaust Pressure: ____ inches water column

Exhaust Flow Rate: 590234.86 CFM Oxygen Level: 14.35 %

Operating Schedule

Please see the revised AQMD Application

Normal: ____ hours/day ____ days/week ____ weeks/yr

Maximum: ____ hours/day ____ days/week ____ weeks/yr

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Serial Number

GAS TURBINE

35 minutes startup and the 25 minutes for trip and part of restart

10 minutes shutdown and normal operation for the remaining 50 minutes

Startup Data	No. of Startups per day:		No. of Startups per year: 129	Duration of each startup: 0.6 hours	
Shutdown Data	No. of Shutdowns per day:		No. of Shutdowns per year: 129	Duration of each shutdown: 0.2 hours	
Startup and Shutdown Emissions Data	**Pollutants**	**Startup Emissions**		**Shutdown Emissions**	
		PPM@15% O_2, dry	lb/Hour	PPM@15% O_2, dry	lb/Hour
	ROG		1.290		1.270
	NOx		14.270		4.010
	CO		6.280		4.160
	PM10		1.840		2.680
	SOx		0.810		1.150
	NH3				

Monitoring and Reporting

Continuous Emission Monitoring System (CEMS)

CEMS Make: GE Energy Systems

CEMS Model:

Will the CEMS be used to measure both on-line and startup/shutdown emissions? (•) Yes ( ) No

The following parameters will be continuously monitored:

[X] NOx [X] CO [X] O_2

[X] Fuel Flow Rate [X] Ammonia Injection Rate [ ] Other (specify)

[X] Ammonia Stack Concentration: Ammonia CEMS Model

Ammonia CEMS Make

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	01-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."

(b) Label the original page "confidential." Circle all confidential items on the page.

(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

South Coast Air Quality Management District

Form 400-A

Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit:
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator):
Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim, CA, 92806
City, State, Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino
Contact Title: Integrated Resources Manager Phone: (714) 765-5177
Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim, CA, 92805
City, State, Zip Code

Contact Name: Steve Sciortino
Contact Title: Integrated Resources Manager Phone: (714) 765-5177
Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY):
09/01/2009

8. Description of Equipment:
SCR4: aqueous ammonia-type selective catalytic reduction (SCR) and oxidation catalyst systems for oxides of nitrogen (NOx) and carbon monoxide (CO) emissions control.

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 3

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location?
Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)?
221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:
Stephen K Ceorton

18. Title:
Integrated Resources Mgr.

19. Print Name:
Steve Sciortino

20. Date:
9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-5
SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM, OXIDATION CATALYST, AND AMMONIA CATALYST

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, CA 92806 (•) Fixed Location ( ) Various Locations

SECTION A: EQUIPMENT INFORMATION

SELECTIVE CATALYTIC REDUCTION (SCR)

SCR Catalyst

Manufacturer: Cormatech
Catalyst Active Material: vanadium / tungsten / titanium
Model Number: CMHT - 21
Type: Homogeneous / extruded honeycomb
Size of Each Layer or Module: Length: 2 ft. 2.00 in. Width: 9 ft. 11.60 in. Height: 6 ft. 5.00 in.
No. of Layers or Modules: 8 Total Volume: 1012.000 cu.ft. Total Weight: lbs.

Reducing Agent

( ) Urea ( ) Anhydrous Ammonia (•) Aqueous Ammonia 19.00 % Injection Rate: 124.000 lb/hr.

Reducing Agent Storage

Diameter: 7 ft. in. ~~Height:~~ Length 42 ft. in. Capacity: 10000.00 gal Pressure Setting: 40.000 psia

Space Velocity

Gas Flow Rate/Catalyst Volume: 720000 hr^{-1}

Area Velocity

Gas Flow Rate/Wetted Catalyst Surface Area: 39600.00 ft/hr

Manufacturer's Guarantee

NOx: 2.300 ppm $\%O_2$: 15.00 NOx: gm/bhp-hr Ammonia Slip: 5.000 ppm @ 15.00 $\%O_2$

Catalyst Life

5 years (expected)

Cost

Capital Cost: $3000000.00 Installation Cost: Catalyst Replacement Cost: $400000.00

OXIDATION CATALYST

Oxidation Catalyst

Manufacturer: BASF (formally Englehard)
Catalyst Active Material: Platinum
Model Number: None
Type: SS foil substrate & platinum
Size of Each Layer or Module: ~~Length~~ Depth: ft. 3.400 in. Width: 2 ft. in. Height: 2 ft. 4.450 in.
No. of Layers or Modules: 80 Total Volume: 109.500 cu.ft. Total Weight: lbs.

Space Velocity

Gas flow rate/Catalyst Volume: 210000 hr^{-1}

Manufacturer's Guarantee

VOC 2.000 ppm VOC gm/bhp-hr CO 4.000 ppm CO gm/bhp-hr
$\%O_2$ 15.00 $\%O_2$ 15.00

Catalyst Life

5 years (expected)

Cost

Capital Cost: $315000.00 Installation Cost: Catalyst Replacement Cost: $250000.00

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SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM, OXIDATION CATALYST, AND AMMONIA CATALYST

AMMONIA CATALYST		
Ammonia Catalyst	Manufacturer:	Catalyst Active Material:
	Model Number: N/A - not used	Type:
	Size of Each Layer or Module: Length: ft. in. Width: ft. in. Height: ft. in.	
	No. of Layers or Modules: Total Volume: cu.ft. Total Weight: lbs.	
Space Velocity	Gas flow rate/Catalyst Volume: hr^{-1}	
Manufacturer's Guarantee	NH3 ppm % O_2	
Catalyst Life	years (expected)	
Cost	Capital Cost: Installation Cost: Catalyst Replacement Cost:	

SECTION B: OPERATION INFORMATION

Operating Temperature	Minimum Inlet Temperature: 540.00 °F (from cold start)		Maximum Temperature: 840.00 °F	
	Warm-up Time: hr. 12 min. (maximum)			
Operating Schedule Please see the revised AQMD Application	Normal:	hours/day	days/week	weeks/yr.
	Maximum:	hours/day	days/week	weeks/yr.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER: Sen. AQ Consultant	PREPARER'S TELEPHONE NUMBER: (619) 243-2823 PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com	
CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT: Steve Sciortino E-MAIL ADDRESS: SSciortino@anaheim.net	CONTACT PERSON'S TELEPHONE NUMBER: (714) 765-5177 FAX NUMBER: (714) 765-4140		DATE SIGNED: 09-09-08

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Attachment to Form 400-E-5

Note: Information provided is typical, preliminary design. Final design will be determined during equipment purchase.

Simple Cycle Catalyst System for General Electric LM 6000PC Sprint – Requested NO_X Catalyst Data

COA CPP Project Emissions Control Module (ECM) provider Project number: ECM = SCR and CO catalyst, catalyst ducting, Stack, ammonia injection grid and skid, tempering air fans and distribution screen.	Express Integrated Technologies (EIT) 8032
Catalyst Model No.	CMHT-21
1. Catalyst manufacturer	Cormetech
2. Catalyst Drawings include catalyst dimensions (SCR)	There are 8 modules per unit (2 rows stacked 4 high) and each module is approximately 107.625" W x 77" H x 26.375 D.
3. Ammonia grid details	8 rows, 2 x 4 Matrix - Details are Proprietary
4. Ammonia injection rate	Nominally 124 lbhr - for 19% Aqueous Ammonia
5. Ammonia emission rate	5 ppmvd corrected to 15% O2
6. Pressure drop across SCR unit including injection grid	6.0 inches w.c.
7. Controls for ammonia injection	feedforward from fuel / feedback from CEMS
8. Type of catalyst	Homogeneuous extruded material containing Ti-V-W
9. Catalyst volume	1,012 cubic feet
10. Space velocity (gas flow rate/catalyst volume)	200 1/sec
11. Area velocity (gas flow rate/wetted catalyst surface area)	nominally 11 ft /sec
12. Manufacturer's Guarantee for Efficiency and Catalyst Life Warranty terms: Commences as of the Power Block achieves Substantial Completion date	First occurrence of: 10,000 hours of operations or Five Consecutive years or

Power Block = gas turbine, emissions control module and CEMS	Five years and six months from catalyst delivery
13. NOx concentration in and out of SCR unit	25 in / 2.3 out ppmvd @ 15% O2
14. SCR unit total cost	$3,000,000.00
15. Catalyst replacement cost	$400,000.00
16. Percent decrease in prime mover output	nominally 500 kW for an LM 6000PC @ 12 inches w.c. (nominally 300 kW for NOx Catalyst delta P alone)
17. Percent increase in HRSG output	N/A
18. SO2 oxidation rate/SO3 emissions	ranges from 40% to 75% based on gas flow & temp
19. Stack temperature after HRSG	840°F max
20. HRSG and turbine modifications	N/A
21. Temperature at which ammonia injection will begin	540°F at backface of NOx Catalyst

(d) In the event the CO Catalyst fails to perform as described above during the second through fifth years of operation after the Substantial Completion Date of the Power Block containing such Catalyst, then Seller shall either:

(i) replace the non-performing CO Catalyst, in which event Seller will be responsible to bear that proportion of the replacement catalyst price equal to ten thousand (10,000) operating hours minus the number of operating hours on the CO Catalyst since the Substantial Completion Date of the Power Block, divided by ten thousand operating hours (10,000) (i.e., (10,000 hrs-N)/10,000 hrs.); and Purchaser will be responsible for the balance. (For example, if the Catalyst fails to perform during its 6,000th hour of operation, then Seller would be responsible for ((10,000 hrs -6,000 hrs.)/10,000 hours = .40) of the replacement price); or

(ii) reactivate the non-performing CO Catalyst, in which event Seller will be responsible to bear that proportion of the reactivation expense equal to ten thousand (10,000) operating hours on the CO Catalyst minus the number of operating hours on the CO Catalyst since the Substantial Completion Date of the Power Block, divided by ten thousand operating hours (10,000); and Purchaser will be responsible for the balance.

(e) Warranty remedies include the cost of the replacement catalyst or reactivation and shipping costs to and from the jobsite only. The cost of labor and lifting equipment, if required, to perform the removal and installation of catalyst covered by warranty is not included and is to be provided by the Purchaser.

14.2 *NOx Catalyst Warranty*

Subject to the provisions below, as with respect to each Power Block, as the "**NOx Catalyst Warranty**," Seller warrants that the NOx Catalyst will, during the NOx Catalyst Warranty Term, cause the Power Block to meet the Warranted Values. The "**NOx Warranted Values**" are the emissions levels guaranteed under the Emissions Guarantees.

14.2.1 *NOx Catalyst Warranty Term*

The "**NOx Catalyst Warranty Term**" as with respect to a Power Block shall commence as of the Substantial Completion Date thereof and shall conclude upon the first occurrence of the following:

Total cumulative fired hours of operation after the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the NOx Catalyst	10,000
Consecutive years from the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the NOx Catalyst	5
Consecutive years from Catalyst Delivery	5.5

Attachment to Form 400-E-5

Note: Information provided is typical, preliminary design. Final design will be determined during equipment purchase.

Simple Cycle Catalyst System for General Electric LM 6000PC Sprint – Requested CO Catalyst Data

COA CPP Project Emissions Control Module provider Project number: ECM = SCR and CO catalyst, catalyst ducting, Stack, ammonia injection grid and skid, tempering air fans and distribution screen.	Express Integrated Technologies (EIT) 8032
1. Type of Catalyst	stainless foil substrate with alumina washcoat that is impregnated with platinum group metals
2. Catalyst Volume	109.5 ft3
3. Space Velocity	210,000 1/hr
4. Linear Velocity	11.7 ft/sec
5. Pressure Drop Across Catalyst	1.5 inches w.c.
6. Manufacturer's Guarantee for Efficiency and Catalyst Life Warranty terms: Commences as of the Power Block achieves Substantial Completion date Power Block = gas turbine, emissions control module and CEMS	First occurrence of: 10,000 hours of operations or Five Consecutive years or Five years and six months from CO catalyst delivery
7. Operating temperature Range of Catalyst	500° to 1200°F
8. Effect of Temperature on Efficiency	Efficiency decreases outside of operating range specified above
9. CO Conversion Efficiency	75% or greater - depending on operating case
10. Unsaturated Hydrocarbon Conversion Efficiency	35%
11. Saturated (Non-Methane) Hydrocarbon Conversion Efficiency	0%
12. Methane Conversion Efficiency	0%

13. CO Catalyst Total Cost	Catalyst + Frame = $315,000.00
14. Catalyst Replacement Cost	$250,000.00
15. Catalyst and Heat Recovery Steam Generator (HRSG) Drawings Including Catalyst Dimensions	CO Catalyst dimensions are nominally 18 ft W x 25 ft H x 3.4 inches Deep
16. Catalyst Manufacturer	BASF (formally Englehard)
17. CO and HC Concentration In and Out of CO Catalyst	CO - 53 In / 4.0 Out ppmvd @ 15% O2 VOC's NMNEHC - 3 In / 2 Out ppmd @ 15% O2
18. Catalyst Depth	nominally 3.4 inches
19. Catalyst Cell Density (Cells Per Square Inch)	145

Article 14 Catalyst Warranties

14.1 *CO Catalyst Warranty*

Subject to the provisions below, as with respect to each Power Block, as the "**CO Catalyst Warranty**," Seller warrants that the CO Catalyst will, during the CO Catalyst Warranty Term, cause the Power Block to meet the Warranted Values. The "**CO Warranted Values**" are the CO emissions levels guaranteed under the Emissions Guarantees.

14.1.1 CO Catalyst Warranty Term

The "**CO Catalyst Warranty Term**" as with respect to a Power Block shall commence as of the Substantial Completion Date of such Power Block and shall conclude upon the first occurrence of the following:

Total cumulative fired hours of operation after the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the CO Catalyst	10,000
Consecutive years from the Substantial Completion Date of the Power Block that includes the Emissions Control Module containing the CO Catalyst	5
Consecutive years from Catalyst Delivery	5.5

14.1.2 *Warranty Guidelines*

The CO Catalyst Warranty is conditioned upon the assumption that the Purchaser will:

(a) operate and maintain the CO Catalyst material within the design specifications set forth in Attachment 2-A and 2-B and the parameters of the Emissions Guarantees as set forth in Attachment 9; and

(b) have handled and installed the CO Catalyst according to Seller's operation and maintenance manual(s); and

(c) give Seller access to the relevant process operating logs in the event that Seller requires such access in order to perform their obligations hereunder.

14.1.3 *CO Catalyst Operating Guidelines*

(a) The following contaminants are known catalyst deactivators and contribute to shortened catalyst life. The Parties acknowledge that the CO Catalyst vendor will keep a sample of the CO Catalyst provided to Purchaser hereunder. This sample will, as necessary, be used to benchmark the original level of contaminants as contained in the CO Catalyst as originally provided to Purchaser, for purposes hereof. In the event that Seller (or the CO Catalyst vendor on behalf of Seller) can demonstrate that the CO Catalyst, as a result of operation of the CTG Unit, contains, either singularly or collectively levels of the contaminants listed below in excess

South Coast Air Quality Management District

FORM 400-PS
PLOT PLAN AND STACK INFORMATION FORM

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A and Form 400-CEQA

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, California 92806 (•) Fixed Location ( ) Various Locations

SECTION A: LOCATION DATA

Plot Plan
Please attach a site map for the project. Identify and locate the proposed equipment on the property. A copy of the appropriate Thomas Brothers page that shows the location, or a drawing or sketch that show the major street and identifies the location of the equipment is acceptable.

Location of School Nearby
Is the facility located within a 1/4 mile radius (1,320 feet) of the outer boundary of a school?
( ) Yes (•) No. If yes, please provide name(s) of school(s) below.

School Name	School Address	Distance from stack or equipment vent to the outer boundary of the school.

Note: Per Section 42301.9 of the California Health and Safety Code, a "school" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in

Population Density
(•) Urban (area of dense population) ( ) Rural (area of sparse population)

Zoning Classification
( ) Mixed Use Residential Commercial Zone (M-U) ( ) Service and Professional Zone (C-S) ( ) Medium Commercial (C-3)
( ) Heavy Commercial (C-4) (•) Commercial Manufacturing (C-M)

SECTION B: EMISSION RELEASE PARAMETERS -STACKS, VENTS

Stack Data
Stack Height: 86.00 feet (height above ground level)* What is the height of the closest building nearest the stack ? 43.50 feet
Stack Inside Diameter: 140.000 inches Stack Flow: 590234 acfm Stack Temperature: 840.00 oF
Rain Cap Present: ( ) Yes (•) No Stack Orientation: (•) Vertical ( ) Horizontal
* If the stack height is less than 2.5 times the closest building height (H), please provide information on any building within 5xH distance from the stack(attach additional sheet if necessary

Building #/name:	Building #/name:
(see attachment)	
Building Height: feet	Building Height: feet
Building Width: feet	Building Width: feet
Building Length: feet	Building Length: feet

Receptor Distance from equipment stack or roof vents/openings
Distance to nearest residence 887.00 feet or 270.36 meters | Distance to nearest business 61.00 feet or 18.59 meters

Building Information
Are the emissions released from vents and/or openings from the building? ( ) Yes (•) No
If yes, please provide:

Building height above ground level: ft.	Building dimensions: length ft. or width ft.	Total square footage of building where the source of the emissions is located.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	09-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

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(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Canyon Power Plant

AQMD Form 400-PS Attachment

Building data for buildings near SCR Exhaust Stacks:

Building Name	Height*	Width*	Length*
CTG-SCR 1	34	27	135
CTG-SCR 2	34	27	135
CTG-SCR 3	34	27	135
CTG-SCR 4	34	27	135
4-cell Chiller Cooling Tower	38.5	52.7	43.3
Water Treatment System With Sun Shade Roof	21.5	52.7	60.7
Black Start Diesel Generator	10	20.0	7.9
Main Electrical Equipment Enclosure (EEE)	17	31.3	71.3
Plant Operation Building And Warehouse	36.73	155.1	68.3
DI Water Storage Tank	36.7	Dia-34	
Raw Water Storage Tank	43.5	Dia-40	

*All dimensions given are in feet.

South Coast Air Quality Management District

Form 400-A
Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit:
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator):
Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim — CA, — 92806
City — State — Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim — CA — 92805
City — State — Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY): 09/01/2009

8. Description of Equipment:
One 10,000 gallon, aqueous ammonia storage tank

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 0

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location?
Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title:
Integrated Resources Mgr.

19. Print Name:
Steve Sciortino

20. Date:
9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $ / Tracking #

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South Coast Air Quality Management District

FORM 400-E-18
STORAGE TANK

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765
Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, California 92806 — (•) Fixed Location ( ) Various Locations

Tank Type (Select ONE): ( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) (•) Horizontal Tank (HT) ( ) Vertical Fixed Roof Tank (VFRT) ( ) Domed External Roof Tank (DEFRT)

Identification: Tank Identification Number: | Tank Contents/Product (include MSDS): Aqueous Ammonia

SECTION A: TANK INFORMATION

Physical Characteristics

Tank Characteristics

Shell Diameter (ft):	Shell Length (ft):	Shell Height (ft):	TurnoversPer Year:
7.00	42.00	10.00	4.5

Is Tank Heated?	Is Tank Underground?	Net Throughput (gal/year):	Self Support Roof
( ) Yes (•) No	( ) Yes (•) No		( ) Yes (•) No

Number of Columns?

Effective Column Diameter: ( ) 9" by 7" Built Up Column – 1.1 ( ) 8" Diameter Pipe – 0.7 ( ) Unknown – 1

External Shell Condition:	Internal Shell Color:	External Shell Color:	
( ) Good	( ) Light Rust	( ) White/White	( ) Gray/Light
( ) Poor	( ) Dense Rust	( ) Aluminum/Specular	( ) Gray/Medium
	( ) Gunite Lining	( ) Aluminum/Diffuse	( ) Red/Primer

Average LiquidHeight (ft): (VERT Only)	Maximum LiquidHeight (ft): (VERT Only)	Working Volume (gal): (VERT Only)

Paint Condition:	Paint Color/Shade:		
( ) Good	( ) White/White	( ) Gray/Light	( ) Gray/Medium
( ) Poor	( ) Aluminum/Diffuse	( ) Aluminum/Specular	( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon ( ) Dome Roof (Height ft.) ( ) Double Deck ( ) Cone Roof (Height ft.)

Roof Fitting Category: ( ) Typical ( ) Detail

Roof Height:

Roof Paint Condition	Roof Color/Shade		
( ) Good	( ) White/White	( ) Gray/Light	( ) Gray/Medium
( ) Poor	( ) Aluminum/Diffuse	( ) Aluminum/Specular	( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: ( ) Welded ( ) Bolted

Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft):	Deck Seam:
( ) Sheet		( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide
( ) Panel		( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim-Seal System (Floating Roof Tank)

Tank Construction:	Primary Seal:		Secondary Seal:	
( ) Welded	( ) Mechanical Shoe	( ) Liquid Mounted	( ) Rim Mounted	( ) None
( ) Riveted	( ) Vapor Mounted		( ) Shoe Mounted	

Breather Vent Setting

Vacuum Setting (psig):	Pressure Setting (psig):
	25.000

*Section C of the application MUST be completed.

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SECTION A: TANK INFORMATION (Cont.)

Site Selection

Nearest Major City: Anaheim, Ca

Daily Average Ambient Temperature (°F): 65.00

Annual Average Minimum Temperature (°F): 39.20

Annual Average Maximum Temperature (°F): 91.70

Average Wind Speed (mph): 5.050

Annual Average Solar Insulation Factor (Btu/(ft³ * ft * day)):

Tank Contents

Chemical Category: ○ Organic Liquids ○ Cude Oil ○ Petroleum Distillates

Liquid: ◉ Single ○ Multiple:

If Multiple, Select Speciation Option: ○ Full Speciation ○ Partial Speciation ○ Various Weight Speciation ○ None

SECTION B: OPERATION INFORMATION

Vapor Control

Vapor Control During Loading or Unloading:

☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line

☐ Vented to Air Pollution Control Equipment[1]

[1]If yes, a separate permit is required. If APC equpment is already permitted, provide Permit or Device Number:

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discarging to (Check Appropriate Box) Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:

aqueous ammonia

If Material is stored in a solution, supply the following information:

Name of Solvent: Name of Materials Dissolved:

Concentration of Materials Dissolved: 19.00 % by Weight OR % by Volume OR lbs/gal

SECTION C: ROOF/DECK FITTING

Section C is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tank, or Domed External Floating Roof Tank.

Select the number of fittngs for each applicable question. For Example: 3 Unbolted Cover, Ungasketed / Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)
   - Bolted Cover, Gasketed
   - Unbolted Cover, Ungasketed
   - Unbolted Cover, Gasketed

2. Automatic Gauge Float Well (20" diameter well)
   - Bolted Cover, Gasketed
   - Unbolted Cover, Ungasketed
   - Unbolted Cover, Gasketed

3. Column Well (24" diameter well)
   - Built-Up Col – Sliding Cover, Gasketed
   - Built-Up Col – Sliding Cover, Ungasketed
   - Pipe Col – Flex. Fabric Sleeve Seal
   - Pipe Col – Sliding Cover, Gasketed
   - Pipe Col. – Sliding Cover, Ungasketed

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Roof/Deck Fitting Details (Cont.)

4. Gauge Hatch/Sample Well (8" diameter well)

- Weighted Mechanical Actuation, Gasketed
- Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)

- Sliding Cover, Gasketed
- Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)

- Weighted Mechanical Actuation, Gasketed
- Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)

- Open
- 90% Close

8. Roof Leg (3" diameter leg)

- Adjustable, Pontoon Area, Ungasketed
- Adjustable, Center Area, Ungasketed
- Adjustable, Double-Deck Roofs
- Fixed
- Adjustable, Pontoon Area, Gasketed
- Adjustable, Pontoon Area, Sock
- Adjustable, Center Area, Gasketed
- Adjustable, Center Area, Sock

9. Roof Leg or Hang Well

- Adjustable
- Fixed

10. Sample Pipe (24" diameter)

- Slotted Pipe – Sliding Cover, Gasketed
- Slotted Pipe – Sliding Cover, Ungasketed
- Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well

- Ungasketed, Sliding Cover, Without Float
- Ungasketed Sliding Cover, With Float
- Gasketed Sliding Cover, Without Float
- Gasketed Sliding Cover, With Float
- Gasketed Sliding Cover, With Pole Sleeve
- Gasketed Sliding Cover, With Pole Wiper
- Gasketed Sliding Cover, With Float, Wiper
- Gasketed Sliding Cover, With Float, Sleeve, Wiper
- Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. Stub Drain (1" diameter)

13. Unslotted Guide – Pole Well

- Ungasketed, Sliding Cover
- Gasketed Sliding Cover
- Ungasketed Sliding Cover with Sleeve
- Gasketed Sliding Cover with Sleeve
- Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)

- Weighted Mechanical Actuation, Gasketed
- Weighted Mechanical Actuation, Ungasketed

SECTION D: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	09-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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System Entire : Ammonium Hydroxide (Aqua Ammonia) Cargo Transport Deliveries

Task Overview	
Number	A-17
Location	LaMirada Service Center (LaMirada, CA)
Date Issued	January 8, 1991
Revised	11/07/2007 09:05 am
Operators	One (1) operator is required. An operator must be present at the location during the entire delivery process.
Protective Apparel	Chemical splash goggles, face shield, gauntlet type rubber gloves, safety shoes, splash apron. . For emergency purposes, a safety eyewash shower and a full face gas mask with a 30 minute canister should be close in case of spill or splash back.
Required Training	Ammonia Awareness Training, Emergency First Aid for Anhydrous Ammonia, Review MSDS 4002--Aqueous Ammonia. 24 Hour Hazwoper plus annual refresher
Reviewed/Certified By	**Jim Smith** *Operations Manager - West* **Airgas Specialty Products** *LaMirada Service Center (LaMirada CA)* (714) 521-9811
Date Reviewed	11/7/2007 10:05:05 AM

Task Instructions

For exposure to ammonia:

EYE CONTACT: Flush with large amounts of water for at least 15 minutes then immediately seek medical aid.

SKIN CONTACT: Immediately flush with large quantities of water for at least 15 minutes while removing clothing. If clothing has frozen to skin, thaw with water before removal. Seek immediate medical aid.

INHALATION: Remove from exposure. If breathing has stopped or is difficult, administer artificial respiration or oxygen as needed. Seek immediate medical aid.

INGESTION: Do not induce vomiting: Have victim drink large quantities of water if conscious. Immediately seek medical aid. Never give anything by mouth to an unconscious person .

Procedures: Pre-transfer.

1. Position truck so cargo tank is substantially level and in such a location that delivery hoses can be connected without straining them by stretching or excessive bending.

   NOTE: To read the liquid level gauge, if there is one, on the cargo tank accurately and unload completely, the cargo tank must be in a substantially horizontal position.

   Shut engine off.

   HAZARD: Avoid any strain which could weaken ammonia hose and cause rupture.

2. Set hand brake and place chock blocks at front and back of drive or trailer wheels on one side.

   NOTE: The driver is at no time permitted to sit in the cab of the truck.

   HAZARD: Prevent movement of vehicle during ammonia transfer.

3. Put on protective apparel.

   NOTE: If the operator must stand in an area from which escape is not readily accomplished, he must wear a full face gas mask.

4. If the size of the receiving storage tank is known, compute the expected % value for the liquid level gauge of the receiving tank at the completion of the delivery.

   HAZARD: Exceeding the maximum volume fill density of 95% creates a release hazard. The pressure relief valve is likely to open.

5. Determine whether the product transfer is to be accomplished by using a liquid pump on the cargo tank trailer or by using compressed air supplied by the customer.

6. If the cargo tank trailer pump is to be utilized, follow the procedure outlined in steps 7 through 12 below. If customer compressed air is to be used, follow the procedure outlined in steps 13 through 17 below.

Pump Unloading

7. Remove the liquid delivery hose from its rack or storage area. Remove protective line caps and attach one end of the empty hose to the cargo tank liquid pump discharge connection and the other end to the receiving storage tank fill connection. (Be sure to install the bleeder connection in the liquid line) Connect the vapor hose from the top of the cargo tank and the other end to the receiving storage tank vapor equalizing connection. (Use Velcro straps to secure cam-lock levers on both ends of liquid and vapor hoses.)

   NOTE: All connections must be securely tightened. Avoid sharp bends in hose.

8. Slightly open the liquid delivery line valve on the receiving storage tank. Open fully if no leaks are evident. Open the liquid delivery line valve on the cargo tank. Slightly open the vapor equalizing line valve on the receiving storage tank. Then open fully if no leaks are evident. Open the vapor equalizing line valve on the cargo tank. Open any additional valves in the pump transfer system to allow an unrestricted flow from the bottom of the cargo tank to the delivery opening of the receiving storage tank.

   HAZARD: Opening valves quickly does not allow operator to shut off valves rapidly if necessary.

9. Slowly place the pump into operation, checking liquid delivery line connections for signs of any product leakage. If there is any such leakage, stop the pump and remedy the situation by tightening the connection.

10. Check the cargo tank and receiving storage tank level indicators frequently during unloading to avoid overfilling. The operator must remain in constant attendance.

    NOTE: some cargo tanks are equipped with a Base Remote Emergency Shutdown device which can be activated by the operator in case of emergency stopping the flow of ammonia from the cargo tank.

    HAZARD: Exceeding the maximum volume fill density of 95% creates a release hazard. The pressure relief valve is likely to open.

11. When the cargo tank is empty, shut down pump and close liquid valve on cargo tank. Open air valve and blow any residual liquid in hose back to storage tank. Close air valve and liquid valve on cargo tank.

12. Close liquid and vapor valves on storage tank. Slowly open drain valves on liquid and vapor lines to relieve any pressure. Drains should be directed onto a 5 gallon bucket or other suitable container. Slowly disconnect liquid and vapor hose connections between cargo tank and storage tank. Return hoses to rack or storage area.

Air Pressure Unloading

13. Remove the liquid delivery hose from its rack or storage area. Remove protective line caps and attach one end of the empty hose to the cargo tank liquid outlet connection and the other end to the receiving storage tank fill connection. (Be sure to install the bleeder connection in the liquid line) Remove the customer's air pressure hose from its rack or storage area. Remove protective line caps and attach one end of the air hose to the air supply connection and the other end to the connection accessing the top of the cargo tank. (Use Velcro straps to secure cam-lock levers on both ends of liquid and vapor hoses.)

    NOTE: All connections must be securely tightened. *Avoid sharp bends in hose.*

14. Slightly open the liquid delivery line valve on the receiving storage tank. Open fully if no leaks are evident. Open the liquid delivery line valve on the cargo tank. Slightly open air supply line valve. Open fully if no leaks are evident. Open the cargo tank connection valve accessing the top of the cargo tank.

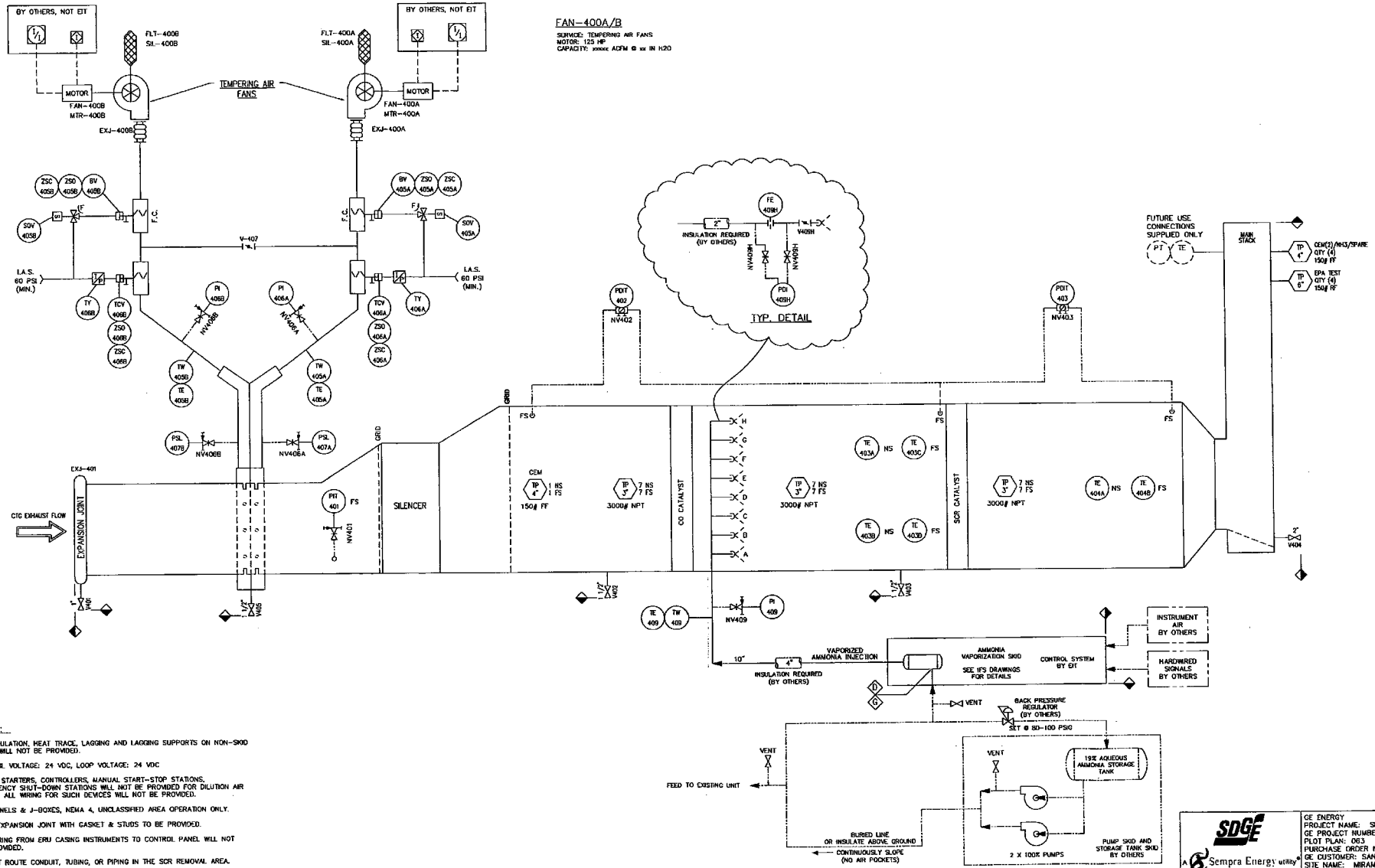
15. Check the cargo tank and receiving storage tank level indicators frequently during unloading to avoid overfilling.

    NOTE: The operator must remain in constant attendance.

    HAZARD: Exceeding the maximum volume fill density of 95% creates a release hazard. The pressure relief valve is likely to open. *Exceeding the max. Cargo tank pressure of 30 psig will cause relief valve venting*

16. When the cargo tank is empty, close the liquid connection valve on the customer's storage tank. Then close the air supply line connection valves and disconnect the air hose.

If a connection to introduce air into the liquid fill line upstream of the storage tank liquid valve is available, attach the air line and open its valve to blowback any possible residual liquid in the fill hose into the cargo tank. Continue the blowback process for two minutes. Close cargo tank liquid valve and then the air supply valve. Carefully vent the hose prior to disconnecting.



FAN-400A/B

SERVICE: TEMPERING AIR FANS
MOTOR: 125 HP
CAPACITY: xxxxx ACFM @ xx IN H2O

NOTES:

1. ALL INSULATION, HEAT TRACE, LAGGING AND LAGGING SUPPORTS ON NON-SKID ITEMS WILL NOT BE PROVIDED.
2. CONTROL VOLTAGE: 24 VDC, LOOP VOLTAGE: 24 VDC
3. MOTOR STARTERS, CONTROLLERS, MANUAL START-STOP STATIONS, EMERGENCY SHUT-DOWN STATIONS WILL NOT BE PROVIDED FOR DILUTION AIR FANS. ALL WIRING FOR SUCH DEVICES WILL NOT BE PROVIDED.
4. ALL PANELS & J-BOXES, NEMA 4, UNCLASSIFIED AREA OPERATION ONLY.
5. INLET EXPANSION JOINT WITH GASKET & STUDS TO BE PROVIDED.
6. ALL WIRING FROM ERU CASING INSTRUMENTS TO CONTROL PANEL WILL NOT BE PROVIDED.
7. DO NOT ROUTE CONDUIT, TUBING, OR PIPING IN THE SCR REMOVAL AREA.

NO	DATE	BY	CHK'D	APP'D	DESCRIPTION	DWG NO	DESCRIPTION
						0020	P&ID

REVISIONS — REFERENCE DRAWINGS

Express Integrated Technologies

SDGE — A Sempra Energy utility

GE ENERGY
PROJECT NAME: SDG&E MEF II
GE PROJECT NUMBER: 20211
PLOT PLAN: 063
PURCHASE ORDER NUMBER: 411505695
GE CUSTOMER: SAN DIEGO GAS AND ELECTRIC
SITE NAME: MIRAMAR ENERGY FACILITY II

THIS DRAWING IS THE PROPERTY OF AND INTENDED ONLY FOR THE PRIVATE USE OF EXPRESS INTEGRATED TECHNOLOGIES L.L.C. AND MAY NOT BE COPIED OR USED IN WHOLE OR IN PART FOR ANY REASON WITHOUT PRIOR WRITTEN CONSENT.

DRAWN: JPS
DATE: 4.27.07
SCALE: NONE
CHK'D: BLP
APP'D: BEL

EMISSIONS REDUCTION UNIT - GAS SIDE P&ID

JOB NO	PC	DRAWING NO	REV
07025	2	0021	A

South Coast Air Quality Management District

Form 400-A

Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit:
Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator):
Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim — CA, — 92806
City — State — Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim — CA, — 92805
City — State — Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY):
09/01/2009

8. Description of Equipment:
One 750 kW Black Start Diesel Generator

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 0

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location?
Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)?
221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title:
Integrated Resources Mgr.

19. Print Name:
Steve Sciortino

20. Date:
9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

FORM 400-E-13a

Emergency Internal Combustion Engine

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765
Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Street location where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, California 92806 (• Fixed ○ Various)

Section A: EQUIPMENT INFORMATION

Internal Combustion Engine	Manufacturer: Caterpillar	Model No.: CAT C27 ATAAC 750ekW
	Serial No.: MJE00001 or equivalent	Date of Manufacture: (mm/dd/yyyy)
	Manufacturer Maximum Rating: 1141 BHP @ 1800 RPM	Date of Installation: (mm/dd/yyyy)
		For an ICE manufactured after 7/18/94, please provide manufacturer's specification and guarantee.

ICE Emergency Function: • Electrical Generator ○ Fire Pump ○ Flood Control ○ Pump Driver ○ Compressor

Type: • Fixed site ○ Portable — How Is This Type of Equipment Used? (Check All That Apply) ☒ Within Facility ☐ Off- Site ☐ Rental

Fuel: • Diesel Oil No. 2 ○ LPG ○ Natural Gas ○ Other:

Cycle Type: ○ Two Cycle • Four Cycle

Combustion Type: • Lean Burn ○ Rich Burn

No. of Cylinders: ○ Four ○ Six ○ Eight ○ Ten • Twelve ○ Sixteen ○ Other

Aspiration Type: ○ Turbocharged • Turbocharged/Aftercooled ○ Naturally Aspirated ☐ Timing Retarded ≥ 4° (relative to standard timing)

Air Pollution Control (if applicable):

○ Selective Catalytic Reduction (SCR)* • No Controls
○ Selective Non-catalytic Reduction (SNCR)* ○ Air Fuel Ratio Controller
○ Non-selective Catalytic Reduction (NSCR) ○ Other (specify)

* Separate application is required.

Manufacturer: Model No.:

If already permitted, indicate Permit No. Device No.

Section B: OPERATION INFORMATION

Fuel Consumption: Maximum Rated load: 53.500 gal./hr. OR cu. ft./hr Average Load: 21.100 gal./hr. OR cu. ft./hr.

Operating Schedule:

Normal: hours/day days/week weeks/yr.

Maximum: hours/day days/week weeks/yr.

Testing & Maintenance (Emergency ICE only): 200 hours/year

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:
(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Engine Data

(1) Select year of manufacture and rated horsepower.

(2) Provide actual emission figures from manufacturing specifications (if available) for the Rated Power selected. If engine fuel is LPG or Natural Gas, select Spark Ignition.

(3) The compression ignited diesel fuel internal combustion engine (ICE's) must meet the State of California or EPA's Non-Road Emission Standards as listed below (please provide manufacturer's specification and guarantee.

	Rated Power	Year	Figures	Carbon Monoxide (grams/bhp-hr)	Hydrocarbons (grams/bhp-hr)	Oxides of Nitrogen (grams/bhp-hr)	Particulate Matter (grams/bhp-hr)
Compressor Ignition							
	50 – 750 H.P.						
○	50 - 100 H.P.		BACT	8.5	1.0	6.9	0.38
			Actual				
○	100 - 175 H.P.		BACT	8.5	1.0	6.9	0.38
			Actual				
○	175 - 750 H.P.		BACT	2.6	1.0	3.8	0.15
			Actual				
	751 and greater H.P						
◉		2000 and	BACT	8.5	1.0	6.9	0.38
			Actual	2.301	0.020	4.794	0.020

		Figures	VOC	NOx	CO
Spark Ignition		For natural gas fired or LPG. The ICE must meet the requirements for BACT as listed below.			
	○	BACT	1.5 grams/bhp-hr	1.5 grams/bhp-hr	2.0 grams/bhp-hr
		Actual			

Section C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	
	Sen. AQ Consultant	
CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	**CONTACT PERSON'S TELEPHONE NUMBER**	**DATE SIGNED:**
John Lague	(619) 243-2823	09/05/08

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South Coast Air Quality Management District

FORM 400-E-13A

Emergency ICE Attachment A

Official Use Only

Engr. Ini.	
A/N	
Appln Date:	
Class	

Data Input

Applicant	Canyon Power Plant	**ID**	
Mailing Address	201 South Anaheim Blvd, Suite 802 Anaheim, CA 92805		
Equipment Location	3071 East Miraloma Ave., Anaheim, California 92806	**Equipment Type**	Fixed site

Equipment Description		
	Manufacturer:	Caterpillar
	Model No:	CAT C27 ATAAC 750ekW
	Serial No.:	MJE00001 or equivalent
	Manufacturer Date:	
	Installation Date:	
	Cylinders:	Twelve
	HP Rating:	1141.000

Aspiration Type	**Turbocharged**	**Turbocharged/Aftercooled**	**Naturally Aspirated**
	0	X	0
	Turbocharged/Aftercooled		

Driving (ICE Emergency Function)	**Generator**	**Compressor**	**Pump**
	X	0	0
	Electrical Generator		

Emission Factors, g/HP-hr	**VOC**	**NOx**	**CO**	**PM**
	0.020	4.794	2.301	0.020
	(Note: Emission factors taken from engine manufacturer specs included with application			

Retard Timing	**Yes**	**No**

Operating Schedule				
	Hrs/Day Max.		**Hrs/Month Max**	
	Hrs/Day Ave.	1	**Wks/Yr**	1
	Days/Wk.	1		
	Days/Mo	4		

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South Coast Air Quality Management District

FORM 400-E-13A

Emergency ICE Attachment A

Official Use Only

A/N:	

Given

HP	1141.000						
G to lb conversion factor	0.0022046						
Operating Schedule	Hrs/Day Max.						
	Hrs/Day Avg.	1					
	Days/Wk.	1					
	Days.Mo.	4					
	Hrs/Month Max.						
	Wks/Yr.	1					
Emission Factors	VOC	NOx	SOx	CO	PM	PM10	
	0.020	4.794	0.160	2.301	0.020	0.144	
Retard Timing	Yes	No					
Emission Correction Factor	VOC	NOx	SOx	CO	PM	PM10	
	1.000		1.000		1.000	1.000	

Computations

	VOC	NOx	SOx	CO	PM	PM10
Emission factor, g/HP-hr	0.746		0.160		0.150	0.144
lb/hr.	1.877		0.402		0.377	0.362
lb/day Max.						
lb/day Avg.						
lb/yr.						

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT *ENGINEERING AND COMPLIANCE* APPLICATION PROCESSING AND CALCULATIONS	PAGE	1 of 3	**For Official Use Only**
	CHECKED BY:		
	A/N:		
	PROCESSED BY:		
	DATE:		

Applicant's Name: Canyon Power Plant ID:

Equipment Location: 3071 East Miraloma Ave., Anaheim, California 92806

Equipment Description:

EQUIPMENT:	INTERNAL COMBUSTION ENGINE
MANUFACTURER:	Caterpillar
MODEL NO.:	CAT C27 ATAAC 750ekW
FUELED WITH:	Diesel Oil No. 2
DRIVING:	Engine Generator
SERIAL NO.:	MJE00001 or equivalent
CYLINDERS:	Twelve
ASPIRATION:	Turbocharged/Aftercooled
HP RATING:	1141.000

Permit Description:

INTERNAL COMBUSTION ENGINE, Fixed site, Caterpillar, MODEL NO. CAT C27 ATAAC 750ekW, SERIAL NO. MJE00001 or equivalent, Diesel Oil No. 2 FUELED, Four CYCLES, Twelve CYLINDERS, Turbocharged/Aftercooled, RATED AT 1141 B.H.P., DRIVING AN EMERGENCY Engine Generator.

CALCULATIONS
See ATTACHMENT A

EVALUATION:

Rule 212: (Not Applicable if more than 1,000 feet from a school.)

This is a not significant project as defined by this rule. Hence, public notice is not required.

Rule 401:

Based on experience with similar equipment, this engine is expected to comply with the visible emission limits.

Rule 402:

Based on experience with similar equipment, nuisance complaints are not expected.

Rule 404:

Based on experience with similar equipment, compliance with this rule is expected.

Rule 431.2:

Diesel fuel supplied to this equipment must contain 0.05% or less sulfur by weight. Compliance is expected.

Rule 1110.2:

Exempt per Rule 1110.2 (i)(2) and (i)(10).

REGULATION XIII:

Exempt per Rule 1301 (b)(3).

REGULATION XIV:

Exempt per Rule 1401 (g)(1)(F).

CARB-EPA Emission Limits for Nonroad Compression-Ignited Engines:

For engine manufacture date on or after and engine rating between 751 and greater H.P. , the following emission limits apply:

	NOx	ROG	CO	PM
Required	6.9	1	8.5	0.4
Actual	4.794	0.020	2.301	0.020
Compliance	Yes	Yes	Yes	Yes

CONDITIONS

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITIONS AT ALL TIMES.

3. SULFUR CONTENT OF DIESEL FUEL SUPPLIED TO THE ENGINE SHALL NOT EXCEED 0.05% BY WEIGHT.

4. THIS ENGINE SHALL NOT OPERATE MORE THAN 200 HOURS IN ANY ONE YEAR.

5. THIS ENGINE SHALL NOT OPERATE MORE THAN 50 HOURS IN ANY ONE YEAR FOR MAINTENANCE AND TESTING PURPOSES.

6. AN OPERATIONAL NON-RESETTABLE TOTALIZING TIME METER SHALL BE INSTALLED AND MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.

7. AN ENGINE OPERATING LOG LISTING THE DATE OF OPERATION AND THE ELAPSED TIME, IN HOURS, AND THE REASON FOR OPERATION SHALL BE KEPT AND MAINTAINED ON FILE FOR A MINIMUM OF TWO YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

8. IN ADDITION TO MAINTENANCE AND TESTING OF THIS ENGINE, THIS ENGINE SHALL ONLY BE USED FOR EITHER PROVIDING ELECTRICAL POWER TO PORTABLE OPERATIONS OR EMERGENCY POWER TO STATIONARY SOURCES. PORTABLE OPERATIONS ARE THOSE WHERE IT CAN BE DEMONSTRATED THAT BECAUSE OF THE NATURE OF THE OPERATION. IT IS NECESSARY TO PERIODICALLY MOVE THE EQUIPMENT FROM ONE LOCATION TO ANOTHER. EMERGENCIES AT STATIONARY SOURCES ARE THOSE THAT RESULT IN AN INTERRUPTION OF SERVICE OF THE PRIMARY POWER SUPPLY OR DURING STAGE II OR III ELECTRICAL EMERGENCIES DECLARED BY THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR.

9. UPON THE FIFTH DAY AFTER PLACEMENT OF THIS EQUIPMENT INTO OPERATION AT A NEW SITE, THE DISTRICT SHALL BE NOTIFIED VIA TELEPHONE AT 1-877-810-6995 OF THE EXACT NATURE OF THE PROJECT AS FOLLOWS:

   A. THE PERMIT NUMBER OF THE PORTABLE EQUIPMENT.

   B. THE NAME AND TELEPHONE NUMBER OF A CONTACT PERSON.

   C. THE LOCATION WHERE THE PORTABLE EQUIPMENT WILL BE OPERATED.

   D. THE ESTIMATED TIME THE PORTABLE EQUIPMENT WILL BE LOCATED AT THE SITE.

   E. DESCRIPTION OF THE PROJECT.

   F. IF LESS THAN 1/4 MILE, THE DISTANCE TO THE NEAREST SENSITIVE RECEPTOR. SENSITIVE RECEPTORS ARE DEFINED AS LONG-TERM HEALTH CARE FACILITIES, REHABILITATION CENTERS, CONVALESCENT CENTERS, RETIREMENT HOMES, RESIDENCES, SCHOOLS, PLAYGROUNDS, CHILD CARE CENTERS, AND ATHLETIC FACILITIES.

10. THIS ENGINE AND ITS REPLACEMENT UNIT INTENDED TO PERFORM THE SAME OR SIMILAR FUNCTION, SHALL NOT RESIDE AT ANY ONE LOCATION FOR MORE THAN 12 CONSECUTIVE MONTHS. THE PERIOD DURING WHICH THE ENGINE AND ITS REPLACEMENT IS MAINTAINED AT A STORAGE FACILITY SHALL BE EXCLUDED FROM RESIDENCY TIME DETERMINATION.

11. THIS ENGINE SHALL NOT BE REMOVED FROM ONE LOCATION FOR A PERIOD OF TIME, AND THEN IT OR ITS EQUIVALENT ENGINE RETURNED TO THE SAME LOCATION, IN ORDER TO CIRCUMVENT THE PORTABLE ENGINE RESIDENCE TIME REQUIREMENTS.

South Coast Air Quality Management District

FORM 400-PS
PLOT PLAN AND STACK INFORMATION FORM

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A and Form 400-CEQA

Permit to be issued to (Business name of operator to appear on permit):

Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):

3071 East Miraloma Ave., Anaheim, California 92806 — (•) Fixed Location ( ) Various Locations

SECTION A: LOCATION DATA

Plot Plan

Please attach a site map for the project. Identify and locate the proposed equipment on the property. A copy of the appropriate Thomas Brothers page that shows the location, or a drawing or sketch that show the major street and identifies the location of the equipment is acceptable.

Location of School Nearby

Is the facility located within a 1/4 mile radius (1,320 feet) of the outer boundary of a school?

( ) Yes (•) No. If yes, please provide name(s) of school(s) below.

School Name	School Address	Distance from stack or equipment vent to the outer boundary of the school.

Note: Per Section 42301.9 of the California Health and Safety Code, a "school" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in

Population Density

(•) Urban (area of dense population) ( ) Rural (area of sparse population)

Zoning Classification

( ) Mixed Use Residential Commercial Zone (M-U) ( ) Service and Professional Zone (C-S) ( ) Medium Commercial (C-3)
( ) Heavy Commercial (C-4) (•) Commercial Manufacturing (C-M)

SECTION B: EMISSION RELEASE PARAMETERS -STACKS, VENTS

Stack Data

Stack Height: 20.00 feet (height above ground level)* What is the height of the closest building nearest the stack ? 17.00 feet

Stack Inside Diameter: 10.000 inches Stack Flow: 5646.3 acfm Stack Temperature: 949.80 °F

Rain Cap Present: ( ) Yes (•) No Stack Orientation: (•) Vertical ( ) Horizontal

* If the stack height is less than 2.5 times the closest building height (H), please provide information on any building within 5xH distance from the stack(attach additional sheet if necessary

Building #/name:	Building #/name:
(see attachment)	
Building Height: feet	Building Height: feet
Building Width: feet	Building Width: feet
Building Length: feet	Building Length: feet

Receptor Distance from equipment stack or roof vents/openings

Distance to nearest residence 887.00 feet or 270.36 meters | Distance to nearest business 61.00 feet or 18.59 meters

Building Information

Are the emissions released from vents and/or openings from the building? ( ) Yes (•) No
If yes, please provide:

Building height above ground level: ft.	Building dimensions: length ft. or width ft.	Total square footage of building where the source of the emissions is located.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	09-09-08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Canyon Power Plant

AQMD Form 400-PS Attachment

Building data for buildings near SCR Exhaust Stacks:

Building Name	**Height***	**Width***	**Length***
CTG-SCR 1	34	27	135
CTG-SCR 2	34	27	135
CTG-SCR 3	34	27	135
CTG-SCR 4	34	27	135
4-cell Chiller Cooling Tower	38.5	52.7	43.3
Water Treatment System With Sun Shade Roof	21.5	52.7	60.7
Black Start Diesel Generator	10	20.0	7.9
Main Electrical Equipment Enclosure (EEE)	17	31.3	71.3
Plant Operation Building And Warehouse	36.73	155.1	68.3
DI Water Storage Tank	36.7	Dia-34	
Raw Water Storage Tank	43.5	Dia-40	

*All dimensions given are in feet.

South Coast Air Quality Management District

Form 400-A
Application For Permit To Construct and Permit To Operate

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

Section A: Operator Information

1. Business Name of Operator To Appear On The Permit: Canyon Power Plant

2. Valid AQMD Facility ID (Available on Permit or Invoice issued by AQMD):

3. Owner's Business Name (only if different from Business Name of Operator): Southern California Public Power Authority

Section B: Equipment Location

4. Equipment Location Address:
For equipment operated at various locations in AQMD's jurisdiction, provide address of initial site

3071 East Miraloma Ave.
Street Address

Anaheim, CA, 92806
City State Zip Code

County: ○ Los Angeles ◉ Orange ○ San Bernardino ○ Riverside

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section C: Permit Mailing Address

5. Permit and Correspondence Information:
☐ Check here if same as equipment location address

201 South Anaheim Blvd, Suite 802
Street Address

Anaheim, CA, 92805
City State Zip Code

Contact Name: Steve Sciortino

Contact Title: Integrated Resources Manager Phone: (714) 765-5177

Fax: (714) 765-4140 E-Mail: SSciortino@anaheim.net

Section D: Application Type

The facility is in ○ RECLAIM ○ Title V ◉ RECLAIM & Title V Program (please check if applicable)

6. Reason for Submitting Application (Select only ONE):

- ◉ New Construction (Permit to Construct)
- ○ Equipment Operating Without A Permit or Expired Permit*
- ○ Administrative Change
- ○ Equipment On-Site But Not Constructed or Operational
- ○ Title V Application (Initial, Revisions, Modifications, etc.)
- ○ Compliance Plan
- ○ Facility Permit Amendment
- ○ Registration/Certification
- ○ Streamlined Standard Permit
- ○ Permitted Equipment Altered/ Modified Without Permit Approval*
- ○ Proposed Alteration/Modification to Permitted Equipment
- ○ Change of Condition For Permit To Operate
- ○ Change of Condition For Permit To Construct
- ○ Change of Location—Moving to New Site

Existing Or Previous Permit/Application Number:
(If you checked any of the items in this column, you MUST provide a existing Permit/ Application Number)

* A Higher Permit Processing Fee applies to those items with an asterisk (Rule 301 (c) (1) (D)

7. Estimated Start Date of Operation/Construction (MM/DD/YYYY): 09/01/2009

8. Description of Equipment:
One oil water separator for collection of water captured within bermed equipment.

9. Is this equipment portable AND will it be operated at different locations within AQMD's jurisdiction? ◉ No ○ Yes

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each) 0

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less, or a not-for-profit training center?) ◉ No ○ Yes

12. Has a Notice of Violation (NOV) or a Notice To Comply (NC) been issued for this equipment?
◉ No ○ Yes If yes, provide NOV/NC #:

Section E: Facility Business Information

13. What type of business is being conducted at this equipment location? Power generation

14. What is your businesses primary NAICS Code (North American Industrial Classification System)? 221112

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ○ No ◉ Yes

16. Are there any schools (K-12) within a 1000-ft. radius of the equipment physical location? ◉ No ○ Yes

Section F: Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

17. Signature of Responsible Official:

18. Title: Integrated Resources Mgr.

19. Print Name: Steve Sciortino

20. Date: 9/10/08

Check List

- ☒ Form(s) signed and dated by authorized official
- ☒ Supplemental Equipment Form (400-E-XX or 400-E-GEN)
- ☒ CEQA Form (400-CEQA) attached
- ☒ Payment for permit processing fee attached

Your application will be rejected if any of the above items are missing.

AQMD USE ONLY	APPLICATION/TRACKING #	TYPE B C D	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $	VALIDATION
ENG. A R DATE	ENG. A R DATE	CLASS I III IV	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	Tracking #

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South Coast Air Quality Management District

Form 400-CEQA

California Environmental Quality Act (CEQA) Applicability

Mail Application To:
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385

www.aqmd.gov

The SCAQMD is required by state law, the California Environmental Quality Act (CEQA), to review discretionary permit project applications for potential air quality and other environmental impacts. This form is a screening tool to assist the SCAQMD in clarifying whether or not the project[1] has the potential to generate significant adverse environmental impacts that might require preparation of a CEQA document [CEQA Guidelines §15060(a)].[2] Refer to the attached instructions for guidance in completing this form.[3] For each Form 400-A application, also complete and submit one Form 400-CEQA. If submitting multiple Form 400-A applications for the same project at the same time, only one 400-CEQA form is necessary for the entire project. If you need assistance completing this form, contact Lori Inga at (909) 396-3109.

FACILITY INFORMATION

Business Name of Operator to Appear on the Permit:	Facility ID (6-Digit):
Canyon Power Plant	

Project Description:

One oil water separator for collection of water captured within bermed equipment.

REVIEW FOR EXEMPTION FROM FURTHER CEQA ACTION

Check "Yes" or "No" as applicable

	Yes	No	Is this application for:
A.	◉	○	**A CEQA and/or NEPA document previously or currently prepared that specifically evaluates this project?** If yes, a permit cannot be issued until a Final CEQA document and Notice of Determination is submitted.
B.	○	◉	**A request for a change of permittee only (without equipment modifications)?**
C.	○	◉	**Equipment certification or equipment registration** (qualifies for Rule 222)?
D.	○	◉	**A functionally identical permit unit replacement with no increase in rating or emissions?**
E.	○	◉	**A change of daily VOC permit limit to a monthly VOC permit limit?**
F.	○	◉	**Equipment damaged as a result of a disaster during state of emergency?**
G.	○	◉	**A Title V** (i.e., Regulation XXX) **permit renewal (without equipment modifications)?**
H.	○	◉	**A Title V administrative permit revision?**
I.	○	◉	**The conversion of an existing permit into an initial Title V permit?**

If "Yes" is checked for any question above, your application does not require additional evaluation for CEQA applicability. Skip to page 2, "SIGNATURES" and sign and date this form.

REVIEW OF IMPACTS WHICH MAY TRIGGER CEQA

Complete Sections I-VI by checking "Yes" or "No" as applicable. To avoid delays in processing your application(s), explain all "Yes" responses on a separate sheet and attach it to this form.

	Yes	No	Section I – General
1.	○	◉	**Has this project generated any known public controversy regarding potential adverse impacts that may be generated by the project?** Controversy may be construed as concerns raised by local groups at public meetings; adverse media attention such as negative articles in newspapers or other periodical publications, local news programs, environmental justice issues, etc.
2.	◉	○	**Is this project part of a larger project?**
			Section II – Air Quality
3.	○	◉	**Will there be any demolition, excavating, and/or grading construction activities that encompass an area exceeding 20,000 square feet?**
4.	○	◉	**Does this project include the open outdoor storage of dry bulk solid materials that could generate dust?** If Yes, include a plot plan with the application package.

[1] A "project" means the whole of an action which has a potential for resulting in physical change to the environment, including construction activities, clearing or grading of land, improvements to existing structures, and activities or equipment involving the issuance of a permit. For example, a project might include installation of a new, or modification of an existing internal combustion engine, dry-cleaning facility, boiler, gas turbine, spray coating booth, solvent cleaning tank, etc.

[2] To download the CEQA guidelines, visit http://ceres.ca.gov/env_law/state.html.

[3] To download this form and the instructions, visit http://www.aqmd.gov/ceqa or http://www.aqmd.gov/permit

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	Yes	No	
5.	○	◉	**Would this project result in noticeable off-site odors from activities that may not be subject to SCAQMD permit requirements?** For example, compost materials or other types of greenwaste (i.e., lawn clippings, tree trimmings, etc.) have the potential to generate odor complaints subject to Rule 402 – Nuisance.
6.	○	◉	**Does this project cause an increase of emissions from marine vessels, trains and/or airplanes?**
7.	○	◉	**Will the proposed project increase the QUANTITY of hazardous materials stored aboveground onsite or transported by mobile vehicle to or from the site by greater than or equal to the amounts associated with each compound on the attached Table 1?[4]**
			Section II – Water Resources
8.	○	◉	**Will the project increase demand for water at the facility by more than 5,000,000 gallons per day?** The following examples identify some, but not all, types of projects that may result in a "yes" answer to this question: 1) projects that generate steam; 2) projects that use water as part of the air pollution control equipment; 3) projects that require water as part of the production process; 4) projects that require new or expansion of existing sewage treatment facilities; 5) projects where water demand exceeds the capacity of the local water purveyor to supply sufficient water for the project; and 6) projects that require new or expansion of existing water supply facilities.
9.	○	◉	**Will the project require construction of new water conveyance infrastructure?** Examples of such projects are when water demands exceed the capacity of the local water purveyor to supply sufficient water for the project, or require new or modified sewage treatment facilities such that the project requires new water lines, sewage lines, sewage hook-ups, etc.
			Section IV – Transportation/Circulation
10.			**Will the project result in** (Check all that apply):
	○	◉	**a. the need for more than 350 new employees?**
	○	◉	**b. an increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round-trips per day?**
	○	◉	**c. increase customer traffic by more than 700 visits per day?**
			Section V – Noise
11.	○	◉	**Will the project include equipment that will generate noise GREATER THAN 90 decibels (dB) at the property line?**
			Section VI – Public Services
12.			**Will the project create a permanent need for new or additional public services in any of the following areas** (Check all that apply):
	○	◉	**a. Solid waste disposal?** Check "No" if the projected potential amount of wastes generated by the project is less than five tons per day.
	○	◉	**b. Hazardous waste disposal?** Check "No" if the projected potential amount of hazardous wastes generated by the project is less than 42 cubic yards per day (or equivalent in pounds).

REMINDER: For each "Yes" checked in the Sections above, attach all pertinent information including but not limited to estimated quantities, volumes, weights, etc.

SIGNATURES

I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. I UNDERSTAND THAT THIS FORM IS A SCREENING TOOL AND THAT THE SCAQMD RESERVES THE RIGHT TO CONSIDER OTHER PERTINENT INFORMATION IN DETERMINING CEQA APPLICABILITY.

SIGNATURE OF RESPONSIBLE OFFICIAL OF FIRM:	TITLE OF RESPONSIBLE OFFICIAL OF FIRM:	
	Integrated Resources Manager	
TYPE OR PRINT NAME OF RESPONSIBLE OFFICIAL OF FIRM: Steve Sciortino	RESPONSIBLE OFFICIAL'S TELEPHONE NUMBER: (714) 765-5177	DATE Signed: 9/10/08
SIGNATURE OF PREPARER, IF PREPARED BY PERSON OTHER THAN RESPONSIBLE OFFICIAL OF FIRM:	TITLE OF PREPARER: Senior AQ Consultant	
TYPE OR PRINT NAME OF PREPARER: John Lague	PREPARER'S TELEPHONE NUMBER: (619) 2432-823	DATE Signed: 04/01/08

THIS CONCLUDES FORM 400-CEQA. INCLUDE THIS FORM AND THE ATTACHMENTS WITH FORM 400-A.

[4] Table 1 – Regulated Substances List and Threshold Quantities for Accidental Release Prevention can be found in the Instructions for Form 400-CEQA.

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Form 400-CEQA
Additional Information on each Items for which a "yes" answer was entered

2. The oil water separator will be installed as part of the Canyon Power Plant, for which an application for Permit to Construct has already been submitted to SCAQMD (AQMD ID# 153992). The California Energy Commission licensing process constitutes the CEQA review for this entire project.

South Coast Air Quality Management District

FORM 400-E-18
STORAGE TANK

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A, Form CEQA, Plot Plan and Stack Form

Permit to be issued to (Business name of operator to appear on permit):
Canyon Power Plant

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
3071 East Miraloma Ave., Anaheim, California 92806 ◉ Fixed Location ○ Various Locations

Tank Type (Select ONE): ○ External Floating Roof Tank (EFRT) ○ Internal Floating Roof Tank (IFRT) ◉ Horizontal Tank (HT) ○ Vertical Fixed Roof Tank (VFRT) ○ Domed External Roof Tank (DEFRT)

Identification: Tank Identification Number: ____ Tank Contents/Product (include MSDS): water with some emulsified oil

SECTION A: TANK INFORMATION

Physical Characteristics

Tank Characteristics

Shell Diameter (ft): 3.50 | Shell Length (ft): 7.75 | Shell Height (ft): 0.00 | TurnoversPer Year: 100

Is Tank Heated? ○ Yes ◉ No | Is Tank Underground? ◉ Yes ○ No | Net Throughput (gal/year): 55000.000 | Self Support Roof ◉ Yes ○ No

Number of Columns? ____ Effective Column Diameter: ○ 9" by 7" Built Up Column – 1.1 ○ 8" Diameter Pipe – 0.7 ○ Unknown – 1

External Shell Condition:	Internal Shell Color:	External Shell Color:	
◉ Good	○ Light Rust	○ White/White	○ Gray/Light
○ Poor	○ Dense Rust	○ Aluminum/Specular	○ Gray/Medium
	○ Gunite Lining	○ Aluminum/Diffuse	○ Red/Primer

Average LiquidHeight (ft): (VERT Only) ____ | Maximum LiquidHeight (ft): (VERT Only) ____ | Working Volume (gal): (VERT Only) ____

Paint Condition:	Paint Color/Shade:		
◉ Good	○ White/White	○ Gray/Light	○ Gray/Medium
○ Poor	○ Aluminum/Diffuse	○ Aluminum/Specular	○ Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ○ Pontoon ○ Dome Roof (Height____ft.) ○ Double Deck ○ Cone Roof (Height____ft.) | Roof Fitting Category: ○ Typical ○ Detail | Roof Height: ____

Roof Paint Condition	Roof Color/Shade		
○ Good	○ White/White	○ Gray/Light	○ Gray/Medium
○ Poor	○ Aluminum/Diffuse	○ Aluminum/Specular	○ Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: ○ Welded ○ Bolted | Deck Fitting Characteristics: ○ Typical ○ Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft):	Deck Seam:
○ Sheet	____	○ 5 ft. wide ○ 6 ft. wide ○ 7 ft. wide
○ Panel	____	○ 5 x 7.5 ft. ○ 5 x 12 ft.

Tank Construction and Rim-Seal System (Floating Roof Tank)

Tank Construction: ○ Welded ○ Riveted | Primary Seal: ○ Mechanical Shoe ○ Liquid Mounted ○ Vapor Mounted | Secondary Seal: ○ Rim Mounted ○ None ○ Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig): 0.000 | Pressure Setting (psig): 0.000

*Section C of the application MUST be completed.

SECTION A: TANK INFORMATION (Cont.)

Site Selection

Nearest Major City: Anaheim, Long Beach for TANK program inputs

Daily Average Ambient Temperature (°F): 65.00

Annual Average Minimum Temperature (°F): 54.00

Annual Average Maximum Temperature (°F): 76.00

Average Wind Speed (mph): 6.000

Annual Average Solar Insulation Factor (Btu/(ft² * ft * day)):

Tank Contents

Chemical Category
- (•) Organic Liquids ( ) Crude Oil
- ( ) Petroleum Distillates

Liquid
- ( ) Single
- (•) Multiple:

If Multiple, Select Speciation Option:
- ( ) Full Speciation ( ) Partial Speciation
- (•) Various Weight Speciation ( ) None

SECTION B: OPERATION INFORMATION

Vapor Control

Vapor Control During Loading or Unloading:
- [ ] Sparger [ ] Vapor Balance System [ ] Vapor Return Line
- [ ] Vented to Air Pollution Control Equipment[1]

[1]If yes, a separate permit is required. If APC equipment is already permitted, provide Permit or Device Number:

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discarging to (Check Appropriate Box) Atmosphere	Vapor Control	Flare
Combination				[ ]	[ ]	[ ]
Pressure				[ ]	[ ]	[ ]
Vaccum				[ ]	[ ]	[ ]
Open		0.000		[x]	[ ]	[ ]

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:
water with emulsified oils from various sources

If Material is stored in a solution, supply the following information:
Name of Solvent: water Name of Materials Dissolved: various oils

Concentration of Materials Dissolved: _____ % by Weight OR 10.00 % by Volume OR _____ lbs/gal

SECTION C: ROOF/DECK FITTING

Section C is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tank, or Domed External Floating Roof Tank.

Select the number of fittings for each applicable question. For Example: 3 Unbolted Cover, Ungasketed / Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)
   - _____ Bolted Cover, Gasketed
   - _____ Unbolted Cover, Ungasketed
   - _____ Unbolted Cover, Gasketed
2. Automatic Gauge Float Well (20" diameter well)
   - _____ Bolted Cover, Gasketed
   - _____ Unbolted Cover, Ungasketed
   - _____ Unbolted Cover, Gasketed
3. Column Well (24" diameter well)
   - _____ Built-Up Col – Sliding Cover, Gasketed
   - _____ Built-Up Col – Sliding Cover, Ungasketed
   - _____ Pipe Col – Flex. Fabric Sleeve Seal
   - _____ Pipe Col – Sliding Cover, Gasketed
   - _____ Pipe Col. – Sliding Cover, Ungasketed

Roof/Deck Fitting Details (Cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
- ____ Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
- ____ Sliding Cover, Gasketed
- ____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
- ____ Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
- ____ Open
- ____ 90% Close

8. Roof Leg (3" diameter leg)
- ____ Adjustable, Pontoon Area, Ungasketed
- ____ Adjustable, Center Area, Ungasketed
- ____ Adjustable, Double-Deck Roofs
- ____ Fixed
- ____ Adjustable, Pontoon Area, Gasketed
- ____ Adjustable, Pontoon Area, Sock
- ____ Adjustable, Center Area, Gasketed
- ____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
- ____ Adjustable
- ____ Fixed

10. Sample Pipe (24" diameter)
- ____ Slotted Pipe – Sliding Cover, Gasketed
- ____ Slotted Pipe – Sliding Cover, Ungasketed
- ____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
- ____ Ungasketed, Sliding Cover, Without Float
- ____ Ungasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, Without Float
- ____ Gasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, With Pole Sleeve
- ____ Gasketed Sliding Cover, With Pole Wiper
- ____ Gasketed Sliding Cover, With Float, Wiper
- ____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
- ____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. ____ Stub Drain (1" diameter)

13. Unslotted Guide – Pole Well
- ____ Ungasketed, Sliding Cover
- ____ Gasketed Sliding Cover
- ____ Ungasketed Sliding Cover with Sleeve
- ____ Gasketed Sliding Cover with Sleeve
- ____ Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
- ____ Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

SECTION D: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (619) 243-2823
	Sen. AQ Consultant	PREPARER'S E-MAIL ADDRESS: john_lague@urscorp.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Steve Sciortino	TELEPHONE NUMBER: (714) 765-5177	03/31/08
E-MAIL ADDRESS: SSciortino@anaheim.net	FAX NUMBER: (714) 765-4140	

CONFIDENTIAL INFORMATION

Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:

(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."

(b) Label the original page "confidential." Circle all confidential items on the page.

(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

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Estimation of Oil-Separator Emissions

The TANKS4.0 model was used to estimate maximum emissions from the Canyon Power Plant oil-water separator (OWS). The TANKS4.0 output file provided in this Attachment shows the input data provided to the program and the predicted ROG emissions output. The assumptions made regarding the quantity and nature of the materials assumed to appear in the OWS for purposes of these calculations are as follows:

1. All petroleum products entering the OWS are assumed to be in the form of diesel oil.
2. Water flow into the OWS is assumed to amount to 55,000 gallons per year, roughly the average annual rainfall on the combined areas of the power plant site that can be drained to the OWS, plus an additional quantity for equipment washing. A spreadsheet indicating the basis for this calculation is provided with this Attachment The bermed equipment areas from which water could be allowed into the OWS are limited to the aqueous ammonia storage tank with unloading apron, four generator step-up transformers, five compressors, two service transformers and two station transformers.
3. For emission purposes, the 550 gallon OWS vault is assumed to be full with up to 10% (55 gallons) of diesel oil.

These assumptions are extremely conservative, because only water verified by operator visual inspection to be free of any significant quantity of visible oil or other hazardous materials will be actually allowed to flow into the OWS by opening the valve to the separator, which will otherwise remain in the closed position. In the even an oily sheen or other evidence of contamination is observed, a hazardous waste contractor will be called in to remove this liquid for proper disposal.

Even with the highly conservative input assumptions, TANKS4.0 predicts that annual emissions of ROG will be no higher than 0.59 pounds per year. The program does not calculate emissions of specific ROG species. However, very conservative estimates of the emissions for toxic contaminants contained in diesel oil can be derived as follows.

A reasonable speciation of specific toxic compounds in diesel is provided below:

- n-Hexane (110-54-3) - 0.0001% by wt.
- Benzene (71-43-2) - 0.0008% by wt
- Toluene (108-88-3) - 0.032% by wt
- Ethylbenzene (100-41-4) - 0.013% by wt
- m-Xylene (1330-20-7) - 0.29% by wt

- 1,2,4-Trimethylbenzene - 1% by wt

Note that the above are weight percentages of the liquid diesel, which would not translate to percent weights for the vapor above the liquid surface. However, as a worst case, we can assume that the emitted ROG mass is composed *entirely* of the above volatiles, and calculate normalized percentage weight fractions for each compound, which can then be multiplied by 0.59 lb ROG/year to yield speciated annual emission totals, as shown in the following table. Clearly, even with such grossly conservative input assumptions, the calculated emissions will be very small for all species.

Assumed Speciation of 0.59 lb/year ROG Predicted for OWS by TANKS4.0

Chemical	CAS	% by WT	Normalized Weight	Emissions (lbs/yr)
n-Hexane	110-54-3	0.0001%	7.49E-05	4.42E-05
Benzene	71-43-2	0.0008%	5.99E-04	3.53E-04
Toluene	108-88-3	0.032%	2.40E-02	1.41E-02
Ethylbenzene	100-41-4	0.013%	9.73E-03	5.74E-03
m-Xylene	1330-20-7	0.29%	2.17E-01	1.28E-01
1,2,4-Trimethylbenzene		1.0%	7.49E-01	4.42E-01
		1.3359%	1	
Total ROGs: from Tanks 4.0	0.59	Lbs/year		

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	OWS
City:	Long Beach
State:	California
Company:	
Type of Tank:	Horizontal Tank
Description:	Oil water separator for general drainage at power plant

Tank Dimensions

Shell Length (ft):	7.75
Diameter (ft):	3.50
Volume (gallons):	550.00
Turnovers:	100.00
Net Throughput(gal/yr):	55,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

OWS - Horizontal Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Oily Water	Jan	60.03	60.03	60.03	63.31	0.0065	0.0065	0.0065	130.0000			188.00	
Distillate fuel oil no. 2						0.0065	0.0065	0.0065	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Feb	60.66	60.66	60.66	63.31	0.0067	0.0067	0.0067	130.0000			188.00	
Distillate fuel oil no. 2						0.0067	0.0067	0.0067	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Mar	61.19	61.19	61.19	63.31	0.0068	0.0068	0.0068	130.0000			188.00	
Distillate fuel oil no. 2						0.0068	0.0068	0.0068	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Apr	62.58	62.58	62.58	63.31	0.0071	0.0071	0.0071	130.0000			188.00	
Distillate fuel oil no. 2						0.0071	0.0071	0.0071	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	May	63.96	63.96	63.96	63.31	0.0075	0.0075	0.0075	130.0000			188.00	
Distillate fuel oil no. 2						0.0075	0.0075	0.0075	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Jun	65.55	65.55	65.55	63.31	0.0079	0.0079	0.0079	130.0000			188.00	
Distillate fuel oil no. 2						0.0079	0.0079	0.0079	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Jul	67.59	67.59	67.59	63.31	0.0084	0.0084	0.0084	130.0000			188.00	
Distillate fuel oil no. 2						0.0084	0.0084	0.0084	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Aug	68.19	68.19	68.19	63.31	0.0085	0.0085	0.0085	130.0000			188.00	
Distillate fuel oil no. 2						0.0085	0.0085	0.0085	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Sep	67.31	67.31	67.31	63.31	0.0083	0.0083	0.0083	130.0000			188.00	
Distillate fuel oil no. 2						0.0083	0.0083	0.0083	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Oct	65.42	65.42	65.42	63.31	0.0079	0.0079	0.0079	130.0000			188.00	
Distillate fuel oil no. 2						0.0079	0.0079	0.0079	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Nov	62.40	62.40	62.40	63.31	0.0071	0.0071	0.0071	130.0000			188.00	
Distillate fuel oil no. 2						0.0071	0.0071	0.0071	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Dec	60.09	60.09	60.09	63.31	0.0065	0.0065	0.0065	130.0000			188.00	
Distillate fuel oil no. 2						0.0065	0.0065	0.0065	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

OWS - Horizontal Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October
No Standing Losses: Underground Tank										
Working Losses (lb):	0.0431	0.0441	0.0450	0.0473	0.0496	0.0522	0.0556	0.0566	0.0551	0.0520
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0065	0.0067	0.0068	0.0071	0.0075	0.0079	0.0084	0.0085	0.0083	0.0079
Net Throughput (gal/mo.):	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333
Annual Turnovers:	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
Turnover Factor:	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667
Tank Diameter (ft):	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.0431	0.0441	0.0450	0.0473	0.0496	0.0522	0.0556	0.0566	0.0551	0.0520

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

OWS - Horizontal Tank
Long Beach, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Oily Water	0.59	0.00	0.59
Distillate fuel oil no. 2	0.59	0.00	0.59

GENERAL SPECIFICATIONS

NO. REQ'D: (1)
CAPACITY: 550 GALLONS
TYPE: HTC, HIGHGUARD, DOUBLE WALL
MATERIAL: MILD CARBON STEEL
FLOW RATE: 55 GPM

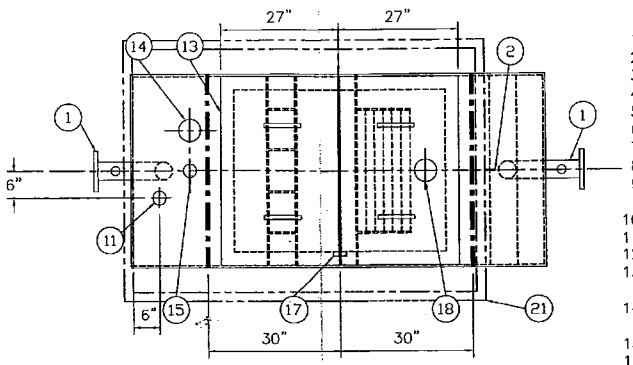
GAUGE:	INNER:	OUTER:
SHELL–	7GA	10 GA
HEADS–	7GA	10 GA

SURFACE PREP:
SSPC NO.6 BLAST ALL EXTERIOR SURFACES
SSPC NO.10 BLAST ALL INTERIOR SURFACES

COATING:	MATERIAL	THICKNESS
EXTERIOR–	POLYURETHANE	(70 MILS)
INTERIOR–	POLYURETHANE	(12–15 MILS)

OPERATING PRESSURE– ATMOSPHERIC
LABEL: U.L. 2215
OPERATING PRESSURE– ATMOSPHERIC
HIGH OIL LEVEL @ 20%= 94 GALLONS
HIGH–HIGH OIL LEVEL @ 43% = 202 GALLONS
EMERGENCY SPILL @ 80% = 376 GALLONS

NOTES:
1. POLYURETHANE HIGHGUARD TANK IS NOT APPROVED FOR THE STORAGE OF HEATED PRODUCTS
2. TANK HAS 10 YEAR LIMITED WARRANTY
3. 15000 VOLT SPARK TEST PROVIDED AT FACTORY
4. ALL VENT PIPING BY INSTALLER



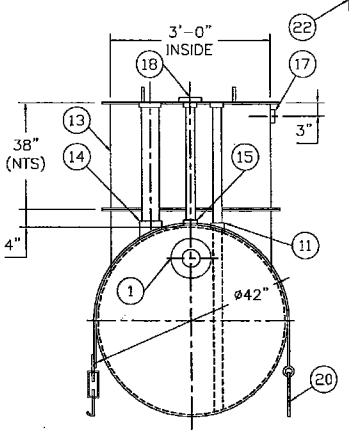
(42"ø POLYESTER HOLD DOWN STRAP SPACING, 2 REQUIRED – SHIPPED LOOSE)

PLAN VIEW

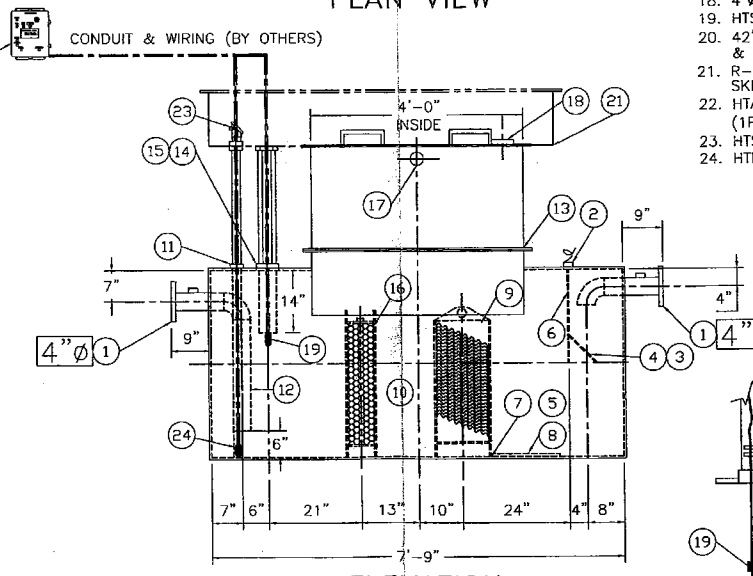
PROVIDED EQUIPMENT

DRAWING 1 OF 2

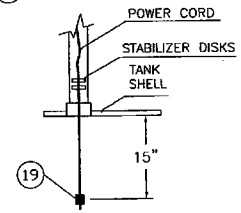
1. 150# R.F.S.O. FLANGE W/ 2" NPT FOR VENT
2. MONITOR LUG
3. VELOCITY HEAD DIFFUSION BAFFLE
4. WEAR PLATE
5. SEDIMENT CHAMBER
6. UNDERFLOW BAFFLE (REMOVABLE)
7. SLUDGE BAFFLE
8. STRIKER PLATE
9. REMOVABLE PARALLEL CORRUGATED PLATE COALESCER (CORELLA PVC) (27"X27"X12") 3" PLATE SPACING
10. OIL/WATER SEPARATOR CHAMBER
11. 2"øFTG. FOR LEAK DETECTION W/ RISER PIPE SHIPPED LOOSE
12. OUTLET DOWNCOMER
13. E–Z ACCESS MANWAY WITH BOLT–ON EXTENSION SHIPPED LOOSE REMOVABLE COVERS WITH HANDLES PROVIDED
14. 4"øFTG. FOR OIL PUMP–OUT W/ INTERNAL PIPE INSTALLED & RISER PIPE SHIPPED LOOSE
15. 2"øFTG. FOR LEVEL SENSOR W/ RISER PIPE SHIPPED LOOSE
16. 6" THICK REMOVABLE COALESCER MATERIAL INSTALLED W/ PULL ROD SHIPPED LOOSE (27"X27"X6")
17. 2"øFTG. FOR VENT
18. 4"øFTG. FOR GAUGE WITH PLUG
19. HTSF–1 FLOAT HIGH OIL INTERFACE SENSOR W/ 40' OF CABLE
20. 42"ø POLYESTER HOLD DOWN STRAPS, W/ GALVANIZED TB, WIRE ROPE & CLAMPS.
21. R– GLM – 78" X 54" RECTANGULAR GRADE LEVEL MANWAY W/ 12" SKIRT.
22. HTAP–2 NEMA 4X 2 CHANNEL CONTROL/ALARM PANEL (1PH–60HZ–120V)
23. HTSC–2B NEMA 4 CAP FOR LEAK SENSOR (SHIP DIRECT)
24. HTLP 1.5 LIQUID LEAK SENSOR W/ 40' OF CABLE



END VIEW



ELEVATION



INTERFACE SENSOR FLOAT POSITION
HTSF–2A–57E/15

550 GALLON OIL WATER SEPARATOR
HTC, E/Z ACCESS, HIGHGUARD, DOUBLE WALL

HIGHLAND TANK
ONE HIGHLAND ROAD
STOYSTOWN, PA 15563

NOTE :
ALL RIGHTS RESERVED. THIS DRAWING OR ANY PART THEREOF MUST NOT BE REPRODUCED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF HIGHLAND TANK.
HIGHLAND TANK SHALL BE RESPONSIBLE ONLY FOR ITEMS INDICATED ON THIS FABRICATION DRAWING UNLESS OTHERWISE NOTED. CUSTOMER IS RESPONSIBLE FOR VERIFYING CORRECTNESS OF SIZE / LOCATION OF FITTINGS , ACCESSORIES & COATINGS SHOWN ON THIS DRAWING

1/2"=1'-0" 3/7/08 JFK 58310

APPENDIX B

Original vendor emissions data has been revised to reflect 4ppm CO control emissions and 2.3ppm NOx emissions.

Performance By:

Project Info: **City of Anaheim**

Engine: **LM6000PC Sprint with Water Injection for NOx control**
Deck Info:
Generator:

Date: **10-Oct-07**

Fuel:

Version: **Rev D**

PERMIT SUBSET

Case #	1	2	3	4	5	6	7	8	9	ISO
Ambient Conditions	100	75	50	100	75	50	100	75	50	100
Dry Bulb, °F	109.0	109.0	109.0	59.0	59.0	59.0	38.0	38.0	38.0	59.0
Wet Bulb, °F	71.5	71.5	71.5	51.4	51.4	51.4	34.7	34.7	34.7	51.5
RH, %	15.0	15.0	15.0	60.0	60.0	60.0	72.3	72.3	72.3	60.0
Altitude, ft	220.0	220.0	220.0	220.0	220.0	220.0	220.0	220.0	220.0	0.0
Ambient Pressure, psia	14.580	14.580	14.580	14.580	14.580	14.580	14.580	14.580	14.580	14.696
Engine Inlet										
Comp Inlet Temp, °F	50.2	97.2	109.0	45.0	59.0	59.0	38.0	38.0	38.0	59.0
RH, %	95.0	21.3	15.0	95.0	60.0	60.0	72.3	72.3	72.3	60.0
Conditioning	CHILL	CHILL	NONE	CHILL	NONE	NONE	NONE	NONE	NONE	NONE
Tons or kBtu/hr	1325	226	0	338	0	0	0	0	0	0
Pressure Losses										
Inlet Loss, inH20	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Volute Loss, inH20	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Exhaust Loss, inH20	9.40	6.79	4.74	9.59	6.93	4.84	9.83	7.10	4.95	9.27
Partload %	100	75	50	100	75	50	100	75	50	100
kW, Gen Terms	**50116**	**37736**	**25069**	**50951**	**38220**	**25486**	**50851**	**38276**	**25524**	**49169**
Est. Btu/kW-hr, LHV	**8527**	**9052**	**10266**	**8511**	**8961**	**10042**	**8502**	**8917**	**10054**	**8569**
Fuel Flow										
MMBtu/hr, LHV	427.3	341.6	257.4	433.6	342.5	255.9	432.3	341.3	256.6	421.3
lb/hr	20752	16588	12498	21058	16631	12429	20994	16575	12461	20461
NOx Control	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**
Water Injection										
lb/hr	19394	14839	9418	20295	12997	10626	22879	14890	10355	19197
Temperature, °F	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SPRINT	**LPC**	**LPC**	**LPC**	**LPC**	**LPC**	**OFF**	**HPC**	**HPC**	**OFF**	**LPC**
lb/hr	8761	8485	8096	8246	9528	0	3772	3772	0	9604
Control Parameters										
HP Speed, RPM	10451	10440	10124	10432	10102	9826	10454	10024	9663	10480
LP Speed, RPM	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600
PS3 - CDP, psia	456.3	384.2	314.1	461.9	398.0	332.4	463.2	405.6	341.2	450.9
T3CRF - CDT, °F	972	999	943	970	908	908	988	905	865	978
T48IN, °R	2038	2003	1899	2038	1914	1811	2038	1887	1758	2038
T48IN, °F	1578	1543	1440	1578	1454	1352	1578	1427	1298	1578
Exhaust Parameters										
Temperature, °F	841.6	858.9	832.6	838.6	785.5	754.2	836.7	759.9	710.4	846.3
lb/sec	296.3	252.2	212.4	300.1	267.7	231.2	301.6	275.7	241.1	292.8
lb/hr	1066554	907936	764619	1080197	963857	832416	1085651	992555	867866	1054016
Energy, Btu/s- Ref 0 °R	100077	86197	70566	101010	85645	71130	100982	85721	71048	99273
Energy, Btu/s- Ref T2 °F	61977	50812	40309	62858	50844	41402	63310	51553	41429	60971
Cp, Btu/lb-R	0.2776	0.2775	0.2743	0.2772	0.2731	0.2683	0.2760	0.2703	0.2656	0.2778
Emissions (NOT FOR USE IN ENVIRONMENTAL PERMITS)										
NOx ppmvd Ref 15% O2	25	25	25	25	25	25	25	25	25	25
NOx as NO2, lb/hr	43	34	26	44	34	26	43	34	26	42
CO ppmvd Ref 15% O2	15	8	7	18	15	21	30	29	33	14
CO, lb/hr	15.60	6.93	4.53	19.40	12.20	13.25	31.27	24.35	20.91	14.81

	PERMIT SUBSET									
Case #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**ISO**
CO2, lb/hr	55928.00	44738.18	33747.90	56750.23	44873.37	33598.69	56570.61	44728.35	33690.59	55143.81
HC ppmvd Ref 15% O2	2	2	2	2	2	2	3	3	4	2
HC, lb/hr	1.25	1.00	0.75	1.26	1.00	0.80	1.98	1.54	1.34	1.23
SOX as SO2, lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)										
AR	1.2195	1.2216	1.2294	1.2211	1.2281	1.2444	1.2269	1.2377	1.2498	1.2195
N2	71.5118	71.6360	72.0932	71.6036	72.0172	72.9699	71.9485	72.5764	73.2861	71.5143
O2	14.4945	14.9851	15.8589	14.5081	15.4893	16.6650	14.6735	15.8721	16.9809	14.5126
CO2	5.2438	4.9275	4.4137	5.2537	4.6556	4.0363	5.2108	4.5064	3.8820	5.2318
H20	7.5260	7.2263	6.4018	7.4089	6.6059	5.0806	6.9345	5.8025	4.5965	7.5175
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0015	0.0008	0.0006	0.0018	0.0013	0.0016	0.0029	0.0025	0.0024	0.0014
HC	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001
NOX	0.0028	0.0026	0.0023	0.0028	0.0025	0.0021	0.0027	0.0024	0.0020	0.0028
Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)										
AR	0.9674	0.9653	0.9617	0.9674	0.9633	0.9589	0.9670	0.9621	0.9578	0.9673
N2	80.8967	80.7149	80.4145	80.8986	80.5504	80.1818	80.8610	80.4496	80.0899	80.8898
O2	14.3552	14.7821	15.4869	14.3506	15.1676	16.0321	14.4379	15.4033	16.2469	14.3713
CO2	3.7760	3.5341	3.1338	3.7784	3.3147	2.8232	3.7278	3.1797	2.7005	3.7669
H20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0017	0.0009	0.0007	0.0020	0.0014	0.0017	0.0032	0.0027	0.0026	0.0016
HC	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0003	0.0003	0.0002
NOX	0.0028	0.0026	0.0023	0.0028	0.0024	0.0021	0.0027	0.0023	0.0020	0.0028
Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)										
AR	0.8543	0.8568	0.8656	0.8560	0.8640	0.8823	0.8625	0.8746	0.8884	0.8544
N2	71.4388	71.6438	72.3776	71.5811	72.2493	73.7769	72.1205	73.1347	74.2871	71.4432
O2	12.6769	13.1208	13.9391	12.6977	13.6045	14.7515	12.8773	14.0028	15.0697	12.6930
CO2	3.3345	3.1369	2.8206	3.3432	2.9731	2.5977	3.3248	2.8906	2.5048	3.3270
H20	11.6913	11.2385	9.9943	11.5175	10.3056	7.9879	10.8082	9.0924	7.2454	11.6784
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0015	0.0008	0.0006	0.0018	0.0013	0.0016	0.0029	0.0025	0.0024	0.0014
HC	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0002
NOX	0.0024	0.0023	0.0021	0.0025	0.0022	0.0019	0.0024	0.0021	0.0018	0.0024

Aero Energy Fuel Number — **900-773 (City of Anaheim Peaker)**

	Volume %	Weight %
Hydrogen	0.0000	0.0000
Methane	96.7000	92.4298
Ethane	1.2500	2.2395
Ethylene	0.0000	0.0000
Propane	0.2560	0.6726
Propylene	0.0000	0.0000
Butane	0.0920	0.3186
Butylene	0.0000	0.0000
Butadiene	0.0000	0.0000
Pentane	0.0210	0.0903
Cyclopentane	0.0000	0.0000
Hexane	0.0200	0.1027
Heptane	0.0000	0.0000
Carbon Monoxide	0.0000	0.0000
Carbon Dioxide	1.4330	3.7577
Nitrogen	0.2330	0.3889
Water Vapor	0.0000	0.0000
Oxygen	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000
Ammonia	0.0000	0.0000

Btu/lb, LHV	20593
Btu/scf, LHV	913
Btu/scf, HHV	1012
Btu/lb, HHV	22835
Fuel Temp, °F	77.0
NOx Scalar	0.976

	PERMIT SUBSET									
Case #	1	2	3	4	5	6	7	8	9	ISO
Specific Gravity	0.58									
Engine Exhaust										
Exhaust Avg. Mol. Wt., Wet Basis	28.0	28.0	28.1	28.0	28.1	28.3	28.1	28.2	28.4	28.0
Inlet Flow Wet, pps	286.4	256.5	250.8	290.0	279.2	268.8	292.1	289.4	285.0	282.8
Inlet Flow Dry, pps	284.3	254.4	248.8	288.3	277.4	267.0	291.1	288.4	284.0	281.0
Shaft HP	68377	51582	34449	69512	52238	35012	69377	52314	35063	67090
Generator Information										
Capacity kW	48952	48952	48952	64115	64115	64115	69366	69366	69366	64115
Efficiency	0.983	0.981	0.976	0.983	0.981	0.976	0.983	0.981	0.976	0.983
Inlet Temp, °F	109.0	109.0	109.0	59.0	59.0	59.0	38.0	38.0	38.0	59.0
Gear Box Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRQ48, Torque Limit Cold End	122121	95993	70510	124066	98427	74396	124522	100293	75821	119904
Correct Control Parameters										
PS3JQA, psia	462.025	389.020	318.041	467.695	402.993	336.570	469.011	410.689	345.481	466.512
XN25R3, rpm	6311	6259	6173	6301	6235	6050	6269	6178	6035	6320
8th Stage Bleed										
Flow, pps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pressure, psia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Temperature, °R	0	0	0	0	0	0	0	0	0	0
CDP Bleed										
Flow, pps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pressure, psia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Est. Gas Pressure at Baseplate, psig	**597.3**	**496.4**	**397.4**	**604.9**	**507.5**	**411.3**	**605.2**	**512.7**	**418.7**	**589.9**
CardPack	**8fk**	**8fk**	**8fk**	**8fk**	**8fk**	**8fk**	**8fk**	**8fk**	**8fk**	**8fk**
Exhaust CardPack	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**
NSI	**304**	**305**	**0**	**304**	**0**	**439**	**304**	**0**	**439**	**304**
NSI	**0**	**0**	**0**	**1716**	**0**	**0**	**1716**	**0**	**0**	**0**
NSI	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SOx, Lb/hr	0.33	0.27	0.20	0.34	0.27	0.20	0.34	0.27	0.20	0.33
PM10, lb/hr	2.99	2.39	1.80	3.04	2.40	1.79	3.03	2.39	1.80	2.95
SCR / CO System performance										
Stack Emissions (after SCR/oxcat)										
NOx ppmvd Ref 15% O2	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32
CO ppmvd Ref 15% O2	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
VOC ppmvd Ref 15% O2	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
NH3 ppmvd Ref 15% O2	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
NOx as NO2, lb/hr	3.99	3.19	2.40	4.05	3.20	2.38	4.03	3.18	2.39	3.93
CO, lb/hr	6.28	5.01	3.78	6.36	5.01	3.75	6.34	5.00	3.76	6.17
VOC, lb/hr	1.19	0.95	0.71	1.20	0.95	0.70	1.20	0.96	0.71	1.17
NH3, lb/hr	3.59	2.86	2.12	3.64	2.83	2.07	3.59	2.79	2.05	3.64
SOX, lb/hr	0.33	0.27	0.20	0.34	0.27	0.20	0.34	0.27	0.20	0.33
PM10, lb/hr	2.99	2.39	1.80	3.04	2.40	1.79	3.03	2.39	1.80	2.95
Stack exhaust temperature, F	841.60	858.90	832.60	838.60	785.50	754.20	836.70	759.90	710.40	846.30
Stack exhaust mass flow, pps	296.30	252.20	212.40	300.10	267.70	231.20	301.60	275.70	241.10	292.80
SO2 ppmvd Ref 15% O2	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

Commissioning data based on 156 hours total commissioning time

Activity	Duration (hours)	% Output at ISO	Exhaust Temp (°F)	Estimate Fuel Rate (MMBtu/hr)	Exhaust Flow (lb/sec)	Total Pollutant Estimated Emission per Event (lbs) NO_x	CO	VOC	PM_{10}	SO_x
1. First fire the unit and then shutdown to check for leaks, etc.	24	CI	694	77.5	114	200	822	27	72	5.82
2. Synch and check e-stop	18	SI	694	77.5	114	150	617	20	54	4.37
3. Additional automatic voltage regulator (AVR) commissioning	18	5%	726	95.9	125	261	329	8	54	5.40
4. Break-in run	12	5%	726	95.9	125	174	219	5	36	3.60
5. Dynamic commissioning of AVR and commission water injection and SPRINT										
load step 1	6	10%	733	111	137	124.2	69.3	0.9	18.0	2.08
load step 2	6	20%	713	144	161	86.4	38.7	0.5	18.0	2.70
load step 3	6	30%	733	175	178	105.3	54.3	0.6	18.0	3.29
load step 4	6	40%	753	206	194	124.2	69.9	0.9	18.0	3.87
load step 5	6	50%	782	240	209	144.6	86.7	1.1	18.0	4.51
load step 6	6	60%	781	276	232	166.4	102.6	1.2	18.0	5.18
load step 7	6	70%	785	312	255	188.1	111.9	1.4	18.0	5.86
load step 8	6	80%	766	348	276	209.6	86.0	1.2	18.0	6.53
load step 9	6	90%	792	384	288	231.3	97.2	1.4	18.0	7.21
load step 10	6	100%	843	424	294	255.8	102.2	1.5	18.0	7.96
Step 5 Total	*60*					*1635.8*	*818.7*	*10.5*	*180.0*	*49.2*
6. Base load AVR commissioning	24	100%	843	424	294	1023.2	408.8	30.0	72.0	31.8
Total commissioning	156	100%	843	424	294	3443	3213	99	468	100

Notes:

After SCR catalyst installation, the NOx emissions would be reduced by 82%, this applies to activities 2-6, thus NOx emissions presented in this table will be reduced by 82%.

After CO catalyst installation, the CO emissions would be reduced by 85%, this applies to activities 2-6, thus CO emissions presented in this table will be reduced by 85%.

CTG = combustion turbine generator

AVR = automatic voltage regulator

SCR = selective catalytic reduction

At ISO = ambient temperature of 59 °F, relative humidity of 60%, and sea level

CI = core idle mode of turbine operation, no load placed on unit

SI = synch idle mod of turbine operation, no load placed on unit

CALCULATION (MODEL INPUT)

base load AVR commissioning

NO2 emission rate	42.63125 (lb/hr)				
with exhaust Temp	843 deg F, =	723.71 K			
with exhaust flow rate	294 lb/sec, =	1058400 lb/hr, =	580283.7 acfm, =	27.5596 m/s	
First Fire the unit & then shutdown to check for leaks, etc.					
CO emission rate	34.25 (lb/hr)				
NO2 emission rate	8.3125 (lb/hr)				
with exhaust Temp	694 deg F, =	640.93 K			
with exhaust flow	114 lb/sec, =	410400 lb/hr, =	199271.4 acfm, =	9.4641 m/s	

Revised Turbine Startup Sequence and Emissions for 35–Minute Startup Event Showing SOx Emissions for Worst Case and Expected Natural Gas Fuel Sulfur Contents

			Stack emissions per Turbine											
Time	CT	SCR	NOx		CO		ROG		PM10		SOx @ 0.25 gr		SOx @ 1 gr	
(min)	Δ time	Δ time	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total
0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0
1	1		18	0.3	22.00	0.37	2.5	0.04	0.63	0.01	0.07	0	0.28	0
2			18	0.6	22.00	0.73	2.5	0.08	0.63	0.02	0.07	0	0.28	0.01
4			18	1.2	22.00	1.47	2.5	0.17	0.63	0.04	0.07	0	0.28	0.02
6	5		18	1.8	9.99	1.80	2.25	0.24	0.63	0.06	0.07	0.01	0.28	0.03
8	2		18	2.4	9.99	2.13	2.25	0.32	0.63	0.08	0.07	0.01	0.28	0.04
10			50	4.07	4.54	2.28	0.36	0.33	1.16	0.12	0.13	0.01	0.51	0.05
12		12	26	4.93	6.81	2.51	0.9	0.36	1.69	0.18	0.19	0.02	0.74	0.08
14			33	6.03	3.08	2.61	0.9	0.39	2.22	0.25	0.24	0.03	0.97	0.11
15		3	38	6.67	3.52	2.67	0.9	0.4	2.48	0.29	0.27	0.03	1.09	0.13
16			15.49	6.92	3.74	2.73	0.99	0.42	2.75	0.34	0.3	0.04	1.2	0.15
17	9		16.63	7.2	4.18	2.80	1.13	0.44	3.01	0.39	0.33	0.04	1.32	0.17
18			15.93	7.47	4.18	2.87	1.17	0.46	3.01	0.44	0.33	0.05	1.32	0.19
20			14.52	7.95	4.18	3.01	1.17	0.5	3.01	0.54	0.33	0.06	1.32	0.24
22			13.11	8.39	4.18	3.15	1.17	0.54	3.01	0.64	0.33	0.07	1.32	0.28
24			11.71	8.78	4.18	3.29	1.17	0.58	3.01	0.74	0.33	0.08	1.32	0.33
26			10.3	9.12	4.18	3.43	1.17	0.61	3.01	0.84	0.33	0.09	1.32	0.37
28			8.9	9.42	4.18	3.57	1.17	0.65	3.01	0.94	0.33	0.1	1.32	0.41
30			7.49	9.67	4.18	3.71	1.17	0.69	3.01	1.04	0.33	0.11	1.32	0.46
32			6.09	9.87	4.18	3.85	1.17	0.73	3.01	1.14	0.33	0.13	1.32	0.5
34			4.68	10.03	4.18	3.99	1.17	0.77	3.01	1.24	0.33	0.14	1.32	0.55
35		18	3.98	10.09	4.18	4.06	1.17	0.79	3.01	1.29	0.33	0.14	1.32	0.57
35			0	10.09	0.00	4.06	0	0.79	0	1.29	0	0.14	0	0.57
36			0	10.09	0.00	4.06	0	0.79	0	1.29	0	0.14	0	0.57
38			0	10.09	0.00	4.06	0	0.79	0	1.29	0	0.14	0	0.57
40	5		0	10.09	0.00	4.06	0	0.79	0	1.29	0	0.14	0	0.57
40	0		0	10.09	0.00	4.06	0	0.79	0	1.29	0	0.14	0	0.57
41	1	0	18	10.39	22.00	4.42	2.5	0.83	0.63	1.3	0.07	0.14	0.28	0.57
42			18	10.69	9.99	4.59	2.33	0.87	0.63	1.31	0.07	0.14	0.28	0.58
43		2	6.8	10.81	9.99	4.76	2.33	0.91	0.63	1.32	0.07	0.15	0.28	0.58
44			6.8	10.92	9.99	4.92	2.33	0.95	0.63	1.34	0.07	0.15	0.28	0.59
46	5		6.8	11.15	9.99	5.26	2.33	1.03	0.63	1.36	0.07	0.15	0.28	0.6
48	2		6.8	11.37	9.99	5.59	2.33	1.1	0.63	1.38	0.07	0.15	0.28	0.6
50			18.9	12	2.20	5.66	0.45	1.12	1.16	1.42	0.13	0.16	0.51	0.62
52			9.83	12.33	3.30	5.77	0.9	1.15	1.69	1.47	0.19	0.16	0.74	0.65
54			12.47	12.75	3.08	5.88	0.9	1.18	2.22	1.55	0.24	0.17	0.97	0.68
56			15.49	13.26	3.74	6.00	0.99	1.21	2.75	1.64	0.3	0.18	1.2	0.72
57	9		16.63	13.54	4.18	6.07	1.13	1.23	3.01	1.69	0.33	0.19	1.32	0.74
58			15.78	13.8	4.18	6.14	1.17	1.25	3.01	1.74	0.33	0.19	1.32	0.76
60			14.1	14.27	4.18	6.28	1.17	1.29	3.01	1.84	0.33	0.2	1.32	0.81
72		15.00	3.98	15.07	4.18	7.12	1.17	1.52	3.01	2.44	0.33	0.27	1.32	1.07

Note: time intervals should be taken at the end of the minute referenced.

SHUTDOWN

Revised Turbine Shutdown Sequence Emissions for 10 –Minute Shutdown Event Showing SOx Emissions for Worst Case and Expected Natural Gas Fuel Sulfur Contents

			Stack emissions per turbine									
Time	CT	SCR	NOx		CO		ROG		PM10		SOx @ .25gr		SOx @ 1gr	
(min)	Δ time	Δ time	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total
0	0	0	3.98	0	4.24	0.00	1.17	0	3.01	0	0.33	0	1.32	0.02
1	1		6.53	0.11	2.86	0.05	0.99	0.02	2.52	0.04	0.28	0	1.11	0.04
2	2		5.26	0.2	3.30	0.10	0.81	0.03	2.03	0.08	0.22	0.01	0.89	0.06
3	3		4.17	0.27	2.42	0.14	0.63	0.04	1.58	0.1	0.17	0.01	0.69	0.07
4	4		2.9	0.31	1.56	0.17	0.45	0.05	1.14	0.12	0.13	0.01	0.5	0.08
5	5		6.35	0.42	3.08	0.22	2.25	0.09	0.63	0.13	0.07	0.01	0.28	0.08
6	6		3.27	0.47	4.84	0.30	2.25	0.12	0.63	0.14	0.07	0.02	0.28	0.08
7	7		3.27	0.53	4.84	0.38	2.25	0.16	0.63	0.15	0.07	0.02	0.28	0.09
8	8		3.27	0.58	4.84	0.46	2.25	0.2	0.63	0.16	0.07	0.02	0.28	0.09
9	9		3.27	0.64	4.84	0.54	2.25	0.24	0.63	0.17	0.07	0.02	0.28	0.1
10	10		3.27	0.69	4.84	0.62	2.25	0.27	0.63	0.18	0.07	0.02	0.28	0.1
10	10		3.27	0.69	4.84	0.62	2.25	0.27	0.63	0.18	0.07	0.02	0.28	0.1

Note: During the shutdown sequence the SCR is operating over the full shutdown time at the transient removal efficiency. NOx removal rates reflect this transitory operational mode and, therefore, the SCR Δtime remains unchanged throughout the shutdown.

Case	1	2	3	4	5	7	8	9
Ambient Temperature (°F)	109	109	109	59	59	38	38	38
Stack Diameter (ft)	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67
Exhaust Flow (lb/hr)	1,066,554	907,936	764,619	1,080,197	963,857	1,085,651	992,555	867,866
CTG Load Level (%)	100	75	50	100	75	100	75	50
Evap. Cooler	ON	ON	NONE	ON	NONE	NONE	NONE	NONE
Data from Vendor	Area =	106.96	ft^2					

Expected Operation of Each Gas Turbine - Normal Operation

(Reference: City of Anaheim Date 9/24/07 Rev B LM6000 PC Sprint with Water Injection for NOx Control)

Heat Consumed (MMBTU/hr) - LHV	427.3	341.6	257.4	433.6	342.5	432.3	341.3	256.6
Heat Consumed (MMBTU/hr) - HHV	473.6	378.6	285.3	480.6	379.6	479.2	378.3	284.4
Turbine Outlet Temperature (°F)	841.6	858.9	832.6	838.6	785.5	836.7	759.9	710.4
Turbine Outlet Temperature (°K)	722.9	732.5	717.9	721.3	691.8	720.2	677.5	650.0
Exhaust Flow (acfm)	584126	503865	415867	590234	505123	592346	509469	427386
Stack Exit Velocity, ft/m	5461.0	4710.7	3888.0	5518.1	4722.4	5537.9	4763.1	3995.7
Stack Exit Velocity, m/s	27.74	23.93	19.75	28.03	23.99	28.13	24.20	20.30
Nitrogen, % Vol	80.90	80.71	80.41	80.90	80.55	80.86	80.45	80.09
Oxygen, % Vol	14.36	14.78	15.49	14.35	15.17	14.44	15.40	16.25
Carbon Dioxide, % Vol	3.78	3.53	3.13	3.78	3.31	3.73	3.18	2.70
Argon, % Vol	0.97	0.97	0.96	0.97	0.96	0.97	0.96	0.96
Water Vapor, % Vol	11.69	11.24	9.99	11.52	10.31	10.81	9.09	7.25
Molecular Weight	31.40	31.29	31.03	31.37	31.11	31.23	30.88	30.50
				3.726				

Average Emission Rates from Each Gas Turbine (lbs/hr) - Normal Operations

NO_X at 2.3 ppmvd BACT level	3.67	2.94	2.21	3.98	2.94	3.71	2.93	2.20
CO at 4.0 ppmvd BACT level	4.19	3.34	2.52	4.24	3.34	4.23	3.34	2.5
VOC at 2.0 ppmvd BACT level	1.19	0.95	0.71	1.20	0.95	1.20	0.96	0.71
SO_2 short-term rate	1.34	1.07	0.81	1.36	1.07	1.35	1.07	0.80
SO_2 long-term rate	0.33	0.27	0.20	0.34	0.27	0.34	0.27	0.20
PM_{10}	2.99	2.39	1.80	3.04	2.40	3.03	2.39	1.80
NH_3 at 5 ppmvd BACT level	3.59	2.86	2.12	3.64	2.83	3.59	2.79	2.05

Sulfur content in fuel basis for above: 1 grains total S/100 scf short-term max hourly value

0.25 grains total S/100 scf long-term

Vendor turbine can meet the emission limit of 3.00 lbs/hr for PM_{10}.

Data from Vendor

Startup / Shutdown Emissions Per Turbine

Startup

duration in minutes	35 mimutes	60 minutes	72 miute				
	normal start	includes part of restart	includes trip and full restart	Normal	MAX 1 hour With Startup, trip and part of restart	10 minute shutdown	Normal Ops (g/sec)
	Emissions (lb)			Emissions			
				lb/hour	lb/hour	lb/event	
NO_X	10.09	14.27	15.07	3.98	14.27	0.69	0.501
CO	4.06	6.28	7.12	4.24	6.28	0.62	0.534
VOC	0.79	1.29	1.52	1.20	1.29	0.27	0.151
SO_2	0.57	0.81	1.07	1.36	0.81	0.02	0.171
PM_{10}	1.29	1.84	2.44	3.00	1.84	0.18	0.378

Assumptions:

NOx, CO, VOC, SO2, and PM10 values highest from the data in the STARTUP tab

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Normal emissions are highest of all operating cases listed above (case 4).

Startup SO_2 emissions based on peak short-term sulfur content

Shutdown

duration in minutes	10	50	Emissions for 1 hour with a shut down and normal operations	Emissions if shutting down for an entire hour
	Shutdown Emissions	Normal Emissions		
	lb/event	lb/hour	lb/hr	lb/hr
NO_X	0.69	3.98	4.01	4.14
CO	0.62	4.24	4.16	3.74
VOC	0.27	1.20	1.27	1.62
SO_2	0.02	1.36	1.15	0.12
PM_{10}	0.18	3.00	2.68	1.08

Assumptions:

NOx, CO, VOC, SO2, and PM10 values highest from the data in the shutdown tab

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Normal emissions are highest of all operating cases listed above (case 4).

Shutdown SO_2 emissions based on peak short-term sulfur content

Worst-Case 1-Hour Emissions per Turbine

Worst-Case (non-commissioning) 1-Hour Emissions consists of the maximum of an hour of startup with trip and restart; an hour with 1 normal startup & normal operations; an hour with 1 shutdown and normal operations; an hour with 1 normal startup, 1 shutdown, and normal operations; or normal operations.

Emissions per turbine	Max Worst-case	Startup w trip, restart	Startup, Shutdown and Normal Op	Shutdown w Balance Normal Op	Normal Operations	Normal startup with run	Worst-case Total
	lb/hr						g/s
NO_2	14.27	14.27	11.78	4.01	3.98	11.75	1.79798
CO	6.28	6.28	5.74	4.16	4.24	5.82	0.79120
VOC	1.36	1.29	1.36	1.27	1.20	1.29	0.17136
SO_2	1.36	0.81	0.93	1.15	1.36	1.14	0.17097
PM_{10}	3.00	1.84	2.22	2.68	3.00	2.54	0.37799

Worst-Case 3 Hour Emission Rate per Turbine

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.

3-Hour emission scenarios consist scenario #1: 1 Startup (72 minute trip, restart scenario), 1 Shutdown and remaining time at normal rate; and scenario #2: normal operations all the 3 hours

Worst-case 3-Hour emission Scenario is equal to 3 hours at normal rate with peak short-term sulfur content

Emissions per turbine	Max lb/hr	72 minute trip, restart scenario	Shutdown	Normal Operations (lb/hr)	Total	Worst-case Total
	Pounds					g/s
Hours of Operation	3.0	1.200	0.167	1.63	3.00	
SO_2 with startup & shutdown	1.10	1.07	0.02	2.22	3.31	0.13890
SO_2 normal operations	1.36				4.07	0.17097

Worst-Case 8-Hour Emission Rates per Turbine

Only CO is considered for an average 8-hour Ambient Air Quality Standard.

Worst-case (non-commissioning) 8-Hour Scenarios include: scenario #1: 1 Startup (72 minute trip, restart scenario), 1 Shutdown and remaining time at normal rate; and scenario #2:1 Startup (72 minute trip, restart scenario) and remaining time at normal rate; #3: normal operations all the 8 hours

Emissions per turbine	Max lb/hr	72 minute trip, restart scenario	Shutdown	Normal Operations	Total	Worst-case Total
	Pounds					g/s
Hours of Operaton		1.20	0.167	6.63	8.00	
lbs CO with startup and shutdown	4.48	7.1	0.6	28.13	35.86	0.56
lbs CO with startup	4.49	7.1		28.83	35.95	0.57
lb CO normal operations	4.24				33.92	0.53

Worst-Case 24 Hour Emission Rate per Turbine

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case 24-hour scenario for SO_2 & PM_{10} use normal operational emissions.

Worst-case 24-hour SO_2 emissions are based on peak short-term sulfur content

Emissions per turbine	Worst-case	Normal Operations	Worst-case Total
	lb/hr		g/s
SO_2 normal operations	1.36	1.36	0.17097
PM_{10} normal operations	3.00	3.00	0.37799

Average Annual Emissions

Average Operation lb/hr Emission Rates presented below for normal operations are based on normal operation scenario (max emissions) for 2,408 total operating hours all 4 units, plus a total of 516 startup events and 516 shutdown events for 4 all units.

Emissions per turbine	Startup	Shutdown	Normal Operations lb/hr	Total lbs	lb/hr	Worst-case Total g/s
Total Hours of Operation	75.25	21.50	602.0			
Number per Scenario	129.0	129.0				
Duration of Event (min)	35	10.0	60			
NO_X (lb/event)	10.09	0.69	3.98	3786.58	0.43	0.05446
CO (lb/event)	4.06	0.62	4.24	3156.45	0.36	0.04540
VOC (lb/event)	0.79	0.27	1.20	859.14	0.10	0.01236
SO_2 (lb/event)	0.14	0.02	0.34	224.85	0.03	0.00323
PM_{10}	1.29	0.18	3.00	1995.63	0.23	0.02870

Note:

Annual normal SO_2 emissions based on long-term sulfur content

Est. annual normal operating hours per turbine		602.0			
Number of Turbines:	1	4		4 turbines +	
ANNUAL TOTALS	1 unit	4 units		blackstart	
NO_X	1.89	7.57	tpy	8.78	tpy
CO	1.58	6.31	tpy	6.89	tpy
VOC	0.43	1.72	tpy	1.72	tpy
SO_2	0.11	0.45	tpy	0.45	tpy
PM_{10}	1.00	3.99	tpy	3.996	tpy

Emissions from Black Start Engine Generator

Rated Horsepower	1141	**bhp**
Max Engine Power	750	Kw
Total Efficiency	100	%
Expected annual usage	200	**hr/yr**

Diesel Fuel Fired	Emision Factor	Emission Rate (full 1 hour)	Actual Emission Rate (38 mins Testing)	Yearly Emission Rate
	g/Kw/Hr	lb/hr	lb/hr	lb/yr
NO_X	6.21	12.06	7.638	2412.00
CO	3.50	5.79	3.665	1157.43
VOC (Total Hydrocarbons)	0.03	0.05	0.032	10.00
SO_2		0.006	0.004	1.14
PM_{10}	0.03	0.0496	0.031	9.92

NO_x and VOC emission rates provided by SCAQMD from the recent permit evaluation on Caterpillar Model C-27, 1141hp

NO_x emission rate 12.06 lb/hr = 4.79 g/bhp-hr = 7.29 g/kW-hr provided by SCAQMD

VOC emission rate 0.05 lb/hr = 0.02 g/bhp-hr = 0.03 g/kW-hr provided by SCAQMD

Other pollutant emission rates based on EPA Tier 2 emission limits

PM_{10} emission rate includes filterable and condensable emissions and assumes 85% control efficiency by a particulate trap.

SO_2 emission rate calculation based on sulfur content in the fuel.

Engine parameters

Flow Rate (acfm)	5,647	
Exhaust Temp (degrees F)	949.8	
Stack Diameter (feet)	0.833	10 inches
Stack height (feet)	20	(12 ft building + 8 ft stack)
fuel rate (gal/hr)	53.5	
Data from Vendor		
Diesel Sulfur content (ppm)	15	
diesel density (lb/gal)	7.1	
Satck height (m)	6.096	
Exhaust Temp (K)	783.04	
Exit velocity (m/s)	52.59	
Stack diameter (m)	0.254	

Stack diameter based on CARB Table 1 of "Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines", Oct 2000.

GEN SET PACKAGE PERFORMANCE DATA [DM9071]

SEPTEMBER 20, 2007

For Help Desk Phone Numbers Click here

Performance Number: DM9071

Change Level: 00

Sales Model: C27 DITA
Engine Power: 750 W/F EKW 778 W/O F EKW 1,141 HP
Manifold Type: DRY
Turbo Quantity: 2
Hertz: 60
Rating Type: STANDBY

Combustion: DI
Speed: 1,800 RPM
Governor Type: ELEC
Engine App: GP
Engine Rating: PGS
Certification: EPA TIER-2 2006 - -

Aspr: TA
After Cooler: ATAAC
After Cooler Temp(F): 120
Turbo Arrangement:
Strategy:

General Performance Data 1

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL RATE LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
750.0	100	1141	304	0.328	53.5	121.1	53.1	2,034.1	1,213.5	949.8	5,646.8
675.0	90	1036	276	0.333	49.2	117.5	48.5	1,928.2	1,186.7	937.0	5,297.2
600.0	80	931	248	0.338	45.0	114.4	43.8	1,829.3	1,159.2	921.6	4,954.7
562.5	75	879	234	0.341	42.8	112.8	41.4	1,776.3	1,144.8	912.6	4,785.1
525.0	70	826	220	0.343	40.5	110.8	38.4	1,709.2	1,128.6	902.8	4,566.2
450.0	60	722	192	0.345	35.6	106.0	31.9	1,550.3	1,085.5	878.5	4,061.2
375.0	50	618	165	0.347	30.6	101.1	25.3	1,394.9	1,030.1	846.0	3,556.2
300.0	40	517	138	0.350	25.9	97.7	19.2	1,243.1	960.3	800.8	3,072.4
225.0	30	414	110	0.356	21.1	95.7	13.7	1,101.8	868.5	733.5	2,578.0
187.5	25	362	96	0.361	18.7	94.8	11.1	1,031.2	814.5	692.4	2,330.8
150.0	20	308	82	0.368	16.2	93.9	8.6	964.1	755.1	645.8	2,080.0
75.0	10	201	54	0.403	11.5	92.5	4.9	868.7	616.8	532.2	1,663.3

General Performance Data 2

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	COMPRESS OUT PRESS KPA	COMPRESS OUT TEMP DEG F
750.0	100	1141	189	342.3
675.0	90	1036	172	322.9
600.0	80	931	155	304.7
562.5	75	879	147	295.7
525.0	70	826	137	283.6
450.0	60	722	114	255.0
375.0	50	618	91	226.4
300.0	40	517	70	198.7
225.0	30	414	50	170.4
187.5	25	362	41	156.2
150.0	20	308	33	141.8
75.0	10	201	20	120.2

Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
750.0	100	18,540.0	8,360.0	40,662.0	22,975.0	6,199.0	7,621.0	48,396.0	116,015.0	123,578.0
675.0	90	17,459.0	7,677.0	37,762.0	21,212.0	5,687.0	6,711.0	43,904.0	106,517.0	113,512.0
600.0	80	16,151.0	7,166.0	34,861.0	19,506.0	5,175.0	5,858.0	39,468.0	97,191.0	103,560.0
562.5	75	15,241.0	7,166.0	33,439.0	18,596.0	4,948.0	5,460.0	37,250.0	92,527.0	98,556.0
525.0	70	14,559.0	6,881.0	31,677.0	17,573.0	4,663.0	5,005.0	35,032.0	87,466.0	93,153.0
450.0	60	13,421.0	5,971.0	27,809.0	15,184.0	4,095.0	3,924.0	30,596.0	76,717.0	81,722.0
375.0	50	11,715.0	5,687.0	23,828.0	12,739.0	3,526.0	2,957.0	26,217.0	66,026.0	70,348.0
300.0	40	10,464.0	4,948.0	19,904.0	10,237.0	2,957.0	2,104.0	21,952.0	55,732.0	59,372.0
225.0	30	9,611.0	3,867.0	15,867.0	7,621.0	2,389.0	1,365.0	17,573.0	45,382.0	48,339.0
187.5	25	9,213.0	3,298.0	13,876.0	6,369.0	2,161.0	1,081.0	15,355.0	40,150.0	42,766.0
150.0	20	8,758.0	2,673.0	11,943.0	5,118.0	1,877.0	796.0	13,080.0	34,918.0	37,193.0
75.0	10	6,938.0	2,218.0	8,417.0	2,787.0	1,308.0	398.0	8,530.0	24,909.0	26,501.0

EMISSIONS DATA

EPA TIER-2 2006 - - ********** BS
Gaseous emissions data measurements are consistent with those described in
EPA 40 CFR PART 89 SUBPART D and ISO 8178 for measuring HC, CO, PM, and NOx

Gaseous emissions values are WEIGHTED CYCLE AVERAGES and are in compliance
with the following non-road regulations:

LOCALITY	AGENCY/LEVEL	MAX LIMITS - g/kW-hr		
U.S. (incl Calif)	EPA/TIER-2	CO:3.5	NOx + HC:6.4	PM:0.2

EXHAUST STACK DIAMETER	--
WET EXHAUST MASS	9,385.1 LB/HR
WET EXHAUST FLOW (950.00 F STACK TEMP)	5,650.35 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	1,924.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	1,762.56 STD CFM
FUEL FLOW RATE	54 GAL/HR

RATED SPEED "Not to exceed data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT
750.0	100	1141	16.2000	1.1400	.1300	.1100	8.5000
562.5	75	879	9.2700	1.5000	.1800	.1300	9.6000
375.0	50	618	5.8400	1.4500	.2100	.3200	10.7000
187.5	25	362	4.0500	1.2300	.2000	.2500	12.6000
75.0	10	201	2.8900	1.2200	.2200	.1700	14.8000

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT
750.0	100	1141	13.3900	.6100	.0700	1,168.3	.0500	8.5000
562.5	75	879	7.6600	.8000	.1000	929.1	.0700	9.6000
375.0	50	618	4.8300	.7700	.1100	659.8	.1600	10.7000
187.5	25	362	3.3400	.6600	.1100	398.4	.1300	12.6000
75.0	10	201	2.3900	.6500	.1200	246.4	.0900	14.8000

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp.	50 F	68 F	86 F	104 F	122 F	NORMAL
Altitude						
0 F	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp
984 F	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp
1,640 F	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp
3,281 F	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp
4,921 F	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,141 hp
6,562 F	1,141 hp	1,141 hp	1,141 hp	1,141 hp	1,139 hp	1,141 hp
8,202 F	1,141 hp	1,141 hp	1,141 hp	1,104 hp	1,070 hp	1,141 hp
9,843 F	1,141 hp	1,108 hp	1,071 hp	1,037 hp	1,004 hp	1,141 hp
11,483 F	1,075 hp	1,039 hp	1,004 hp	972 hp	943 hp	1,085 hp
13,123 F	1,008 hp	974 hp	941 hp	912 hp	884 hp	1,029 hp
14,764 F	944 hp	912 hp	882 hp	854 hp	827 hp	975 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	2671232	**Lube Oil Press @ Rated Spd(PSI):**	71.4
Effective Serial No:	MJE00001	**Piston Speed @ Rated Eng SPD(FT/Min):**	1,773.6
Primary Engine Test Spec:	0K7492	**Max Operating Altitude(FT):**	9,881.9
Performance Parm Ref:	TM5739	**PEEC Elect Control Module Ref**	
Performance Data Ref:	DM9071	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:		**Turbocharger Model**	GT5008
Certification Ref:	EPA TIER 2	**Fuel Injector**	
Certification Year:	2006	**Timing-Static (DEG):**	--
Compression Ratio:	16.5	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	120	**Unit Injector Timing (MM):**	--
Crankcase Blowby Rate(CFH):	--	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	--	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	68.2	**Peak Torque (LB/FT):**	--

Reference Number: DM9071

Core Arrn: 258-8773
EPA TIER-2 2006- B5

Parameters Reference: TM5739

GEN SET - PACKAGED - DIESEL
TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER	+/-	3%
EXHAUST STACK TEMPERATURE	+/-	8%
GENERATOR POWER	+/-	5%
INLET AIR FLOW	+/-	5%
INTAKE MANIFOLD PRESSURE - GAGE	-/-	10%
EXHAUST FLOW	+/-	6%
SPECIFIC FUEL CONSUMPTION	+/-	3%
FUEL RATE	+/-	5%
HEAT REJECTION	+/-	5%
HEAT REJECTION EXHAUST ONLY	+/-	10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.000

OF 99 KPA (29.01 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 MJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1995, ISO 3046-1 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

GEN SET - PACKAGED - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS
EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

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Chiller - Cooling Tower Drift Calculation

Chiller - Cooling Tower						
design circulating water rate		7,740	gallons/min			
cycles of concentration		10	already included in TDS value			
TDS		922	ppm			
		922	mg/liter			
		7.69	lb/1000 gallons			
Drift Eliminator Control		0.000010				
Operating hours per year		2795				
		total cooling tower		per cell		
Drift PM emissions	total	0.04	lb/hr	0.009	lb/hr	4 cell tower
		99.9	lb/yr	24.966	lb/yr	
		0.05	**tpy**			

water = 1000 g/liter
g/l = water * ppm/10^6
mg/l = water * ppm/10^6 * 1000 mg/g

Chiller cooling tower data provide by PB Engineering:

Fan diameter:	13	Feet 7 blades each fan	
Exhaust flow	230,750	ACFM per each fan	99.9
Exhaust flow	3,800,961	pph total for 4 fans	
Exhaust temp	87.7	DB deg F	
Circulating water rate	7740	gpm for all 4 units	
	3,870,000	pph	
Cycles	10		
TDS	922	ppm after cycling maximum GWRS	
Drift	0.0010%		
Exhaust stream solids	0.0357	pph	

Note: conditions are for design day of 89 F DB, 36% RH

Exit velocity (m/s) 8.831

Estimation of Oil-Separator Emissions

The TANKS4.0 model was used to estimate maximum emissions from the Canyon Power Plant oil-water separator (OWS). The TANKS4.0 output file provided in this Attachment shows the input data provided to the program and the predicted ROG emissions output. The assumptions made regarding the quantity and nature of the materials assumed to appear in the OWS for purposes of these calculations are as follows:

b. All petroleum products entering the OWS are assumed to be in the form of diesel oil.
c. Water flow into the OWS is assumed to amount to 55,000 gallons per year, roughly the average annual rainfall on the combined areas of the power plant site that can be drained to the OWS, plus an additional quantity for equipment washing. A spreadsheet indicating the basis for this calculation is provided with this Attachment The bermed equipment areas from which water could be allowed into the OWS are limited to the aqueous ammonia storage tank with unloading apron, four generator step-up transformers, five compressors, two service transformers and two station transformers.
d. For emission purposes, the 550 gallon OWS vault is assumed to be full with up to 10% (55 gallons) of diesel oil.

These assumptions are extremely conservative, because only water verified by operator visual inspection to be free of any significant quantity of visible oil or other hazardous materials will be actually allowed to flow into the OWS by opening the valve to the separator, which will otherwise remain in the closed position. In the even an oily sheen or other evidence of contamination is observed, a hazardous waste contractor will be called in to remove this liquid for proper disposal.

Even with the highly conservative input assumptions, TANKS4.0 predicts that annual emissions of ROG will be no higher than 0.59 pounds per year. The program does not calculate emissions of specific ROG species. However, very conservative estimates of the emissions for toxic contaminants contained in diesel oil can be derived as follows.

A reasonable speciation of specific toxic compounds in diesel is provided below:

- n-Hexane (110-54-3) - 0.0001% by wt.
- Benzene (71-43-2) - 0.0008% by wt
- Toluene (108-88-3) - 0.032% by wt

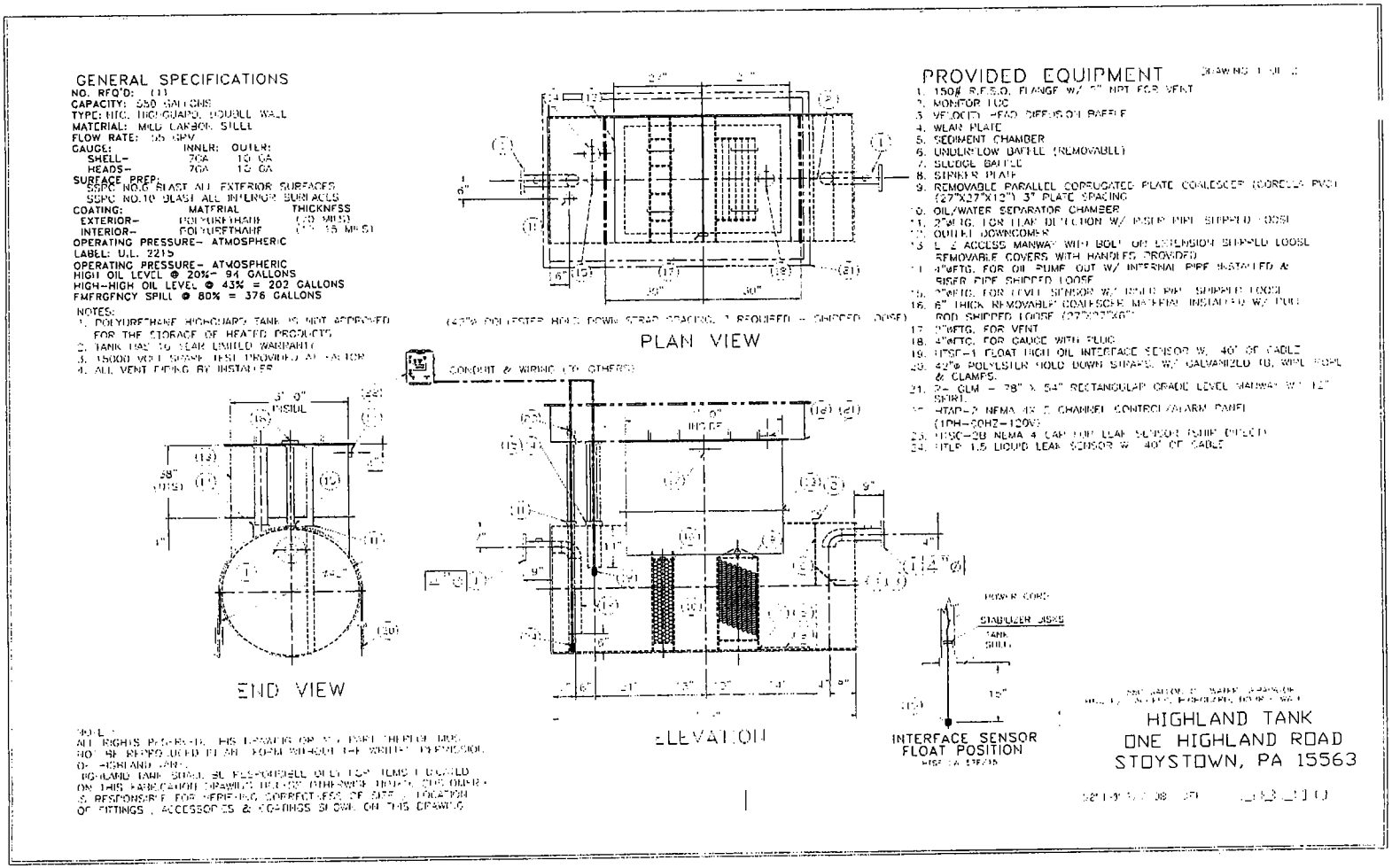
- Ethylbenzene (100-41-4) - 0.013% by wt
- m-Xylene (1330-20-7) - 0.29% by wt
- 1,2,4-Trimethylbenzene - 1% by wt

Note that the above are weight percentages of the liquid diesel, which would not translate to percent weights for the vapor above the liquid surface. However, as a worst case, we can assume that the emitted ROG mass is composed *entirely* of the above volatiles, and calculate normalized percentage weight fractions for each compound, which can then be multiplied by 0.59 lb ROG/year to yield speciated annual emission totals, as shown in the following table. Clearly, even with such grossly conservative input assumptions, the calculated emissions will be very small for all species.

SCPPA CPP Estimate of OWS throughput

From rainfall: 11.2 in per yr

	sq ft (ea)	sq ft (total)	Vol (cu ft)	Vol (gal)	
NH3 tank	588	588	549	4,111	
NH3 unloa	200	200	187	1,398	
GSU	788	3,152	2,942	22,035	
Compress	424	2,120	1,979	14,820	
Service xfn	624	624	582	4,362	
Station xfm	112	224	209	1,566	
			total	48,292	gallons/yr
				55,000	**gallons/yr <= use for max rain year**
Active tank	550	gallons			**plus some washdown**
Turnovers/	100	volumes / yr			


GENERAL SPECIFICATIONS
NO. REQ'D: (1)
CAPACITY: 550 GALLONS
TYPE: HIGHGUARD, DOUBLE WALL
MATERIAL: MILD CARBON STEEL
FLOW RATE: 55 GPM
GAUGE: INNER: OUTER:
SHELL- 7GA 10 GA
HEADS- 7GA 10 GA
SURFACE PREP:
SSPC NO.6 BLAST ALL EXTERIOR SURFACES
SSPC NO.10 BLAST ALL INTERIOR SURFACES
COATING: MATERIAL THICKNESS
EXTERIOR- POLYURETHANE (20 MILS)
INTERIOR- POLYURETHANE (12-15 MILS)
OPERATING PRESSURE- ATMOSPHERIC
LABEL: U.L. 2215
OPERATING PRESSURE- ATMOSPHERIC
HIGH OIL LEVEL @ 20%- 94 GALLONS
HIGH-HIGH OIL LEVEL @ 43% = 202 GALLONS
EMERGENCY SPILL @ 80% = 376 GALLONS
NOTES:
1. POLYURETHANE HIGHGUARD TANK IS NOT APPROVED FOR THE STORAGE OF HEATED PRODUCTS
2. TANK HAS 10 YEAR LIMITED WARRANTY
3. 15000 VOLT SPARK TEST PROVIDED AT FACTOR
4. ALL VENT PIPING BY INSTALLER
PLAN VIEW
PROVIDED EQUIPMENT
1. 150# R.F.S.O. FLANGE W/ 2" NPT FOR VENT
2. MONITOR LUG
3. VELOCITY HEAD DIFFUSION BAFFLE
4. WEAR PLATE
5. SEDIMENT CHAMBER
6. UNDERFLOW BAFFLE (REMOVABLE)
7. SLUDGE BAFFLE
8. STRIKER PLATE
9. REMOVABLE PARALLEL CORRUGATED PLATE COALESCER (CORELLA PVC) (27"X27"X12") 3" PLATE SPACING
10. OIL/WATER SEPARATOR CHAMBER
11. 2"ØFTG. FOR FLAP DEFLECTION W/ RISER PIPE SHIPPED LOOSE
12. OUTLET DOWNCOMER
13. L-2 ACCESS MANWAY WITH BOLT ON EXTENSION SHIPPED LOOSE REMOVABLE COVERS WITH HANDLES PROVIDED
14. 4"ØFTG. FOR OIL PUMP OUT W/ INTERNAL PIPE INSTALLED & RISER PIPE SHIPPED LOOSE
15. 2"ØFTG. FOR LEVEL SENSOR W/ RISER PIPE SHIPPED LOOSE
16. 6" THICK REMOVABLE COALESCER MATERIAL INSTALLED W/ PULL ROD SHIPPED LOOSE (27"X27"X6")
17. 2"ØFTG. FOR VENT
18. 4"ØFTG. FOR GAUGE WITH PLUG
19. HTSC-1 FLOAT HIGH OIL INTERFACE SENSOR W/ 40' OF CABLE
20. 42"Ø POLYESTER HOLD DOWN STRAPS W/ GALVANIZED TB, WIRE ROPE & CLAMPS.
21. 2- GLM - 78" X 54" RECTANGULAR GRADE LEVEL MANWAY W/ 12" SKIRT.
22. HTAP-2 NEMA 4X 2 CHANNEL CONTROL/ALARM PANEL (1PH-60HZ-120V)
23. HTSC-2B NEMA 4 CAP FOR LEAK SENSOR (SHIP DIRECT)
24. HTLP 1.5 LIQUID LEAK SENSOR W/ 40' OF CABLE
CONDUIT & WIRING (TO OTHERS)
END VIEW
ELEVATION
POWER CORD
STABILIZER JACKS
TANK SHELL
INTERFACE SENSOR FLOAT POSITION
HIGHLAND TANK
ONE HIGHLAND ROAD
STOYSTOWN, PA 15563

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	OWS
City:	Long Beach
State:	California
Company:	
Type of Tank:	Horizontal Tank
Description:	Oil water separator for general drainage at power plant

Tank Dimensions

Shell Length (ft):		7.75
Diameter (ft):		3.50
Volume (gallons):		550.00
Turnovers:		100.00
Net Throughput(gal/yr):		55,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	
Shell Condition	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

OWS - Horizontal Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg	Min	Max	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg	Min	Max	Vapor Mol Weight	Liquid Mass Fract	Vapor Mass Fract	Mol Weight	Basis for Vapor Pressure Calculations
Oily Water	Jan	60.03	60.03	60.03	63.31	0.0065	0.0065	0.0065	130.0000			188.00	
Distillate fuel oil no. 2						0.0065	0.0065	0.0065	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Feb	60.66	60.66	60.66	63.31	0.0067	0.0067	0.0067	130.0000			188.00	
Distillate fuel oil no. 2						0.0067	0.0067	0.0067	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Mar	61.19	61.19	61.19	63.31	0.0068	0.0068	0.0068	130.0000			188.00	
Distillate fuel oil no. 2						0.0068	0.0068	0.0068	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Apr	62.58	62.58	62.58	63.31	0.0071	0.0071	0.0071	130.0000			188.00	
Distillate fuel oil no. 2						0.0071	0.0071	0.0071	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	May	63.96	63.96	63.96	63.31	0.0075	0.0075	0.0075	130.0000			188.00	
Distillate fuel oil no. 2						0.0075	0.0075	0.0075	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Jun	65.55	65.55	65.55	63.31	0.0079	0.0079	0.0079	130.0000			188.00	
Distillate fuel oil no. 2						0.0079	0.0079	0.0079	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Jul	67.59	67.59	67.59	63.31	0.0084	0.0084	0.0084	130.0000			188.00	
Distillate fuel oil no. 2						0.0084	0.0084	0.0084	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Aug	68.19	68.19	68.19	63.31	0.0085	0.0085	0.0085	130.0000			188.00	
Distillate fuel oil no. 2						0.0085	0.0085	0.0085	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Sep	67.31	67.31	67.31	63.31	0.0083	0.0083	0.0083	130.0000			188.00	
Distillate fuel oil no. 2						0.0083	0.0083	0.0083	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Oct	65.42	65.42	65.42	63.31	0.0079	0.0079	0.0079	130.0000			188.00	
Distillate fuel oil no. 2						0.0079	0.0079	0.0079	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Nov	62.40	62.40	62.40	63.31	0.0071	0.0071	0.0071	130.0000			188.00	
Distillate fuel oil no. 2						0.0071	0.0071	0.0071	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V
Oily Water	Dec	60.09	60.09	60.09	63.31	0.0065	0.0065	0.0065	130.0000			188.00	
Distillate fuel oil no. 2						0.0065	0.0065	0.0065	130.0000	1.0000	1.0000	188.00	Option 1: VP60 = .0065 V

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

OWS - Horizontal Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October
No Standing Losses: Underground Tank										
Working Losses (lb)	0.0431	0.0441	0.0450	0.0473	0.0496	0.0522	0.0556	0.0566	0.0551	0.0520
Vapor Molecular Weight (lb/lb-mole)	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.0065	0.0067	0.0068	0.0071	0.0075	0.0079	0.0084	0.0085	0.0083	0.0079
Net Throughput (gal/mo.)	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333	4,583.3333
Annual Turnovers	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
Turnover Factor	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667	0.4667
Tank Diameter (ft)	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000
Working Loss Product Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb)	0.0431	0.0441	0.0450	0.0473	0.0496	0.0522	0.0556	0.0566	0.0551	0.0520

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

OWS - Horizontal Tank
Long Beach, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Oily Water	0.59	0.00	0.59
Distillate fuel oil no. 2	0.59	0.00	0.59

1-Hour Normal Operation Emission Scenario

Only NO_2, CO and SO_2 are considered for the 1-hour Ambient Air Quality Standard.

1-Hour normal operation turbine emissions do not include any startup & shutdown event;

Turbine SO_2 emission rate based on peak short-term sulfur content

Black Start engine operates 38 minute for the 1-Hour Normal Operation Emission Scenario

Emissions per Turbine	lb/hr	g/s
NO_2	3.98	0.50148
CO	4.24	0.53424
SO_2	1.36	0.17097
Emissions from Black Start Engine		
NO_2	7.64	0.96239
CO	3.67	0.46182
SO_2	0.004	0.00045

3 Hour Emissions Scenarios

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.

Worst-case 3-Hour emission Scenario is the normal operation all the time in this 3 hour period.

Worst-case 3-Hour emission Scenario is equal to 3 hours at normal rate with peak short-term sulfur content

Black Start engine operates up to 38 minute each day and up to 200 hours every year

Emissions per Turbine	lb/hr	g/s
SO_2	1.36	0.17097
Emissions from Black Start Engine		
SO_2	0.0012	0.00015

8-Hour Emissions Scenarios

Only CO is considered for an average 8-hour Ambient Air Quality Standard.

Worst-case 8-Hour emission Scenario includes 1 Startup (72 minute trip, restart scenario), 1 Shutdown and remaining time at normal rate.

Black Start engine operates up to 38 minute each day and up to 200 hours every year

Emissions per Turbine	lb/hr	g/s
CO	4.49	0.56617
Emissions from Black Start Engine		
CO	0.46	0.05773

24-Hour Emissions Scenarios

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case (non-commissioning) 8-Hour Scenario includes: 1 Startup (72 minute trip, restart scenario), 1 Shutdown and remaining time at normal rate;
Turbine SO_2 emission rate based on peak short-term sulfur content
Black Start engine operates up to 38 minute each day and up to 200 hours every year

Emissions per Turbine	**lb/hr**	**g/s**
SO_2	1.36	0.17097
PM_{10}	3.00	0.37800
Emissions per Cooling Tower Cell	**lb/hr**	**g/s**
PM_{10}	0.0089	0.00113
Emissions from Black Start Engine		
SO_2	0.00015	0.00002
PM_{10}	0.00131	0.00016

Average Annual Emissions (in normal operation year)

Average turbine operation emission rates are based on the annual operation scenario for 602 hours plus 129 startup/shutdown events for all each turbine.

Cooling tower operates 2795 hours per cell per year.

Turbine SO_2 normal emission rate based on long-term sulfur content

Black Start engine operates 200 hours per year.

Emissions per Turbine	lb/hr	g/s
NO_X	0.432	0.05446
CO	0.360	0.04540
VOC	0.098	0.01236
SO_2	0.026	0.00323
PM_{10}	0.228	0.02870
Emissions per Cooling Tower Cell		
PM_{10}	0.003	0.00036
Emissions from Black Start Engine		
NO_2	2.75E-01	0.03469
CO	1.32E-01	0.01665
VOC	1.14E-03	0.00014
SO_2	1.30E-04	0.0000164
PM_{10}	1.13E-03	0.000143

Startup Scenario for Modeling

Only 1-hour NO_2, 1-hour CO and 8-hour CO are modeled in startup scenario

Startup 1-Hour turbine emissions consists of the maximum of an hour with 1 sixty-minutes startup

Black Start engine won't operate while tubine is doing startup

Emissions per Turbine	lb/hr	g/s
1-hour NO_2	14.27	1.79802
1-hour CO	6.28	0.79121
8-hour CO	4.49	0.56617

APPENDIX C

APPENDIX C Supporting Calculations for Project Toxic Air Contaminant Emissions Estimates

Hazardous Air Pollutant Emissions from The Project

Source	Total Annual HAP Emissions (ton/yr)
Unit 1	0.112
Unit 2	0.112
Unit 3	0.112
Unit 4	0.112
Black Start Engine	0.000
Chiller Cooling Tower	0.005
Total all sources	**0.451**

Pollutant	Total Annual HAP Emissions All Sources (ton/yr)
1,3-Butadiene	2.89E-04
Acetaldehyde	2.69E-02
Acrolein	2.43E-03
Benzene	2.19E-03
Ethylbenzene	2.15E-02
Formaldehyde	2.42E-01
Propylene Oxide	1.95E-02
Toluene	8.73E-02
Xylenes	4.30E-02
Naphthalene	0.001
PAHs (other than naphthalene)	3.42E-04
Antimony	3.25E-07
Arsenic	2.60E-06
Beryllium	5.42E-08
Cadmium	5.42E-08
Chlorine	5.04E-03
Chromium	5.96E-07
Cobalt	1.19E-06
Cyanide	2.49E-05
Lead	8.66E-07
Manganese	4.98E-06
Mercury	2.71E-08
Nickel	5.42E-08
Selenium	8.66E-06
Total	**0.451**

Note: Ammonia and Diesel Particulate are not Clean Air Act HAPs.

For the CAA112 requirements the combination of all Polyaromatic Hydrocarbons (PAH) will be considered Polycylic Organic Matter (POM), each individual PAH is not a HAP.

Toxic Air Contaminant Emissions from Each Turbine

Max Fuel Flow (HHV) **480.6** **MMBtu/hr**
Maximum annual hours of operation **698.75** **hr/yr**
includes 602 hours of normal operations plus 129 startups (35-minute events) and 129 shutdowns (10-minute events)

Operations Fuel Flow based on the maximum fuel flow (Case 4; 59°F ambient temperature; 100% load with evaporative cooling)

Pollutant	CAS	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMcf)	Emission factor source	Hourly Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
Ammonia *	7664417			max TBACT level	3.64	2.54E+03
1,3-Butadiene	106990	4.30E-07		AP-42	2.07E-04	1.44E-01
Acetaldehyde	75070	4.00E-05		AP-42	1.92E-02	1.34E+01
Acrolein	107028	3.62E-06		AP-42	1.74E-03	1.22E+00
Benzene	71432	3.26E-06		AP-42	1.57E-03	1.09E+00
Ethylbenzene	100414	3.20E-05		AP-42	1.54E-02	1.07E+01
Formaldehyde	50000	3.60E-04		AP-42	1.73E-01	1.21E+02
Propylene Oxide	75569	2.90E-05		AP-42	1.39E-02	9.74E+00
Toluene	108883	1.30E-04		AP-42	6.25E-02	4.37E+01
Xylenes	1330207	6.40E-05		AP-42	3.08E-02	2.15E+01
PAH						
Benzo(a)anthracene	56553	2.23E-08	2.26E-05	CATEF mean	1.07E-05	7.50E-03
Benzo(a)pyrene	50328	1.37E-08	1.39E-05	CATEF mean	6.60E-06	1.32E-01
Benzo(b)fluoranthene	205992	1.12E-08	1.13E-05	CATEF mean	5.37E-06	3.75E-03
Benzo(k)fluoranthene	207089	1.09E-08	1.10E-05	CATEF mean	5.22E-06	3.65E-03
Chrysene	218019	2.49E-08	2.52E-05	CATEF mean	1.20E-05	8.36E-03
Dibenz(a,h)anthracene	53703	2.32E-08	2.35E-05	CATEF mean	1.12E-05	7.80E-03
Indeno(1,2,3-cd)pyrene	193395	2.32E-08	2.35E-05	CATEF mean	1.12E-05	7.80E-03
Naphthalene	91203	1.64E-06	1.66E-03	CATEF mean	7.88E-04	5.51E-01
Total PAHs (other than naphthalene)					6.22E-05	1.71E-01
Total Annual HAP Emissions per Turbine (ton/yr)						**1.12E-01**

Notes:

- Emission factors obtained from US EPA AP-42 Table 3.1-3 for uncontrolled natural gas-fired stationary turbines. Formaldehyde, Benzene, and Acrolein emission factors are from the Background document for AP-42 Section 3.1, Table 3.4-1 for a natural gas-fired combustion turbine with a CO catalyst.

- Emission factors obtained from the CATEF database for natural gas-fired combustion turbines with SCR and CO catalyst.
- Ammonia emission rate based on an exhaust NH_3 limit of 5 ppmv @ 15% O_2 provided by the turbine vendor.
- Used a HHV (Btu/scf) = 1012
* not a CAA112 HAP

Toxic Air Contaminant Emissions from Black Start Engine

Rated Horsepower	**750**	**kW**
Expected non-emergency usage	**200**	**hr/yr**
Fuel usage	**53.5**	**gal/hr**

AB2588 Toxic Hotspots TAC	CAS	Emission Factor (Power Output) (g/kW-hr)	Emission factor source	Hourly Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
Diesel Particulate (PM10)	9901	0.03	EPA Tier 2 emission limit	0.0496	9.912

Note 1 Includes a 85% control particulate matter efficiency for particulate trap

Toxic Air Contaminant Emissions from Chiller Cooling Tower

design circulating water rate	7,740	gallons/min	1935
cycles of concentration	10		
Drift Eliminator Control	0.000010	=	0.001 %
Operating hours per year	2,795		
Number of cells in the cooling tower	4		

Toxic Air Contaminant	CAS	TAC Concentration in water[1]		Total tower emissions		Emissions per cell	
		ug/liter	lb/(1000 gallon)	lb/hr	lb/yr	lb/hr	lb/yr
Antimony **	7440360	0.6	0.000005	2.33E-07	6.50E-04	5.81E-08	1.62E-04
Arsenic	7440382	4.8	0.000040	1.86E-06	5.20E-03	4.65E-07	1.30E-03
Beryllium	7440417	0.1	0.000001	3.88E-08	1.08E-04	9.69E-09	2.71E-05
Cadmium	7440439	0.1	0.000001	3.88E-08	1.08E-04	9.69E-09	2.71E-05
Chlorine	7782505	9300	0.077603	3.60E-03	1.01E+01	9.01E-04	2.52E+00
Chromium	18540299	1.1	0.000009	4.26E-07	1.19E-03	1.07E-07	2.98E-04
Cobalt **	7440484	2.2	0.000018	8.53E-07	2.38E-03	2.13E-07	5.96E-04
Copper *	7440508	28	0.000234	1.09E-05	3.03E-02	2.71E-06	7.58E-03
Cyanide	57125	46	0.000384	1.78E-05	4.98E-02	4.46E-06	1.25E-02
Fluoride *	1101	30	0.000250	1.16E-05	3.25E-02	2.91E-06	8.12E-03
Lead	7439921	1.6	0.000013	6.20E-07	1.73E-03	1.55E-07	4.33E-04
Manganese	7439965	9.2	0.000077	3.57E-06	9.96E-03	8.91E-07	2.49E-03
Mercury	7439976	0.05	0.000000	1.94E-08	5.42E-05	4.84E-09	1.35E-05
Nickel	7440020	0.1	0.000001	3.88E-08	1.08E-04	9.69E-09	2.71E-05
Selenium	7782492	16	0.000134	6.20E-06	1.73E-02	1.55E-06	4.33E-03
Silica *	1175	970	0.008094	3.76E-04	1.05E+00	9.40E-05	2.63E-01
Sulfate *	9960	2550	0.021278	9.88E-04	2.76E+00	2.47E-04	6.90E-01
Total Annual HAP Emissions (ton/yr)					**5.08E-03**		

Note:

1. The maximum concentration for each TAC as determined from water samples collected from the water for use with the cooling tower.

* not a CAA112 HAP

** not a TAC for HRA purposes

COA AMPS

Summary of Water Quality Testing

Component	Units	GWRS Water Quality			Value Used in HRA (ug/L)	TAC in HRA	HAPs
		Minimum	Average	Maximum			
Antimony, Sb	ug/L	0.6	0.6	0.6	0.6	n	Antimony Compounds
Arsenic, As	ug/L	0.2	0.71	4.8	4.8	y	Arsenic Compounds
Beryllium, Be	ug/L	0.1	0.1	0.1	0.1	y	Beryllium Compounds
Cadmium, Cd	ug/L	0.1	0.1	0.1	0.1	y	Cadmium Compounds
Chloride, Cl	mg/L	5.35	7.08	9.3	9300	y	Chlorine
Chromium, Cr	ug/L	0.1	0.16	1.1	1.1	y	Chromium Compounds
Cobalt, Co	ug/L	0.1	0.22	2.2	2.2	n	Cobalt Compounds
Copper, Cu	ug/L	0.1	13.2	28	28	y	no
Cyanide, CN	ug/L	0.5	6.5	46	46	y	Cyanide Compounds
Fluoride, F	mg/L	0.01	0.02	0.03	30	y	no
Lead, Pb	ug/L	0.1	0.26	1.6	1.6	y	Lead Compounds
Manganese, Mn	ug/L	0.1	0.73	9.2	9.2	y	Manganese Compounds
Mercury, Hg	ug/L	0.05	0.05	0.05	0.05	y	Mercury Compounds
Nickel, Ni	ug/L	0.1	0.1	0.1	0.1	y	Nickel Compounds
Selenium, Se	ug/L	0.5	1.36	16	16	y	Selenium Compounds
Silica, SiO2	mg/L	0.26	0.68	0.97	970	y	no
Sulfate, SO4	mg/L	1.25	1.78	2.55	2550	y	no

APPENDIX D

NOTE: FOLLOWING THE DISTRIBUTION DATE OF THIS PROTOCOL, ANAHEIM MUNICIPAL POWER STATION HAS CHANGED ITS NAME TO CANYON POWER PLANT

MODELING PROTOCOL FOR THE ANAHEIM MUNICIPAL POWER STATION ANAHEIM, CALIFORNIA

PREPARED FOR:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AND CALIFORNIA ENERGY COMMISSION

OCTOBER 4, 2007

AIR QUALITY MODELING PROTOCOL FOR THE ANAHEIM MUNICIPAL POWER STATION PROJECT ANAHEIM, CALIFORNIA

Prepared For:

- South Coast Air Quality Management District

- California Energy Commission

Prepared on behalf of

Southern California Public Power Authority

October 4, 2007

URS

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San Diego, CA 92108-4314
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October 4, 2007

Mr. Mark Liu
Air Quality Analysis and Compliance Supervisor
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

Subject: Modeling Protocol for the Anaheim Municipal Power Station Project
Anaheim, California
URS Project No.: 28906973.01010

Dear Mr. Liu,

Please find enclosed for SCAQMD review and comment two copies of the air quality modeling protocol for the Anaheim Municipal Power Station Project, which is being proposed by Southern California Public Power Authority (SCPPA). Copies of the protocol are also being provided for review and comment to the California Energy Commission (CEC) air modeling staff. Please provide one of the enclosed copies to the District's air modeling specialist who is being assigned to this project.

The Project will consist primarily of four simple cycle LM6000 peaker turbines with a combined maximum generating capacity of approximately 200 MW. The project site is located in northeastern Anaheim, approximately 1 mile northeast of the CA-91 and CA-57 interchange, at 3071 East Miraloma Avenue, Anaheim, California.

An Application for Certification for the proposed power generation facility will be submitted to CEC in the near future. We would thus appreciate receiving your review comments as soon as possible, so that any changes that may be required can be incorporated. Please distribute the protocol among your colleagues as appropriate.

Thank you in advance for your review of this protocol. Do not hesitate to contact Julie Mitchell (619-294-9400) with any questions or concerns regarding any aspect of our intended modeling methodology.

Sincerely,

URS CORPORATION

John Lague
Senior Air Quality Consultant

JL:ml

Enclosures

cc: Keith Golden, California Energy Commission (w/enclosures)

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$\mu g/m^3$	Micrograms per cubic meter
°C	degrees Celsius
AAQS	Ambient Air Quality Standards
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AFC	Application for certification
AQRV	Air quality related values
ARB	Air Resources Board
ARM	Ambient Ratio Method
ATC	Authority to construct
BACT	Best available control technology
BPIP	Building profile input program
BPIP-Prime	Building Parameter Input Program – Prime
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CEC	California Energy Commission
CO	Carbon monoxide
CTG	Combustion turbine generator
ERC	Emission reduction credit
g/s	Gram per second
GEP	Good engineering practice
HARP	Hotspots analysis and reporting program
HHV	Higher heating value
HRA	Health risk assessment
ISCST3	Industrial Source Complex Short Term 3rd version
km	Kilometers
MEI	Maximally exposed individual
mm	Millimeter
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NNSR	Non-attainment New Source Review
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NSR	New source review
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OLM	Ozone limiting method
Pb	Lead
PM_{10}	Particulate matter less than 10 μm in diameter
$PM_{2.5}$	Particulate matter less than 2.5 μm in diameter
PMS	Particulate Matter Speciation
ppb	Parts per billion
ppm	Parts per million
PSD	Prevention of significant deterioration
ROC	Reactive organic compound

SCAQMD	South Coast Air Quality Management District
SCPPA	Southern California Public Power Authority
SCR	Selective catalytic reduction
SIL	Significant impact level
SO_2	Sulfur dioxide
TAC	Toxic air contaminants
T-BACT	Best available control technology for toxics
tpy	Tons per year
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTM	Universal Transverse Mercator

SECTION 1 INTRODUCTION

1.1 BACKGROUND

The Anaheim Municipal Power Station (AMPS) Project will be a nominal 200-megawatt (MW) simple cycle peaker power plant to be constructed in the city of Anaheim, California. The Project will be owned by Southern California Public Power Authority (SCPPA) and operated by the City of Anaheim. The AMPS will be permitted as a peaker plant consisting of four General Electric (GE) LM6000 natural gas-fired combustion turbine-electrical generators (CTGs).

The AMPS site is located at 3071 East Miraloma Avenue, Anaheim, California. The nearest major cross streets are Miraloma Avenue and Kraemer Boulevard. The AMPS will occupy approximately four and a half of a nine acre parcel in the Anaheim Canyon Business Center, the remaining four and a half acres will be used for construction laydown (see Figure 1-1).

The project is subject to the site licensing requirements of the California Energy Commission (CEC). The CEC will coordinate its independent air quality evaluations with the South Coast Air Quality Management District (SCAQMD) through the Determination of Compliance (DOC) process. Annual emissions of all criteria pollutants will be below the emission level thresholds specified by the United States Environmental Protection Agency's (USEPA) Prevention of Significant Deterioration (PSD) regulations for Major Sources. Specifically, the AMPS Facility will emit less than: 250 tons per year (tpy) of nitrogen oxides (NO_x), carbon monoxide (CO), reactive organic compounds (ROC) and sulfur dioxide (SO_2), less than 0.6 tons per year of lead (Pb) and less than 7.0 tons per year of sulfuric acid mist.

SCAQMD new source review (NSR) and non-attainment NSR (NNSR) regulations are potentially applicable to all criteria pollutants emitted by a new source, depending on the quantities of pollutants that will be emitted. The area around the AMPS site is classified as national attainment/unclassified for nitrogen dioxide (NO_2), CO and SO_2, and non-attainment for ozone (O_3), particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), and PM_{10}. With respect to the California Ambient Air Quality Standards (CAAQS), the area around the AMPS is classified as attainment for CO, NO_2, sulfates, Pb, and SO_2, unclassified for hydrogen sulfide, and non-attainment for O_3, $PM_{2.5}$, and PM_{10}. NO_2 and SO_2 are regulated as PM_{10} precursors, and NO_2 and ROC as O_3 precursors. Project emissions of non-attainment pollutants and their precursors will be offset to satisfy state and local NNSR regulations.

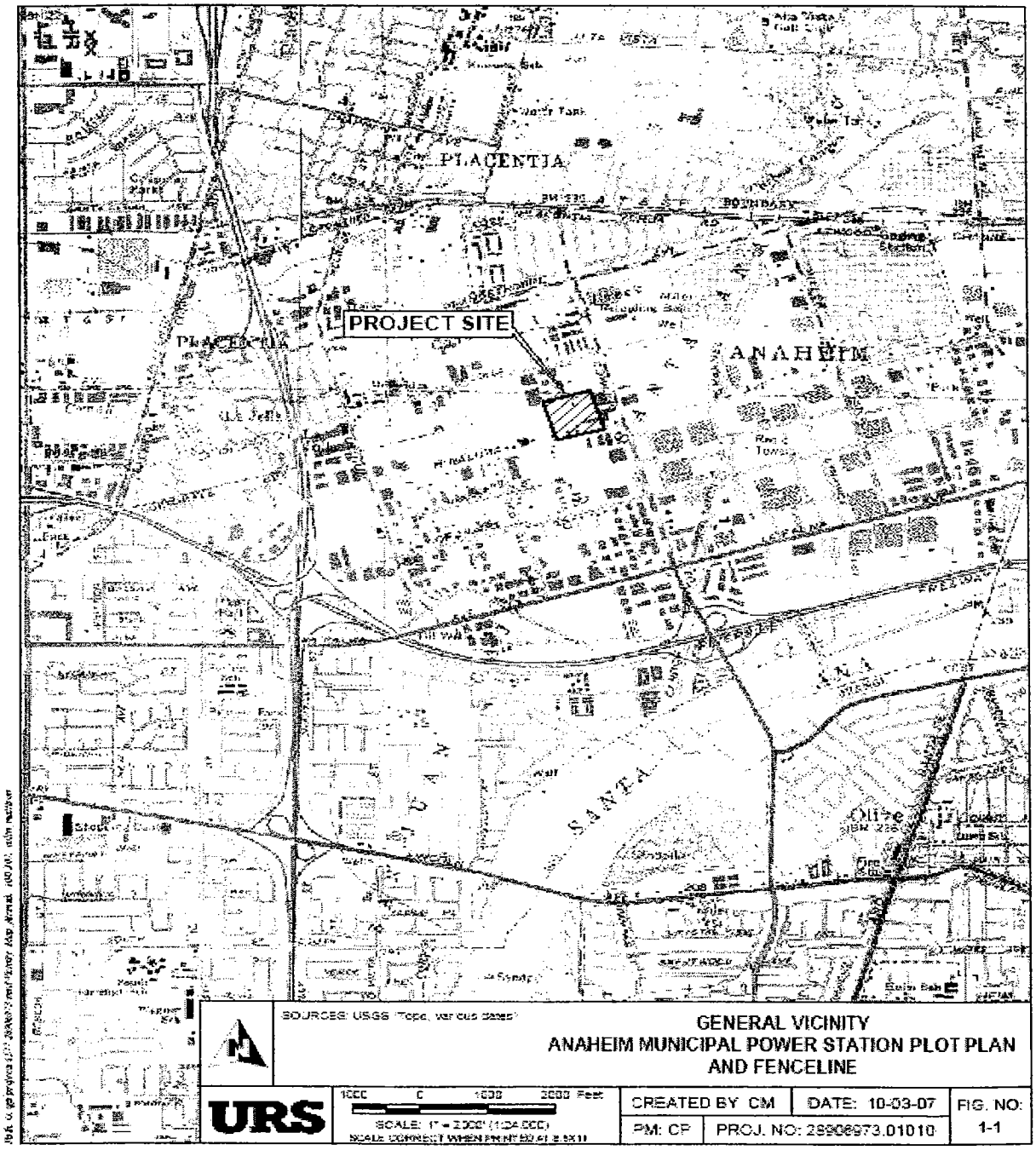
1.2 PURPOSE

The CEC and SCAQMD require the use of atmospheric dispersion modeling to demonstrate that a new power generation facility or modification to an existing facility will comply with applicable air quality standards. These agencies also require an assessment of the potential impacts on human health from the toxic air contaminants that may be emitted by such projects. In addition, CEC power plant siting regulations require modeling to evaluate the cumulative impacts of the proposed project with other new and reasonably foreseeable projects within 6 miles of the project site.

This document summarizes the procedures that are proposed for the air dispersion modeling for project certification and permitting. Modeling of both operational and construction emissions from to the proposed Project will be performed in accordance with CEC guidance (CEC, 1997). This protocol is

being submitted to the CEC and SCAQMD for their review and comment prior to completion of the applicable permit applications. The proposed model selection and modeling approach is based on review of applicable regulations, agency guidance documents, and recent discussions with staffs of the responsible agencies.

Figure 1-1
General Vicinity – Anaheim Municipal Power Station Project



SECTION 2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The location of the proposed project is shown on Figure 1-1, which also illustrates the project site, and nearby roads and other features. The AMPS site is approximately 9 acres in size, and is located in Anaheim, California, at 3071 East Miraloma Avenue. This location is northeast-east of the CA-57 and CA-91 interchange. Approximately half of the proposed 9 acre site will be used for the turbines and ancillary equipment, and the other half will be used for the laydown area during construction. The site is accessible from Miraloma Avenue.

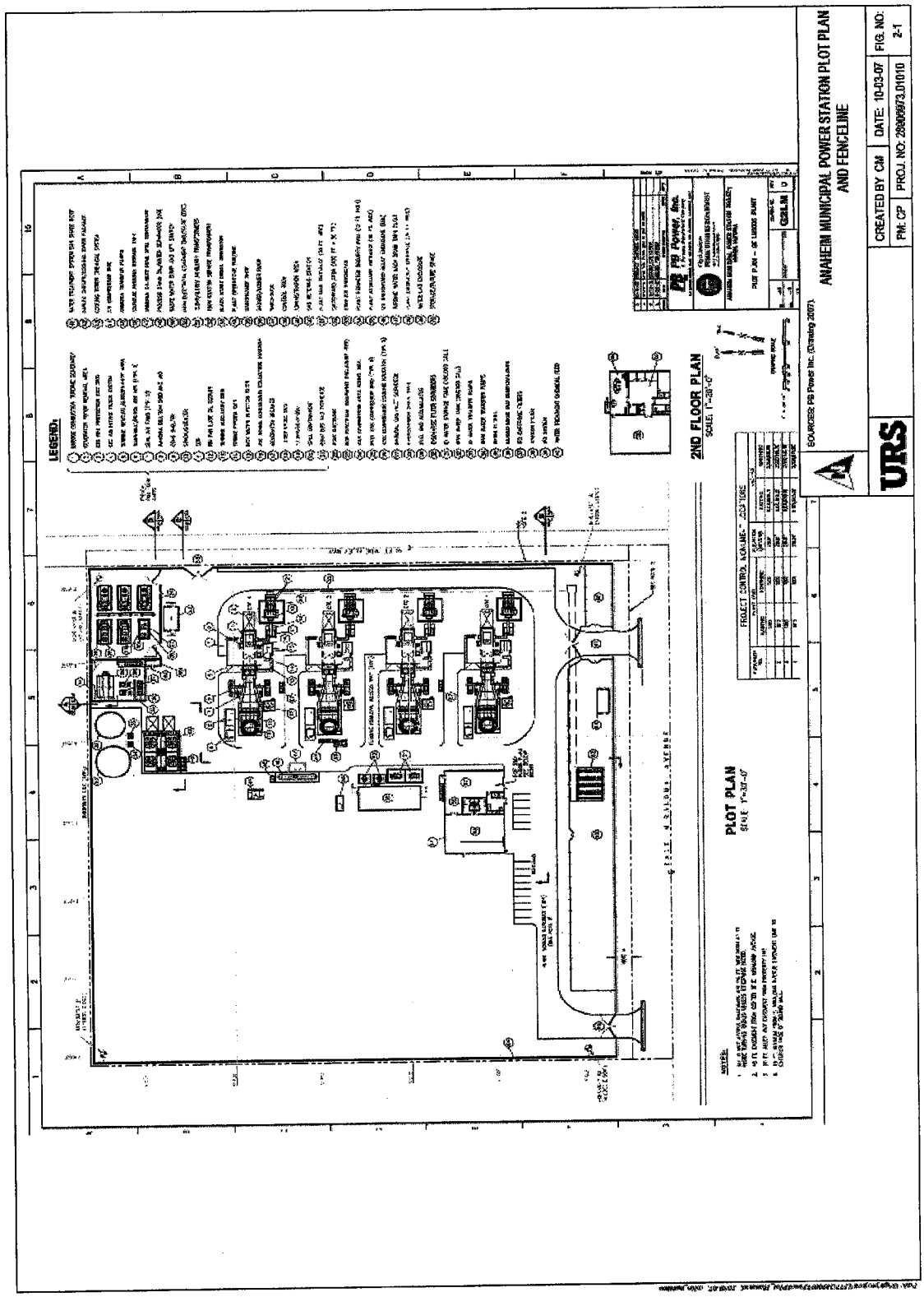
2.2 DESCRIPTION OF THE PROPOSED SOURCES

The proposed AMPS project will consist of four simple cycle GE LM6000 CTGs, each with an ISO baseload gross output of approximately 50 MW for a total output of 200 MW.

The gas turbines will be fired exclusively on pipeline-quality natural gas and will be equipped with water injection and selective catalytic reduction (SCR) for the control of NO_x emissions. An oxidation catalyst system will also be incorporated into the air quality control system to control emissions of CO and VOC. Aqueous ammonia will be used in the SCR system.

Other sources of emissions will include one 750 kilowatt diesel black start generator, and a 4-cell wet cooling tower which is a relatively small source of PM_{10} and TACs (drift). Figure 2-1 is a scaled plot plan showing the layout of Project facilities.

Figure 2-1
Anaheim Municipal Power Station Plot Plan and Fenceline



SECTION 3 REGULATORY SETTING

3.1 CALIFORNIA ENERGY COMMISSION REQUIREMENTS

For projects with electrical power generation capacity greater than 50 MW, CEC requires that applicants prepare a comprehensive Application for Certification (AFC) document addressing the proposed project's environmental and engineering features. An AFC must include the following air quality information (CEC, 1997):

- A description of the project, including project emissions of air pollutants and greenhouse gases, fuel type(s), control technologies and stack characteristics;
- The basis for all emission estimates and/or calculations;
- An analysis of Best Available Control Technology (BACT) according to SCAQMD Rules;
- Existing baseline air quality data for all regulated pollutants;
- Existing meteorological data, including temperature, wind speed and direction;
- A listing of applicable laws, ordinances, regulations, standards (LORS), and a determination of compliance with all applicable LORS;
- An emissions offset strategy;
- An air quality impact assessment (i.e., national and state ambient air quality standards [AAQS]) and protocol for the assessment of cumulative impacts of the proposed project along with permitted and under construction projects within a 10 km radius; and
- An analysis of human exposure to air toxics (i.e., health risk assessment [HRA]).

For the AMPS project, the air quality impact assessment, the cumulative impacts assessment, and the HRA will be performed using dispersion models.

3.2 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT REQUIREMENTS

The SCAQMD has promulgated new source review permitting requirements under Rule 1303. In general, all equipment with the potential to emit air pollutants is subject to the requirements of this rule, which has the following major requirements that potentially apply to new sources such as the AMPS:

- Installation of BACT,
- Ambient air quality impact modeling to demonstrate compliance with NAAQS,
- Emission offsets,
- Statewide compliance for all applicant-owned or operated facilities in California,

Plume visibility modeling will not be conducted for AMPS since it is not a PSD source and the nearest Class I area is San Gabriel Wilderness Area, approximately 42 kilometers from AMPS, a greater distance than the distance specified in SCAQMD Rule 1303.

Assembly Bill 2588, California Air Toxics Hot Spots Program and SCAQMD Rule 1401 (New Source Review of Toxic Air Contaminants [TAC]) establishes allowable risks for new or modified sources of TAC emissions. This rule specifies limits for maximum individual cancer risk (MICR), cancer burden, and non-carcinogenic acute and chronic hazard indices (HI) for new or modified sources of TAC emissions. The health risks resulting from project emissions, as determined by a health risk assessment using approved modeling methods, must not exceed established threshold values. While Rule 1401 does not specifically require the application of best available control technology for toxics (T-BACT) to a new or modified source that emits carcinogenic TACs, the rule relaxes the MICR risk threshold when T-BACT is applied. In order to have access to the emission reduction credits in the SCAQMD Priority Reserve (Rule 1309.1) projects within an Environmental Justice Area (EJA) must meet stricter MICR, cancer burden, and non-carcinogenic acute and chronic HIs.

3.3 U.S. ENVIRONMENTAL PROTECTION AGENCY REQUIREMENTS

USEPA has promulgated PSD regulations applicable to new Major Sources and Major Modifications to existing Major Sources. The AMPS facility will not be a major source for criteria pollutants; thus a PSD analysis will not be conducted. The applicant will accept a permit condition limiting the annual operating hours of the proposed plant to a level that will avoid triggering PSD requirements.

SECTION 4 AIR QUALITY IMPACT ANALYSIS

This section describes the dispersion models and modeling techniques that will be used in performing the criteria pollutant impact analysis for the AMPS. The objectives of the modeling are to demonstrate that air emissions from the AMPS will not contribute to exceedances of state and federal ambient air quality standards.

In November 2005, the USEPA officially recognized the American Meteorological Society/ Environmental Protection Agency Regulatory Model (AERMOD) as the preferred dispersion model for regulatory applications, replacing the Industrial Source Complex Short Term 3 (ISCST3) model. Also, CEC and EPA staff supports the use of AERMOD for power plant licensing/permitting analyses. Accordingly, AERMOD (Version 07026) will be used for the dispersion modeling associated with the AMPS.

4.1 TURBINE SCREENING MODELING

An initial screening modeling analysis will be conducted to determine the turbine stack parameters for the most important project sources, i.e., the CTGs that correspond to maximum ground-level pollutant concentrations. This information will be obtained by running a series of AERMOD simulations with the full meteorological input data set (see Section 4.6) with source inputs representing a range of different load conditions and ambient temperatures. The AERMOD screening runs will be setup with unit emission rate (1 g/s per turbine) to obtain the unit concentration (X/Q) in ($\mu g/m^3$)/(g/s) per averaging time. The unit concentration will then be multiplied by the actual emission rate for that scenario to obtain the pollutant concentration. The stack parameters that align with the highest offsite impact from these sources for each pollutant and averaging time will be used in the subsequent refined modeling simulations.

4.2 REFINED MODELING

The purpose of the refined modeling analysis is to demonstrate that air emissions from the AMPS will not cause or contribute to an ambient air quality violation. The AERMOD model (version 07026) will be used for the refined modeling of criteria pollutants. Specific modeling procedures that will be used for evaluating project impacts versus the state and federal ambient air quality standards and applicable health risk criteria are discussed below. Table 4-1 shows the regulatory criteria that will be used to evaluate the significance of predicted pollutant concentrations.

Analysis of land uses adjacent to the AMPS was conducted in accordance with Section 8.2.8 of the Guideline on Air Quality Models (EPA-450/2-78-027R and Auer [1978]), EPA AERMOD implementation guide (2005), and its addendum (2006).

Based on the Auer land use procedure, more than 50 percent of the area within a 3-km radius of the AMPS site is classified as urban. Since the Auer classification scheme requires more than 50 percent of the area within the 3-km radius around a proposed new source to be non-rural for an urban classification, the urban mode will be used in the AERMOD modeling analyses. All regulatory default options will be used, including building and stack tip downwash, default wind speed profiles, exclusion of deposition and gravitational settling, consideration of buoyant plume rise, and complex terrain.

Table 4-1
Relevant Ambient Air Quality Standards and Significance Levels

Pollutant	Averaging Time	CAAQS[a,c]	NAAQS[b,c]	SCAQMD Significant Change in Air Quality Concentration (µg/m³)	PSD Significant Emission Rates (TPY)
CO	8-hour	9.0 ppm (10,000 µg/m³)	9.0 ppm (10,000 µg/m³)	500	250
	1-hour	20 ppm (23,000 µg/m³)	35 ppm (40,000 µg/m³)	1,100	
NO_2[d]	Annual	-	0.053 ppm (100 µg/m³)	1	250
	1-hour	0.25 ppm (470 µg/m³)	-	(20)[e]	
SO_2	Annual	-	0.03 ppm (80 µg/m³)	-	250
	24-hour	0.04 ppm (105 µg/m³)	0.14 ppm (365 µg/m³)	-	
	3-hour	-	0.5 ppm (1,300 µg/m³)	-	
	1-hour	0.25 ppm (655 µg/m³)	-	-	
PM_{10}	Annual	20 µg/m³	-	1	250
	24-hour	50 µg/m³	150 µg/m³	2.5[f]	
$PM_{2.5}$	Annual	12 µg/m³	15 µg/m³	-	-
	24-hour	-	35 µg/m³	-	-
O_3	8-hour	0.07 ppm (137 µg/m³)	0.08 ppm (157 µg/m³)	-	250 (of ROCs)
	1-hour	0.09 ppm (180 µg/m³)	See footnote[g]	-	-

[a] California standards for ozone (as volatile organic compounds, carbon monoxide, sulfur dioxide (1-hour), nitrogen dioxide, and PM_{10}, are values that are not to be exceeded.

[b] National standards, other than those for ozone, particulate matter, and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

[c] Concentrations are expressed first in units in which they were promulgated. Equivalent units are given in parentheses and based on a reference temperature of 25° Celsius (C) and a reference pressure of 760 millimeters (mm) of mercury (1,013.2 millibar).

[d] Nitrogen dioxide (NO_2) is the compound regulated as a criteria pollutant; however, emissions are usually based on the sum of all oxides of nitrogen (NO_x). On February 27, 2007 the California Air Resources Board recommended that the NO_2 1-hour and annual standards be lowered. The proposed levels are 0.18 ppm (338 µg/m³) for 1-hour and 0.3 ppm (56 µg/m³) for annual. These standards have not yet been approved by the Office of Administrative Law but are expected to be promulgated later in 2007.

Table 4-1
Relevant Ambient Air Quality Standards and Significance Levels
(Continued)

[e] Previous SCAQMD 1-hour NO_2 Significant Impact Level in Rule 1303 rescinded for NO_2 attainment areas on April 20, 2001.
[f] Per SCAQMD Rule 1303 this threshold applies to each emission unit.
[g] New federal 8-hour ozone and fine particulate matter ($PM_{2.5}$) standards were promulgated by USEPA on July 18, 1997. The federal 1-hour ozone standard was revoked by USEPA on June 15, 2005.

- = Not applicable
CAAQS = California Ambient Air Quality Standard
NAAQS = National Ambient Air Quality Standard
Ppm = parts per million by volume, or micromoles of pollutant per mole of gas
TPY = ton per year
$\mu g/m^3$ = micrograms per cubic meter

4.2.1 Ambient Air Quality Standards Analysis

In accordance with SCAQMD Rule 1303(b)(1), the proposed AMPS will be required to demonstrate compliance with one of the following requirements:

- The project impact plus background must not exceed the most stringent applicable ambient air quality standard for each attainment pollutant (NO_2, SO_2, CO).
- The incremental effect of each permit unit of the AMPS may not exceed the Significant Change in Air Quality Concentration standards (listed in Table 4-1 as SCAQMD Significance Levels) for non-attainment pollutants (PM_{10}).

Compliance with these modeling requirements for attainment pollutants will be demonstrated by determining the maximum impact of the proposed Project at any receptor and adding a conservative background concentration based on recent data from the SCAQMD air quality monitoring station determined to be most representative of pre-project conditions in the project area.

Initially, the modeling will assume full conversion of NO_x to NO_2. If required, a 75% conversion rate of NO_x to NO_2 will be assumed for purposes of modeling annual NO_2 impacts. [EPA Ambient Ratio Method (ARM)]. Alternatively the AERMOD option to employ the ozone limiting method (OLM) may be used for estimating hourly and annual concentrations of NO_2. If 1-hour and annual concentrations do not exceed the applicable ambient air quality standard, then compliance is demonstrated and no further modeling is necessary for NO_2.

For PM_{10}, which is a non-attainment pollutant in the project area, the maximum incremental contribution from each individual turbine of the proposed AMPS will be compared directly with the SCAQMD 24-hour and annual Significant Change in Air Quality Concentration thresholds shown in Table 4-1. If the maximum predicted values are below these significant change thresholds, no further demonstration of compliance for this pollutant is required.

Note that emissions reduction credits will be obtained by the applicant to provide at least a one-to-one offsetting of all Project emissions increases of all non-attainment pollutants and their precursors, i.e. NO_x,

ROC, PM_{10} and SO_2. Some pollutant emission reduction credits will be obtained from the Priority Reserve, South Coast Air Quality Management District Rule 1309.1.

AMPS is considered an In-District Electric Generating Facility (EGF) under 1309.1(5)(A)(iii). The AMPS site is in an Environmental Justice Area (EJA) and has a maximum capacity of 500 MW or less, therefore, in order to draw credits from the Priority Reserve, AMPS must demonstrate the following:

a) The rate of PM_{10} emissions from each new or modified electrical generating units at full load does not exceed 0.060 lb/MW-hr, corrected to 59°F, 60% relative humidity, and 14.7 psia, except during startups and shutdowns as specified in the permit; and

b) The rate of NO_x emissions from each new or modified electrical generating units at full load does not exceed 0.080 lb/MW-hr, corrected to 59°F, 60% relative humidity, and 14.7 psia, except during startups and shutdowns as specified in the permit; and

c) The applicant substantiates with modeling that the 24-hour impact of the total combined PM_{10} emissions from the new or modified electrical generating units shall not exceed 5.0 $\mu g/m^3$; and

d) The applicant substantiates with modeling that the annual impact of the total combined PM_{10} emissions from the new or modified electrical generating units shall not exceed 0.75 $\mu g/m^3$; and

e) For simple cycle electric generating units, the unit shall operate a maximum of 4000 hours per year or less.

4.2.2 Health Risk Assessment Analysis

Both CEC and SCAQMD require a health risk assessment (HRA) to evaluate potential health effects of TAC emissions from the operation of the project. Contaminants emitted by the project with potential carcinogenic effects or chronic and/or acute non-carcinogenic effects will be considered. This health risk assessment will be performed following the SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (SCAQMD, 2005), Supplemental Guidelines for Preparing Risk Assessments for the Toxics "Hot Spots" Information and Assessment Act (AB2588) (SCAQMD, 2005) and Office of Environmental Health Hazard Assessment (OEHHA), Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2003). As recommended by the SCAQMD guideline, the California Air Resources Board (CARB) Hotspots Analysis and Reporting Program (HARP) (CARB, 2005) will be used to perform a refined SCAQMD Tier 4 and OEHHA Tier 1 health risk assessment for the project. HARP includes two modules: a dispersion module and a risk module. The HARP dispersion module incorporates the USEPA ISCST3 air dispersion model, and the HARP risk module implements the latest Risk Assessment Guidelines developed by OEHHA. CARB is currently working on a HARP interface with AERMOD, but this is still in early development and not ready for use by the general public. Thus HARP as presently designed with ISCST3 will be used to conduct the required HRA modeling.

First, ground-level concentrations from the AMPS emissions will be estimated using the ISCST3 dispersion model within HARP. The HARP modeling analysis will be consistent with, and use similar source parameters, as the modeling approach discussed above for the AAQS analyses using AERMOD, except that the ISCST3 control parameter NOCALMS will be selected per SCAQMD requirements for HRAs. The meteorological data used in the HRA will be obtained from the SCAQMD for the Anaheim

station for 1981. Based on the impacts determined by the ISCST3 model, the HARP model will be used to estimate the corresponding health risks. The maximum 1-hour and annual impacts determined by the ISCST3 will be used in the HARP model to estimate the corresponding health risks. Receptor spacing will be described later in this document. The HARP simulations will also include the census receptors out to 10 km, and additional receptors will be placed at all sensitive locations (e.g., schools, hospitals, etc.) where infants, children, elderly, chronically ill or populations more susceptible to exposure are located, out to a distance of 3 miles. Receptors will also be placed at nearby residents.

Per SCAQMD guidelines, cancer risk will be determined using the "Derived (Adjusted)" calculation method. Chronic non-cancer risks will be calculated with the "Derived (OEHHA)" method. Since the AMPS site is surrounded by urban development, the dairy milk and local meat ingestion and drinking water consumption pathways will not be included in this analysis.

The HRA performed by means of the HARP model will follow the following steps:

- Define the location of the point of maximum impact (PMI) for cancer risk (i.e., the location where the highest carcinogenic risk may occur);
- Define the location of the maximally exposed individual resident (MEIR) (i.e., the resident where the highest carcinogenic risk may occur);
- Define the locations of the maximum chronic non-carcinogenic adverse health effects and the maximum acute adverse health effects;
- Calculate concentrations and adverse health effects at locations of maximum impact for each pollutant;
- Calculate cancer burden if the maximum cancer risk is predicted to be greater than one in ten million;
- Determine the zone of impact for cancer risk if the maximum cancer risk is predicted to be greater than or equal to one in a million; and
- Determine the zone of impact for acute and chronic health risks if the acute or chronic health index is predicted to be greater than or equal to 0.5.

To qualify for SCAQMD Rule 1309.1 stricter HRA criteria have been established, as described below:

a) The cancer risk from the combined new or modified electrical generating units is less than 1 in one million; and

b) The non-cancer risk (acute and chronic) Hazard Index from the combined new or modified electrical generating units is less than 0.5; and

c) The cancer burden from the combined new or modified electrical generating units is less than 0.1, based on a 1 in 10 million risk level.

4.3 MODELING EMISSIONS INVENTORY

4.3.1 Operational Project Sources

Operational emissions from the project will be dominated by the turbines. Conceptual plant design includes SCR for NO_x and oxidation catalysts for CO that will comply with recent BACT determinations for similar projects in California and elsewhere. Emissions of SO_2 and PM_{10} will be maintained at low levels, owing to the exclusive use of interstate pipeline quality natural gas as fuel for the gas turbines. Table 4-2 summarizes the estimated annual emissions from the project sources for each criteria pollutant, the 4 turbines, the 4-cell cooling tower and diesel blackstart engine. The diesel blackstart engine will normally operate only a few hours per year in order to test operability in the event of an emergency situation. However, emissions from this engine will be included in the dispersion modeling conducted for the AMPS.

Short-term turbine emissions to be used in the modeling analyses will incorporate the maximum number of startups and/or shutdown during the averaging time of concern. These emissions may be higher than normal full load operations.

Separate modeling will be conducted using AERMOD to evaluate the maximum short-term effects of commissioning for the impacts on offsite 1-hour NO_2 concentrations and 1-hour and 8-hour CO concentrations.

Table 4-2
Approximate Annual Pollutant Emissions from the AMPS Project

Pollutant	Annual Emissions (tpy)		
	4 Turbines	Cooling Tower	Blackstart Engine
NO_x	38	0	0.05
CO	57	0	0.03
SO_2	3	0	0.01
PM_{10}	25	0.5	0.002
VOC	7	0	0.01

4.3.2 Project Construction Sources

Temporary construction emissions will result from heavy equipment exhaust (primarily NO_x and diesel particulate emissions) and fugitive dust (PM_{10}) from earthmoving activities and vehicle traffic on paved and unpaved surfaces. Equipment-specific emissions factors will be used to estimate mass emissions for all criteria pollutants from diesel-fueled construction equipment and vehicles using SCAQMD OFFROAD Emission Factors. Fugitive dust emissions resulting from onsite soil disturbances and travel on unpaved roads will be estimated using SCAQMD CEQA Handbook (SCAQMD, 1993) emission factors. A dust control efficiency of 85 percent for the construction area activities will be achieved for these activities by frequent watering or other measures when required. Emissions from on-road delivery

trucks and worker commute trips will be estimated using emission factors provided by SCAQMD for Onroad Vehicles from the EMFAC2007 model. An ultra-low fuel sulfur content of 0.0015 percent by weight (15 ppm) will be used in all diesel construction equipment.

A detailed Excel Workbook will be created to estimate criteria pollutant emissions for non-overlapping phases of Project construction, based on information from the Project design engineers on the equipment use by month throughout the construction schedule and the area extent of ground disturbance that will occur during different construction phases. Depending on the magnitude of emissions for different pollutants and the proximity of construction activities to the property boundary for each phase, one or more emission scenarios representing reasonable worst-case equipment activity and ground disturbance for each averaging time will be selected for subsequent dispersion modeling to ensure that maximum off-site air quality impacts due to these temporary activities will be assessed. The selected emissions scenarios will be modeled using AERMOD with the same near-field receptor grids and the same meteorological input data used for the modeling of the Project's operational emissions. The construction site, including the corridors for new transmission lines, gas lines or water pipelines, parking areas and lay-down areas will be modeled as area or volume sources.

4.3.3 Toxic Air Contaminant Sources

TACs will also be emitted from the operational AMPS project due to combustion of natural gas and diesel fuels. However, only small quantities of TACs will be emitted from these sources - primarily benzene, formaldehyde, and polycyclic aromatic hydrocarbons, since only natural gas will be used as fuel for the turbines. The 4-cell cooling tower will emit small quantities of TACs, primarily in the form of metals. One new diesel-fired blackstart engine is also proposed as part of the project. Emission estimates for TACs from these sources will be based on emission factors obtained from SCAQMD, CARB, EPA factors and/or vendor data, if available.

4.3.4 Greenhouse Gas Emissions

Potential greenhouse gas emissions from the proposed project will be calculated using the California Climate Action Registry power/utility protocol. The estimated greenhouse gas emissions from the Project will be presented in a table.

4.3.5 Cumulative Impact Analysis Including Off-Property Sources

A cumulative modeling analysis will be performed using AERMOD to evaluate the combined impacts of the AMPS Project emissions increases with those of any other new sources within 6 miles from the AMPS that are currently either under construction, undergoing permitting or expected to be permitted in the near future. Requests will be made to the SCAQMD and the City of Anaheim to request information that will be used to develop lists of all such new or planned emission sources. When received, these lists will be forwarded to CEC for review. Based on this information, and the CEC response, additional sources may be included in the cumulative source modeling analysis.

4.4 BUILDING WAKE EFFECTS

The effect of building wakes (i.e., downwash) upon the stack plumes of emission sources at the facility will be evaluated in accordance with USEPA guidance (USEPA, 1985). Direction-specific building data will be generated for stacks below good engineering practice (GEP) stack height using the most recent version of USEPA Building Parameter Input Program – Prime (BPIP-Prime) for input into AERMOD. For the HRA analysis in HARP, ISCST3 incorporates the results from BPIP, the predecessor to BPIP-Prime. Appropriate information will be provided in the AFC and permit applications that describe the input assumptions and output results from the BPIP-Prime and BPIP model.

4.5 RECEPTOR GRID

The receptor grids that will be used in the AERMOD modeling analyses described in this protocol for operational sources will be as follows:

- 25-meter spacing along the fenceline and extending from the fenceline out to 100 meters beyond the property line;
- 100-meter spacing from 100 m to 1 km beyond the property line;
- 500-meter spacing within 1 to 5 km of project sources; and
- 1,000-meter spacing within 5 to 10 km of project sources.

During the refined modeling analysis for operational Project emissions, if a maximum predicted concentration for a particular pollutant and averaging time is located within the portion of the receptor grid with spacing greater than 25 meters, a supplemental dense receptor grid will be placed around the original maximum concentration point and the model will be rerun. The dense grid will use 25-meter spacing and will extend to the next grid point in all directions from the original point of maximum concentration.

Due to the large computation time required to run AERMOD, this receptor grid, with the additional dense nested grid points, was determined to best balance the need to predict maximum pollutant concentrations and allow the all operational modeling runs to be completed in a timely manner.

Because construction emission sources release pollutants to the atmosphere from small equipment exhaust stacks or from soil disturbances at ground level, maximum predicted construction impacts for all pollutants and averaging times will occur within the first kilometer from the AMPS site boundary. Accordingly, only the portion of the above grid with 25 meter spacing out to a distance of 1 km will be used for the construction modeling.

For the HRA modeling, receptors will be placed at a 25-meter spacing around the facility fenceline and 100-meter spacing outside the fence out to 10 km. All receptors that HARP creates inside the fenceline will be excluded. The HARP simulations will also include the census receptors out to 10 km, these receptors are located in the populated areas nearest to the proposed facility. Receptors will be placed at all sensitive locations (e.g., schools, hospitals, etc.) out to a distance of 3 miles. Discrete receptors will also be placed at the locations of nearby residences.

A detailed project map including surrounding area will be provided in the AFC showing the locations of the grid receptors. Actual Universal Transverse Mercator (UTM) coordinates will be used. The CAAQS and NAAQS apply to all locations outside the applicant's facility, i.e. everywhere where public access is not under the control of the applicant. Therefore, the fenceline will be placed along the facility's property boundary, and the receptors will be placed on and outside of the fenceline.

4.6 METEOROLOGICAL AND AIR QUALITY DATA

4.6.1 Meteorological Data

The most representative NWS surface station with adequate data collection to support the required modeling effort was determined to be the John Wayne Airport. The Fullerton Airport station is nearer, but had insufficient data collection. Hourly NWS surface data for 2002-2006 from John Wayne Airport and upper air data from Miramar Naval Air Station for the same time frame will be processed in AERMET for input into AERMOD.

The meteorological data recorded at John Wayne Airport are acceptable for use at AMPS for two reasons, proximity and terrain similarity. The terrain immediately surrounding the Project site can be categorized as a fairly flat industrial urban area. The terrain around the John Wayne Airport also consists of relatively flat urban areas. Thus the land use and the location with respect to near-field terrain features are similar. Additionally, there are no significant terrain features separating the John Wayne Airport from the AMPS site that would cause differences in wind or temperature conditions between these respective areas. Therefore the five years of meteorological data selected from the John Wayne Airport were determined to be representative for purposes of evaluating the Project's air quality impacts.

The land use characteristics for the entire 360 degrees out to a distance of 3 kilometers surrounding both the John Wayne Airport and the AMPS site are urban. The land-use parameter values show in Table 4-3 are proposed to be used in AERMET for purposes of processing the meteorological data, and represent the surface characteristics around both the John Wayne Airport and the AMPS site.

Table 4-3
Land Use Characteristics Surrounding John Wayne Airport and AMPS

Land Use Characteristic	Spring	Summer	Autumn	Winter
Albedo	0.14	0.16	0.18	0.14
Bowen Ratio	2.0	4.0	4.0	2.0
Surface Roughness (meters)	1.0	1.0	1.0	1.0

The meteorological input data to be used in the HARP/ISC modeling comes from SCAQMD. The data are from the SCAQMD Anaheim station for 1981, were processed by SCAQMD and are model ready.

The annual wind rose based on the five years of John Wayne Airport surface meteorological data is provided as Appendix A to this protocol document. Winds for all seasons and all years blow predominantly from the southwest.

4.6.2 Air Quality Monitoring Data

Air quality monitoring data to represent existing air quality in the Project area were obtained from the USEPA AirData (2006) and the CARB-California Air Quality Data website (2006). The most recent three years of data (2004-2006) from the Anaheim-Pampas Lane, La Habra, Costa Mesa-Mesa Verde Drive, and Mission Viejo, monitoring stations were collected to determine the most representative baseline concentrations for each air pollutant and averaging period addressed in the California and National ambient air quality standards. The maximum concentration recorded at these monitoring stations over the three-year period will be used as a conservative representation of existing air quality condition at the proposed Project site.

The monitoring stations within Orange County that are closest to the proposed project site are the Anaheim-Pampas station, located approximately 4.8 miles west-southwest of the proposed project site, and the La Habra station, located about 6.8 miles to the northwest of the proposed site. The Anaheim-Pampas station measures all criteria pollutant concentrations except sulfur dioxide (SO_2). The La Habra station only measures carbon monoxide (CO), and nitrogen dioxide (NO_2). The closest station that measures SO_2 is the Costa Mesa-Mesa Verde Drive station, located approximately 13.2 miles south southwest of the project site. The Costa Mesa station also measures CO, and NO_2. The Mission Viejo station is the second closest station (the first being the Anaheim-Pampas station) that measures PM_{10} and $PM_{2.5}$. The Mission Viejo station is about 19.1 miles south southeast of the AMPS site.

The selected maximum baseline concentrations for all pollutants are summarized in Table 4-4. These data will be added to the modeled maximum impacts due to project emissions for each pollutant and averaging time, and the totals will then be compared with the applicable AAQS. This is a conservative approach because it assumes that the highest recorded background values and the modeled maximum impacts occur at the same time and location for each pollutant and averaging time, a highly unlikely scenario. Note that the maximum background concentrations of PM_{10} and $PM_{2.5}$ currently exceed the corresponding CAAQS and NAAQS.

Table 4-4
Highest Monitored Pollutant Concentrations near the Proposed AMPS Site (2004 – 2006)

Pollutant	Averaging Time	Highest Monitoring Concentration	Monitoring Station Address	Year
CO	8-hour	4.09 ppm (4,544 µg/m³)	Anaheim Pampas Lane	2004
	1-hour	7.4 ppm (8,510 µg/m³)	La Habra	2004
NO_2	Annual	0.025 ppm (46.7 µg/m³)	La Habra	2004 and 2005
	1-hour	0.122 ppm (229.1 µg/m³)	Anaheim Pampas Lane	2004
SO_2	Annual	0.002 ppm (5.33 µg/m³)	Costa Mesa-Mesa Verde Drive	2004
	24-hour	0.008 ppm (21.0 µg/m³)	Costa Mesa-Mesa Verde Drive	2004 and 2005
	3-hour	0.020 ppm (52.0 µg/m³)	Costa Mesa-Mesa Verde Drive	2004
	1-hour	0.031 ppm (81.2 µg/m³)	Costa Mesa-Mesa Verde Drive	2004
PM_{10} (Non-attainment area)	Annual	33.9 µg/m³	Anaheim Pampas Lane	2004
	24-hour	104.0 µg/m³	Anaheim Pampas Lane	2006
$PM_{2.5}$ (Non-attainment area)	Annual	19.0 µg/m³	Anaheim Pampas Lane	2004
	24-hour	58.9 µg/m³	Anaheim Pampas Lane	2004

4.7 FUMIGATION MODELING

Fumigation occurs when a stable layer of air lies a short distance above the release point of a plume and unstable air lies below. Especially on sunny mornings with light winds, the heating of the earth's surface causes a layer of turbulence which grows in depth over time and may intersect an elevated exhaust plume, rapidly drawing it down to ground level and creating relatively high pollutant concentrations for a short period. Typically, fumigation analysis is conducted using SCREEN3 when the project site is rural and the stack height is greater than 10 meter. However, since the AMPS project site is urban, the SCREEN3 fumigation analysis is not considered to be valid.

SECTION 5 PRESENTATION OF MODELING RESULTS

5.1 NAAQS AND CAAQS ANALYSES

The results of the AAQS analyses to evaluate the construction and operational impacts of the AMPS facility will be presented in summary tables. A figure indicating the locations of the maximum predicted pollutant concentrations for each applicable pollutant and averaging time will be provided. The maximum modeled values of the criteria pollutants from the AMPS sources will be added to the background concentrations (see Section 4.6.2) for each averaging time and compared with the NAAQS and CAAQS. PM_{10} impacts will be compared against the SCAQMD significance change thresholds. The cumulative impact values from combination of project sources in AMPS and new sources within 6 miles of the proposed project site will be added to the background concentrations for the corresponding pollutants and averaging times and will be compared with the NAAQS and CAAQS.

5.2 HEALTH RISK ASSESSMENT ANALYSIS

Maps depicting the following data will be prepared:

- The locations of sensitive receptors, including schools, pre-schools, hospitals, etc., within a 3-mile radius of the project, and the nearby residences included in the HRA;
- Table listing all sensitive receptors within a 3-mile radius of the project;
- A map depicting current and future residential land uses;
- Isopleths for any areas where predicted exposures to air toxics result in estimated chronic non-cancer impacts and acute impacts equal to or exceeding a hazard index of 0.5; and
- Isopleths for any areas where exposures to air toxics lead to an estimated carcinogenic risk equal to or greater than one in one million.

Health risk assessment modeling results will be summarized to include maximum annual (chronic, carcinogenic, and non-carcinogenic) and hourly (acute) adverse health effects from the AMPS's toxic air contaminant emissions. The estimated cancer burden will be presented if the maximum off-site cancer risk is predicted to be greater than one in ten million. Health risk values will be calculated and presented in the summary table for the points of maximum impact and the sensitive receptors with the maximum risk values.

5.3 DATA SUBMITTAL

Electronic copies of the modeling input and output files for all the analyses described in this protocol will be provided to SCAQMD and CEC.

SECTION 6 REFERENCES

American Meteorological Society. Journal of Applied Meteorology, 17(5): 636-643. "Correlation of Land Use and Cover with Meteorological Anomalies", August Auer Jr., May 1978.

ARB 2003. HARP User Guide – Software for Emission Inventory Database Management, Air Dispersion Modeling Analyses, and Health Risk Assessment version 1.3, Air Resources, Board, California Environmental Protection Agency. December 2003.

CEC, 1997. "Regulations Pertaining to the Rules of Practice and Procedure and Plant Site Certification". Title 20, California Code of Regulations. Chapter 1, 2, 5.

CEC, 2006. Rules of Practice and Procedure & Power Plant Site Certification Regulations Revisions, 04-SIT-2, December 14, 2006.

Office of Environmental Health Hazard Assessment (OEHHA), 2003. Air Toxics Hot Spots Program Risk Assessment Guidelines, August 2003.

South Coast Air Quality Management District, 2005. Risk Assessment Procedure for Rules 1401 and 212, Version 7, July 2005.

South Coast Air Quality Management District, 2005. Supplemental Guidelines for Preparing Risk Assessments for the Toxics "Hot Spots" Information and Assessment Act (AB2588), July 2005.

South Coast Air Quality Management District, 2007. Risk Assessment Procedure for Rules 1301.9, August 2007.

United States Environmental Protection Agency, 1985. *Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations),* EPA-450/4-85-023R, June 1985.

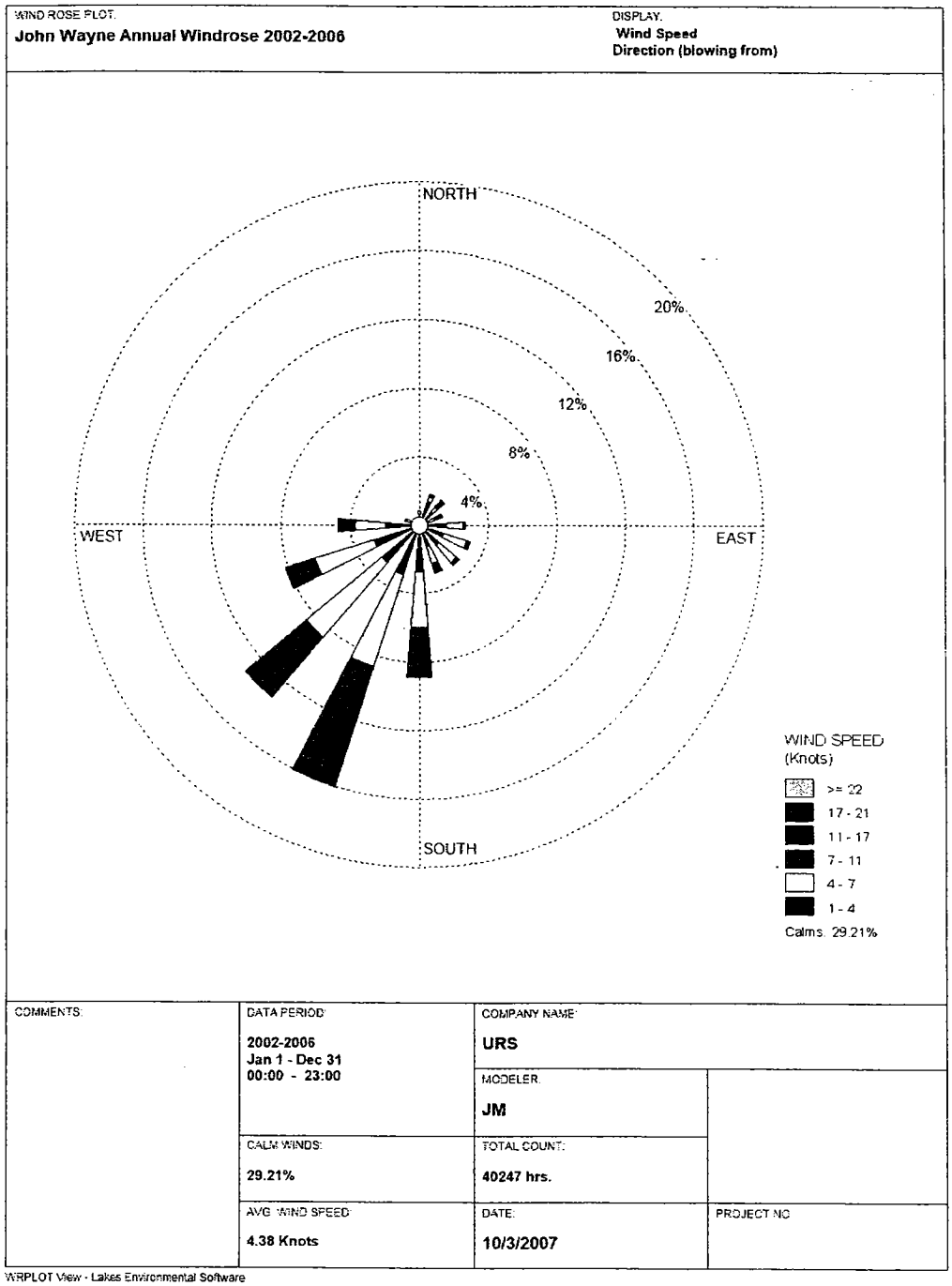
United States Environmental Protection Agency, 2004. User's Guide for the AMS/EPA Regulatory Model-AERMOD. September 2004.

United States Environmental Protection Agency, 2005. AERMOD Implementation Guide. September 2005.

United States Environmental Protection Agency, 2006. Addendum to User's Guide for the AMS/EPA Regulatory Model-AERMOD. December 2006.

United States Environmental Protection Agency, 2006. USEPA AirData.

Figure A-1
Annual Windrose for John Wayne Airport based on Surface Data for 2002-2006



APPENDIX E

APPENDIX E

Project Stack Parameters and Emission Rates Used in Modeling Analyses

Modeled Emission Rates/Stack Parameters during Normal Operation (Data for Individual Turbine)

Parameter	Individual Turbine
Stack Diameter, ft	11.7
Stack Height, ft	86
Stack Temp, deg F	838.67
Exhaust Flow, acfm	590,179
Stack Velocity, ft/s	91.96

Pollutant	Averaging	Per-Turbine Emissions (g/s)	Notes
NO_x	1-hour	0.501 (3.98 lb/hour)	No startup
	Annual	0.055	Non-commissioning year
CO	1-hour	0.791	No startup
	8-hour	0.57	
SO_x	1-hour	0.171	No startup; 1.0 gr/100 SCF fuel sulfur content
	3-hour	0.171	1.0 gr/100 SCF fuel sulfur content
	24-hour	0.171	1.0 gr/100 SCF fuel sulfur content
	Annual	0.0032	Non-commissioning year; 0.25 gr/100 SCF fuel sulfur content for normal operations
PM_{10}	24-hour	0.378	
	Annual	0.0287	Non-commissioning year

1 hour all pollutants: Based on maximum normal full load operation,

8-hour CO: Modeling for this pollutant and averaging time will be based on full 1.2 hour start/purge/restart scenario (see startup emission table at end of this Appendix) and then 6.8 hours of normal full-load operation. This results in a maximum 8-hour average emission rate, i.e., higher than with more of the period filled with normal full-load operations.

3-hour SO_2: Based on full load normal operation for three hours and natural gas fuel sulfur content of 1.0 gr/100 SCF

24-hour SO_2 and PM_{10} Based on maximum full load normal operation and natural gas fuel sulfur content of 1.0 gr/100 SCF

Annual all pollutants: Based on 129 35-minute startups, 129 10-minute shutdowns and 602 hours of max full load operation. Did not use trip/restart scenario for startups because 129 cycles is sufficient to cover the Maximum expected number of such events. Natural gas sulfur content of 0.25 gr/100 SCF used for normal operations for annual emission calculation.

Modeled Emission Rates/Stack Parameters During Startup (Data for Individual Turbine)

Parameter	Turbine
Stack Diameter, ft	11.7
Stack Height, ft	86
Stack Temp, deg F	783
Exhaust Flow, acfm	505,554
Stack Velocity, ft/s	78.37

Data from table of minute by minute startup data

Pollutant	Averaging Time	Per-Turbine Emissions (g/s)	Note
NO_x	1-hour	1.798 (14.27 lb/hr)	Includes 35-minute startup, turbine trip. 5 minute purge and first 20 minutes of restart
CO	1-hour	0.791(6.28 lb/hour)	Includes 35-minute startup, turbine trip, 5 minute purge and first 20 minutes of restart
	8-hour	0.57 (4.49 lb/hour)	See normal 8 hour CO scenario above

1-hour NO_x and CO: Based on full startup (35 minutes) followed by 5-minute purge and then first 20 minutes of restart. Note that the 1-hour NO_x emission rate in this table is the peak hourly emission rate among all turbine operating scenarios and the applicant requests that this be the basis for any permit condition limiting hourly NO_x emissions.

Modeled Emission Rates/Stack Parameters During Commissioning (Data for Individual Turbine)

Parameter	Turbine - Base Load Test	Turbine - First Fire Test
Stack Diameter, ft	11.7	11.7
Stack Height, ft	86	86
Stack Temp, deg F	843	694
Exhaust Flow, acfm	580,274	199,268
Stack Velocity, ft/s	90.42	31.05

Pollutant	Averaging Time	Turbine - Base Load Test	Turbine - First Fire Test
		Emissions (g/s)	Emissions (g/s)
NO_x	1-hour	5.371	1.047 (Did model despite lower emission rate because much lower stack exhaust velocity)
CO	1-hour	2.146 (Not modeled because clearly not worst case)	4.315
	8-hour	2.146 (Not modeled because clearly not worst case)	4.315

Modeled Emission Rates/Stack Parameters for HRA
(Data for Individual Turbine)

Parameter	Turbine
Stack Diameter, ft	11.7
Stack Height, ft	86
Stack Temp, deg F	838.67
Exhaust Flow, acfm	590,179
Stack Velocity, ft/s	91.96

Toxic Air Contaminant Emissions from Each Turbine						
Max Fuel Flow (HHV)		480.6	MMBtu/hr			
Maximum annual hours of operation		698.75	hr/yr			
Pollutant	CAS	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMcf)	Emission factor source	Hourly Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
Ammonia *	7664417			max TBACT level	3.64	2.54E+03
1,3-Butadiene	106990	4.30E-07		AP-42	2.07E-04	1.44E-01
Acetaldehyde	75070	4.00E-05		AP-42	1.92E-02	1.34E+01
Acrolein	107028	3.62E-06		AP-42	1.74E-03	1.22E+00
Benzene	71432	3.26E-06		AP-42	1.57E-03	1.09E+00
Ethylbenzene	100414	3.20E-05		AP-42	1.54E-02	1.07E+01
Formaldehyde	50000	3.60E-04		AP-42	1.73E-01	1.21E+02
Propylene Oxide	75569	2.90E-05		AP-42	1.39E-02	9.74E+00
Toluene	108883	1.30E-04		AP-42	6.25E-02	4.37E+01
Xylenes	1330207	6.40E-05		AP-42	3.08E-02	2.15E+01
PAH						
Benzo(a)anthracene	56553	2.23E-08	2.26E-05	CATEF mean	1.07E-05	7.50E-03
Benzo(a)pyrene	50328	1.37E-08	1.39E-05	CATEF mean	6.60E-06	1.32E-01
Benzo(b)fluoranthene	205992	1.12E-08	1.13E-05	CATEF mean	5.37E-06	3.75E-03
Benzo(k)fluoranthene	207089	1.09E-08	1.10E-05	CATEF mean	5.22E-06	3.65E-03
Chrysene	218019	2.49E-08	2.52E-05	CATEF mean	1.20E-05	8.36E-03
Dibenz(a,h)anthracene	53703	2.32E-08	2.35E-05	CATEF mean	1.12E-05	7.80E-03

Indeno(1,2,3-cd)pyrene	193395	2.32E-08	2.35E-05	CATEF mean	1.12E-05	7.80E-03
Naphthalene	91203	1.64E-06	1.66E-03	CATEF mean	7.88E-04	5.51E-01
Total PAHs (other than naphthalene)					6.22E-05	1.71E-01

698.75 operating hours in annual emission calculation includes 602 hours of normal operations plus 129 startups (35-minute events) and 129 shutdowns (10-minute events)

Cooling Tower Stack Parameters

Parameter	Value	Units	Notes
Fan diameter:	13	Feet	7 blades each fan
Exhaust flow	230,750	ACFM per each fan	
Exhaust flow	3,800,961	Pounds/hr total for 4 fans	
Exhaust temp	87.7	DB deg F	
Circulating water rate	7740	gpm for all 4 units	
	3,870,000	pph	
Cycles	10		
TDS	922	ppm after cycling maximum GWRS	
Drift	0.0010%	% of circulating water	
Exhaust stream solids	0.0357	Pounds/hr	

Note: Conditions are for design day of 89 F DB, 36% RH
Annual cooling tower emissions based conservatively on assumed operation for 2,795 hours per year (i.e., 4 x 698.75)

Emission Rates for Cooling Tower

Toxic Air Contaminant	CAS	TAC Concentration in water[1]		Emissions per cell		Total tower emissions	
		ug/liter	lb/(1000 gallon)	lb/hr	lb/yr	lb/hr	lb/yr
Antimony **	7440360	0.6	0.000005	5.81E-08	1.61E-04	2.33E-07	6.50E-04
Arsenic	7440382	4.8	0.000040	4.65E-07	1.29E-03	1.86E-06	5.20E-03
Beryllium	7440417	0.1	0.000001	9.69E-09	2.69E-05	3.88E-08	1.08E-04
Cadmium	7440439	0.1	0.000001	9.69E-09	2.69E-05	3.88E-08	1.08E-04
Chlorine	7782505	9300	0.077603	9.01E-04	2.50E+00	3.60E-03	1.01E+01
Chromium	18540299	1.1	0.000009	1.07E-07	2.96E-04	4.26E-07	1.19E-03
Cobalt **	7440484	2.2	0.000018	2.13E-07	5.91E-04	8.53E-07	2.38E-03
Copper *	7440508	28	0.000234	2.71E-06	7.53E-03	1.09E-05	3.03E-02
Cyanide	57125	46	0.000384	4.46E-06	1.24E-02	1.78E-05	4.98E-02
Fluoride *	1101	30	0.000250	2.91E-06	8.07E-03	1.16E-05	3.25E-02
Lead	7439921	1.6	0.000013	1.55E-07	4.30E-04	6.20E-07	1.73E-03
Manganese	7439965	9.2	0.000077	8.91E-07	2.47E-03	3.57E-06	9.96E-03
Mercury	7439976	0.05	0.000000	4.84E-09	1.34E-05	1.94E-08	5.42E-05
Nickel	7440020	0.1	0.000001	9.69E-09	2.69E-05	3.88E-08	1.08E-04
Selenium	7782492	16	0.000134	1.55E-06	4.30E-03	6.20E-06	1.73E-02
Silica *	7631869	970	0.008094	9.40E-05	2.61E-01	3.76E-04	1.05E+00
Sulfate *	9960	2550	0.021278	2.47E-04	6.86E-01	9.88E-04	2.76E+00

Note:
1. The maximum concentration for each TAC as determined from water samples collected from the water for use with the cooling tower.

* not a CAA112 HAP

** not a TAC for HRA purposes

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Diesel IC Engine Stack Parameters

Parameter	Value
Flow Rate (acfm)	5,647
Exhaust Temp (degrees F)	949.8
Stack Diameter (feet)	0.833 (10 inches)
Stack height (feet)	20 (12 ft building + 8 ft stack)
fuel rate (gal/hr)	53.5
diesel Sulfur content (ppm)	15
diesel density (lb/gal)	7.1
stack height (m)	6.096
exhaust temp (K)	783.04
exit velocity (m/s)	52.59
stack diameter (m)	0.254

IC Engine Emissions

Pollutant	Diesel Engine Emission Rate (lbs/hr)	Diesel Engine Emission (lbs per 38-minute test)[1]	Diesel Engine Emissions (lb/year)[2]
Diesel Particulate (PM_{10})	0.0496	0.031	9.91

Note:
[1]. If necessary, the applicant will accept a condition limiting the duration of maintenance tests for this engine to 38 minutes per test.
[2]. Annual emissions based on 200 total hours/year engine operation

Model Results – Normal Operation (Impacts due to Individual CTGs and all four CTGs combined)

Pollutant	Averaging Period	Maximum Predicted Concentration ($\mu g/m^3$)					Background Concentration ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$)[1]	Significant Change in Air Quality Concentration ($\mu g/m^3$)[2]	Comply (Yes /No)
		CTG 1	CTG 2	CTG 3	CTG 4	All 4 CTGs				
NO_2	1-hour[2]	1.87	1.87	1.86	1.88	6.69	229.1	339	20	Yes
	Annual	0.01	0.01	0.01	0.01	0.04	46.7	57	1	Yes
CO	1-hour	1.99	1.99	1.98	2.00	7.12	8,510	23,000	1,100	Yes
	8-hour	1.41	1.42	1.42	1.41	5.30	4,544	10,000	500	Yes
SO_2	1-hour	0.64	0.64	0.63	0.64	2.28	81.2	655	n/a	Yes
	3-hour	0.48	0.49	0.49	0.49	1.81	52	1,300	n/a	Yes
	24-hour	0.21	0.21	0.21	0.21	0.82	21	105	n/a	Yes
	Annual	0.001	0.001	0.001	0.001	0.002	5.3	80	n/a	Yes
PM_{10}	24-hour	0.47	0.47	0.47	0.47	1.81	104	50	2.5	Yes
	Annual	0.005	0.005	0.005	0.005	0.02	33.9	20	1	Yes
$PM_{2.5}$	24-hour	0.47	0.47	0.47	0.47	1.81	58.9	35	n/a	Yes
	Annual	0.005	0.005	0.005	0.005	0.02	19	15	n/a	Yes

Notes:
1 In February 2007, the CARB approved new, more stringent CAAQS for NO2. The new standards, which became effective on 20 March 2008, are 339 $\mu g/m^3$ (1-hour) and 57 $\mu g/m^3$ (annual).

2 From South Coast Air Quality Management District Rule 1303 Table A-2.

Model Results – Normal Operation (Impacts due to all Project Sources)

Pollutant	Averaging Period	Maximum Predicted Impact (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)
NO_2	1-hour	107.388	229.1	336.49
	Annual	0.403	46.7	47.10
CO	1-hour	77.369	8,510	8587.37
	8-hour	6.362	4,544	4550.36
SO_2	1-hour	2.280	81.2	83.48
	3-hour	1.813	52	53.81
	24-hour	0.819	21	21.82
	Annual	0.002	5.3	5.30
PM_{10}	24-hour	1.833	104	105.83
	Annual	0.022	33.9	33.92
$PM_{2.5}$	24-hour	1.833	58.9	60.73
	Annual	0.022	19	19.02

Model Results – Startup (Impacts due to Individual CTGs) CO 1 & 8 hr changes

Pollutant	Averaging Period	Maximum Predicted Concentration ($\mu g/m^3$)					Background Concentration ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$) [1]	Significant Change in Air Quality Concentration ($\mu g/m^3$) [2]	Comply (Yes /No)
		CTG 1	CTG 2	CTG 3	CTG 4	All 4 CTGs				
NO_2	1-hour	7.80	7.87	7.85	7.77	27.57	229.1	339	20	Yes
CO	1-hour	2.95	2.95	2.93	2.95	10.53	8,510	23,000	1,100	Yes
	8-hour	1.51	1.51	1.51	1.51	5.65	4,544	10,000	500	Yes

Model Results – Startup (Turbines)

Pollutant	Averaging Period	Maximum Predicted Impact (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)
NO_2	1-hour	27.565	229.1	256.67
CO	1-hour	10.534	8,510	8520.53
	8-hour	5.653	4,544	4549.65

Model Results – Commissioning – All Four Turbines

Pollutant	Averaging Period	Maximum Predicted Impact (ug/m^3) All four turbines		Background Concentration (ug/m^3)	Total Concentration (ug/m^3) All four turbines	
		Baseload Test	First Fire Test		Baseload Test	First Fire Test
NO_2	1-hour	58.48	29.1	229.1	283.58	258.20
CO	1-hour	N/A	122.52	8,510	N/A	8,632.5
	8-hour	N/A	103.95	4,544	N/A	4,648.0

Model Results – Commissioning- Individual Turbines

Modeling Scenario	Pollutant	Averaging Period	Maximum Estimated Impact all 4 CTGs (µg/m³)	Maximum Estimated Impact per CTG (µg/m³)				Background[2] (µg/m³)	Max Predicted Concentration for any one CTGs (µg/m³)
				CTG 1	CTG 2	CTG 3	CTG 4		
First Fire	CO	1 hour	123	35.66	35.2	35.65	35.67	8,510	8,546
		8 hour	104	28.58	29.19	31.87	31.63	4,544	4,576
	NO_2	1 hour	29.1	8.52	8.54	8.65	8.66	229.1	237.8
Base Load AVR	NO_2	1 hour	58.5	16.7	15.7	14.8	13.4	229.1	245.8

Model Results – HRA – All Sources (Modeling redone to include 698.75 operating hours a year for each turbine)

Receptor Type	Risk Type	Maximum Risk	Year	HARP Receptor Number	Receptor Grid	NAD 83 UTM Easting (m)	NAD83 UTM Northing (m)	Description of Receptor (distance from fenceline)
PMI	Cancer	0.62200	1981	24976	E	420263	3746903	northern property boundary near east edge of site
	Chronic	0.00429	1981	24977	E	420287	3746910	northern property boundary near east edge of site
	Acute	0.01650	1981	14928	E	422572	3744781	grid approximately 3 km southeast
Sensitive	Cancer	0.09690	1981	25147	E	419563	3746289	resident3 ~700 m SW of fence
	Chronic	0.00078	1981	25146	E	420880	3746899	resident2 ~500 m E of fence
	Acute	0.01620	1981	25091	E	420384	3750118	Placentia Veterinary Clinic ~3.3km N

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Maximum Impacts Summary due to the Total Project

Maximum Impacts and Locations of impact due to the Total Project

Receptor	Cancer Risk (per million)			
	MICR	**UTM Easting (m)**	**UTM Northing (m)**	**Description of location of impact**
Point of Maximum Impact	0.622	420,263	3,746,903	northern property boundary near east edge of site
Residential/ Sensitive	0.097	419,563	3,746,289	Resident about 700 m southwest of fence
Off-site worker/ Commercial	0.0885	420,292	3,746,942	Woodridge Press
Receptor	**Chronic Hazard Index**			
	HIC	**UTM Easting (m)**	**UTM Northing (m)**	**Description of location of impact**
Point of Maximum Impact	0.0051	420,292	3,746,942	Woodridge Press
Residential/ Sensitive	0.0008	420,880	3,746,899	Resident about 500 m east of fence
Off-site worker/ Commercial	0.0051	420,292	3,746,942	Woodridge Press
Receptor	**Acute Hazard Index**			
	HIA	**UTM Easting (m)**	**UTM Northing (m)**	**Description of location of impact**
Point of Maximum Impact	0.0165	422,572	3,744,781	grid approximately 3 km southeast
Residential/ Sensitive	0.0162	420,384	3,750,118	Placentia Veterinary Clinic about 3.3km north
Off-site worker/ Commercial	0.0006	420,183	3,746,896	Euro Sport Accessories Inc

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Maximum Residential and Commercial Impacts due to Each Emission Source

Cancer Risk (in 1 million)								
Source	Residential				Commercial			
	MICR	UTM Easting (m)	UTM Northing (m)	Description of location of impact	MICR	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Gas Turbine No. 1	0.0045	422484	3749818	Harmony Home (~3.5 km NE)	2.51E-05	420292	3746942	Woodridge Press (~25m N of fence)
Gas Turbine No. 2	0.0046	422484	3749818	Harmony Home (~3.5 km NE)	2.49E-05	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)
Gas Turbine No. 3	0.0046	422484	3749818	Harmony Home (~3.5 km NE)	2.41E-05	420374	3746808	Reel lumber service warehouse(~15m E of fence)
Gas Turbine No. 4	0.0046	422484	3749818	Harmony Home (~3.5 km NE)	2.38E-05	420374	3746808	Reel lumber service warehouse(~15m E of fence)
Black start Engine	0.0910	419925	3746623	Resident about 250 m west of fence	0.083	420292	3746942	Woodridge Press (~25m N of fence)
Cooling Tower	0.0036	420880	3746899	Resident about 500 m east of fence	0.006	420292	3746942	Woodridge Press (~25m N of fence)
Total Project	0.0969	419563	3746289	Resident about 700 m southwest of fence	0.0885	420292	3746942	Woodridge Press (~25m N of fence)
Chronic Non-cancer Hazard Index								
Source	Residential				Commercial			
	HIC	UTM Easting (m)	UTM Northing (m)	Description of location of impact	HIC	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Gas Turbine No. 1	0.0001	422484	3749818	Harmony Home (~3.5 km NE)	1.89E-06	420292	3746942	Woodridge Press (~25m N of fence)
Gas Turbine No. 2	0.0001	422484	3749818	Harmony Home (~3.5 km NE)	1.87E-06	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)
Gas Turbine No. 3	0.0001	422484	3749818	Harmony Home (~3.5 km NE)	1.81E-06	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)
Gas Turbine No. 4	0.0001	422484	3749818	Harmony Home (~3.5 km NE)	1.79E-06	420374	3746808	Reel lumber service warehouse(~15m E of fence)
Black start Engine	0.0001	419925	3746623	Resident about 250 m west of fence	2.63E-04	420292	3746942	Woodridge Press (~25m N of fence)
Cooling Tower	0.0007	420880	3746899	Resident about 500 m east of fence	4.81E-03	420292	3746942	Woodridge Press (~25m N of fence)
Total Project	0.0008	420880	3746899	Resident about 500 m east of fence	0.0051	420292	3746942	Woodridge Press (~25m N of fence)
Acute Non-cancer Hazard Index								
Source	Residential				Commercial			

	HIA	UTM Easting (m)	UTM Northing (m)	Description of location of impact	HIA	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Gas Turbine No. 1	0.0040	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	7.02E-05	420344	3746992	Kraemer Auto Collision Center (~85m NE of fence)
Gas Turbine No. 2	0.0040	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	6.44E-05	420344	3746992	Kraemer Auto Collision Center (~85m NE of fence)
Gas Turbine No. 3	0.0040	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	5.94E-05	420344	3746992	Kraemer Auto Collision Center (~85m NE of fence)
Gas Turbine No. 4	0.0040	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	5.52E-05	420344	3746992	Kraemer Auto Collision Center (~85m NE of fence)
Black start Engine	0	NA	NA	NA	0	NA	NA	NA
Cooling Tower	0.0001	420186	3750043	Resident about 450 m south of fence	3.76E-04	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)
Total Project	0.0161	420420	3750043	Atria Senior Living Group: Atria De Palma (~3km N)	0.00057	420183	3746896	Euro Sport Accessories Inc (~35m N of fence)

Note the CPP operates continuously and thus the default GLC and exposure assumptions were used to estimate the offsite worker cancer risk.

Maximum Impacts due to Turbines Only

Permit Unit	Cancer Risk (excess risk in 1 million)			Chronic Hazard Index			Acute Risk Hazard Index			Cancer burden
	MICR	UTM Easting (m)	UTM Northing (m)	HIC	UTM Easting (m)	UTM Northing (m)	HIA	UTM Easting (m)	UTM Northing (m)	(based on a 1 in 1 million risk)
Turbines 1-4	0.0210	422268	3748871	0.0003	422268	3748871	0.0164	422572	3744781	0

Note: Impacts from receptors that are inside the property are not included, these are grid receptor numbers 12322 and 12444-5. East receptor packet is where all peak impacts occurred.

Note: Cancer burden based on a 1 in 1 million risk level. If the peak cancer risk is < 1 in a million then the cancer burden is 0.

Maximum Impacts due to Each Emission Source and locations of these impacts

Permit Unit	Cancer Risk (per million)				Cancer burden (based on a 1 in 1 million risk)
	MICR	UTM Easting (m)	UTM Northing (m)	Description of location of impact	
Turbine 1	0.0053	422268	3748871	grid ~2.7 km northeast	0
Turbine 2	0.0052	422268	3748871	grid ~2.9 km northeast	0
Turbine 3	0.0052	422268	3748871	grid ~2.9 km northeast	0
Turbine 4	0.0053	422268	3748871	grid ~2.9 km northeast	0
Cooling Tower	0.0203	420287	3746910	northern property boundary	0
Black Start Engine	0.6090	420263	3746903	northern property boundary	0

Permit Unit	Chronic Hazard Index			
	HIC	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Turbine 1	0.0001	422268	3748871	grid ~2.7 km northeast
Turbine 2	0.0001	422268	3748871	grid ~2.7 km northeast
Turbine 3	0.0001	422268	3748871	grid ~2.7 km northeast
Turbine 4	0.0001	422268	3748871	grid ~2.7 km northeast
Cooling Tower	0.0039	420287	3746910	northern property boundary
Black Start Engine	0.0004	420263	3746903	northern property boundary

Permit Unit	Acute Hazard Index			
	HIA	UTM Easting (m)	UTM Northing (m)	Description of location of impact
Turbine 1	0.0041	422672	3744681	grid ~3.1 km southeast
Turbine 2	0.0041	422572	3744781	grid ~3 km southeast
Turbine 3	0.0041	422572	3744781	grid ~3 km southeast
Turbine 4	0.0041	422519	3744925	grid ~2.8 km southeast
Cooling Tower	0.0004	420287	3746910	northern property boundary
Black Start Engine	NA	NA	NA	NA

Note: The following East package receptors are onsite, and thus the predicted risk is ignored at receptors 12322 and 12444-5.

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Note: Only the east receptor package was examined since all of the peak impacts occurred there.
Note: Cancer burden based on a 1 in 1 million risk level. If the peak cancer risk is < 1 in a million then the cancer burden is 0.

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Revised 72-Minute Sequence of Normal Startup and Emission Control with Turbine Trip and Restart

			Stack emissions per Turbine											
Time	CT	SCR	NOx		CO		ROG		PM10		SOx @ 0.25 gr		SOx @ 1 gr	
(min)	Δ time	Δ time	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total
0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1		18.00	0.30	22	0.4	2.50	0.04	0.63	0.01	0.07	0.00	0.28	0.00
2			18.00	0.60	22	0.7	2.50	0.08	0.63	0.02	0.07	0.00	0.28	0.01
4			18.00	1.20	22	1.5	2.50	0.17	0.63	0.04	0.07	0.00	0.28	0.02
6	5		18.00	1.80	10.0	1.8	2.25	0.24	0.63	0.06	0.07	0.01	0.28	0.03
8	2		18.00	2.40	10.0	2.1	2.25	0.32	0.63	0.08	0.07	0.01	0.28	0.04
10			50.00	4.07	4.5	2.3	0.36	0.33	1.16	0.12	0.13	0.01	0.51	0.05
12		12	26.00	4.93	6.8	2.5	0.90	0.36	1.69	0.18	0.19	0.02	0.74	0.08
14			33.00	6.03	3.1	2.6	0.90	0.39	2.22	0.25	0.24	0.03	0.97	0.11
15		3	38.00	6.67	3.5	2.7	0.90	0.40	2.48	0.29	0.27	0.03	1.09	0.13
16			15.49	6.92	3.7	2.7	0.99	0.42	2.75	0.34	0.30	0.04	1.20	0.15
17	9		16.63	7.20	4.2	2.8	1.13	0.44	3.01	0.39	0.33	0.04	1.32	0.17
18			15.93	7.47	4.2	2.9	1.17	0.46	3.01	0.44	0.33	0.05	1.32	0.19
20			14.52	7.95	4.2	3.0	1.17	0.50	3.01	0.54	0.33	0.06	1.32	0.24
22			13.11	8.39	4.2	3.2	1.17	0.54	3.01	0.64	0.33	0.07	1.32	0.28
24			11.71	8.78	4.2	3.3	1.17	0.58	3.01	0.74	0.33	0.08	1.32	0.33
26			10.30	9.12	4.2	3.4	1.17	0.61	3.01	0.84	0.33	0.09	1.32	0.37
28			8.90	9.42	4.2	3.6	1.17	0.65	3.01	0.94	0.33	0.10	1.32	0.41
30			7.49	9.67	4.2	3.7	1.17	0.69	3.01	1.04	0.33	0.11	1.32	0.46
32			6.09	9.87	4.2	3.8	1.17	0.73	3.01	1.14	0.33	0.13	1.32	0.50
34			4.68	10.03	4.2	4.0	1.17	0.77	3.01	1.24	0.33	0.14	1.32	0.55
35		18	**3.98**	**10.09**	4.2	4.1	1.17	0.79	3.01	1.29	0.33	0.14	1.32	0.57
36			0.00	10.09	0	4.1	0.00	0.79	0.00	1.29	0.00	0.14	0.00	0.57
38			0.00	10.09	0	4.1	0.00	0.79	0.00	1.29	0.00	0.14	0.00	0.57
40	5		0.00	10.09	0	4.1	0.00	0.79	0.00	1.29	0.00	0.14	0.00	0.57
40	0		0.00	10.09	0	4.1	0.00	0.79	0.00	1.29	0.00	0.14	0.00	0.57
41	1	0	18.00	10.39	22	4.4	2.50	0.83	0.63	1.30	0.07	0.14	0.28	0.57
42			18.00	10.69	10.0	4.6	2.33	0.87	0.63	1.31	0.07	0.14	0.28	0.58
43		2	6.80	10.81	10.0	4.8	2.33	0.91	0.63	1.32	0.07	0.15	0.28	0.58
44			6.80	10.92	10.0	4.9	2.33	0.95	0.63	1.34	0.07	0.15	0.28	0.59
46	5		6.80	11.15	10.0	5.3	2.33	1.03	0.63	1.36	0.07	0.15	0.28	0.60

			Stack emissions per Turbine											
Time	CT	SCR	NOx		CO		ROG		PM10		SOx @ 0.25 gr		SOx @ 1 gr	
(min)	Δ time	Δ time	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total
48	2		6.80	11.37	10.0	5.6	2.33	1.10	0.63	1.38	0.07	0.15	0.28	0.60
50			18.90	12.00	2.2	5.7	0.45	1.12	1.16	1.42	0.13	0.16	0.51	0.62
52			9.83	12.33	3.3	5.8	0.90	1.15	1.69	1.47	0.19	0.16	0.74	0.65
54			12.47	12.75	3.1	5.9	0.90	1.18	2.22	1.55	0.24	0.17	0.97	0.68
56			15.49	13.26	3.7	6.0	0.99	1.21	2.75	1.64	0.30	0.18	1.20	0.72
57	9		16.63	13.54	4.2	6.1	1.13	1.23	3.01	1.69	0.33	0.19	1.32	0.74
58			15.78	13.80	4.2	6.1	1.17	1.25	3.01	1.74	0.33	0.19	1.32	0.76
60			**14.10**	**14.27**	**4.2**	**6.3**	**1.17**	**1.29**	**3.01**	**1.84**	**0.33**	**0.20**	**1.32**	**0.81**
72		15	**3.98**	**15.07**	**4.18**	**7.12**	**1.17**	**1.52**	**3.01**	**2.44**	**0.33**	**0.27**	**1.32**	**1.07**

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Pollutant Emissions for a 10-Minute Shutdown Sequence for Individual Turbine

		Engine emissions (#/hr)			Stack emissions											
	(pps)				NOx		CO		VOC		PM10		SOx @ .25gr		SOx @ 1gr	
Time (min)	exh flow	NOx	CO	VOC	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total	(#/hr)	# total
0	300	44.00	19.00	1.30	3.98	0.00	4.24	0.00	1.17	0.00	3.01	0.00	0.33	0.00	1.32	0.02
1	273	36.00	13.00	1.10	6.53	0.11	2.86	0.05	0.99	0.02	2.52	0.04	0.28	0.00	1.11	0.04
2	246	29.00	15.00	0.90	5.26	0.20	3.30	0.10	0.81	0.03	2.03	0.08	0.22	0.01	0.89	0.06
3	214	23.00	11.00	0.70	4.17	0.27	2.42	0.14	0.63	0.04	1.58	0.10	0.17	0.01	0.69	0.07
4	175	16.00	7.10	0.50	2.90	0.31	1.56	0.17	0.45	0.05	1.14	0.12	0.13	0.01	0.50	0.08
5	124	35.00	14.00	2.50	6.35	0.42	3.08	0.22	2.25	0.09	0.63	0.13	0.07	0.01	0.28	0.08
6	124	18.00	22.00	2.50	3.27	0.47	4.84	0.30	2.25	0.12	0.63	0.14	0.07	0.02	0.28	0.08
7	124	18.00	22.00	2.50	3.27	0.53	4.84	0.38	2.25	0.16	0.63	0.15	0.07	0.02	0.28	0.09
8	124	18.00	22.00	2.50	3.27	0.58	4.84	0.46	2.25	0.20	0.63	0.16	0.07	0.02	0.28	0.09
9	124	18.00	22.00	2.50	3.27	0.64	4.84	0.54	2.25	0.24	0.63	0.17	0.07	0.02	0.28	0.10
10	**124**	**18.00**	**22.00**	**2.50**	**3.27**	**0.69**	**4.84**	**0.62**	**2.25**	**0.27**	**0.63**	**0.18**	**0.07**	**0.02**	**0.28**	**0.10**

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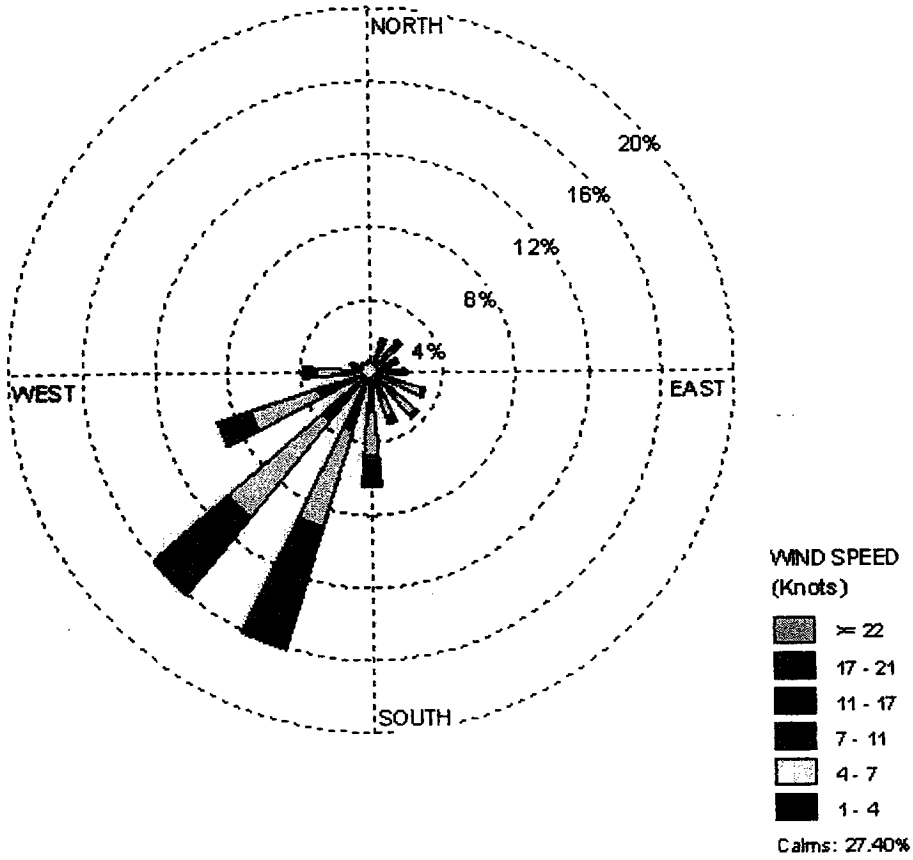
Zinc *	7440666	5	0.000042	4.84E-07	1.34E-03	1.94E-06	5.42E-03

APPENDIX F

APPENDIX F

Annual and Seasonal Wind Roses for John Wayne Airport (2002 – 2006)



Annual windrose for John Wayne Airport
Data taken from 2002-2006 for all months.

Displays wind speed, direction (blowing from)

Station ID: 72297 Run ID:
Year: 2002 2003 2004 2005 2006
Date Range: Jan 1 - Dec 31 ANNUAL
Time Range: 00:00 - 23:00

Frequency Distribution
(Count)

	Speed Knots						
Wind Direction	1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	240	59	6	1	0	0	306
11.25 - 33.75	668	118	37	22	3	1	849
33.75 - 56.25	577	154	106	141	32	15	1025
56.25 - 78.75	344	151	105	99	11	5	715
78.75 - 101.25	550	253	46	11	0	1	861
101.25 - 123.75	717	587	64	0	0	0	1368
123.75 - 146.25	817	578	80	13	0	0	1488
146.25 - 168.75	673	457	146	53	5	3	1337
168.75 - 191.25	981	1007	604	131	3	2	2728
191.25 - 213.75	1472	2364	2669	365	2	0	6872
213.75 - 236.25	1530	2917	2234	186	0	0	6867
236.25 - 258.75	1336	1680	774	40	0	0	3830
258.75 - 281.25	714	608	293	34	0	0	1649
281.25 - 303.75	330	158	45	4	0	0	537
303.75 - 326.25	235	71	13	1	0	0	320
326.25 - 348.75	189	48	4	0	0	0	241
Sub-Total:	11373	11210	7226	1101	56	27	30993
Calms:							11695
Missing/Incomplete:							1136
Total:							43824

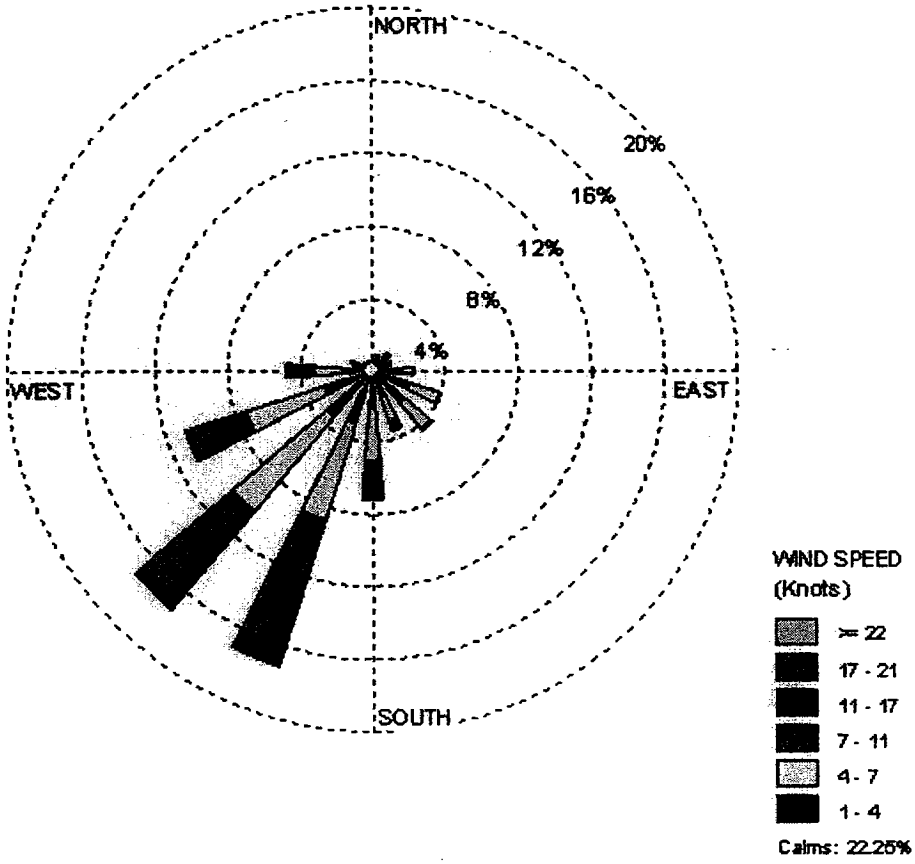
Frequency of Calm Winds: 27.40%
Average Wind Speed: 4.39 Knots

Station ID: 72297 Run ID:
Year: 2002 2003 2004 2005 2006
Date Range: Jan 1 - Dec 31 ANNUAL
Time Range: 00:00 - 23:00

Frequency Distribution
(Normalized)

	Speed Knots						
Wind Direction	1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	0.005622	0.001382	0.000141	0.000023	0.000000	0.000000	0.007168
11.25 - 33.75	0.015648	0.002764	0.000867	0.000515	0.000070	0.000023	0.019888
33.75 - 56.25	0.013517	0.003608	0.002483	0.003303	0.000750	0.000351	0.024011
56.25 - 78.75	0.008058	0.003537	0.002460	0.002319	0.000258	0.000117	0.016749
78.75 - 101.25	0.012884	0.005927	0.001078	0.000258	0.000000	0.000023	0.020170
101.25 - 123.75	0.016796	0.013751	0.001499	0.000000	0.000000	0.000000	0.032046
123.75 - 146.25	0.019139	0.013540	0.001874	0.000305	0.000000	0.000000	0.034858
146.25 - 168.75	0.015766	0.010706	0.003420	0.001242	0.000117	0.000070	0.031320
168.75 - 191.25	0.022981	0.023590	0.014149	0.003069	0.000070	0.000047	0.063906
191.25 - 213.75	0.034483	0.055379	0.062523	0.008550	0.000047	0.000000	0.160982
213.75 - 236.25	0.035841	0.068333	0.052333	0.004357	0.000000	0.000000	0.160865
236.25 - 258.75	0.031297	0.039355	0.018132	0.000937	0.000000	0.000000	0.089721
258.75 - 281.25	0.016726	0.014243	0.006864	0.000796	0.000000	0.000000	0.038629
281.25 - 303.75	0.007731	0.003701	0.001054	0.000094	0.000000	0.000000	0.012580
303.75 - 326.25	0.005505	0.001663	0.000305	0.000023	0.000000	0.000000	0.007496
326.25 - 348.75	0.004427	0.001124	0.000094	0.000000	0.000000	0.000000	0.005646
Sub-Total:	0.266421	0.262603	0.169275	0.025792	0.001312	0.000632	0.707215
Calms:							0.266863
Missing/Incomplete:							0.025922
Total:							1.000000

Frequency of Calm Winds: 27.40%
Average Wind Speed: 4.39



Spring windrose for John Wayne Airport
Data taken from 2002-2006 for Mar., Apr., and May months

Displays wind speed, direction (blowing from)

Station ID: 72297
Year: 2002 2003 2004 2005 2006
Date Range: Mar 1 - May 31 SPRING
Time Range: 00:00 - 23:00

Run ID:

Frequency Distribution
(Count)

	Speed Knots						
Wind Direction	1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	35	11	3	0	0	0	49
11.25 - 33.75	85	15	1	1	1	1	104
33.75 - 56.25	97	18	8	18	6	3	150
56.25 - 78.75	67	29	13	13	1	2	125
78.75 - 101.25	169	79	6	1	0	0	255
101.25 - 123.75	236	188	12	0	0	0	436
123.75 - 146.25	252	202	20	1	0	0	475
146.25 - 168.75	171	152	48	11	1	0	383
168.75 - 191.25	237	300	189	49	2	0	777
191.25 - 213.75	340	596	795	132	1	0	1864
213.75 - 236.25	366	736	705	77	0	0	1884
236.25 - 258.75	312	486	349	34	0	0	1181
258.75 - 281.25	175	176	148	19	0	0	518
281.25 - 303.75	81	42	19	2	0	0	144
303.75 - 326.25	41	15	8	1	0	0	65
326.25 - 348.75	42	8	2	0	0	0	52
Sub-Total:	2706	3053	2326	359	12	6	8462
Calms:							2421
Missing/Incomplete:							1136
Total:							12019

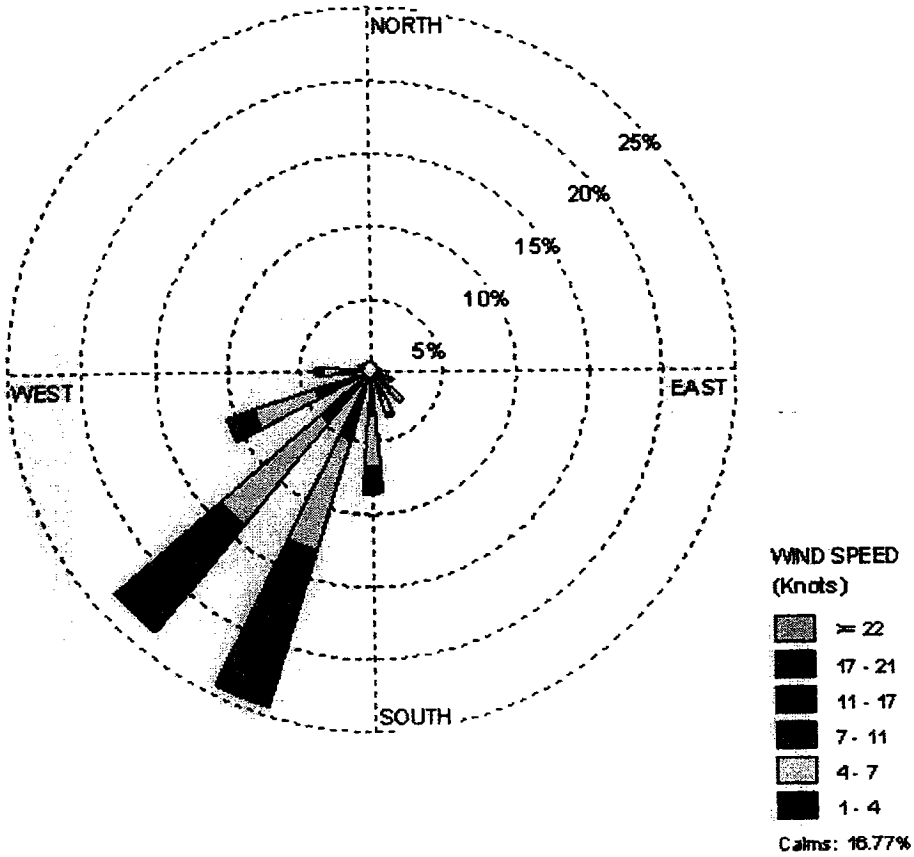
Frequency of Calm Winds: 22.25%
Average Wind Speed: 4.94 Knots

Station ID: 72297 Run ID:
Year: 2002 2003 2004 2005 2006
Date Range: Mar 1 - May 31 SPRING
Time Range: 00:00 - 23:00

Frequency Distribution
(Normalized)

	Speed Knots						
Wind Direction	1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	0.003216	0.001011	0.000276	0.000000	0.000000	0.000000	0.004502
11.25 - 33.75	0.007810	0.001378	0.000092	0.000092	0.000092	0.000092	0.009556
33.75 - 56.25	0.008913	0.001654	0.000735	0.001654	0.000551	0.000276	0.013783
56.25 - 78.75	0.006156	0.002665	0.001195	0.001195	0.000092	0.000184	0.011486
78.75 - 101.25	0.015529	0.007259	0.000551	0.000092	0.000000	0.000000	0.023431
101.25 - 123.75	0.021685	0.017275	0.001103	0.000000	0.000000	0.000000	0.040062
123.75 - 146.25	0.023155	0.018561	0.001838	0.000092	0.000000	0.000000	0.043646
146.25 - 168.75	0.015713	0.013967	0.004411	0.001011	0.000092	0.000000	0.035193
168.75 - 191.25	0.021777	0.027566	0.017367	0.004502	0.000184	0.000000	0.071396
191.25 - 213.75	0.031241	0.054764	0.073050	0.012129	0.000092	0.000000	0.171276
213.75 - 236.25	0.033630	0.067628	0.064780	0.007075	0.000000	0.000000	0.173114
236.25 - 258.75	0.028669	0.044657	0.032068	0.003124	0.000000	0.000000	0.108518
258.75 - 281.25	0.016080	0.016172	0.013599	0.001746	0.000000	0.000000	0.047597
281.25 - 303.75	0.007443	0.003859	0.001746	0.000184	0.000000	0.000000	0.013232
303.75 - 326.25	0.003767	0.001378	0.000735	0.000092	0.000000	0.000000	0.005973
326.25 - 348.75	0.003859	0.000735	0.000184	0.000000	0.000000	0.000000	0.004778
Sub-Total:	0.248645	0.280529	0.213728	0.032987	0.001103	0.000551	0.704052
Calms:							0.201431
Missing/Incomplete:							0.094517
Total:							1.000000

Frequency of Calm Winds: 22.25%
Average Wind Speed: 4.94 Knots



Summer windrose for John Wayne Airport
Data taken from 2002-2006 for Jun., Jul., and Aug. months

Displays wind speed, direction (blowing from)

Station ID: 72297 Run ID:
Year: 2002 2003 2004 2005 2006
Date Range: Jun 1 - Aug 31 SUMMER
Time Range: 00:00 - 23:00

Frequency Distribution
(Count)

	Speed Knots						
Wind Direction	1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	29	11	0	0	0	0	40
11.25 - 33.75	32	8	1	0	0	0	41
33.75 - 56.25	29	3	0	0	0	0	32
56.25 - 78.75	34	4	1	0	0	0	39
78.75 - 101.25	72	16	0	0	0	0	88
101.25 - 123.75	112	65	2	0	0	0	179
123.75 - 146.25	204	120	3	0	0	0	327
146.25 - 168.75	202	151	22	2	0	0	377
168.75 - 191.25	336	375	187	18	0	0	916
191.25 - 213.75	541	860	1070	157	0	0	2628
213.75 - 236.25	506	987	962	84	0	0	2539
236.25 - 258.75	449	482	212	2	0	0	1145
258.75 - 281.25	229	144	49	0	0	0	422
281.25 - 303.75	84	23	1	0	0	0	108
303.75 - 326.25	54	12	1	0	0	0	67
326.25 - 348.75	46	6	1	0	0	0	53
Sub-Total:	2959	3267	2512	263	0	0	9001
Calms:							1813
Missing/Incomplete:							1136
Total:							11950

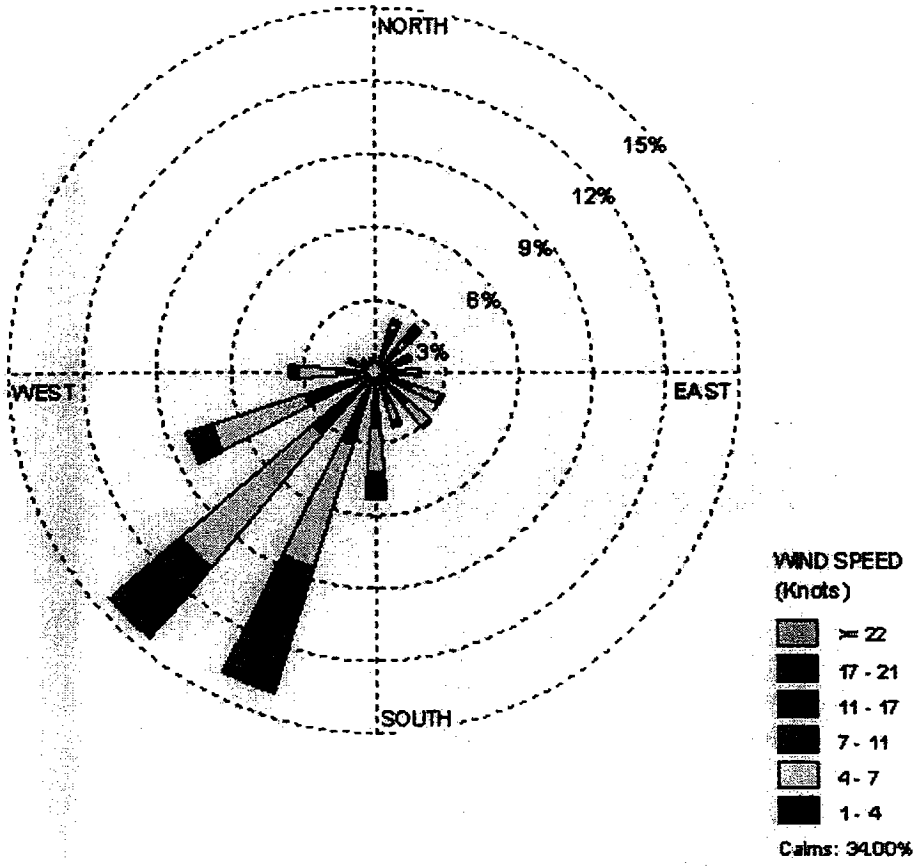
Frequency of Calm Winds: 16.77%
Average Wind Speed: 5.16 Knots

Station ID: 72297 Run ID:
Year: 2002 2003 2004 2005 2006
Date Range: Jun 1 - Aug 31 SUMMER
Time Range: 00:00 - 23:00

Frequency Distribution
(Normalized)

	Speed Knots						
Wind Direction	1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	0.002682	0.001017	0.000000	0.000000	0.000000	0.000000	0.003699
11.25 - 33.75	0.002959	0.000740	0.000092	0.000000	0.000000	0.000000	0.003791
33.75 - 56.25	0.002682	0.000277	0.000000	0.000000	0.000000	0.000000	0.002959
56.25 - 78.75	0.003144	0.000370	0.000092	0.000000	0.000000	0.000000	0.003606
78.75 - 101.25	0.006658	0.001480	0.000000	0.000000	0.000000	0.000000	0.008138
101.25 - 123.75	0.010357	0.006011	0.000185	0.000000	0.000000	0.000000	0.016553
123.75 - 146.25	0.018864	0.011097	0.000277	0.000000	0.000000	0.000000	0.030239
146.25 - 168.75	0.018679	0.013963	0.002034	0.000185	0.000000	0.000000	0.034862
168.75 - 191.25	0.031071	0.034677	0.017292	0.001665	0.000000	0.000000	0.084705
191.25 - 213.75	0.050028	0.079527	0.098946	0.014518	0.000000	0.000000	0.243018
213.75 - 236.25	0.046791	0.091271	0.088959	0.007768	0.000000	0.000000	0.234788
236.25 - 258.75	0.041520	0.044572	0.019604	0.000185	0.000000	0.000000	0.105881
258.75 - 281.25	0.021176	0.013316	0.004531	0.000000	0.000000	0.000000	0.039023
281.25 - 303.75	0.007768	0.002127	0.000092	0.000000	0.000000	0.000000	0.009987
303.75 - 326.25	0.004994	0.001110	0.000092	0.000000	0.000000	0.000000	0.006196
326.25 - 348.75	0.004254	0.000555	0.000092	0.000000	0.000000	0.000000	0.004901
Sub-Total:	0.273627	0.302108	0.232291	0.024320	0.000000	0.000000	0.753222
Calms:							0.151715
Missing/Incomplete:							0.095063
Total:							1.000000

Frequency of Calm Winds: 16.77%
Average Wind Speed: 5.16 Knots



Fall windrose for John Wayne Airport
Data taken from 2002-2006 Sep., Oct., and Nov. months.

Displays wind speed, direction (blowing from)

Station ID: 72297
Year: 2002 2003 2004 2005 2006
Date Range: Sep 1 - Nov 30 FALL
Time Range: 00:00 - 23:00

Run ID:

Frequency Distribution
(Count)

Wind Direction	Speed Knots 1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	65	12	2	0	0	0	79
11.25 - 33.75	204	23	15	7	1	0	250
33.75 - 56.25	149	40	34	43	9	3	278
56.25 - 78.75	77	38	34	20	6	1	176
78.75 - 101.25	137	58	9	2	0	1	207
101.25 - 123.75	173	139	14	0	0	0	326
123.75 - 146.25	198	125	11	1	0	0	335
146.25 - 168.75	154	80	23	4	1	1	263
168.75 - 191.25	255	189	100	25	0	1	570
191.25 - 213.75	343	565	550	40	0	0	1498
213.75 - 236.25	372	757	401	16	0	0	1546
236.25 - 258.75	333	428	121	0	0	0	882
258.75 - 281.25	181	158	42	1	0	0	382
281.25 - 303.75	82	49	7	0	0	0	138
303.75 - 326.25	63	20	1	0	0	0	84
326.25 - 348.75	48	18	1	0	0	0	67
Sub-Total:	2834	2699	1365	159	17	7	7081
Calms:							3647
Missing/Incomplete:							1136
Total:							11864

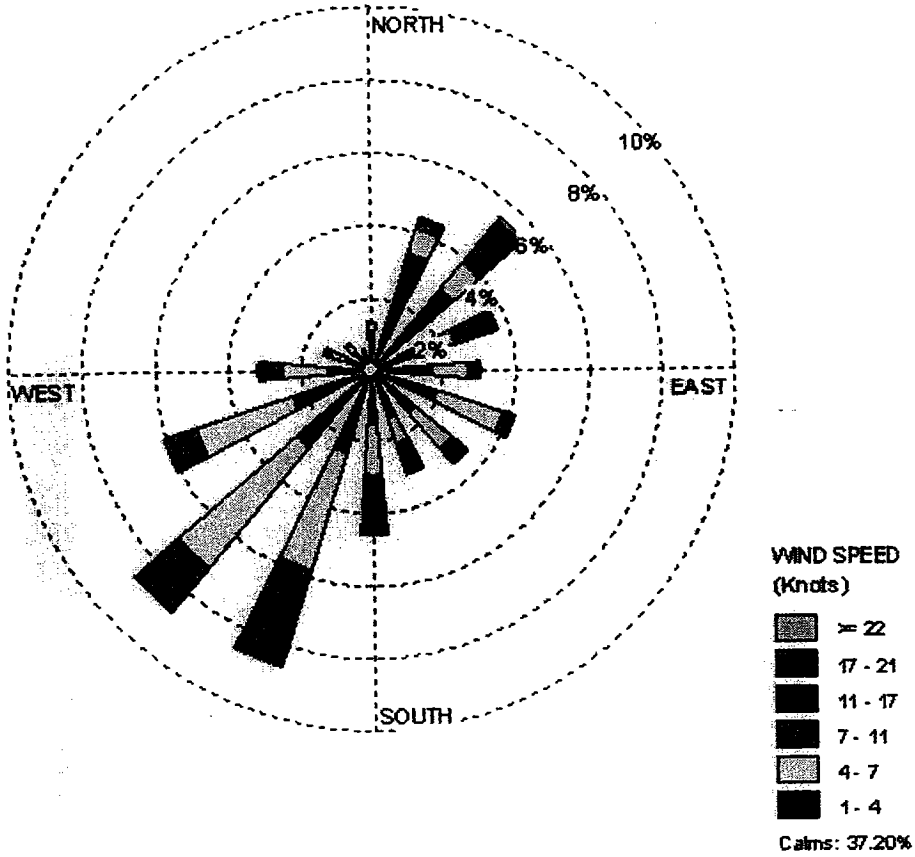
Frequency of Calm Winds: 34.00%
Average Wind Speed: 3.78 Knots

Station ID: 72297 Run ID:
Year: 2002 2003 2004 2005 2006
Date Range: Sep 1 - Nov 30 FALL
Time Range: 00:00 - 23:00

Frequency Distribution
(Normalized)

	Speed Knots						
Wind Direction	1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	0.006059	0.001119	0.000186	0.000000	0.000000	0.000000	0.007364
11.25 - 33.75	0.019016	0.002144	0.001398	0.000652	0.000093	0.000000	0.023304
33.75 - 56.25	0.013889	0.003729	0.003169	0.004008	0.000839	0.000280	0.025913
56.25 - 78.75	0.007177	0.003542	0.003169	0.001864	0.000559	0.000093	0.016406
78.75 - 101.25	0.012770	0.005406	0.000839	0.000186	0.000000	0.000093	0.019295
101.25 - 123.75	0.016126	0.012957	0.001305	0.000000	0.000000	0.000000	0.030388
123.75 - 146.25	0.018456	0.011652	0.001025	0.000093	0.000000	0.000000	0.031227
146.25 - 168.75	0.014355	0.007457	0.002144	0.000373	0.000093	0.000093	0.024515
168.75 - 191.25	0.023770	0.017617	0.009321	0.002330	0.000000	0.000093	0.053132
191.25 - 213.75	0.031972	0.052666	0.051268	0.003729	0.000000	0.000000	0.139635
213.75 - 236.25	0.034676	0.070563	0.037379	0.001491	0.000000	0.000000	0.144109
236.25 - 258.75	0.031040	0.039896	0.011279	0.000000	0.000000	0.000000	0.082215
258.75 - 281.25	0.016872	0.014728	0.003915	0.000093	0.000000	0.000000	0.035608
281.25 - 303.75	0.007644	0.004567	0.000652	0.000000	0.000000	0.000000	0.012864
303.75 - 326.25	0.005872	0.001864	0.000093	0.000000	0.000000	0.000000	0.007830
326.25 - 348.75	0.004474	0.001678	0.000093	0.000000	0.000000	0.000000	0.006245
Sub-Total:	0.264169	0.251585	0.127237	0.014821	0.001585	0.000652	0.596848
Calms:							0.307401
Missing/Incomplete:							0.095752
Total:							1.000000

Frequency of Calm Winds: 34.00%
Average Wind Speed: 3.78 Knots



Winter windrose for John Wayne Airport
Data taken from 2002-2006 Dec., Jan., and Feb. months.

Displays wind speed, direction (blowing from)

Station ID: 72297 Run ID:
Year: 2002 2003 2004 2005 2006
Date Range: Dec 1 - Feb 28 WINTER
Time Range: 00:00 - 23:00

Frequency Distribution
(Count)

	Speed Knots						
Wind Direction	1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	111	25	1	1	0	0	138
11.25 - 33.75	347	72	20	14	1	0	454
33.75 - 56.25	302	93	64	80	17	9	565
56.25 - 78.75	166	80	57	66	4	2	375
78.75 - 101.25	170	98	31	8	0	0	307
101.25 - 123.75	194	193	36	0	0	0	423
123.75 - 146.25	163	131	46	11	0	0	351
146.25 - 168.75	146	73	53	36	3	2	313
168.75 - 191.25	153	143	128	39	1	1	465
191.25 - 213.75	248	342	252	36	1	0	879
213.75 - 236.25	285	437	161	9	0	0	892
236.25 - 258.75	242	284	92	4	0	0	622
258.75 - 281.25	128	130	54	14	0	0	326
281.25 - 303.75	83	44	18	2	0	0	147
303.75 - 326.25	77	24	3	0	0	0	104
326.25 - 348.75	53	16	0	0	0	0	69
Sub-Total:	2868	2185	1016	320	27	14	6430
Calms:							3809
Missing/Incomplete:							1136
Total:							11375

Frequency of Calm Winds: 37.20%
Average Wind Speed: 3.63 Knots

Station ID: 72297 Run ID:
Year: 2002 2003 2004 2005 2006
Date Range: Dec 1 - Feb 28 WINTER
Time Range: 00:00 - 23:00

Frequency Distribution
(Normalized)

Wind Direction	Speed Knots 1 - 4	4 - 7	7 - 11	11 - 17	17 - 21	>= 22	Total
348.75 - 11.25	0.010841	0.002442	0.000098	0.000098	0.000000	0.000000	0.013478
11.25 - 33.75	0.033890	0.007032	0.001953	0.001367	0.000098	0.000000	0.044340
33.75 - 56.25	0.029495	0.009083	0.006251	0.007813	0.001660	0.000879	0.055181
56.25 - 78.75	0.016213	0.007813	0.005567	0.006446	0.000391	0.000195	0.036625
78.75 - 101.25	0.016603	0.009571	0.003028	0.000781	0.000000	0.000000	0.029983
101.25 - 123.75	0.018947	0.018849	0.003516	0.000000	0.000000	0.000000	0.041313
123.75 - 146.25	0.015920	0.012794	0.004493	0.001074	0.000000	0.000000	0.034281
146.25 - 168.75	0.014259	0.007130	0.005176	0.003516	0.000293	0.000195	0.030569
168.75 - 191.25	0.014943	0.013966	0.012501	0.003809	0.000098	0.000098	0.045415
191.25 - 213.75	0.024221	0.033402	0.024612	0.003516	0.000098	0.000000	0.085848
213.75 - 236.25	0.027835	0.042680	0.015724	0.000879	0.000000	0.000000	0.087118
236.25 - 258.75	0.023635	0.027737	0.008985	0.000391	0.000000	0.000000	0.060748
258.75 - 281.25	0.012501	0.012697	0.005274	0.001367	0.000000	0.000000	0.031839
281.25 - 303.75	0.008106	0.004297	0.001758	0.000195	0.000000	0.000000	0.014357
303.75 - 326.25	0.007520	0.002344	0.000293	0.000000	0.000000	0.000000	0.010157
326.25 - 348.75	0.005176	0.001563	0.000000	0.000000	0.000000	0.000000	0.006739
Sub-Total:	0.280105	0.213400	0.099228	0.031253	0.002637	0.001367	0.565275
Calms:							0.334857
Missing/Incomplete:							0.099868
Total:							1.000000

Frequency of Calm Winds: 37.20%
Average Wind Speed: 3.63 Knots

APPENDIX G

APPENDIX G

Air Monitoring Data Used To Characterize Background Air Quality For Modeling

1.0 Existing Air Quality

Ambient air quality standards have been set by both the federal government and the State of California to protect public health and welfare with an adequate margin of safety. Pollutants for which NAAQS or CAAQS have been established are often referred to as "criteria" air pollutants. This term is derived from the comprehensive health and damage effects review that culminates in pollutant-specific air quality criteria documents, which precede the establishment of NAAQS and CAAQS. These standards are reviewed on a legally prescribed frequency and revised as warranted by new health and welfare effects data. Each NAAQS or CAAQS is based on a specific averaging time over which the concentration is measured. Different averaging times are based upon protection against short-term, high-dosage effects or longer-term, low-dosage effects. Most NAAQS may be exceeded no more than once per year. CAAQS are not to be exceeded.

The ambient air quality in Orange County is monitored at a number of permanent air quality monitoring stations operated by SCAQMD and California Air Resources Board (CARB). The monitoring stations within Orange County that are closest to the proposed project site are the Anaheim-Pampas Lane station, located approximately 4.8 miles west-southwest of the proposed project site, and the La Habra station, located about 6.8 miles to the northwest of the proposed site. The Anaheim-Pampas Lane station measures all criteria pollutant concentrations except sulfur dioxide (SO_2) and lead (Pb). The La Habra station only measures ozone, carbon monoxide (CO), and nitrogen dioxide (NO_2). The closest station that measures SO_2 is the Costa Mesa station, located approximately 13.2 miles south southwest of the project site. This station also measures CO, NO_2, and ozone. The Mission Viejo station is the next closest station (after the Anaheim-Pampas Lane station) that measures PM_{10} and $PM_{2.5}$. The Mission Viejo station is about 19.1 miles south southeast of the CPP site. The closest station that measures lead is the Pico Rivera station, located approximately 15.8 miles northwest of the proposed project site.

Therefore, the criteria pollutants monitored at these stations include ozone, PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2, and lead (Pb). Air quality measurements taken at these stations are presented in Tables below. For the air quality impact analysis, the maximum recorded concentration from the most recent 3 years (2004-2006) at any of these monitoring stations were used to represent peak background air quality levels.

1.1 Ozone. On June 15, 2005 the 1-hour federal ozone standard was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. EAC areas are those that do not yet have an effective date for their 8-hour designations. This happened by virtue of 40 CFR 50.9(b). Since there are no EAC areas in California, the 1-hour federal ozone standard is no longer in effect in any California air basin.

Concentration data for ozone in parts per million (ppm) that were recorded within the most recent three years at the Anaheim-Pampas Lane, Costa Mesa, and La Habra monitoring stations are summarized in Tables 1A, 1B, and 1C.

TABLE 1A
CONCENTRATION DATA SUMMARY FOR OZONE
AT ANAHEIM-PAMPAS LANE STATION

Year	Highest Concentration for O_3 (ppm)		Number of Days Exceeding Standards	
	1-hour	8-hour	Federal 8-hr	State 1-hr
2006	0.113	0.088	1	6
2005	0.095	0.077	0	1
2004	0.120	0.097	8	14

The federal 8-hour average ozone standard is 0.08 ppm. On June 15, 2005, the 1-hour ozone standard (0.12 ppm) was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. The project site is not located within one of the EAC areas that are still subject to the 1-hour ozone standard.
The state ozone standards are 1-hour average (0.09 ppm) and 8-hour average (0.07 ppm).
Monitoring site address: 1630 W. Pampas Lane, Anaheim, CA
Source: California Air Resources Board (CARB) – California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm)

TABLE 1B
CONCENTRATION DATA SUMMARY FOR OZONE
AT COSTA MESA-MESA VERDE DRIVE STATION

Year	Highest Concentration for O_3 (ppm)		Number of Days Exceeding Standards	
	1-hour	8-hour	Federal 8-hr	State 1-hr
2006	0.074	0.062	0	0
2005	0.085	0.072	0	0
2004	0.104	0.087	1	2

The federal 8-hour average ozone standard is 0.08 ppm. On June 15, 2005, the 1-hour ozone standard (0.12 ppm) was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. The project site is not located within one of the EAC areas that are still subject to the 1-hour ozone standard.
The state ozone standards are 1-hour average (0.09 ppm) and 8-hour average (0.07 ppm).
Monitoring site address: 2850 Mesa Verde Drive, Costa Mesa, CA
Source: California Air Resources Board (CARB) – California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm)

The 1-hour state ozone CAAQS of 0.09 ppm was exceeded each year for the past 3 years at the Anaheim-Pampas Lane monitoring station (14 times in 2004). The Costa Mesa Station exceeded the 1-hour state ozone standard twice in 2004, but did not exceed the state

standards in 2005 or 2006. The La Habra station did not exceed the state standard in 2005, but recorded values above the 1-hour state ozone standards 6 times in 2004 and 8 times in 2006.

TABLE 1C
CONCENTRATION DATA SUMMARY FOR OZONE
AT LA HABRA STATION

	Highest Concentration for O_3 (ppm)		Number of Days Exceeding Standards	
Year	1-hour	8-hour	Federal 8-hr	State 1-hr
2006	0.146	0.114	4	8
2005	0.094	0.075	0	0
2004	0.099	0.079	0	6

The federal 8-hour average ozone standard is 0.08 ppm. On June 15, 2005, the 1-hour ozone standard (0.12 ppm) was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. The project site is not located within one of the EAC areas that are still subject to the 1-hour ozone standard.
The state ozone standards are 1-hour average (0.09 ppm) and 8-hour average (0.07 ppm).
Monitoring site address: 621 W. Lambert, La Habra, CA
Source: California Air Resources Board (CARB) – California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm)

The federal 8-hour ozone NAAQS of 0.08 ppm has also been exceeded occasionally at all three monitoring stations. The federal standard requires maintaining 0.08 ppm as a 3-year average of the fourth-highest daily maximum values. Therefore, the number of days that the maximum concentration exceeds the standard concentration is not the number of violations of the standard for the year. The 8-hour ozone NAAQS was exceeded at the Anaheim-Pampas Lane Station monitoring station once in 2006, 8 times in 2004, and was not exceeded in 2005. At the Costa Mesa station, the 8-hour ozone NAAQS was exceeded once in 2004, but was not exceeded in 2005 or 2006. The La Habra station exceeded the 8-hour federal ozone standards 4 times in 2006, but was below this standard in 2005 or 2004. As supported by the data in Table 1A, the proposed project site is located in an area that is in nonattainment of the state 1-hour ozone standard.

1.2 **Particulates.** PM_{10} Particulates in the air are caused by a combination of: 1) windblown fugitive dust or road dust; 2) particles emitted directly from combustion sources (primarily carbon particles); and 3) organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides. Respirable particulate matter is referred to as PM_{10}, which has a diameter of 10 microns or less. It can contribute to increased respiratory disease, lung damage, cancer, premature death, as well as reduced visibility, and surface soiling. In 1987, the United States Environmental Protection Agency

(USEPA) adopted standards for PM_{10} and phased out the previous standards that had been in effect for total suspended particulate (TSP) standards that had been in effect until then.

The South Coast Air Basin is designated as serious nonattainment for PM_{10}. Concentration data for this pollutant in micrograms per cubic meter ($\mu g/m^3$) that were recorded within the most recent three years at the Anaheim-Pampas Lane and Mission Viejo monitoring stations are summarized in Tables 2A and 2B. The federal standard uses a gravimetric/beta attenuation method for measuring particulate matter, while the state standard uses an intertial separation and gravimetric analysis method. The tables show that the 24-hour average CAAQS for PM_{10} of 50 $\mu g/m^3$ is frequently exceeded in the vicinity of the proposed project site. The federal 24-hour average PM_{10} NAAQS of 150 $\mu g/m^3$ was not exceeded at any time in the last three years at either the Anaheim-Pampas Lane Station or Mission Viejo station, with a maximum recorded 24-hour PM_{10} concentration of 104 $\mu g/m^3$ in 2006. The annual PM_{10} data are also presented in Tables 6.2-3a and 6.2-3b. As shown by these two tables, the Basin has not been in attainment of the state PM_{10} standards during any of the last three years.

TABLE 2A
CONCENTRATION DATA SUMMARY FOR PM_{10}
AT ANAHEIM-PAMPAS LANE STATION

Year	Highest 24-hour Concentration for PM_{10} ($\mu g/m^3$)		Annual Arithmetic Mean for PM_{10} ($\mu g/m^3$)	Number of Days Exceeding Standards	
	Federal	State	State	Federal 24-hour	State 24-hour
2006	104	103	33.3	0	7
2005	65	65	28.2	0	3
2004	74	74	33.9	0	7

The federal PM_{10} standard is 24-hour average: 150 $\mu g/m^3$.
The state PM_{10} standards are annual arithmetic mean: 20 $\mu g/m^3$ and 24-hour average: 50 $\mu g/m^3$.
Monitoring site address 1630 W. Pampas Lane, Anaheim, CA
Source: California Air Resources Board -California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm)

TABLE 2B
CONCENTRATION DATA SUMMARY FOR PM_{10}
AT MISSION VIEJO STATION

Year	Highest 24-hour Concentration for PM_{10} ($\mu g/m^3$)		Annual Arithmetic Mean for PM_{10} ($\mu g/m^3$)	Number of Days Exceeding Standards	
	Federal	State	State	Federal 24-hour	State 24-hour
2006	57	56	23	0	1
2005	41	41	26	0	0
2004	47	46	30	0	0

The federal PM_{10} standard is 24-hour average: 150 $\mu g/m^3$.
The state PM_{10} standards are annual arithmetic mean: 20 $\mu g/m^3$ and 24-hour average: 50 $\mu g/m^3$.
Monitoring site address: 26081 Via Pera, Mission Viejo, CA
Source: California Air Resources Board -California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm)

Prior to July 2003, the annual geometric mean PM_{10} concentration was referred to as the state annual average. Since then, the state annual average has been changed to match the federal standards (i.e., annual arithmetic mean), which is called the national annual average and calculated as the arithmetic average of the four arithmetic quarterly averages. The federal annual PM_{10} standard was revoked by the USEPA in 2006 due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution. However, the measured annual geometric and arithmetic mean concentrations recorded at the nearest air monitoring stations to the project site have consistently been above the CAAQS for PM_{10} of 20 $\mu g/m^3$.

The maximum annual arithmetic mean concentration recorded at Anaheim-Pampas Lane station was 33.9 $\mu g/m^3$ in 2004.

$PM_{2.5}$ fine particulates result from fuel combustion in motor vehicles and industrial sources, residential and agricultural burning, and from atmospheric reactions involving NO_X, SO_X, and organics. Fine particulates are referred to as $PM_{2.5}$ and have a diameter equal to or less than 2.5 microns. The potential health effects of $PM_{2.5}$ are considered more serious than those of PM_{10}. In 1997, EPA established annual and 24-hour NAAQS for $PM_{2.5}$ for the first time. The standard regulating the 3-year average of the 98th percentile of 24-hour PM_{10} concentrations (35 $\mu g/m^3$) became effective on December 17, 2006.

$PM_{2.5}$ data is presented in Tables 3A and 3B for the Anaheim-Pampas Lane and Mission Viejo air quality monitoring stations. The South Coast Air Basin is designated as serious nonattainment for $PM_{2.5}$. Both stations show that the federal 24-hour average NAAQS of 35 $\mu g/m^3$ is exceeded frequently in vicinity of the proposed project. The highest 24-hour $PM_{2.5}$ concentration of 58.9 $\mu g/m^3$ was measured at the Anaheim-Pampas Lane monitoring station during 2004. Note that the $PM_{2.5}$ 24-hour standard was changed from 65 $\mu g/m^3$ to 35

$\mu g/m^3$ in October of 2006; thus, the monitored values were below the federal standard that was in effect at that time. The annual average $PM_{2.5}$ data for the same monitoring stations are also presented in these tables. The annual arithmetic mean concentrations at both monitoring stations are above the California $PM_{2.5}$ ambient air quality standard of 12 $\mu g/m^3$. The maximum annual arithmetic mean concentration recorded at Anaheim-Pampas Lane station was 17.0 $\mu g/m^3$ in 2004, which is also above the federal annual $PM_{2.5}$ NAAQS of 15 $\mu g/m^3$.

1.3 **Carbon Monoxide.** CO is a product of incomplete combustion, principally from automobiles and other mobile sources of pollution, but also from stationary combustion sources. CO emissions from wood-burning stoves and fireplaces can also be important sources of this pollutant. Health effects resulting from exposure to high CO levels can include chest pain in heart patients, headaches, and reduced mental alertness.

TABLE 3A
CONCENTRATION DATA SUMMARY FOR $PM_{2.5}$
AT ANAHEIM-PAMPAS LANE STATION

Year	Highest 24-hour Concentration for $PM_{2.5}$ ($\mu g/m^3$)	Annual Arithmetic Mean for $PM_{2.5}$ ($\mu g/m^3$)	
	Federal	Federal	State
2006	56.2	14	NA
2005	54.7	14.7	NA
2004	58.9	17	19

The federal $PM_{2.5}$ standards are 24-hour average (35 $\mu g/m^3$) and annual arithmetic mean (15 $\mu g/m^3$).
The state $PM_{2.5}$ standard is annual arithmetic mean: 12 $\mu g/m^3$.
Monitoring site address: 1630 W. Pampas Lane, Anaheim, CA
Source: California Air Resources Board-California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm)
NA = There were insufficient data available to determine the value.

TABLE 3B
CONCENTRATION DATA SUMMARY FOR $PM_{2.5}$
AT MISSION VIEJO STATION

Year	Highest 24-hour Concentration for $PM_{2.5}$ ($\mu g/m^3$)	Annual Arithmetic Mean for $PM_{2.5}$ ($\mu g/m^3$)	
	Federal	Federal	State
2006	46.9	NA	11
2005	35.3	10.6	11
2004	49.4	12	15

The federal $PM_{2.5}$ standards are 24-hour average (35 $\mu g/m^3$) and annual arithmetic mean (15 $\mu g/m^3$).
The state $PM_{2.5}$ standard is annual arithmetic mean: 12 $\mu g/m^3$.
Monitoring site address: 26081 Via Pera, Mission Viejo, CA
Source: California Air Resources Board-California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm)
NA = There were insufficient data available to determine the value.

Recorded CO monitoring data for the Anaheim-Pampas Lane, Costa Mesa-Mesa Verde Drive and La Habra monitoring stations are provided in Tables 4A through 4C. These tables indicate that the South Coast Air Basin is in attainment for CO. The data in Tables 4A through 4C show that maximum 1-hour average CO levels comply with the NAAQS and CAAQS of 35 ppm and 20 ppm, respectively. Neither limit has been exceeded at any station in the last three years. The maximum 1-hour concentration was 7.4 ppm at the La Habra monitoring site in 2004. The tables also show that maximum recorded 8-hour average CO levels comply with the NAAQS and CAAQS of 9.0 ppm within the last three years. The maximum 8-hour concentration was 4.09 ppm at the Anaheim-Pampas Lane and La Habra stations in 2004. The South Coast Air Basin was redesignated as attainment for CO in 2007.

TABLE 4A
CONCENTRATION DATA SUMMARY FOR CARBON MONOXIDE
AT ANAHEIM-PAMPAS LANE STATION

Year	Highest Concentration for CO (ppm)		Number of Days Exceeding Standards (days)			
	1-hour	8-hour	Federal 1-hour	Federal 8-hour	State 1-hour	State 8-hour
2006	4.5	2.9	0	0	0	NA
2005	4.1	3.27	0	0	0	0
2004	5.3	4.09	0	0	0	0

The federal CO standards are 1-hour average (35 ppm) and 8-hour average (9 ppm).

The state CO standards are 1-hour average (20 ppm) and 8-hour average (9 ppm).
Monitoring site address: 1630 W. Pampas Lane, Anaheim, CA.
Source: EPA AirData (http://www.epa.gov/air/data/index.html).
NA = There were insufficient (or no) data available to determine the value.

TABLE 4B
CONCENTRATION DATA SUMMARY FOR CARBON MONOXIDE AT COSTA MESA-MESA VERDE DRIVE STATION

	Highest Concentration for CO (ppm)		Number of Days Exceeding Standards (days)			
Year	1-hour	8-hour	Federal 1-hour	Federal 8-hour	State 1-hour	State 8-hour
2006	3.5	3.01	0	0	0	0
2005	4.7	3.16	0	0	0	0
2004	4.9	4.07	0	0	0	0

The federal CO standards are 1-hour average (35 ppm) and 8-hour average (9 ppm).
The state CO standards are 1-hour average (20 ppm) and 8-hour average (9 ppm).
Monitoring site address: 2850 Mesa Verde Drive, Costa Mesa, CA.
Source: EPA AirData (http://www.epa.gov/air/data/index.html).

TABLE 4C
CONCENTRATION DATA SUMMARY FOR CARBON MONOXIDE AT LA HABRA STATION

	Highest Concentration for CO (ppm)		Number of Days Exceeding Standards (days)			
Year	1-hour	8-hour	Federal 1-hour	Federal 8-hour	State 1-hour	State 8-hour
2006	6.0	2.87	0	0	0	0
2005	6.8	3.07	0	0	0	0
2004	7.4	4.09	0	0	0	0

The federal CO standards are 1-hour average (35 ppm) and 8-hour average (9 ppm).
The state CO standards are 1-hour average (20 ppm) and 8-hour average (9 ppm).
Monitoring site address: 621 W. Lambert, La Habra, CA.
Source: EPA AirData (http://www.epa.gov/air/data/index.html).

1.4 Nitrogen Dioxide. Nitrogen oxide emissions are primarily generated from the combustion of fuels. Nitrogen oxides include nitric oxide and NO_2. Because nitric oxide converts to NO_2 in the atmosphere over time and NO_2 has been demonstrated to cause the more adverse health effects, of the two, NO_2 is the listed criteria pollutant. The control of NO_2 also is important because of this pollutant's role in the atmospheric formation of ozone, the principal component of smog. It also can provoke lung irritation and damage.

Recorded NO_2 concentration data for the Anaheim-Pampas Lane, Costa Mesa-Mesa Verde Drive, and La Habra monitoring stations are provided in Tables 5A through 5C. As supported by the tables, the Basin has been in attainment of NO_2 for many years.

TABLE 5A
CONCENTRATION DATA SUMMARY FOR NITROGEN DIOXIDE
AT ANAHEIM-PAMPAS LANE STATION

Year	Highest 1-hour Concentration for NO_2 (ppm)	Annual Average for NO_2 (ppm)	Number of Days Exceeding Standards (days)	
			Federal	State
2006	0.114	0.020	0	0
2005	0.089	0.021	0	0
2004	0.122	0.020	0	0

The federal NO_2 standards is annual average: 0.053 ppm.
The state NO_2 standards is 1-hour average: 0.25 ppm.
Monitoring site address: 1630 W. Pampas Lane, Anaheim, CA.
Source: California Air Resources Board -California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm).

TABLE 5B
CONCENTRATION DATA SUMMARY FOR NITROGEN DIOXIDE
AT COSTA MESA-MESA VERDE DRIVE STATION

Year	Highest 1-hour Concentration for NO_2 (ppm)	Annual Average for NO_2 (ppm)	Number of Days Exceeding Standards (days)	
			Federal	State
2006	0.101	0.015	0	0
2005	0.085	0.014	0	0
2004	0.097	0.016	0	0

The federal NO_2 standards is annual average: 0.053 ppm.
The state NO_2 standards is 1-hour average: 0.25 ppm.
Monitoring site address: 2850 Mesa Verde Drive, Costa Mesa, CA.
Source: California Air Resources Board -California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm).

Maximum annual average (arithmetic mean) NO_2 levels comply with the federal NAAQS of 0.053 ppm. This limit has not been exceeded in the last three years. The maximum annual average concentration was 0.025 ppm at the La Habra station in 2004 and 2005. The data in the tables also show that maximum 1-hour average NO_2 levels comply with the CAAQS of 0.25 ppm. This limit also has not been exceeded in the last three years. The maximum 1-hour concentration was 0.122 ppm at the Anaheim-Pampas Lane station in 2004.

TABLE 5C
CONCENTRATION DATA SUMMARY FOR NITROGEN DIOXIDE
AT LA HABRA STATION

Year	Highest 1-hour Concentration for NO_2 (ppm)	Annual Average for NO_2 (ppm)	Number of Days Exceeding Standards (days)	
			Federal	State
2006	0.091	0.022	0	0
2005	0.090	0.025	0	0
2004	0.105	0.025	0	0

The federal NO_2 standards is annual average: 0.053 ppm.
The state NO_2 standards is 1-hour average: 0.25 ppm.
Monitoring site address: 621 W. Lambert, La Habra, CA.
Source: California Air Resources Board -California Air Quality Data website (http://www.arb.ca.gov/aqd/aqdpage.htm).

On February 23, 2007, CARB approved new, more stringent ambient California standards for NO_2. The new 1-hour standard will be 0.18 ppm not to be exceeded, and the new annual average standard is 0.030 ppm. The Office of Administrative Law must approve the standards before they take effect. The new CAAQS are expected to become effective in the near future.

1.5 **Sulfur Dioxide.** SO_2 is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains trace quantities of sulfur, while fuel oils contain much larger amounts. SO_2 can increase lung disease and breathing problems for asthmatics. It reacts in the atmosphere to form acid rain, which is destructive to crops and vegetation, as well as to buildings, materials, and works of art.

Summaries of monitored SO_2 concentration data at Costa Mesa-Mesa Verde Drive Station are presented in Table 6. The Anaheim-Pampas Lane and La Habra monitoring stations do not monitor for SO_2. The table shows that the site is in attainment for all applicable state and federal ambient standards for SO_2.

The SO_2 data in Table 6 demonstrates that the 24-hour average CAAQS of 0.04 ppm is not exceeded in the proposed project vicinity and the federal 24-hour average SO_2 NAAQS of 0.14 ppm has not been exceeded over the same time period. The maximum 24-hour SO_2 monitored concentration of 0.008 ppm was measured at the Costa Mesa-Mesa Verde Drive monitoring station in 2004 and 2005. The recorded annual average (arithmetic mean) SO_2 concentrations at the monitoring station are also presented in the table, and in all cases are

TABLE 6
CONCENTRATION DATA SUMMARY FOR SULFUR DIOXIDE AT COSTA MESA-MESA VERDE DRIVE STATION

	Highest Concentration for SO_2 (ppm)			Annual	Number of Days Exceeding Standards (days)				
Year	1-hour	3-hour	24-hour	Average for SO_2 (ppm)	Federal 3-hour	Federal 24-hour	Federal Annual Mean	State 1-hour	State 24-hour
2006	0.012	0.009	0.005	0.001	0	0	0	0	0
2005	0.012	0.010	0.008	0.001	0	0	0	0	0
2004	0.031	0.020	0.008	0.002	0	0	0	0	0

The federal SO_2 standards are annual average (0.03 ppm,) 24-hour average (0.14 ppm), and 3-hour average (0.50 ppm).
The state SO_2 standards are 24-hour average (0.04 ppm) and 1-hour average (0.25 ppm).
Monitoring site address: 2850 Mesa Verde Drive, Costa Mesa, CA.
Source: EPA AirData (http://www.epa.gov/air/data/index.html).

well below the federal ambient air quality standard of 0.03 ppm. The maximum 1-hour concentration was 0.031 which easily complied with the CAAQS of 0.25 ppm.

1.6 **Lead.** Lead exposure can occur through multiple pathways, including inhalation of air and ingestion of lead in food from water, soil, or dust contamination. Excessive exposure to lead can trigger seizures, mental retardation or behavioral disorders, and other central nervous system damage. Lead gasoline additives, nonferrous smelters, and battery plants were the most significant contributors to atmospheric lead emissions. Legislation in the early 1970s required gradual reduction of the lead content of gasoline over a period of time, which has dramatically reduced lead emissions from mobile and other combustion sources. In addition, unleaded gasoline was introduced in 1975, and together these controls have essentially eliminated violations of the lead standard for ambient air in urban areas. There are no monitoring stations in Orange County that measure lead concentrations. Measured lead concentration levels for Los Angeles County Pico Rivera Station are presented in Table 7. The data in this table support the attainment status of the South Coast Air Basin for lead.

1.7 **Particulate Sulfates.** Particulate sulfates are the product of further oxidation of SO_2. Sulfate compounds consist of primary and secondary particles. Primary sulfate particles are directly emitted from open pit mines, dry lakebeds, and desert soils. Fuel combustion is another source of sulfates, both primary and secondary. Secondary sulfate particles are produced when SO_X emissions are transformed into particles through physical and chemical processes in the atmosphere. Particles can be transported long distances. The South Coast Air Basin is in attainment with the state standard for sulfates, and there is no federal standard.

1.8 **Other State-Designated Criteria Pollutants.** Along with sulfates, California has designated hydrogen sulfide and visibility-reducing particles as criteria pollutants, in addition to the federal criteria pollutants. The entire state is in attainment for visibility-reducing particles, and the South Coast Air Basin has an unclassified attainment status for hydrogen sulfide.

TABLE 7
CONCENTRATION DATA SUMMARY FOR LEAD
AT PICO RIVERA STATION

Year	Highest 24-hour Concentration for Lead (μg/m³)	Number of Days Exceeding Federal and State Standards (days)
2006	0.09	0
2005	0.04	0
2004	0.05	0

The federal lead standard is quarterly average: 1.5 μg/m³.
The state lead standard is 30 days average: 1.5 μg/m³.
Monitoring site address: 4144 San Gabriel River Parkway, Pico Rivera, CA.
Source: EPA AirData (http://www.epa.gov/air/data/index.html).

APPENDIX H

Appendix H
Sensitive Receptor summary used for HRA assessment

Number	Type	Name	Address (California)	X_UTM (NAD83 Z11)	Y_UTM (NAD83 Z11)
77001	School	Abraham Lincoln Elementary School		416933.9	3744593.0
77002	School	Acacia Elementary School		417079.1	3749458.6
77003	School	Benito Juarez Elementary School		418570.9	3743624.1
77004	School	Brookhaven Elementary School		420559.4	3750908.2
77005	School	Charles Wagner Elementary School		421326.7	3750439.4
77006	School	Commonwealth Elementary School		417529.2	3748037.6
77007	School	Fletcher Elementary School		420730.0	3743636.9
77008	School	Glenview Elementary School		424877.0	3747884.6
77009	School	James M Guinn Elementary School		418538.1	3742823.8
77010	School	John O Tynes Elementary School		420872.2	3748379.5
77011	School	Morse Elementary School		420678.2	3749736.2
77012	School	Nohl Canyon Elementary School		423564.3	3744414.3
77013	School	Rio Vista Elementary School		419612.0	3745155.5
77014	School	Riverdale Elementary School		424321.2	3745917.5
77015	School	Rose Drive Elementary School		422329.4	3750585.2
77016	School	Ruby Drive Elementary School		419260.1	3749162.6
77017	School	Sierra Vista Elementary School		419352.2	3750856.2
77018	School	Sunkist Elementary School		418714.0	3745317.2
77019	School	Taft Elementary School		422030.4	3742302.2
77020	School	Theodore Roosevelt Elementary School		417514.0	3743295.0
77021	School	Thomas Edison Elementary School		417074.1	3745916.9
77022	School	Topaz Elementary School		419753.7	3749775.0
77023	School	Van Buren Elementary School		423092.5	3749685.3
77024	School	Colonel J K Tuffree Junior High School		420153.8	3751495.9
77025	School	Kraemer Junior High School		419796.6	3748726.7
77026	School	Ladera Vista Junior High School		417068.6	3748257.8
77027	School	Peralta Junior High School		422293.2	3742977.6
77028	School	South Junior High School		418367.0	3743811.0
77029	School	Sycamore Junior High School		417326.7	3745391.3
77030	School	El Camino Real Continuation High School		422615.8	3747933.8
77031	School	El Dorado High School		420916.0	3750534.8
77032	School	Katella High School		418180.0	3743041.9
77033	School	Lutheran High School		423450.7	3743060.2
77034	School	Rosary High School		417081.8	3749766.9
77035	School	Southern California Christian High School		421973.3	3744704.5
77036	School	Troy High School		417463.1	3749271.2
77037	School	Valenda High School		419900.3	3748848.9
77038	School	YMCA	2190 N Canal St, Orange, CA 92865 (714) 974-0733	422275.7	3743009.1
77039	School	Heim School		421990.4	3743749.6
77040	School	Marywood School		423844.5	3744165.9
77041	School	McFadden School		419318.2	3746852.3
77042	School	Olive School		421972.2	3744581.4
77043	School	Saint Anthony Claret School		416890.6	3745456.1
77044	School	Saint Joseph School		419697.3	3749127.9
77045	School	Saint Marys Annex School		417081.0	3749674.9
77046	School	Saint Pauls School		422220.7	3743624.6
77047	School	Zion School		416472.1	3744690.2
77048	School	California State University Fullerton		418182.3	3749233.9
77049	School	Pacific Christian College		418230.3	3748894.2
77050	School	Simon Greenleaf University		422655.8	3746485.3
77051	School	Southern California College of Optometry		418139.6	3750281.1
77052	School	Western State University of Law		417771.3	3749298.5
77053	Daycare/Preschool	Amalie Montessori School	1231 E Chapman Ave, Fullerton, CA 92831 (714) 526-6245	416189.2	3748564.5
77054	Daycare/Preschool	American Montessori House	2338 E Wagner Ave, Anaheim, CA 92806 (714) 776-7772	418298.7	3743146.2
77055	Daycare/Preschool	Billeh Family Day Care	705 E Vista Del Playa Ave, Orange, CA 92865 (714) 282-8843	421638.9	3743206.5
77056	Daycare/Preschool	Blessed Sacrament Children's	1314 N Angelina Dr, Placentia, CA 92870 (714) 528-3070	420309.2	3749876.1
77057	Daycare/Preschool	Calvary Baptist Church Preschl	2780 E Wagner Ave, Anaheim, CA 92806 (714) 630-6670	419312.3	3743137.3
77058	Daycare/Preschool	Childtime Learning Center	2839 E Villa Real Dr, Orange, CA 92867 (714) 637-2022	423795.8	3743604.6
77059	Daycare/Preschool	Childtime Learning Center	1000 S State College Blvd, Anaheim, CA 92806 (714) 772-7225	417710.7	3743146.0
77060	Daycare/Preschool	Family Day Care	Orange, CA 92865 (714) 282-1080	421298.1	3743605.4
77061	Daycare/Preschool	First Congregational Pre-Schl	515 N State College Blvd, Anaheim, CA 92806 (714) 776-0605	417728.8	3745445.5
77062	Daycare/Preschool	Fullerton Child Development	1701 E Chapman Ave, Fullerton, CA 92831 (714) 526-7855	416918.1	3748565.6
77063	Daycare/Preschool	Heritage Home Care	225 Breting Way, Placentia, CA 92870 (714) 854-0237	420010.8	3749064.7
77064	Daycare/Preschool	Hillsborough School	4757 Valley View Ave, Yorba Linda, CA 92886 (714) 572-5696	423377.5	3750465.7
77065	Daycare/Preschool	Home Care-Giver Services	2751 E Chapman Ave, Fullerton, CA 92831 (714) 578-5930	418442.6	3748570.4
77066	Daycare/Preschool	Independence Christian School	1820 E Meats Ave, Orange, CA 92865 (714) 974-8649	422769.9	3742839.4
77067	Daycare/Preschool	Ivycrest Montessori	2025 E Chapman Ave, Fullerton, CA 92831 (714) 879-6091	417153.4	3748566.7
77068	Daycare/Preschool	Jeugens Care Home	17352 Glasgow Cir, Yorba Linda, CA 92886 (714) 572-3477	423162.0	3749644.0
77069	Daycare/Preschool	June Bug Pre-School	2829 N Glassell St, Orange, CA 92865 (714) 637-1462	421123.6	3744355.0
77070	Daycare/Preschool	Kinder Care Learning Center	2560 E La Palma Ave, Anaheim, CA 92806 (714) 991-5443	418652.3	3745569.5
77071	Daycare/Preschool	Kinder Care Learning Center	2515 E South St, Anaheim, CA 92806 (714) 774-5141	418897.6	3743947.2
77072	Daycare/Preschool	Li'l Toots Pre-School	744 N East St, Anaheim, CA 92805 (714) 776-5070	416253.5	3745430.2
77073	Daycare/Preschool	Lotz of Love Ed Center & Preschl	231 Laurelwood Ave, Placentia, CA 92870 (714) 961-0561	419837.8	3750879.4
77074	Daycare/Preschool	Madison Home Care	125 Pageantry Dr, Placentia, CA 92870 (714) 524-0419	419935.9	3749410.6
77075	Daycare/Preschool	Messiah Lutheran Preschool	4861 Liverpool St, Yorba Linda, CA 92886 (714) 528-8632	423263.9	3750289.7
77076	Daycare/Preschool	Mulberry Child Care & Preschl	612 N Rose Dr, Placentia, CA 92870 (714) 996-0900	422016.0	3748756.2
77077	Daycare/Preschool	Placentia Head Start	840 S Melrose St, Placentia, CA 92870 (714) 632-8336	419107.7	3747105.1
77078	Daycare/Preschool	Placentia-Yorba Linda School	1775 N Glenview Ave, Anaheim, CA 92807 (714) 779-2639	424804.2	3747832.2
77079	Daycare/Preschool	Prime Time Preschool	2237 N Orange Olive Rd, Orange, CA 92865 (714) 637-9391	421363.4	3743166.3
77080	Daycare/Preschool	St Joseph Catholic Preschool	801 N Bradford Ave, Placentia, CA 92870 (714) 528-1794	419689.5	3749098.4
77081	Daycare/Preschool	St Paul's Lutheran School	1250 E Heim Ave, Orange, CA 92865 (714) 637-2416	422201.1	3743649.4
77082	Daycare/Preschool	St Stephen's Pre-School	2311 E Chapman Ave, Fullerton, CA 92831 (714) 871-6641	417551.4	3748566.3
77083	Daycare/Preschool	Temple Beth Tikvah	1600 N Acacia Ave, Fullerton, CA 92831 (714) 871-3535	416911.1	3750092.3
77084	Daycare/Preschool	Towne & Country Early Ed Center	201 E Madison Ave, Placentia, CA 92870 (714) 524-2780	419990.6	3749235.0
77085	Daycare/Preschool	Trinity Lutheran Christian	4101 E Nohl Ranch Rd, Anaheim, CA 92807 (714) 637-8370	423377.9	3744488.6
77086	Daycare/Preschool	Zion Lutheran School	1244 E Cypress St, Anaheim, CA 92805 (714) 535-3600	416538.2	3744853.1

Appendix H
Sensitive Receptor summary used for HRA assessment

Number	Type	Name	Address (California)	X_UTM (NAD83 Z11)	Y_UTM (NAD83 Z11)
77087	Hospital	Children's Hospital-Orange	1275 E Lincoln Ave, Anaheim, CA 92805 (714) 653-2224	416632.8	3744610.1
77088	Hospital	Parkview Healthcare Center	1514 E Lincoln Ave, Anaheim, CA 92805 (714) 774-2222	417043.5	3744718.5
77089	Hospital	Placentia Linda Hospital		422139.0	3749919.3
77090	Hospital	Placentia Veterinary Clinic		420383.6	3750117.9
77091	Hospital	St Jude Hospital	Fullerton, CA 92831 (714) 871-5319	417409.3	3748850.7
77092	Hospital	Yorba Linda Medical Group Immediate Care		422603.8	3750210.4
77093	Nursing/convalescent hor	Country Angels Care Home	2035 Belford Ave, Placentia, CA 92870 (714) 572-6960	420201.8	3751331.9
77094	Nursing/convalescent hor	Gordon Lane Convalescent Hospital	1821 E Chapman Ave, Fullerton, CA 92831 (714) 879-7301	416968.4	3748566.1
77095	Nursing/convalescent hor	Haven of Joy Residential Care	1022 Oxford Dr, Placentia, CA 92870 (714) 528-8225	420050.7	3749323.3
77096	Nursing/convalescent hor	Hospital Chaplains Ministry of America Inc		420182.6	3748209.0
77097	Nursing/convalescent hor	Leisure Tower 2	608 E Sycamore St, Anaheim, CA 92805 (714) 776-9314	415895.3	3744933.0
77098	Nursing/convalescent hor	Richman Gardens	1510 E Commonwealth Ave, Fullerton, CA 92831 (714) 441-2636	416625.3	3748157.7
77099	Adult Care	Atria Senior Living Group: Atria Acacia	1620 E Chapman Ave, Fullerton, CA 92831 (714) 879-0920	416805.3	3748565.0
77100	Adult Care	Atria Senior Living Group: Atria De Palma	352 E Palm Dr, Placentia, CA 92870 (714) 528-4990	420420.1	3750042.8
77101	Adult Care	Atria Senior Living Group: Atria Fullerton	1621 E Commonwealth Ave, Fullerton, CA 92831 (714) 992-1750	416848.6	3748167.6
77102	Adult Care	Avalon At Bradford Square	1180 N Bradford Ave, Placentia, CA 92870 (714) 996-9292	419812.3	3749591.1
77103	Adult Care	Fullerton Gardens	1510 E Commonwealth Ave, Fullerton, CA 92831 (714) 441-2636	416625.3	3748157.7
77104	Adult Care	Harmony	1356 Montevideo Ave, Placentia, CA 92870 (714) 985-4739	422484.1	3749817.6
77105	Adult Care	TLC at Home	2701 E Chapman Ave, Fullerton, CA 92831 (714) 447-6054	418378.4	3748569.6
77106	Park	ACACIA PARK		417250.2	3749621.1
77107	Park	BOYSEN PARK		417557.6	3743186.0
77108	Park	BRADFORD PARK		420049.6	3750164.7
77109	Park	BYERUM PARK		416031.0	3748608.5
77110	Park	CHAPMAN PARK		418106.6	3748051.2
77111	Park	CITRUS PARK		416139.9	3744352.2
77112	Park	CRAIG REGIONAL PARK		418118.7	3751942.8
77113	Park	EDISON PARK		417231.7	3745862.4
77114	Park	EISENHOWER PARK		422517.8	3744435.0
77115	Park	FULERTON GREENBELT PARK		417491.5	3749915.6
77116	Park	FULLERTON ARBORETUM		418123.5	3750331.5
77117	Park	GEORGE J KOCH PARK		421045.9	3751668.4
77118	Park	GEORGE KEY RANCH HISTICAL PARK		419097.7	3751085.9
77119	Park	GOLDENROD PARK		420474.0	3749074.1
77120	Park	HURLESS BARTON PARK		423663.5	3750739.4
77121	Park	JUAREZ PARK		418420.3	3743451.8
77122	Park	KRAEMER MEMORIAL PARK		419357.3	3748479.2
77123	Park	LINCOLN PARK		416940.5	3744589.5
77124	Park	MCFADDEN PARK		419255.5	3746959.4
77125	Park	OLIVE HILLS PARK		423749.4	3744390.1
77126	Park	OLIVE PARK		421218.6	3744447.4
77127	Park	PARQUE ARROYO VERDE		421754.5	3749676.5
77128	Park	PARQUE DE LOS NINOS		423495.4	3747717.4
77129	Park	PARQUE DE LOS VAQUEROS		422810.9	3749549.9
77130	Park	PIONEER PARK		418752.9	3745250.7
77131	Park	PLACENTIA CHAMPIONS SPORTS CPX		422484.0	3748704.4
77132	Park	RICHARD SAMP PARK		420790.4	3748562.6
77133	Park	RIO VISTA PARK		419677.7	3745089.7
77134	Park	RIVERDALE PARK		424243.0	3746149.9
77135	Park	SANTA FE PARK		418891.0	3748039.1
77136	Park	SHAFFER PARK		421302.6	3742539.9
77137	Park	TRI CITY PARK		419935.9	3751819.7
77138	Park	TUFFREE HILL PARK		419735.0	3751524.7
77139	Park	VALLEY VIEW SPORTS PARK		423542.7	3750431.0
77140	Park	WAGNER PARK		421256.6	3750593.4
77141	Park	YORBA LINDA LAKEBED PARK		424880.5	3748566.7
77142	Park	ALTA VISTA COUNTRY CLUB		421559.5	3748774.9
77143	Park	COYOTE HILLS GOLF COURSE		416592.6	3750971.3
77144	Resident	resident 01	2983 E Miraloma Ave, Anaheim, CA	419925.1	3746623.2
77145	Resident	resident 02	3233 E Miraloma Ave, Anaheim, CA 92806	420880.1	3746899.2
77146	Resident	resident 03	2851 E La Cresta Ave, Anaheim, CA 92806	419562.7	3746288.7
77147	Resident	resident 04	3030 E Coronado St, Anaheim, CA 92806	420374.5	3746288.3
77148	Resident	resident 05	2988 E Coronado St, Anaheim, CA 92806	420186.0	3746232.4

APPENDIX I

Executive Summary

EmeraChem (formerly Goal Line Environmental) submitted a proposal for the supply of Emission Control Modules (ECM) based on the utilization of the EMx / ESx catalyst systems (formerly SCONOX) for the SCPPA Canyon Power Plant (CPP) project. These ECMs would be an emission control system to be used in lieu of the planned ECM system based on SCR / CO catalysts with ammonia injection.

This white paper compares the proposed EMx / ESx systems to the more conventional SCR / CO systems being used in a simple cycle applications. The EMx / ESx technology is an emerging technology for the control of gas turbine emissions in combined cycle applications but has not been demonstrated in a simple cycle application which has a significantly higher turbine exhaust gas temperature around 840°F than the typical combined cycle operation temperature around 525°F. This higher temperature would necessitate the use of larger tempering air fans to cool the exhaust gas prior to the catalyst. Additionally, simple cycle units do not produce steam which is used as a carrier gas for the regeneration hydrogen (H_2) and as a consequence a small natural gas-fired packaged steam boiler would be part of the proposed EMx / ESx system equipment. The H_2 used in the regeneration cycle would be produced by two H_2 production units. While these various systems have been used individually, they have not been used together in a gas turbine simple cycle application and it would be expected that there would be a 'learning curve' period that would be necessary for system optimization and to ensure all systems work properly. At the CPP there will be four turbines and the plant will operate as a peaking facility. The use of the EMx / ESx system on all four units would compound any problems encountered with the new technology when compared to use on a single turbine unit.

A secondary issue concerns the need to generate and use steam as part of the EMx / ESx system. As mentioned previously, the steam would be generated using a packaged steam boiler that will burn natural gas as the fuel source. The exhaust stack from the packaged steam boiler will generate an additional amount of NOx, CO, VOCs, and PM-10 that will contribute to the plant air emissions which is undesirable. Also, from a cold plant startup condition, it will take a significant amount of time for the steam boiler to heat up and produce the necessary process steam which in turn is expected to lengthen the EMx system startup time when compared to the SCR system. This is estimated to take a minimum of one hour.

Even though the EMx / ESx technology removes NOx emissions without the use of ammonia, the guaranteed reduction benefit is for reduced PM10 and VOC emissions. The capital cost of the EMx / ESx system (from the turbine exhaust flange through stack) and the associated H_2 production units and packaged steam boiler including installation is estimated at $37 million dollars for all four units. This compares to an estimated installed cost of $16 million dollars for the more conventional SCR / CO ECM system.

For the EMx / ESx ECM system there is an overall reduction benefit in the cost of purchasing the required emission offsets that amount to approximately $4 million dollars. Therefore, the net additional capital cost increase for the EMx / ESx ECM system would be on the order of $17 million dollars essentially doubling the cost of the ECM systems the CPP project.

A focused Best Available Control Technology (BACT) finds that the SCR/oxidation catalyst and EMx / ESx systems are essentially equivalent in terms of controlling NOx, CO, SOx, VOC, and directly emitted $PM_{10}/PM_{2.5}$. In addition, while the EMx / ESx system has the advantage of zero ammonia emissions compared to the SCR/oxidation catalyst systems, this benefit is not cost-

effective. Based on these findings, along with reliability concerns and the limited application of the technology to the size of units proposed for CPP, the analysis concludes that the SCR/oxidation catalyst system is BACT for CPP.

At the current time the AFC for the CPP has been submitted to the CEC and the Application for the PTC/PTO permits has been submitted the SCAQMD. If the CPP were to change its ECM technology, then both permits would need to be revised and resubmitted placing the planned plant commercial operating date of July 2010 in jeopardy.

At this time it does not appear that the use of an ECM based on EMx / ESx technology warrants further consideration by SCPPA for use in the CPP project. If the technology were proven to have the same reliability as a SCR / CO catalyst system in a LM6000 simple cycle application and if the costs were more competitive, then the technology would warrant further consideration in the early stages of a project.

Project Description

The Canyon Power Plant (CPP) is a proposed simple-cycle power generation project that consists of a nominal 200-megawatt (MW) plant, using four natural gas-fired General Electric LM 6000PC Sprint combustion turbines. The proposed plant will be owned by the Southern California Public Power Authority (SCPPA), and the City of Anaheim (COA) will be the Project Manager and Operator once the plant is built.

The CPP will be located on approximately 10 acres of disturbed land located at 3071 East Miraloma Avenue within an industrial area of the COA. Main access to the CPP site will be at the southeast corner of the project site from East Miraloma Avenue. A second gated entrance will be accessible via East Miraloma Avenue with a third gate off the alley to the east of the site.

The CPP is strictly dedicated for power generation to serve the COA's retail customers. COA has had a deficiency in resources during the summer months in the past. With growing peaking needs in the immediate future and reliability requirements as part of the California Independent System Operator (CAISO), it is critical for COA to develop and construct the Canyon Power Project as soon as feasible. COA is on an aggressive path to have the facility available for service no later than the summer of 2010. The estimates for delay would cost as much as $25-$40 million per year of delay. As a result the output of the plant will be utilized vital resource to serve native load within the COA and to meet resource adequacy requirements imposed by the CAISO.

In addition to the four natural gas-fired GE LM 6000PC Sprint gas turbines, the plant will include generator step-up transformers (GSU's), a 69 kilovolt (kV) switchyard, onsite fuel gas compressors, a gas pressure control and metering station, a packaged chilled water system for combustion turbine engine (CTG) power augmentation with associated cooling tower, selective catalytic reduction system (SCR) emission control systems, and other associated plant infrastructure.

Reason for Technology Evaluation

This evaluation was under taken to assess the technical and economic feasibility of utilizing an alternative means of controlling the gas turbine emissions to meet the project requirements. The alternative emissions control technology evaluated is the use of an EMx system (formerly

SCONOx offered by Goal Line Environmental) offered by EmeraChem LLC. The EMx system can be expanded to include ESx catalyst which removes sulfur from the gas turbine exhaust stream extending the maintenance cycle for the EMx catalyst.

Emission Control Technologies Evaluated

A gas turbine exhaust emission control system based on SCR (Selective Catalytic Reduction) / carbon monoxide (CO) catalyst technology is proposed for the CPP. The CO catalyst oxidizes CO and a portion of the volatile organic compounds (VOC) in the exhaust gas into carbon dioxide (CO_2) with this converted CO_2 contributing an insignificant amount to the overall quantity of CO_2 in the exhaust stream. The SCR catalyst in the presence of ammonia will convert nitrogen oxides (NOx) in the exhaust stream into nitrogen (N_2) and water vapor. With this process, there is a small amount of ammonia which remains unreacted in the exhaust stream and is referred to as "ammonia slip". Aqueous ammonia (19% aqueous ammonia by weight) is stored on site in a bermed tank and pumped to the ammonia injection system where it is vaporized and sprayed upstream of the SCR catalyst thoroughly mixing with the exhaust gas prior to entering the catalyst modules.

The EMx catalyst system is a single catalyst system which removes both CO and NOx with the same catalyst arranged in a module consisting of several isolatable chambers (10 for the CPP). As the NOx passes through the EMx module it is trapped on the catalyst surface where it remains until regeneration occurs. Regeneration is achieved by isolating one of the chambers in the catalyst module (or 2 chambers for the CPP) and passing a reduced atmospheric carrier gas (steam for CPP) containing a small amount of hydrogen gas (H_2) over the NOx attached to the catalyst surface thereby releasing the NOx as N_2 and water vapor. This regeneration stream is then vented into the turbine exhaust duct downstream of the catalyst system and vented to atmosphere (or it can be sent to a condenser for steam (water) recovery).

There is a small amount of sulfur dioxide (SO_2) in the turbine gas and if left untreated the SO_2 will mask the EMx catalyst and require removal for chemical washing to regain effectiveness. The amount of SO_2 in the exhaust stream reaching the EMx catalyst is greatly reduced by the addition of a secondary catalyst system, ESx, upstream of the EMx catalyst. As the exhaust gases pass through the ESx catalyst, the SO_2 is trapped on the catalyst surface. The regeneration gas is passed first through the EMx catalyst and then through the ESx catalyst where the SO_2 is removed and exhausts with the regeneration gas.

As the exhaust gas passes through the catalyst modules both the CO and VOC in the turbine exhaust gas stream are oxidized by the EMx catalyst into CO_2 and water vapor. These are very small additions to total amount of CO_2 and water vapor already existing in the exhaust gas stream.

A regeneration gas is required by the EMx process used to remove the adsorbed NOx or SOx in a reducing atmosphere (to prevent oxidation). The EmeraChem proposed method of developing the regeneration gas is by the use of a H_2 gas generation system (for example a HGM 10000 unit) which produces a 99.9% pure H_2 stream. This unit uses electrical heaters to generate steam which reforms natural gas into H_2 and CO_2. This gas is then be blended with carrier steam to form the regeneration gas. For the CPP, steam for use as the carrier gas would need to be produced by a packaged steam boiler. It should be noted that the auxiliary steam boiler used to generate the steam needed for the EMx process will burn natural gas as the fuel source. Therefore, the steam boiler operation will contribute an additional amount of NOx, CO,

VOCs, and PM-10 air emissions as part of the project which is undesirable. Also, from a cold plant startup condition, it will take a significant amount of time for the steam boiler to heat up and produce the necessary process steam which in turn is expected to lengthen the EMx system startup time when compared to the SCR system.

Due to the nature of 2 out of the 10 catalyst chambers being in the regeneration cycle at any given time this would result in 20% of the duct cross sectional area being blocked. Whether this blockage would impact the effectiveness of the EMx or the ESx is unknown since there is no operational history of this type of catalyst system in an LM6000PC Sprint application. It is well known that each particular turbine has a unique and non-uniform exhaust temperature profile and it may require additional refinements to the EMx system to properly address these characteristics in order to achieve uniform emission reduction control.

An additional area of technology development will be to ensure that there is proper mixing of the turbine exhaust gases with the large quantity of tempering (cooling) air that will be required. The tempering air volume that will be needed is approximately 30% of the total volume of the exhaust gases. This large quantity of tempering air will need to be thoroughly mixed with exhaust gases in a relatively short distance to provide a homogenous gas mixture to the catalyst system for proper emission control.

Installation Area Requirements

The foot print of the ECM module for the SCR / CO system for the CPP project will have a an overall length of 75 feet from the turbine exhaust flange to the end of the stack and have a duct width of approximately 20 feet. Duct height is on the order of 32 feet. The ammonia injection skid adds 10 feet to the width.

For the EMx system proposed for the CPP project, the distance from the turbine flange to the outside of the stack is approximately 75 feet with a casing width on the order of 27 feet. Height of the casing is expected to be 57 feet above the ground while the catalyst service elevator would have a height of 70 feet above grade. The catalyst service elevator, stationary loading platform, and jib crane foundation would add an additional width requirement of approximately 40 feet.

Project Costs

Capital Costs

The CPP installed capital cost of the conventional SCR / CO catalyst system including ammonia tank, piping, controls, etc. is estimated to be approximately $4,100,000 per unit.

Based on budget estimates received from EmeraChem for an EMx / ESx emission control system, the capital cost of the equipment is estimated to be $8,234,000 per unit. The installed cost was estimated to be $9,370,000 per unit. This installed cost includes installation, commissioning, H2 generation equipment, controls, etc. and includes a credit for platinum value at the end of the catalyst useful life.

The increase in installed costs for the EMx system for the four units is estimated to be $21,080,000.

Operating Costs

The estimated annual SCR / CO system operating cost based on 1,000 turbine operating hours per year is $26,500 which includes lost revenue due to parasitic load burden as well as aqueous ammonia consumption. Assuming the SCR / and CO catalyst lasts no longer than the 5 year guarantee, the annualized catalyst replacement cost is estimated to be $322,000.

The estimated annual operating cost for the EMx system proposed is $141,000 that includes lost revenue due to parasitic load burden as well as natural gas consumption, but does not include any costs associated with "washing" the catalyst modules. Assuming the catalyst lasts no longer than the 5 year guarantee, the annualized catalyst replacement cost is $1,839,600 with credit for recoverable platinum. (Note that the loss of the platinum value alone is approximately $450,000 per year for the five year guaranteed life.)

Based on the cost data above, the expected annual operating cost increase for an EMx system is estimated to be $114,300 without consideration of catalyst replacement cost since both catalysts are expected to last well beyond the 5 year guaranteed life.

Permitting Costs

In the process of permitting the CPP the project is required to purchase air emission offsets, Emission Reduction Credits (ERC), for the SOx, PM_{10}, and VOC. These costs are a one time expenditure based upon the expected (and thus restricted by permit operating conditions) operating conditions as stipulated by the SCAQMD regulations. Additionally, there is an ongoing annual permit fee, Reclaim Trading Credits (RTC), for NOx, emissions.

For the SCR / CO ECM system these ERC project costs were estimated at:

SOx	$470,305
PM_{10}	$13,248,800
VOC	$53,540
Total project emission capital cost	$13,771,845

For the EMX system (& associated package boiler) these ERC project costs were estimated at:

	EMx	Packaged Boiler
SOx	$470,305	$12,587
PM_{10}	$9,273,600	$408,480
VOC	$26,770	$2,342
Total project emission capital cost	$9,970,675	$408,420

For the SCR / CO ECM system the RTC operating cost was estimated at:

NOx	$185,365

For the EMX system these RTC operating cost including steam boiler related costs was estimated at:

NOx	$191,000

Reduction in emission capital costs for using the EMx system is estimated to be $3,577,750.

Total project increase in capital costs for the EMx system accounting for reduced emission costs is estimated at $17,512,250.

Operating Parameters

The SCR / CO emission control system (ECM) has certain physical operating characteristics which directly or indirectly impact the facility's ability to function as a peaking power plant in an effective manner. One characteristic is the gas side pressure drop through the ECM which affects the amount of power the gas turbine can produce. Another consideration is the parasitic electrical power consumed by the ECM auxiliary equipment which prevents this power from being used by the utility customers. Chemical consumption by the ECM impacts operating costs and can influence the plant design to accommodate deliveries as well as environmental considerations. Finally, it is expected that the CPP will only operate during the hottest part of the day and normally be off line during nighttime hours. The ECM equipment must also be able to withstand the thermal cycling from maximum to minimum temperature imposed on the structure and catalyst on a daily basis (potentially several hundred start-stop cycles annually). The CPP will be using a SCR / CO catalyst system technology that can control the exhaust emissions to be within permit limits 35 minutes after the turbine is started.

The EMx emission control system is expected to have a backpressure of 10.5 inches of water column (inwc). This backpressure will be the same as the guaranteed backpressure for the SCR system. Since the EMx system operates at a lower catalyst temperature when compared to the SCR / CO system there is an additional amount of cooling air introduced and this equates to an increase of 30 kW in parasitic load for the cooling air fans.

The proposed means of supplying the carrier gas (steam) for the regeneration system is through the use of a standard packaged steam boiler with an approximate rating of 35,000 pounds per hour of steam. It is expected that this boiler could be up to full steam production in less than one hour. The H_2 system has a small storage tank that would provide sufficient H_2 to last over 2.5 hours while the H_2 system warms up which takes on the order of 2 hours to be a full H_2 output. Thus, the ability to meet the stack emission compliance within the required 35 minute time frame can not be met. There is no startup time operating experience with the EMx system in simple cycle operation and it is expected that the EMx system could reasonably reach stack compliance in approximately one hour due to the additional complexity of the steam generation system, hydrogen generation system, and associated control systems.

EmeraChem has proposed a condensate recovery system to recover the regeneration steam after it has passed through the catalyst chambers. This system would vent (into the ECM stack) about 10% of the steam containing the SO_2 captured in the regeneration cycle. Cooling water for the condenser would be sent to the chiller's cooling tower where it would be cooled. This would add about 40% increased duty to the cooling tower and increase plant water usage by about 19% (76 gpm). Water make up to the packaged boiler would be approximately 9 gpm or 2% increase in plant water usage for a total increase in water demand of 21%. Cooling water requirements for the H_2 generator would add a small additional water requirement to the cooling tower duty included above. The EMx system would require operating the plant chiller cooling towers even if the chillers are not needed to operate.

The EMX catalyst requires periodic "washing" to revitalize the catalyst by removing sulfur and other contaminants which fouls the catalyst over time. With the use of the ESx catalyst EmeraChem projects that removing and washing the catalyst should only need to occur once or twice a year. Since the use of EMx in a simple cycle application has not occurred this projected cycle time may differ from expectations. Additionally, EmeraChem has proposed that a 70 foot high elevator structure would be needed to facilitate the catalyst removal and replacement operations.

Industry Experience

The GE LM6000PC SPRINT combustion turbine generator which will be used at the CPP is the industry leader in its size range (50MW) with hundreds of units in operation worldwide and over 60 operating units in California alone. Over 50 of these units are simple cycle peaking units further establishing it as the leading choice for simple cycle peaking duty in power plants of 50MW or greater. All of these units installed in California would have an emission control system similar to the system proposed for the CPP. Newer installations would have lower emissions since as the SCR / CO system technology has matured, the designs are able to achieve lower emissions and is reflected in the low emissions that the ECM vendor has guaranteed for CPP. Operation of the SCR / CO catalyst system requires minimal operator intervention after commissioning and the ammonia storage system with the ammonia forwarding pumps are a proven established operating system within a power plant. The temperature of the CPP CTG exhaust gases exposes to the catalyst range of temperature from 710 to 860°F. The self-contained ammonia injection control system is provided by the SCR / CO system vendor. At the end of the catalyst life, the catalyst is replaced and the old catalyst returned to the catalyst supplier for recycling.

The EMx technology, initially developed in 1996, is currently being used in several installations throughout the country (4 total installations with two installations having two units installed) in cogeneration or combined cycle applications. These units range in size from 5 MW to 43 MW. A second 43 MW unit has been ordered for the City of Redding Power Plant facility (Alstom GTX100 gas turbine) in a combined cycle application. EmeraChem, formerly Goal Line Environmental, who now owns the EMx technology, has indicated that numerous changes have been made to the original design and that the current EMx design overcomes many of the operating difficulties experienced with the early designs. (This evolution would appear to be following the typical progression for an emerging technology.) There are currently no simple cycle projects that have ordered EMx systems nor are there any operating systems within the South Coast Air Quality Management District (SCAQMD).

The EMx system as proposed by EmeraChem would be utilizing two HGM 10000 units manufactured by H_2Gen to produce the H_2 required by the process. Based on H_2Gen's installation, only a single HGM 10000 has been installed to date although over a dozen smaller units of the same design have been installed. In the warm-up cycle these units are at design 100% output within two hours. A pressurized H_2 storage tank would provide the H_2 supply to the regeneration system until full production can be reached. While the H_2Gen HGM 10000 system appears to a successful entry into the H_2 generation market, it has not been applied in an EMx system application and it would be expected that normal first time integration issues would arise.

Best Available Control Technology (BACT)

A top-down Best Available Control Technology (BACT) analysis has been performed by Sierra Research and is attached.

Conclusions

At the current time, the CPP is several months into the plant formal permitting process through the CEC for the AFC (Application for Certification) and the SCAQMD PTC/PTO (Permit to Construct/Permit to Operate). To covert the ECM from an approved BACT technology (SCR / CO system) to a technology (EMx system) not currently listed as BACT for a simple cycle peaking plant would delay the issuances of the CEC certification and the SCAQMD PTC by an estimated 6 to 8 months. SCPPA currently has a contract with GE to supply the four turbine power islands (CTG, ECM, and CEM) for the CPP. This contracting path was pursued to hold one contracting entity responsible for the entire power island rather than issuing separate contracts for the CTG, ECM, and CEM. It is not clear whether GE would be willing to offer an ECM based on EMx technology as part of a complete power island package. GE is typically very conservative with their willingness to guarantee entire packages and this would be a departure from a proven technology (SCR / CO). As a minimum, the renegotiations with GE could jeopardize the equipment delivery needed to meet the plant desired commercial operation date of July 2010. An additional consideration is that Alstom (a competitor with GE in the LM6000 unit size range) is the licensee of the EMx technology for units in the 50 MW and larger range and GE may be hesitant to embrace a technology licensed by a competitor. Depending upon the final selection of regeneration carrier gas, the water consumption of the CPP may increase by as much as 20% possibly necessitating a renegotiation of the water supply contract with the Orange County Water District (OCWD). It is not expected that this would be a concern to OCWD.

While the EMx technology may have a proven record with smaller size combined cycle and cogeneration units, and a single 43 MW combined cycle unit, there are currently no simple cycle units in operation, therefore, it remains to demonstrate reliable operation in a functioning plant. There will always be new challenges to overcome with the first few installations of a new technology. Currently EMx is not considered BACT for LM6000 simple cycle operation although EmeraChem is trying to have the EMx accepted as BACT for both the CEC and SCAQMD. It is expected that it could take several months for the two organizations to review the latest information available and recognize EMx as BACT for simple cycle LM6000 operation. Based on the cost data and operational requirements provided by EmeraChem, the cost to the project to switch technologies at this time would on the order of $17 million without consideration for the impact to the existing contract with GE to supply the power islands which include the SCR / CO system.

Comparison for ECM technologies installed for SCPPA CPP LM6000 CTG

Area of comparison	SCR / CO system	EMx / ESx system
Technology feasible		
Simple Cycle LM 6000 units in California	> 50	0
Emissions (guaranteed per unit)		
NOx (ppmvd@ 15% O2)	2.3	2.3
VOC (ppmvd@ 15% O2)	2	1
CO (ppmvd@ 15% O2)	6	6
SOx (lbs per hour)	0.3	0.3
PM10 (lbs per hour)	3	2.1
Ammonia slip (ppmvd@ 15% O2)	5	0
Time to Achieve Stack Permitted NOx Level From Turbine Start	35 minutes	60 minutes (minimum)
Costs:		
Capital Costs		
Installation*	$16,400,000	$37,492,000
Emission offsets**		
Sox	$470,305	$482,902
VOC	$53,540	$29,167
PM10	$13,248,000	$9,682,080
Total Emission	$13,771,845	$10,194,149
Total Capital	$30,171,845	$47,884,149
Operating Costs		
Utilities		
Natural gas (MBtu / hr, HHV))	0	50.3
Water (gpm)	0	83
Parasitic power kW	572	736
Ammonia (gph)	46	0
Utilities cost (annual)	$26,515	$140,820
Emissions**		
NOx (RTCs)	$185,365	$191,052
Total	$211,880	$331,872
Long term catalyst replacement cost* (based on 5 yr life, both may last longer) annual allowance	$322,000	$1,839,600

Note: Basis for plant operating costs is 1,000 turbine hours per year.
* Credit for recoverable Platinum was included in EMx / ESx costs
** EMx / ESx emission costs include package boiler

EMISSIONS AND OFFSET REQUIREMENTS FOR CPP WITH PROPOSED EMISSION CONTROL SYSTEMS

Pollutant	Emissions (lb/year)	Credits	Offset Type	Unit Price		Cost	
SCR / CO system							
NOx	23,918	23,918	RECLAIM	$7.75		$185,365	annual cost
	(lb/day)						
PM_{10}	120	144	Priority Reserve	$92,000		$13,248,000	one time cost
	(tons/year)						
SO_x	2.7665	2.7665	ERCs or other mitigation	$170,000		$470,305	one time cost
ROG	2.677	2.677		$20,000		$53,540	one time cost
					Total one time cost	$13,771,845	
EMx / ESx system							
NOx	23,918	23,918	RECLAIM	$7.75		$185,365	annual cost
	(lb/day)						
PM_{10}	84	100.8	Priority Reserve	$92,000		$9,273,600	one time cost
	(tons/year)						
SO_x	2.7665	2.7665	ERCs or other mitigation	$170,000		$470,305	one time cost
ROG	1.3385	1.3385		$20,000		$26,770	one time cost
					Total one time cost	$9,770,675	
EMx / ESx system packaged natural gas boiler							
NOx	734	734	RECLAIM	$7.75		$5,687	annual cost
	(lb/day)						
PM_{10}	3.7	4.44	Priority Reserve	$92,000		$408,480	one time cost
	(tons/year)						
SO_x	0.074	0.074	ERCs or other mitigation	$170,000		$12,597	one time cost
ROG	0.117	0.117		$20,000		$2,342	one time cost
					Total one time cost	$423,420	

BACT Analysis for NOx, SOx, and $PM_{10}/PM_{2.5}$ Emissions

Canyon Power Plant Project

BACT is defined in SCAQMD Rule 1302 as:

> *the most stringent emission limitation or control technique which:*
> *(1) has been achieved in practice for such category or class of source; or*
> *(2) is contained in any state implementation plan (SIP) approved by the United States Environmental Protection Agency (EPA) for such category or class of source. A specific limitation or control technique shall not apply if the owner or operator of the proposed source demonstrates to the satisfaction of the Executive Officer or designee that such limitation or control technique is not presently achievable; or*
> *(3) is any other emission limitation or control technique, found by the Executive Officer or designee to be technologically feasible for such class or category of sources or for a specific source, and cost-effective as compared to measures as listed in the Air Quality Management Plan (AQMP) or rules adopted by the District Governing Board.*

Of these three "prongs" of the BACT definition, the first and third are generally controlling. This analysis will follow EPA's guidance for the preparation of "top down" BACT analyses focusing specifically on identifying emission limitations or control techniques that are achieved in practice and technically feasible.

A "top-down" analysis format, consistent with guidance provided in EPA's October 1990 Draft New Source Review Workshop Manual, has been used for the BACT analysis. That guidance lays out five steps for a top-down BACT analysis, as follows:

1. Identify all control technologies;
2. Eliminate technically infeasible options;
3. Rank remaining control technologies by control effectiveness;
4. Evaluate most-effective controls and document results; and
5. Select BACT.

This procedure is followed for each of the three pollutants evaluated in this analysis. BACT for emissions during startup is also addressed.

Control of Nitrogen Oxides

1. Identify All Control Technologies

There are three basic means of controlling NOx emissions from combustion turbines: wet combustion controls, dry combustion controls, and post-combustion controls. Wet and dry combustion controls act to reduce the formation of NOx during the combustion process, while post-combustion controls remove NOx from the exhaust stream. Potential NOx control technologies for combustion turbines are listed below.

- Wet Combustion Controls
  - Water injection
  - Steam injection
- Dry Combustion Controls
  - Dry low-NOx combustor design
  - Catalytic combustors (e.g., XONON)
- Post-Combustion Controls
  - Selective catalytic reduction (SCR)
  - EMx system (formerly SCONOx offered by Goal Line Environmental)

2. Eliminate Technically Infeasible Options

The performance and technical feasibility of available NOx control technologies are discussed in more detail below.

Wet Combustion Controls – Steam or water injection directly into the turbine combustor is one of the most common NOx control techniques for combustion turbines. These wet injection techniques lower the flame temperature in the combustor and thereby reduce thermal NOx formation. Water and steam injection have been in use on both oil- and gas-fired combustion turbines in all size ranges for many years, so these NOx control technologies are clearly technologically feasible and widely available.

Dry Combustion Controls – Combustion modifications that lower NOx emissions without wet injection include lean combustion, reduced combustor residence time, lean premixed combustion, and two-stage rich/lean combustion. The most advanced combination of combustion controls for NOx is referred to as dry low-NOx (DLN) combustors. DLN technology uses lean, premixed combustion to keep peak combustion temperatures low, thus reducing the formation of thermal NOx. Several turbine vendors have developed this technology for their engines, including the engine proposed for this project. This control technique is technically feasible. However, DLN combustors are not compatible

with wet combustion controls; either DLN or wet combustion controls can be used, but not both.

Catalytic combustors use a catalytic reactor bed mounted within the combustor to burn a very lean fuel-air mixture. This technology has been commercially demonstrated under the trade name XONON. No turbine vendors, other than General Electric and Kawasaki, have indicated the commercial availability of catalytic combustion systems at the present time, and then only on small (<10 MW) turbines; therefore, catalytic combustion controls are not available for this specific application and are not discussed further.

Post-Combustion Controls – SCR is a post-combustion technique that controls both thermal and fuel NOx emissions by reducing NOx with a reagent (generally ammonia or urea) in the presence of a catalyst to form water and nitrogen. SCR is used in numerous combustion turbine installations throughout the United States, almost exclusively in conjunction with other wet or dry NOx combustion controls. Consequently, this technology is clearly technologically feasible and widely available.

The EMx system is a proprietary catalytic oxidation and absorption technology that uses a single catalyst for the removal of NOx, CO, and VOC. The catalyst simultaneously oxidizes NO to NO_2, CO to CO_2, and VOCs to CO_2 and H_2O, and adsorbs NO_2 molecules onto the catalyst surface where they are stored as nitrates and nitrites.

With regard to the installation of EMx systems on combustion turbine power plants, the EMx system has been installed at the Sunlaw Federal Cogeneration Plant in Vernon, California; the Wyeth BioPharma cogeneration facility (formally the Genetics Institute Facility) in Massachusetts; the Montefiore Medical Center cogeneration facility in the Bronx, New York; and the University of California at San Diego. In addition, an EMx system is installed at the Redding Power Plant in California. The Sunlaw facility uses a 23 MWe LM-2500 combustion turbine, the Wyeth BioPharma facility has two 5 MWe Solar combustion turbines, the Montefiore Medical Center uses a 5 MWe Solar combustion turbine, the University of California San Diego plant uses two 15 MWe SoLoNOx Titan 130S combustion turbines, and the Redding plant uses a 43 MWe Alstom combustion turbine. Therefore, this technology is technologically feasible and available.

Conclusion – Based on the discussions above, the following NOx control technologies are available and potentially technologically feasible for the proposed project:

- Water injection;
- Steam injection;
- Dry Low-NOx Combustors;
- Selective Catalytic Reduction; and
- EMx System.

3. Rank Remaining Control Technologies by Control Effectiveness

The remaining technically feasible control technologies are ranked by NOx control effectiveness in Table 1.

Table 1
NOx Control Alternatives

NOx Control Alternative	Available?	Technically Feasible?	NOx Emissions (@ 15% O_2)	Environmental Impact	Energy Impacts
Water Injection	Yes	Yes	25-42 ppm	Increased CO/VOC	Decreased Efficiency
Steam Injection	Yes	Yes	15 – 25 ppm	Increased CO/VOC	Increased Efficiency
Dry Low-NOx Combustors	Yes	Yes	9-25 ppm	Reduced CO/VOC	Increased Efficiency
Selective Catalytic Reduction	Yes	Yes	>90% reduction 1 – 2.5 ppm	Ammonia slip	Decreased efficiency
EMx	Yes	Yes	>90% reduction 1 – 2.5 ppm	Reduced CO; potential reduction in VOC	Decreased efficiency

4. Evaluate Most-Effective Controls and Document Results

The proposed project is proposing to use water injection for combustion NOx control. While there may be some additional NOx control available with the use of dry low NOx combustors compared to water injection, with the proposed installation of after-combustion controls the proposed project will meet the most stringent NOx BACT level for this type of combustion turbine regardless of the type of combustion control used. Therefore, no further discussion of combustion control technologies is necessary.

The potential performance of SCR and EMx, insofar as NOx emission levels are concerned, is essentially equivalent. Both technologies have the potential to reduce NOx emissions by at least 90%, and differences between low NOx levels (1 ppm vs. 2 ppm vs. 2.5 ppm) appear, in the case of each technology, to be largely a function of catalyst size, turbine outlet NOx concentration, and compliance terms (e.g., averaging period and monitoring requirements). The principal differences between the two technologies are associated with whether the low emission levels proposed have been achieved in practice using these technologies, their cost-effectiveness in achieving these levels, and secondary environmental impacts.

Achieved in Practice Evaluation – The SCAQMD has established formal criteria for determining when emission control technologies should be considered achieved in

practice (AIP) for the purposes of BACT determinations. The criteria include the elements outlined below.

- Commercial Availability: At least one vendor must offer this equipment for regular or full-scale operation in the United States. A performance warranty or guarantee must be available with the purchase of the control technology, as well as parts and service.

- Reliability: All control technologies must have been installed and operated reliably for at least six months. If the operator did not require the basic equipment to operate daily, then the equipment must have at least 183 cumulative days of operation. During this period, the basic equipment must have operated (1) at a minimum of 50% design capacity; or (2) in a manner that is typical of the equipment in order to provide an expectation of continued reliability of the control technology.

- Effectiveness: The control technology must be verified to perform effectively over the range of operation expected for that type of equipment. If the control technology will be allowed to operate at lesser effectiveness during certain modes of operation, then those modes of operation must be identified. The verification shall be based on a performance test or tests, when possible, or other performance data.

Each of these criteria is discussed separately below for SCR and for EMx.

SCR Technology – SCR has been achieved in practice at numerous combustion turbine installations throughout the world. There are several utility-scale combined cycle projects that limit NOx emissions to 2.5 ppm or less, including the Mountainview Power Plant in San Bernardino County, California; the Inland Empire Energy Center in Riverside County, California; and the Cosumnes Power Plant in Sacramento County, California. However, in order to examine SCR performance for a plant of similar size to the proposed Canyon Power Plant, the Donald Von Raesfeld combined cycle power plant in California was evaluated. The Donald Von Raesfeld plant consists of two combined cycle LM6000 combustion turbines that are equipped with steam injection and SCR systems and that are required to comply with a permitted NOx emission rate of 2.0 ppm, similar to the Canyon Power Plant.

A review of NOx continuous emissions monitoring (CEM) data obtained from the EPA's Acid Rain program website[1] for the Donald Von Raesfeld plant indicates a mean NOx level for the two units of approximately 1.6 ppm during the period from 2005 to 2007. Following the first year of operation, the units at the Donald Von Raesfeld plant have experienced only a few hours of non-compliance per year (fewer than 0.4% of the annual operating hours exceeded the NOx permit limit of 2.0 ppm). At the higher NOx limit of 2.3 ppm required for the proposed Canyon Power Plant, the CEM data show that the number of non-compliant hours drops to approximately 0.1% of the annual operating hours. Enclosed as Attachment 1 is a summary of the CEM NOx emission review for this facility. The experience at the Donald Von Raesfeld plant indicates the ability of the SCR system to consistently control NOx emissions to levels of 2.5 ppm and less.

An evaluation of the proposed AIP criteria as applied to the achievement of extremely low NOx levels (2.5 ppm and lower) using SCR technology is summarized below.

- Commercial Availability: SCR technology is available with standard commercial guarantees for NOx levels at least as low as 2 ppm. Consequently, this criterion is satisfied.

- Reliability: SCR technology has been shown to be capable of achieving NOx levels consistent with a 2.0 ppm permit limit during extended, routine operations of the Donald Von Raesfeld plant. There are no reported adverse effects of operation of the SCR system at these levels on overall plant operation or reliability.

- Effectiveness: SCR technology has been demonstrated to achieve NOx levels of 2.5 ppm and less. At the Donald Von Raesfeld plant, short-term excursions have resulted in NOx concentrations above the permitted level of 2.0 ppm; however, these excursions have not been associated with diminished effectiveness of the SCR system. Rather, these excursions have been associated with SCR inlet NOx levels in excess of those for which the SCR system was designed.

- Conclusion: SCR technology capable of achieving NOx levels of 2.5 ppm and less is considered to be achieved in practice. The proposed permit limits for the proposed Canyon Power Plant include a NOx limit of 2.3 ppm. This proposed limit is consistent with the available data.

EMx Technology – EMx has been demonstrated in service in five applications: the Sunlaw Federal cogeneration plant, the Wyeth BioPharma cogeneration facility, the Montefiore Medical Center cogeneration, the University of California San Diego facility, and the Redding Power Plant. Because the combustion turbines at the first four facilities are much smaller than those proposed for the proposed Canyon Power Plant, this analysis focused on the performance of the EMx system at the Redding Power Plant. The

[1] Available at http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=prepackaged.results

Redding Power Plant currently consists of a single combined cycle 43 MWe Alstom GTX100 combustion turbine with a permitted NOx emission rate of 2.5 ppm. There is a second 43 MWe unit under construction at the Redding Power Plant, but that unit has not begun operation.

A review of NOx continuous emissions monitoring (CEM) data obtained from the EPA's Acid Rain program website[2] indicates a mean NOx level for the unit of less than 1.0 ppm during the period from 2002 to 2007. After the first year of operation, the unit at the Redding Power Plant has experienced only a few hours of non-compliance per year (fewer than 0.1% of the annual operating hours exceed the NOx permit limit of 2.5 ppm). At the lower NOx limit of 2.3 ppm that will be requirement for the proposed Canyon Power Plant, the CEM data show that the number of non-compliant hours increases to approximately 0.2% of the annual operating hours. Enclosed as Attachment 1 is a summary of the CEM NOx emission review for this facility. The experience at the City of Redding Plant indicates the ability of the EMx system to consistently control NOx emissions to levels of 2.5 ppm and less.

Based on this information, the following paragraphs evaluate the proposed AIP criteria as applied to the achievement of extremely low NOx levels (2.5 ppm and lower) using EMx technology.

- Commercial availability: EmeraChem Power has offered standard commercial guarantees for the proposed Canyon Power Plant. Consequently, this criterion is satisfied.

- Reliability: As discussed above, based on a review of the CEM data for the Redding Power Plant the EMx system complied with the 2.5 ppm NOx permit limit with only a few hours each year of excess emissions (following the first year, only approximately 0.1% of the annual operating hours). However, this level of performance was not without some significant operating and reliability issues. According to a June 23, 2005 letter from the Shasta County Air Quality Management District[3] (see Attachment 2), repairs of the EMx system began shortly after initial startup and have continued during several years of operation. Redesign of the EMx system was required due to a problem with the reformer reactor combustion production unit that led to sulfur poisoning of the catalyst. In addition, the EMx system catalyst washings had to occur at a frequency several times higher than anticipated during the first three years of operation, which has resulted in substantial downtime of the combustion turbine. Since the Redding Power Plant is the most representative of all of the EMx-equipped combustion turbine facilities for comparison to the proposed Canyon Power Plant, the problems encountered at the Redding Power Plant bring into question the reliability of the EMx system for the proposed project.

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[2] Available at http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=prepackaged.results

[3] Letter dated June 23, 2005 from Shasta County Air Quality Management District to the Redding Electric Utility regarding Unit 5 demonstration of compliance with its NOx permit limit.

- Effectiveness: The EMx system at the Redding Power plant has been able to demonstrate compliance with a NOx level of 2.5 ppm. However, the Redding Power Plant is the only EMx-equipped facility of a size similar to that of the proposed Canyon Power Plant. In addition, there are no peaker combustion turbine power plants equipped with EMx systems. Since peaker combustion turbine power plants like the proposed Canyon Power Plant undergo significantly more turbine startups than a baseload combined cycle plant like the Redding Power Plant, controlling NOx emissions is more of a challenge for these types of plants. Consequently, due to the lack of actual performance data, there is some question as to the effectiveness of the EMx systems on peaker plants like the proposed project.

- Conclusion: EMx systems are capable of achieving NOx levels of 2.5 ppm and less. However, the operating history at the Redding Power Plant does not support a conclusion that this technology is achieved in practice based on South Coast AQMD guidelines, due mainly to reliability issues.

5. Select BACT

Based on the above analysis, both SCR and EMx-based systems are considered, in general, to be technologically capable of achieving NOx levels of 2.5 ppm and less, given appropriate consideration to turbine-outlet NOx levels, catalyst volume (space velocity), and control system design. Based on this information, BACT for NOx is considered to be the use of either SCR or EMx systems to achieve NOx levels not higher than 2.5 ppm. The proposed Canyon Power Plant proposes to use SCR technology to meet a NOx level of 2.3 ppm. Consequently, the proposed project is consistent with BACT requirements.

Control of Sulfur Oxides

1. Identify All Control Technologies

Natural gas fired combustion turbines have inherently low SOx emissions due to the small amount of sulfur present in the fuel. With typical pipeline quality natural gas sulfur contents well below 1 grain/100 scf, the SOx emissions for natural gas fired combustion turbines are orders of magnitude less than oil-fired turbines. Firing by natural gas and the resulting control of SOx emissions have been used by numerous combustion turbines throughout the world. Due to the prevalence of the use of natural gas to control SOx emissions from combustion turbines, only an abbreviated discussion of post-combustion controls will be addressed in this section.

Post-combustion SOx control systems include dry and wet scrubber systems. These types of systems are typically installed on high SOx emitting sources such as coal-fired power plants. Post-combustion control systems for combustion turbines also include ESx catalyst systems. These systems trap the sulfur in the exhaust stream on an ESx catalyst. During a regeneration process, the sulfur is removed from the ESx catalyst and is either reintroduced back into the exhaust stream or sent to a sulfur scrubbing system. If the

sulfur removed from the ESx catalyst is reintroduced back into the exhaust stream, there is no SOx control associated with the system.

2. Eliminate Technically Infeasible Options

All of the control options discussed above are technically feasible.

3. Rank Remaining Control Technologies by Control Effectiveness

The typical SOx control level for a well-designed wet or dry scrubber installed on coal fire boilers ranges from approximately 70% to 90%[4] with some installations achieving even higher control levels. According to EmeraChem literature,[5] the ESx system is capable of removing approximately 95% of the SOx emissions from the exhaust stream of natural gas fired combustion turbines. With the sulfur scrubber option, during the regeneration cycle of the ESx system the sulfur captured on the ESx catalyst is sent to a sulfur scrubbing unit. A high efficiency sulfur scrubbing unit would achieve a control level similar to that of the wet/dry scrubbers discussed above.

4. Evaluate Most Effective Controls and Document Results

The use of low sulfur content pipeline natural gas has been achieved in practice at numerous combustion turbine installations throughout the world, and the use of this fuel minimizes SOx emissions. While it would be technically feasible to install some type of post-combustion control such as a dry/wet scrubber system or an ESx catalyst with a sulfur scrubber on a natural gas fired turbine, due to the inherently low SOx emissions associated with the use of natural gas these systems are not cost effective and regulatory agencies do not require them. Consequently, no future discussion of post-combustion SOx control is necessary.

5. Select BACT

Since the EMx system proposed for the Canyon Power Plant is not equipped with a regeneration combustion sulfur scrubber, there is no SOx control capability associated with this system. Therefore, the SOx emissions for the proposed project with or without the EMx system are identical. The SOx control method for the proposed Canyon Power Plant is the use of pipeline-quality natural gas. Consequently, the proposed project is consistent with BACT requirements.

Control of $PM_{10}/PM_{2.5}$ Emissions

[4] Air Pollution Control Manual, Air and Waste Management Association, Second Edition, page 206.
[5] High Performance EMx Emissions Control Technology for Fine Particles, NOx, CO, and VOCs from Combustion Turbines and Stationary IC Engines, by Steven DeCicco and Thomas Girdlestone, EmeraChem Power, June 2008, page 19.

1. Identify All Control Technologies

The proposed Canyon Power Plant combustion turbines will be fired by natural gas, which has inherently low directly emitted $PM_{10}/PM_{2.5}$ characteristics. The proposed combustion turbines will also emit the $PM_{10}/PM_{2.5}$ precursors SOx, VOC, and NOx. In addition, with the use of an SCR system the proposed project will emit ammonia, which is also a precursor to the formation of $PM_{10}/PM_{2.5}$.

With regard to directly emitted $PM_{10}/PM_{2.5}$ emissions, the guaranteed maximum hourly emission rates are very similar between the proposed SCR/oxidation catalyst control system and the proposed EMx system, with PM_{10} emission levels of 3.0 lbs/hr and 2.1 lbs/hr, respectively. This difference between the directly emitted $PM_{10}/PM_{2.5}$ emission levels for the SCR/oxidation catalyst system and the EMx system is most likely due to the compliance safety factor assumed in the vendor guarantees rather than a true difference in actual directly emitted $PM_{10}/PM_{2.5}$ emission levels. As an example, according to an EmeraChem document on the EMx system,[6] the actual PM_{10} emissions at the Redding Power Plant were approximately 2.0 lbs/hr. Since the Redding Power Plant combustion turbine is of a similar size to the units proposed for the Canyon Power Plant, the EMx system guarantee of 2.1 lbs/hr does not appear to include much of a compliance safety factor. In addition, due to the problems associated with the current EPA particulate source test method's ability to accurately measure particulate emissions from natural gas fired combustion turbines, it is expected that there will be very little difference in the actual measured PM_{10} emissions for the two control systems. An example of this problem with the EPA particulate source test method is shown by the test data summarized in Attachment 3. This data summarizes particulate emission test results for LM6000 natural gas fired combustion turbines for testing performed between 1995 and 2004. As shown by these data, particulate emissions for the same model combustion turbine vary from 0.05 lbs/hr to 13.08 lbs/hr. Consequently, the two control systems are equivalent with regards to this pollutant.

Regarding SOx emissions, as discussed above there is no difference between the SCR/oxidation catalyst system and the EMx system proposed for the Canyon Power Plant. Consequently, the two control systems are equivalent with regards to this pollutant.

Regarding NOx emissions, as with SOx emissions there is no difference between the SCR/oxidation catalyst system and the EMx system proposed for the Canyon Power Plant. Consequently, the two control systems are also equivalent with regards to this pollutant.

With regards to VOC emissions, the SCR/oxidation catalyst system proposed for the project has a guaranteed level of 2 ppm and the EMx system has a guaranteed level of 1 ppm. While at first this appears to be a significant difference between the two control

[6] High Performance EMx Emissions Control Technology for Fine Particles, NOx, CO, and VOCs from Combustion Turbines and Stationary IC Engines, by Steven DeCicco and Thomas Girdlestone, EmeraChem Power, June 2008, page 7.

systems, these VOC emission levels are close to the detection level of typical EPA source test methods and therefore it is expected that there will be very little difference in the actual measured VOC emissions for the two control systems. Consequently, the two control systems are essentially equivalent with regards to this pollutant.

For ammonia, emissions will result from the use of ammonia-based NOx control technology such as a SCR system. Since a detailed discussion of NOx control systems is discussed above, only an abbreviated discussion of this technology is provided below.

2. Eliminate Technically Infeasible Options

The performance of SCR and EMx, insofar as NOx emission levels are concerned, has been discussed above.

3. Rank Remaining Control Technologies by Control Effectiveness

EMx results in no emissions of ammonia, while SCR results in ammonia slip levels of up to 5 ppm. The following discussion evaluates potential ammonia slip limits of 5 ppm and 0 ppm. The latter limit would be achievable, at the present time, only through the use of EMx technology.

4. Evaluate Most-Effective Controls and Document Results

SCR has been achieved in practice at numerous combustion turbine installations throughout the world. Ammonia slip associated with SCR system operation results from a gradual decline in catalyst activity over time, necessitating the use of increasing amounts of ammonia injection to maintain NOx concentrations at or below the design rate.

The parameters of NOx concentration, ammonia slip limit, and catalyst life are integrally related. That is, catalyst performance is generally specified as being a particular NOx concentration (e.g., 2.3 ppm), guaranteed for N years (e.g., 3 years), with a maximum ammonia slip level of X ppm (e.g., 5 ppm). Such a specification indicates that catalyst performance will degrade over time such that at the end of three years, ammonia slip will increase to not more than 5 ppm while maintaining NOx concentrations at or below 2.3 ppm. During the early period of performance, ammonia slip from an oxidation catalyst is typically less than 1-2 ppm, and will approach the guarantee level only towards the end of the catalyst life. EMx systems have the potential to achieve low NOx levels without any ammonia slip. Consequently, the following discussion compares the use of SCR with a 5 ppm ammonia slip level with EMx to meet comparable NOx levels, but without any ammonia slip.

SCR technology has been shown to be capable of achieving ammonia slip levels below 5 ppm over at least a three-year catalyst life period. There are no reported adverse effects of operation of the SCR system at these levels on overall plant operation or reliability.

Since EMx technology to eliminate ammonia slip may be technologically feasible, a further evaluation of the cost-effectiveness of this technology was performed. In this analysis, the cost of an EMx system was compared with the cost of an SCR and oxidation catalyst system, with the incremental cost assigned to the benefit of eliminating ammonia slip emissions. (It is appropriate to make such an assignment because the performance of the SCR and oxidation catalyst systems is comparable to that proposed for the EMx system with respect to the remaining pollutant emission levels for the proposed Canyon Power Plant.)

As shown in Tables 2 through 4, the results of this analysis indicate that the incremental cost-effectiveness of the EMx system for the purpose of reducing ammonia emissions is approximately $375,000 per ton.

The South Coast AQMD no longer publishes cost-effectiveness criteria for use in performing BACT analyses for major sources (source emissions greater than 10 tons/year). In the absence of SCAQMD-specific criteria, the following values are presented to provide a reference for the calculated cost-effectiveness of EMx as an ammonia control device. Since ammonia is regulated as a precursor to PM_{10}, the values shown below represent the BACT cost-effectiveness thresholds for PM_{10}:

Bay Area AQMD	$ 5,300 /ton[7]
San Joaquin Valley Unified APCD	$11,400 /ton[8]

While these values are not, by themselves, determinative, they indicate that the cost-effectiveness of using EMx to eliminate ammonia emissions is well in excess of costs that are normally required for the control of PM_{10} in BACT determinations in areas of California that exceed the state and/or federal PM_{10} air quality standards.

5. Select BACT

Based on the above information, BACT for ammonia is considered to be an ammonia slip limit of 5 ppm. EMx has the potential to eliminate ammonia emissions; however, this candidate technology was rejected for the reasons discussed above. The Canyon Power Plant proposes to use SCR technology to meet an ammonia slip limit of 5 ppm in conjunction with a NOx level of 2.3 ppm. Consequently, the proposed project is consistent with BACT requirements for ammonia emissions.

Table 2
SCR/Oxidation Catalyst Costs
(total for four combustion turbines)

Total Capital Investment (equipment cost, installation cost, indirect costs)[a]	$16,400,000

[7] Bay Area AQMD BACT/TBACT Policy and Implementation Guidelines.
[8] San Joaquin Valley Unified APCD Revised BACT Cost Effectiveness Thresholds, May 14, 2008.

Capital Recovery Cost (assumed interest rate of 10% over period of 15 years results in cost factor of 0.1315)[b]	$2,156,600/year
Total Annual Costs (operating cost, maintenance costs, utility costs, indirect costs, does not include catalyst replacement costs)[a]	$26,515/year
Total Annualized Costs	$2,183,115/year

[a] ECM Technology White Paper, PB Power, July 2008
[b] From EPA/OAQPS Control Cost Manual, EPA-452/B-02-001, Table A.2, January 2002

Table 3 EMx System Costs (total for four combustion turbines)	
Total Capital Investment (equipment cost, installation cost, indirect costs)[a]	$37,492,000
Capital Recovery Cost (assumed interest rate of 10% over period of 15 years results in cost factor of 0.1315)[b]	$4,930,198/year
Total Annual Costs (operating cost, maintenance costs, utility costs, indirect costs, does not include catalyst replacement costs)[a]	$140,820/year
Total Annualized Costs	$5,071,018/year

[a] ECM Technology White Paper, PB Power, July 2008
[b] From EPA/OAQPS Control Cost Manual, EPA-452/B-02-001, Table A.2, January 2002

Table 4 Cost Effectiveness for Ammonia Emission Control	
EMx Annualized Costs	$5,071,018/year
SCR/Oxidation Catalyst Annualized Costs	$2,183,115/year
Incremental Annualized Costs	$2,887,903/year
Annual Ammonia Emissions with SCR/Oxidation Catalyst (total for four combustion turbines)[a]	7.7 tons/year
Annual Ammonia Emissions with EMx System (total for four combustion turbines)	0 tons/year
Reduction in Ammonia Emissions (total for four combustion turbines)	7.7 tons/year
EMx Cost Effectiveness ($/ton removed)	$375,052/ton

[a] Based on December 2007 Application for Certification for the Canyon Power Plant, Table 6.16-3.

BACT During Startup

1. Identify all control technologies

Startup and shutdown periods are a normal part of the operation of simple cycle power plants such as CPP. BACT must also be applied during the startup and shutdown periods of gas turbine operation. The BACT limits discussed in the previous section apply to steady-state operation, when the turbine has reached stable operation and the emission control systems are fully operational.

During gas turbine startup, the post-combustion controls that are used to achieve additional emissions reductions require specific exhaust temperature ranges to be fully effective. The use of SCR or EMx to control NOx is not technically feasible when the surface of the catalyst is below the manufacturer's recommended operating range. Therefore, the BACT determinations for NOx during normal, steady-state operation are not applicable during startup and shutdown.

2. Eliminate technically infeasible options

As discussed earlier, since the CPP is a peaking power plant, it is advantageous (necessary) for the add-on emissions control system to accommodate a 10-minute start cycle that can be achieved by the gas turbine. The SCR system can reduce turbine NOx emissions to meet the 2.3 ppmc permit limit within 35 minutes after the turbine is started.

The EMx literature states:

> "The thermal characteristics of the EMx technology allows for quick start-up of the emissions system. The low light off curves for destruction of ...NOx on the EMx catalyst provide for emissions control and compliance quickly after start-up."[9]

However, these curves have not been provided for review. Further, because the EMx system requires that each chamber be regenerated every 20 to 28 minutes, it appears that regeneration of at least two chambers would be required during the first hour of operation. The regeneration process requires steam as a carrier gas to carry the hydrogen regenerating gas to the chambers. The steam is generated in a small package boiler. Because the CPP units will be in peaking service, they may be shut down for days at a time and the package boiler would often be cold when the units are called upon to start up. The cold boiler would not be able to begin producing steam immediately—it could take up to an hour for the carrier steam to become available. As discussed earlier, it is unlikely that the EMx system would be able to bring the CPP units into compliance with the NOx limit within the required 35 minute time frame unless the boiler is started up 30 minutes or more before the turbine is started up or unless significant modifications are made to the proposed steam supply system. However, this is not possible at all times since the California ISO is not required to provide any lead time prior to dispatching the

[9] DeCicco, Steven, and Thomas Girdlestone, EmeraChem Power, "High Performance EMx™ Emission Control Technology for Fine Particles, NOx, CO, and VOCs From Gas Turbines and Stationary IC Engines," June 2008.

CPP in emergency situations. In all other situations the CPP will be provided with a minimum of a 45-minute lead time. . Either of these changes to the steam supply system would generate additional air pollutant emissions.

3. Rank remaining control technologies by control effectiveness

It appears that the SCR control technology would be able to achieve full emission control within 35 minutes but the EMx technology would require a longer time to achieve full emission control. Therefore, use of the EMx technology may result in higher emissions during startup for the proposed simple-cycle project.

4. Evaluate most-effective controls and document results

Use of the EMx technology would not appear to result in lower emissions during startup for the proposed simple-cycle project. It does not appear that EMx would be more effective than SCR in controlling emissions from the simple-cycle turbines during startup.

5. Select BACT

Use of the EMx technology would not appear to result in lower emissions than SCR technology during startup for the proposed simple-cycle project. Therefore, the project as proposed is consistent with BACT for startup emissions.

Attachment 1

Summary of NOx CEM Emissions Data

SUMMARY OF NOx CEM EMISSIONS DATA

Redding Power Plant NOx CEM Emissions Data Summary							
Year	No. of Operating Hours[a]	No. of Valid Operating Hours[b]	Number of Turbine Starts	Mean Hourly NOx Emission Rate, ppm[c]	Max. 1-hr Average NOx Emission Rate, ppm	Percent of Hours Exceeding 2.3 ppm[c]	Percent of Hours Exceeding 2.5 ppm[c]
2002	2,555	2,490	13	0.83	5.36	2.3%	1.0%
2003	7,301	7,220	16	0.96	11.43	0.5%	0.1%
2004	6,345	6,250	23	0.94	7.93	0.2%	0.1%
2005	6,684	6,580	23	0.61	15.85	0.1%	0.1%
2006	6,253	6,220	6	0.53	14.48	0.1%	0.1%
2007	5,143	5,074	14	0.69	2.49	0.1%	0.0%

Notes:
a. Total number of CTG operating hours.
b. Total number of operating hours excluding startup/shutdown and low-load operation.
c. All concentrations expressed as ppmvd corrected to 15% O_2.
d. Exceedance frequency as percent of valid operating hours, excluding startup/shutdown and low-load operation.

Donald Von Raesfeld Power Plant NOx CEM Emissions Data Summary							
Year	No. of Operating Hours[a]	No. of Valid Operating Hours[b]	Number of Turbine Starts	Mean Hourly NOx Emission Rate, ppm[c]	Max. 1-hr Average NOx Emission Rate, ppm	Percent of Hours Exceeding 2.0 ppm[c]	Percent of Hours Exceeding 2.3 ppm[c]
Unit 1							
2005	3,344	2,617	166	1.63	15.72	0.8%	0.7%
2006	3,608	2,688	211	1.61	9.51	0.2%	0.1%
2007	5,667	4,834	183	1.61	8.99	0.1%	0.1%
Unit 2							
2005	3,195	2,483	163	1.58	14.87	1.2%	1.0%
2006	3,916	3,083	201	1.62	8.80	0.4%	0.1%
2007	5,694	4,893	185	1.61	7.10	0.1%	0.1%

Notes:
a. Total number of CTG operating hours.
b. Total number of operating hours excluding startup/shutdown and low-load operation.
c. All concentrations expressed as ppmvd corrected to 15% O_2.
d. Exceedance frequency as percent of valid operating hours, excluding startup/shutdown and low-load operation.

Attachment 2

June 23, 2005 Letter from
Shasta County Air Quality Management District

Shasta County

DEPARTMENT OF RESOURCE MANAGEMENT
1855 Placer Street, Redding, CA 96001

Russ Mull, R.E.H.S., A.I.C.P.
Director
Richard D. Barnum
Assistant Director

June 23, 2005

Russ Bennett
Safety and Environmental Coordinator
Redding Electric Utility
P.O. Box 496071
Redding, CA 96049-6071

Dear Mr. Bennett:

UNIT 5 DEMONSTRATION LIMIT, PTO# 00-PO-39 CONDITION # 26

The Shasta County Air Quality Management District (District) is in receipt of your letter dated June 13, 2005, with the data attached regarding the Unit 5 Oxides of Nitrogen (NOx) Demonstration Limit. This information gathering was a result of District oversight of your demonstration program regarding an NOx limit of 2.0 ppmvd at 15% oxygen as contained in note 1 of Condition 26 of the District-issued permit.

With review of the above information and routine reports submitted to the District, the following findings are made:

1. 11.527 tons of NOx were emitted by Redding Power's Unit 5 during the first three years of operation.

2. The average arithmetic NOx concentration during the first three years of operation was 1.24 ppmvd at 15% oxygen. The average NOx concentration during the month of June 2004, was 2.00 and during the month of January 2005, it was 2.8 ppmvd @15% O2.

3. Unit 5 NOx emissions exceeded the District limit of 2.5 ppmvd @ 15% O2 for 28.02 hours over the last three years of operation. Four minutes of this exceedance time was not exempted by District Rule 3:10, Excess Emissions.

4. Unit 5 NOx emissions exceeded the Demonstration limit of 2.0 ppmvd@15% O2 for 296 hours over the last two years.

5. Maintenance and repairs on the existing emission control system began shortly after start up and are continuing to the present. The redesign of the emission control device originally centered around the reformer reactor gas production and has currently led to the catalyst and sulfur poisoning of the catalyst. Additional SCOSOx catalyst was added to the control device during the April 2005, outage.

6. SCONOx catalyst washings have occurred at a frequency several times higher than anticipated during the three years of operation. These additional washings, for the sole purpose of maintaining NOx emission limits, have resulted in substantial downtime for Unit 5.

7. Load summary data indicate that Unit 5 has been operated at 24 megawatts or less for over 60% of total operating hours. Unit 5 is designed for 43 megawatts.

Based on the above findings, the District has determined that Redding Power is not able to reliably and continuously operate while maintaining the NOx demonstration limit of 2.0 ppmvd @ 15% O2. The NOx emission limit in the Permit to Operate and the Title V permit shall remain unchanged from the 2.5 ppmvd 1-hour rolling average @ 15% O2. Note 1 on condition 26 of District issued Permit to Operate #00-PO-39 and note 2 on Condition C7 of Title V Permit # 03-TV-02 that refer to the NOx demonstration limit will be removed as these permits are renewed.

If you have any questions regarding this determination please contact me at 225-5674.

Sincerely,

Ross Bell
Air Quality District Manager

RB/dd

Attachment 3

Summary of PM Test Results
LM6000 Combustion Turbines

LM6000 Combustion Turbine PM Test Result Summary - Natural Gas Fired Units

Project Name	Unit Name	Test Date	Turbine	Nominal Rating	Measured PM (lbs/hr) Probe Catch	Filter Catch	Total F/H	Total B/H	Total
Gilroy Energy	1	4/26/02	LM6000	48 MW	0.02	0.00	0.02	0.02	0.05
SMUD/SCA	A	3/19/97	LM6000	43 MW			0.13	0.08	0.21
Gilroy Energy	1	4/26/02	LM6000	48 MW	0.00	0.00	0.00	0.34	0.34
Almond Power Plant	1	11/19/03	LM6000	49 MW	0.00	0.00	0.00	0.39	0.39
Almond Power Plant	1	11/19/03	LM6000	49 MW	0.00	0.00	0.00	0.49	0.49
Gilroy Energy	1	4/26/02	LM6000	48 MW	0.00	0.02	0.02	0.47	0.50
Carson IceGen	2	9/13/95	LM6000	43 MW					0.55
Goosehaven	1	3/26/04	LM6000	49 MW	0.15	0.05	0.20	0.35	0.55
Carson IceGen	2	9/14/95	LM6000	43 MW					0.63
Almond Power Plant	1	8/26/04	LM6000	49 MW	0.14	0.01	0.15	0.49	0.64
Gilroy Energy	2	5/1/02	LM6000	48 MW	0.40	0.00	0.40	0.28	0.68
Carson IceGen	2	9/13/95	LM6000	43 MW					0.70
Gilroy Energy	3	4/25/02	LM6000	48 MW	0.00	0.00	0.00	0.75	0.75
Carson IceGen	1	9/18/95	LM6000	43 MW					0.78
Gilroy Energy	2	5/1/02	LM6000	48 MW	0.31	0.00	0.31	0.47	0.78
Gilroy Energy	3	4/25/02	LM6000	48 MW	0.00	0.02	0.03	0.81	0.83
Almond Power Plant	1	8/25/04	LM6000	49 MW	0.03	0.00	0.04	0.83	0.87
Carson IceGen	2	11/1/96	LM6000	43 MW			0.36	0.52	0.88
SMUD/SCA	A	3/20/97	LM6000	43 MW			0.23	0.66	0.89
Carson IceGen	1	10/6/95	LM6000	43 MW					1.05
SMUD/SCA	A	3/11/98	LM6000	43 MW			0.81	0.24	1.05
Carson IceGen	1	10/6/95	LM6000	43 MW					1.09
Riverview	1	7/27/04	LM6000	49 MW	0.26	0.26	0.52	0.57	1.09
Creed	1	3/27/04	LM6000	49 MW	0.55	0.00	0.55	0.55	1.10
Goosehaven	1	3/26/04	LM6000	49 MW	0.13	0.21	0.34	0.81	1.15
Almond Power Plant	1	11/19/03	LM6000	49 MW	0.00	0.01	0.01	1.16	1.17
SMUD/SCA	B	3/17/97	LM6000	43 MW			0.17	1.04	1.21
Almond Power Plant	1	8/25/04	LM6000	49 MW	0.24	0.01	0.24	0.97	1.22
Goosehaven	1	3/29/04	LM6000	49 MW	0.62	0.00	0.62	0.62	1.25
SMUD/SCA	B	3/18/97	LM6000	43 MW			0.21	1.08	1.29
SMUD/SCA	B	3/13/98	LM6000	43 MW			0.96	0.42	1.38
Creed	1	3/27/04	LM6000	49 MW	0.71	0.00	0.71	0.71	1.41
Los Esteros	1	3/16/03	LM6000	49 MW	0.89	0.44	1.33	0.12	1.45
Los Esteros	4	3/12/03	LM6000	49 MW	1.03	0.07	1.10	0.36	1.46
Lambie	1	3/26/04	LM6000	49 MW	0.98	0.00	0.98	0.49	1.47
Los Esteros	3	3/14/03	LM6000	49 MW	0.54	0.16	0.70	1.10	1.80
Goosehaven	1	3/29/04	LM6000	49 MW	1.05	0.00	1.05	0.79	1.84
SMUD/SCA	A	3/11/98	LM6000	43 MW			1.32	0.53	1.85
SMUD/SCA	B	3/12/98	LM6000	43 MW			1.65	0.20	1.85
Riverview	1	7/27/04	LM6000	49 MW	0.27	0.27	0.54	1.35	1.89
Los Esteros	2	3/15/03	LM6000	49 MW	1.45	0.12	1.57	0.35	1.92
Lambie	1	3/26/04	LM6000	49 MW	0.98	0.00	0.98	0.98	1.97
Riverview	1	7/27/04	LM6000	49 MW	0.26	0.26	0.51	1.46	1.97
Lambie	1	3/26/04	LM6000	49 MW	1.25	0.00	1.25	0.75	2.00
SMUD/SCA	A	3/11/98	LM6000	43 MW			1.66	0.35	2.01
SMUD/SCA	B	3/12/98	LM6000	43 MW			0.77	1.34	2.11
Goosehaven	1	3/29/04	LM6000	49 MW	0.61	0.00	0.61	1.51	2.12
Creed	1	3/27/04	LM6000	49 MW	0.55	0.00	0.55	1.66	2.21
Gilroy Energy	2	5/1/02	LM6000	48 MW	0.33	0.00	0.33	2.13	2.46
Los Esteros	1	3/16/03	LM6000	49 MW	0.46	0.18	0.64	1.82	2.46
Gilroy Energy	3	4/25/02	LM6000	48 MW	0.55	0.00	0.55	2.05	2.60
Los Esteros	3	3/14/03	LM6000	49 MW	0.02	0.59	0.61	2.13	2.74
Los Esteros	2	3/15/03	LM6000	49 MW	1.18	0.30	1.48	1.27	2.75
Los Esteros	4	3/13/03	LM6000	49 MW	0.96	0.52	1.48	1.40	2.88
Los Esteros	4	3/12/03	LM6000	49 MW	0.92	0.70	1.62	1.29	2.91
Los Esteros	3	3/14/03	LM6000	49 MW	1.37	0.07	1.44	1.52	2.96
Los Esteros	2	3/15/03	LM6000	49 MW	0.97	0.16	1.13	2.09	3.22
Los Esteros	1	3/16/03	LM6000	49 MW	1.26	0.26	1.52	1.95	3.47
SMUD/SCA	B	2/6/97	LM6000	43 MW			2.04	1.70	3.74
Goosehaven	1	3/26/04	LM6000	49 MW	0.31	0.05	0.37	3.40	3.77
SMUD/SCA	B	3/12/98	LM6000	43 MW			3.20	0.77	3.97
SMUD/SCA	A	2/4/97	LM6000	43 MW			1.44	2.89	4.33
Goosehaven	1	2/27/04	LM6000	49 MW	1.39	0.00	1.39	3.06	4.45
Goosehaven	1	2/27/04	LM6000	49 MW	1.63	0.00	1.63	2.99	4.62
SMUD/SCA	A	3/19/97	LM6000	43 MW			3.70	1.07	4.77
Goosehaven	1	2/27/04	LM6000	49 MW	1.67	0.00	1.67	3.62	5.30
Lambie	1	2/26/04	LM6000	49 MW	1.29	0.00	1.29	4.14	5.43
Carson IceGen	2	11/1/96	LM6000	43 MW			1.94	4.11	6.05
SMUD/SCA	B	2/18/97	LM6000	43 MW			3.99	2.11	6.10
Lambie	1	2/26/04	LM6000	49 MW	1.39	0.00	1.39	4.72	6.11
Lambie	1	2/26/04	LM6000	49 MW	1.10	0.00	1.10	5.48	6.58
Creed	1	2/24/04	LM6000	49 MW	1.08	0.00	1.08	5.95	7.03
Creed	1	2/24/04	LM6000	49 MW	2.46	0.00	2.46	6.83	9.29
Creed	1	2/23/04	LM6000	49 MW	2.78	0.00	2.78	10.30	13.08

EmeraChem Power™
YOUR POWER. OUR PERFORMANCE.

Proposal to:

PB Power
City of Anaheim
GE-LM 6000

For an

EMx™ NOx Trap
Multi-Pollutant Emission Reduction Systems

Proposal #PB Power-City of Anaheim-LM 6000-07102008

July 10, 2008

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1 EXECUTIVE SUMMARY

EmeraChem is pleased to provide this proposal for the design, manufacture and delivery of the EMx™ NOx Trap Multi-Pollutant Emission Reduction System for a natural gas fired GE LM-6000 turbine for simple cycle application.

Due to its ultra-clean emission performance, EMx™ minimizes emissions to the local community, minimizes the need for emissions offsets, minimizes project development costs for emissions fees, and allows power plant operators additional operational flexibility.

This proposal is for an EMx™ System guaranteed to reduce NOx from 25 ppmvdc to 2.32 based when operating on natural gas. Carbon monoxide (CO) will be reduced by 80%, volatile organic compounds (NMNEHC) will be reduced by 80% and PM will be reduced by 30%.

The system is configured with a modular design and limited ancillary equipment resulting in a straightforward, time saving installation.

EMx™ catalyst is a Platinum Group Metal (PGM) catalyst. This PGM is a true asset value on the plant site. At the end of its service life, the catalyst can be reprocessed to reclaim these PGMs to recover their cash value or reuse them in the manufacture of replacement catalyst.

TECHNOLOGY DESCRIPTION

1.1 Process Description

Refer to P&IDs. These are general in nature and may be modified in the final design of this project.

1.1.1. *EMx™ Catalytic Process*

The EMx catalyst technology treats combustion exhaust gases from sources such as combustion turbines, reciprocating engines, and boilers. The multi-pollutant catalyst system removes NOx, CO, VOCs, and ultrafine particulate matter (PM2.5). In addition, the system can be designed to contain a sulfur removal plant that will effectively remove sulfur from the concentrated regeneration gas stream.

The EMx catalyst technology performs in the operating temperature range of 425 to 750°F. Best economy and lowest pressure drop are achieved in the temperature range of 550 to 650°F where the catalyst activity is highest and the catalyst volume is minimized. In a simple cycle application, this optimal catalyst operating temperature is achieved by blowing cold outside air into the exhaust stream or adding an air to air exchanger to cool it to the optimum temperature.

This EMx™ reactor system has 10 catalyst chambers stacked vertically. Eight of the catalyst chambers treat combustion gas while the two are being regenerated using a reducing gas in an oxygen free environment. As the engine exhaust passes through the catalyst, CO is oxidized to carbon dioxide, hydrocarbons are oxidized to carbon dioxide and water vapor, and NOx is reacted with surface of the catalyst where it is bound as a solid carbonate.

Each chamber is equipped with a reliable, heavy duty, high-temperature isolation damper on the inlet and outlet of the chamber. The chamber undergoing regeneration is isolated from engine exhaust gases by closing its inlet and outlet isolation dampers.

A timer controls the length of the regeneration cycle. A regeneration cycle typically is set at 5 to 7 minutes, so that each section is in the oxidation/absorption cycle for four cycles (twenty to twenty-eight minutes). When the regeneration cycle has been completed the inlet and outlet isolation dampers open, the dampers on the next chamber close, and the regeneration cycle begins again.

1.1.2. *Regeneration Gas Production and Distribution*

The reducing gas required for regenerating the EMx™ and ESx™ catalyst is produced by a hydrogen generator system. This process has the simplicity, reliability, and operability needed for simple cycle operations. The hydrogen generator will be used in combination with a carrier of saturated steam. Steam will be produced utilizing a package boiler.

The flow rate of regeneration gas is approximately 1% of the engine's volumetric exhaust flow rate. The hydrogen generator uses RO/DI water, electricity and natural gas to produce high purity hydrogen. This hydrogen is then combined with saturated steam to create the regeneration gas.

Because one chamber is always in the regeneration cycle, the production of regeneration gas proceeds at a constant rate.

From the mixing vessel, the regeneration gas flows into a vertical piping header that connects to each of the ten reactor chambers via Class-6, leak-tight block valves assure that the regen gas is directed to the chamber being regenerated.

The regeneration system utilizes EmeraChem's improved and proven "push-pull" design. In the push-pull configuration, regeneration gas is injected between the last row of EMx catalyst and closed outlet isolation damper. The regen gas is distributed evenly across the catalyst surface. The regeneration gas flows upstream through all the catalyst and exits upstream of ESx catalyst, between the closed inlet isolation damper and the ESx catalyst. The entire regeneration cycle is carried out in one flow direction.

As the regeneration gas passes through the catalyst, the catalyst is regenerated. The reducing nature of the regeneration gas displaces engine exhaust and oxygen from the catalyst gas environment. When the oxygen has been depleted the hydrogen reacts with the catalyst surface, the nitrates are reduced to elemental gaseous nitrogen and released from the catalyst surface, and the catalyst NOx storage sites are freed for the next sorption cycle. Similarly, the ESx catalyst SOx storage sites are freed and the stored sulfur is released as SO_2.

The spent regen gas leaving the catalyst exits the reactor chamber through another block valve and into a spent regen gas vertical piping header. A rugged, high-temperature, variable speed induced draft blower draws the spent regen gas through the reactor and discharges it back into the exhaust duct downstream of the EMx reactor where it joins the treated engine exhaust. The blower speed and suction are controlled by the pressure in the chamber being regenerated. This pressure control loop provides conditions that minimize the leakage of regen gas out of the chamber and the leakage of exhaust gas into the chamber.

There are two process options for treating the spent regen gas. If it is not desired to remove sulfur the regeneration exhaust gas can be directed back into the exhaust downstream of the EMx catalyst. In the case of sulfur removal, the exhaust will be directed into a condenser recover the steam in the spent regen gas this further concentrating the SO_2 the scrubber

2.1.3 *Optional Steam Recovery Process Description*

Please refer to attached P&IDs. The optional steam condensing system will be located downstream of the regen exhaust blower. The facility's boiler makeup water will be used as the medium for condensing the exhaust gas. Makeup water requirements are approximately 10% by weight of the saturated steam. As example, 8,500 lb/hr of saturated steam would require approximately 1.7 GPM water flow to the condenser. Most of this saturated steam would be recovered as condensate water.

In the condenser the steam will be converted from gas to liquid, using a cooling water source or an air cooled heat exchanger. The recovered condensate will drain into a small receiver and be pumped back to the facility condensate collection system. The remaining non-condensables and approximately 10% steam that are not recovered flow into the downstream exhaust duct. See attached block diagram.

1.2 Equipment

1.2.1. *EMx™ Reactor Assembly*

The EMx™ reactor will have ten catalyst chambers stacked one above another. Between each chamber are two internal plena. One distributes regeneration gas from the supply header pipe to the downstream end of the chamber where it is injected during catalyst regeneration. The other plenum collects spent regeneration gas from the upstream end of the chamber and delivers it to the spent regen gas header pipe. Each reactor chamber has a catalyst access door used to load and unload catalyst modules.

The reactor will be constructed of carbon steel and designed for outdoor operation. External insulation for energy efficiency and personnel protection will be by others.

The approximate dimensions of each chamber will be as follows: 28 ft wide, 8 ft deep and 42 inches tall for a total reactor height of approximately 50 ft. The weight of catalyst in the reactor will be approximately 83,000 pounds.

Each reactor chamber will be equipped with louver dampers on the inlet and outlet to isolate the chamber from turbine exhaust during the periodic regeneration cycle. Durable high-temperature metallic seals minimize leakage and provide a controlled atmosphere for catalyst regeneration. Alloy sealing strips on the isolation louvers provide a durable and effective barrier against leaks during operation. The metallic seals require virtually no maintenance, in contrast to tadpole-type fabric gaskets. Design details of these isolation dampers are described below.

FRAME: The damper frame will be constructed of structural steel channel and plate. The frame will be designed to resist all loads imposed by shipping, handling and installation, as well as resist all loads imposed by operating conditions.

BLADES: The blades will be of a reinforced single cap design aerodynamically shaped to minimize pressure loss. Blade deflection will be less than L/360 at operating pressure to assure blade integrity. Blade moment of inertia and section modulus will be based on the actual blade cross section for determining deflection and stress. Thermal growth will be controlled by thrust collars, making the blade, in effect, "free floating". The blades will be sized to absorb thermal expansion without binding or interference.

SHAFTS: The blade shafts will be of 304 stainless steel for long bearing and packing life. The stub shafts will be welded to the blade to form a uniform axle with the blade and stiffener. Each damper will have an external blade indicator to show blade orientation.

BEARINGS: The bearings will be pedestal mounted, permanently lubricated and self aligning sleeve bearings. The bearings will be located adjacent to the packing to minimize deflection. Each shaft penetration will have a ductile iron-packing gland holding 3 rings of carbon graphite packing.

DRIVE: The drive will employ a bank of heavy duty pneumatic actuators directly coupled to the damper shafts. The drive will be capable of twice the required torque.

PERIPHERY SEALS: The louver dampers will have WahlcoMetroflex, Inc. Flex Ledge seals. The "Flex Ledge" seal will consist of flexible metal spring seals that contact the blade in the closed position. These seals will be located along the dampers vertical walls in an area less subject to abrasion and corrosion. The periphery mounted "Flex Ledge" seals will be constructed of alloy Inco 625 material. These fully self adjustable seals contact the blade in the closed position with metal to metal contact and allow thermal growth to be absorbed within a wide range of thermal conditions. These seals will be self adjusting to take up blade expansion and misalignment. The top and bottom of the blade periphery will have WahlcoMetroflex, Inc. tip seals. These seals employ Inco 625 spring seals to provide a resilient seat for a conventional high temperature seal.

1.2.2. *Regeneration Gas Production, Distribution and Manifold/Piping system*

HYDROGEN GENERATOR: The proposed solution is one of the lowest cost H2 generation systems available in the marketplace. Consisting of modular units that can be linked together or operated on a stand alone basis, the system can easily be expanded by adding additional units. Two HGM-10000 units will be provided that have the capacity to handle 20,000 scfh of 99.9% pure hydrogen.

The units are assembled at the factory and can often be installed within less than three weeks at your site. For installation, only a flat concrete foundation is required. Installation costs are very low compared to standard stick built plants.

The units are designed for continuous operation with one day maintenance every 3 months. WinCC Software platform and Siemens PLC Hardware are used for monitoring and control. Each unit has an integrated Human Machine Interface (HMI) touch panel screen. If connected to a Local Area Network (LAN), the HMI can be accessed from any PC within the LAN. The operator can remotely view and control the HGM via the remote HMI and access data logs in a non proprietary format. Data may be accessed via common industrial field buses such as ProfiBus and can be logged in logged in CSV file. All equipment is newly manufactured equipment and has an expected 15+ year service life, as maintained according to Operating Maintenance Manuals.

PIPING: Steam piping and valves are 304 stainless steel rated for the available steam temperature. Natural gas piping and valves are carbon steel.

The header and valves that supplies regeneration gas to each reactor chamber are 304 stainless steel. The spent regeneration gas header and valves are carbon steel. Expansion joints will be installed to allow for thermal expansion during heat-up.

Each reactor catalyst chamber will have one Class 6 inlet regeneration gas supply valve and a special internal flow distribution system to distribute regeneration gas evenly across the full face of the catalyst. Each chamber will also have one outlet valve for spent regeneration gas. See attached typical P&ID drawing.

1.2.3. *Control System*

The control system will utilize a "stand alone" programmable logic controller (PLC) with operator inputs made from a HMI panel. This controller is programmed to control all essential EMx™ functions, including opening and closing of reactor isolation dampers and regen gas inlet and outlet valves, measuring and controlling the mass flow rate of steam and hydrogen flow, controlling the speed of the VFD blower to maintain catalyst chamber

pressure during the regeneration cycle, displaying permissives, alarms, and first-out indication. The control system will be located at the regeneration gas system and will be shipped pre-wired to the I/O on the reformer skid. From the HMI the operator will be able to change set points, such as pressures, regeneration cycle times, and flow rates. Buyer supplies all interconnecting wiring and conduit between control panel and the instruments and actuators on the reactor and header pipes.

As options, the system can be remotely monitored by the use of modem, or share signals with other plant control systems.

1.3 Catalyst

The system will utilize EmeraChem's improved EMx™ catalyst. The EMx catalyst has higher NOx sorption capacity than previous formulations which translates into lower emissions and longer operating times between washings.

EMx™ and ESx® are platinum-based catalysts applied to a ceramic substrate. The precious metals in these catalysts are a valuable plant asset that can be recovered when the catalyst has reached the end of its service life. The ceramic catalyst blocks are housed in 304 stainless steel modules that provide structural rigidity and ease of handling. The specific dimensions of the modules, the number of modules, and number of rows of modules are based upon the reactor size, turbine exhaust gas composition, and performance requirements.

For this application the ceramic catalyst blocks will be contained in strong 24W"x42H" stainless steel modules to facilitate handling (the depth of ESx catalyst modules will be 5"; the depth of EMx catalyst modules will be 4". Each of the reactor's catalyst chambers will house one (1) row of ESx catalyst modules standing fourteen (14) modules across, and three (3) rows of EMx catalyst modules standing fourteen (14) modules across.

Initial Supply of Catalyst

EMx™	Three 4-inch depth rows .Identical dimensions for all modules
ESx®	One 5-inch depth row

2 DESIGN BASIS

2.1 Engine Data

The EMx™ system design is based upon the flowing process specifications and operating conditions.

Parameter	Design Value (650F)
Engine Manufacturer & Model	GE LM-6000
Exhaust Gas Flow Rate of Engine	1,085,651 lb/hr
	14,366,680 scfh
Exhaust Gas Flow Rate with Dilution Air added	1,416,846 lb/hr
	18,719,063 scfh
Fuel Type	Natural Gas
Catalyst Temperature	
Minimum	600°F
Operating	650°F
Maximum	700°F
Engine Emissions at Catalyst Inlet	
NOx	25 ppmvd at 15% O_2
CO	30 ppmvd at 15% O_2
HC	3 ppmvd at 15% O_2
PM	3 lbs/hr
SO_2	.3 ppmvd at 15% O_2

2.2 Emissions Performance

EMx is a "NOx trap" technology, where NOx is stored on the surface of the catalyst, then converted to nitrogen and released during the regeneration cycle. The catalyst has a specific capacity to store NOx. As the catalyst captures NOx during the sorption cycle the capacity becomes consumed, the outlet NOx value begins to rise, and the system enters the regeneration cycle to restore the capacity and return the outlet NOx to very low values.

The cyclic nature of this process produces NOx outlet values that rise and fall in a "saw tooth" pattern. The catalyst will be designed so that the top of the "saw tooth" pattern is below emission values defined below, so that the average emission reduction will be greater than the value defined below.

Oxidation of CO and VOCs will be constant and will not exhibit the "saw tooth" pattern characteristic of NOx.

As currently configured, the ESx catalyst will function as a sulfur guard for the EMx NOx trap catalyst. During regeneration the sulfur stored by the ESx catalyst will be released as SO_2 and diverted to the exhaust duct downstream of the EMx reactor. Used in this manner the ESx technology will not permanently remove SOx from the exhaust and the SOx emissions will be identical to that of the engine. As an option, this concentrated, low-volume spent regen gas stream could be directed to the sulfur scrubber system.

The following performance guarantees apply to the proposed system (see Attachment B for warranty information):

Parameter	EMx System Emission Concentration at 15% O_2	Percent Removal
NOx at Catalyst Outlet	2.32 ppmvd	91% guaranteed
CO at Catalyst Outlet	6 ppmvd	80% guaranteed
PM (10/2.5)	2.1 lbs/hr	30 % guaranteed
NMNEHC VOCs at Catalyst Outlet Measured as Aldehydes	< 1ppmvd	90% expected

The catalyst warranty period is 5 years. Expected life of the catalyst is 10-15 years.

2.3 Back Pressure

The catalyst substrate introduces a pressure drop to the flowing engine exhaust. The resulting system backpressure is a function of the size of the gas path (cross-sectional area), exhaust flow rate, catalyst depth, and temperature. The expected level of backpressure across the EMx and ESx catalyst bed at the design conditions is 4.4 inches WC. This value could be reduced by increasing the size of the gas path or changing a number of other variables.

2.4 Emission Reduction Impact

The EMx system is an ultra clean system that greatly reduces emissions over that of conventional combined Carbon Monoxide/Selective Catalytic Reduction catalyst control. The table below highlights the emissions differences in your specific application. These greater reductions can provide for reduced offset fees when permitting your project.

PB Power- City of Anaheim Project
Comparison of Annual Emissions of EMx vs. SCR Alternative

	Estimated Emissions, Pounds Per Year			
	PB Power Original Proposal Four GE LM6000 Turbines with SCR - 1,000 hrs per year	Estimated Emissions from Four GE LM6000s with EMx		
		Expected	Avoided	% Reduction
NOx	20,800	8,320	12,480	60%
CO	32,800	3,280	29,520	90%
NH3	16,560	0	16,560	100%
PM10	12,000	8,400	3,600	30%

3 SCOPE OF SUPPLY

The EmeraChem Scope of Supply for execution of the Project includes the catalyst, equipment and services below and shown in the "Project Division of Responsibility" table. In general, the Scope of Supply can be defined by the following categories:

a. Process design, system detail engineering and project management. Design and drawings are based upon EmeraChem's standards and specifications.

b. EMx™, ESx® catalyst upon EmeraChem standards and specifications.

c. Equipment and components described in Section 2. Designs, specifications, materials of construction, and components supplier selections based upon EmeraChem standards. These systems include the following:

- EMx reactor assembly
- EMx and ESx catalyst
- Air tempering fans and dilution system
- Hydrogen generator and storage tank
- Reactor Transitions and Expansion Joints
- Regeneration Gas Distribution System
- Package boiler producing saturated steam for regeneration gas
- Boiler feedwater and steam system
- Ladders and Platforms
- Exhaust Stack
- Control system
- CFD modeling

d. Technical Advice during installation, commissioning, and startup as described below

3.1 Project Division of Responsibility

SCOPE ITEM	EmeraChem Power	PB Power Anaheim
Engineering Scope of Supply		
EMx Reactor housing & isolation valves.	QEI	
Hydrogen Generator system	H2 Gen	
Electrical panel for H2 Gen and Reactor	QEI	
Interconnecting piping-H2 Gen to Reactor		✓
Process Engineering	Lambert	
Reactor transitions and ducting	Lambert	
Reactor expansion joints	Wahlco	
Gas supply line to H2 Gen		✓
Steam and condensate supply piping		✓
Stack and Silencer	ECP	
Dilution Air System	ECP	
CFD Modeling	ECP	
Hardware Scope of Supply		
EMx™ catalyst	EC	
ESx™ catalyst	EC	
H2 Generator	H2 Gen	
Regeneration gas system	Wahlco	
EMx reactor housing & isolation valves	Wahlco	
Interconnecting piping-H2 Gen to Rx		✓
Electrical panel for H2 Gen and Reactor		✓
Transition to and from Reactor	ECP	
Reactor inlet & outlet expansion joints	ECP	
Stack and Silencer	ECP	
Dilution Air fans and system	ECP	
Saturated boiler system	ECP	
Hydrogen Tank	H2 Gen	
Gas supply line to H2 Gen		✓
Steam and condensate supply piping		✓
Insulation of reactor and piping		✓
UPS		✓
Spent regen gas piping – header to HRSG		✓
Ladders and platforms	Lambert	
Catalyst loading platform	optional	
Installation		
Receiving and verification of goods	ECP	✓
Construction technical supervision	As outlined	✓
Construction craft labor		✓
Construction equipment		✓
Interconnecting wiring and conduit		✓
Catalyst loading	optional	✓
Technical assistance	As outlined	✓
Commissioning & Start-up		
Electrical continuity checks		✓
I/O checks		✓
Pressure/leak tests		✓
Instrument calibration		✓

3.2 Technical Support

A Technical Service Representative for installation and start-up is included in the price. The Technical Service Representative will be supplied as follows:

a. on-site technical advice during installation: three (3) 1-week trips,
b. On-site technical field advice commissioning & startup including classroom instruction on operation and system hands-on training: 30 man days as needed throughout commissioning & startup.
c. Hydrogen generator system integrator will provide onsite personnel for the installation, startup and training of operators up to 10 days without further charge.

Additional support is available based on standard EmeraChem service rates and per diem.

3.3 Exclusions

3.3.1. *The Following Items Are Specifically Excluded From EmeraChem's Scope of Supply:*

a. All required permits
b. Foundations, site construction
c. Mechanical system installation
d. Equipment insulation and heat tracing
e. EMx™ or ESx® catalyst installation, washing and recoating

See also the Project Division of Responsibility Table.

4 PROJECT SCHEDULE

From the receipt of a purchase order, the estimated completion time of this project is approximately 58 weeks, broken down as follows:

6 weeks after receipt of P.O.	Initial process design submittal Initial reactor design submittal
20 weeks after receipt of P.O.	Engineering Design Complete
34 weeks after approval of drawings	Fabrication and delivery of equipment Manufacture and delivery of catalyst

Accelerated deliveries are possible depending on availability of materials and production schedule at the time a purchase order is received by EmeraChem.

5 PRICE AND PAYMENT SCHEDULE

5.1 Price

As described in Sections 2, 3 and 4 of this proposal, the pricing for this EMx™ Multi-Pollutant Emission Reduction "System" includes system hardware, equipment, and components, EMx™, ESx® catalyst, regeneration gas production system, project management, engineering, and technical services.

EMx™ System Price Components	4-LM 6000
System hardware, equipment, and components (including project management, engineering, and technical services)	$ 20,589,901
EMx™, ESx® and steam reformer catalyst without precious metals	$ 6,935,324
Platinum for catalyst (current market price of $1970/troy ounce of Platinum)	$ 15,087,908
Total Capital Price	$ 42,613,133
Reclaim value of precious metals based on current market	($ 12,824,722)
Net Capital Price	$ 29,788,411

As described earlier, the EMx™ technology utilizes precious metal, platinum catalysts. These precious metals give the catalyst true asset value on the plant site. The cost of platinum is passed through to the customer without markup. At the end of its service life the catalyst can be reprocessed to reclaim these precious metals and recover their cash value, or the precious metals can be reclaimed and reused in the manufacture of replacement catalyst. The estimated value of the recovered platinum at today's market price is listed in the above chart.

As an option, a catalyst loading system can be added to provide for quick, easy and safe removal of the catalyst modules for cleaning or replacement.

Catalyst Loading and Handling System (Optional)

System hardware, equipment, and components (including project management, engineering, and technical services)	$785,000 per unit

The prices listed above do not include applicable taxes, installation, and is FCA factory. EmeraChem standard terms and conditions apply. The prices in this proposal are valid for a period of 30 days from the date of this proposal. After 30 days, prices are subject to change without notice. These prices are based on the current industrial value of Platinum (Pt) as of the date of this proposal. If the price of platinum changes by the time of purchase, the catalyst price will be adjusted to compensate for the change in platinum price. The platinum price is the "Industrial Price" as stated in the Wall Street Journal on the day the purchase order is provided.

5.2 Payment Schedule

The following Payment Schedule for the Capital Price is required in order for EmeraChem to purchase and process the material necessary to supply the EMx™ catalyst and associated systems in a time frame consistent with the proposed Project Schedule.

10%	Upon execution of a Purchase Order
40%	Upon sourcing of PGM
45%	Progress Payments through fabrication
5%	Within thirty (30) days of completion of acceptance tests, or within ninety days of completion of installation, whichever occurs first.

5.3 Catalyst Maintenance Services

EmeraChem offers a comprehensive program to handle all catalyst service issues on the EMx™ system along with the provision for technical and operator training. An important benefit of this program is that the catalyst will be maintained to a condition, which optimizes its performance, reliability, and on-line availability thus maximizing the catalyst life. A service proposal can be provided, if desired.

APPENDIX A – Description of Catalytic Principles

Catalyst Oxidation/Absorption Cycle

EMx

The *EMx* catalyst works by simultaneously oxidizing CO to CO_2, VOCs to CO_2 and H_2O, NO to NO_2, and then absorbing NO_2 onto its surface through the use of an alkaline metal solution adsorber coating such as potassium carbonate. These reactions are shown below, and are referred to as the "Oxidation/Absorption Cycle".

$CO + ½O2 \rightarrow CO_2$
$C\ H_2O + O_2 \rightarrow CO_2 + H_2O$
$NO + ½O2 \rightarrow NO_2$
$2NO_2 + K2CO3 \rightarrow CO_2 + KNO2 + KNO3$

ESx

The ESx Sulfur Removal Catalyst works in conjunction with the *EMx* system and is placed upstream of the *EMx* catalyst. The ESx catalyst enhances the efficiency of NOx absorption by removing sulfur compounds from the flue gas. Sulfur is present in the flue gas exhaust primarily as SO_2, which forms potassium sulfate on the *EMx* catalyst. The ESx catalyst acts like a filter and removes the sulfur in the flue gas stream before it reaches the *EMx* catalyst. Chemical reactions for the ESx system oxidation/absorption cycle are shown below.

$CO + ½O2 \rightarrow CO_2$
$SO_2 + ½O2 \rightarrow SO_3$

$SO_3 + SORBER \rightarrow [SO_3 + SORBER]$

Catalyst Regeneration Cycle

EMx

The regeneration of the *EMx* catalyst, one of the features that make the system so unique, is accomplished by passing a dilute reducing gas across the surface of the catalyst in the absence of oxygen. The reductant in the regeneration gas reacts with nitrites and nitrates to form water, elemental nitrogen, and potassium hydroxide. Carbon dioxide in the engine exhaust reacts with potassium hydroxide to form potassium carbonate, which is the absorber coating that was on the surface of the catalyst before the oxidation/absorption cycle began. This cycle is referred to as the "Regeneration Cycle", and the relevant reaction is shown below.

$KNO_2 + KNO_3 + 4H_2 + CO_2 \rightarrow K_2CO_3 + 4H2O + N2$

Water (as steam) and elemental nitrogen are exhausted up the stack instead of NOx, and potassium carbonate is once again present on the surface of the catalyst, allowing the oxidation/absorption cycle to begin again. There is not a net gain or net loss of potassium carbonate after the oxidation/absorption and regeneration cycle.

ESx

The reaction for the regeneration cycle is also similar to that of the *EMx* catalyst. The regeneration gas used for the *EMx* and ESx catalyst is the same, allowing them to be regenerated simultaneously.

$$[4SO_3 + SORBER] + 4H2 + CO_2 \rightarrow 4SO_2 + CO_2 + 2H_2O + SORBER$$

The regeneration reaction illustrates that the sorbed SO_2 is not destroyed, but released; hence, the result of the regeneration step is a concentrated stream of SO_2 that can be disposed of or returned to the exhaust downstream of the *EMx* catalyst.

The sulfur dioxide in the above reaction may be removed by passing the spent regeneration gas through a dry scrubber before it is piped into the HRSG to be exhausted to the atmosphere. Capture of sulfur compounds from an exhaust stream using the ESx process has been proven in the laboratory to be on the order of 90% or higher.

Steam Reforming Chemistry

The methane and steam are combined and react over the steam reforming catalyst surface as indicated in the equation below, forming two to four percent hydrogen in the steam carrier gas.

$$CH_4 + 2H2O \rightarrow 4H_2 + CO2$$

APPENDIX B – Required Utilities

The following are the utility consumption rates for four (4) LM-6000 units firing at 100% load.

Utility	Quantity	Pressure	Other
Natural Gas (to produce H_2 gas used in the regen process)	6,681 scfh	15 or 60 psig	pipeline quality
Steam (used to combine with H_2 to be used as regen gas)	35,000 lb/hr	15 psig	Saturated steam
Electricity (regen gas blower and H_2 generator)	37.5 kWh		480 volt, 3-phase
Compressed Air (for actuators on reactor isolation dampers, regen gas block valves and H_2 generator)	315 scfh.	80 psig (100 psig max.)	
DI Water (for use to create H_2)	3.75 gpm		10 mega ohm/cm resistivity
Cooling Water (used to cool off the H_2 generator equipment)	75 gpm		
Boiler Makeup Water (used to create regen gas steam)	7 gpm		RO quality

ATTACHMENTS

Information specific to this EMx™ installation is provided under the following subheadings.

A. Piping and Instrumentation Drawings

Preliminary P&IDs are attached.

B. EMx™ System Performance Warranty

EmeraChem warrants the products provided in accordance with Section III, "Warranty", of EmeraChem Selling Policy 8130.

Mechanical parts provided by EmeraChem subcontractors are warranted to be free of defects in workmanship, material, or title for a minimum period of one (1) year on a pass through basis.

C. Terms & Conditions

The detailed Terms and Conditions are provided in EmeraChem Selling Policy 8130

D. Field Service Policy and Rate Schedule

EmeraChem field service engineers will provided in accordance with EmeraChem's Selling Policy 8190, "Technical Field Services" and Price List PL8199.

APPENDIX J

APPENDIX J

Emissions Calculations Confirming Project Offset Requirements (New Appendix)

EMISSIONS CALCULATIONS CONFIRMING PROJECT OFFSET REQUIREMENTS Revised (2008/08/12)

Turbine Operating Profile

Non-commissioning year: 602 hours per year of full-load operation
Commissioning year: 446 hours of full load operation in addition to 156-hours of turbine commissioning.

EMISSIONS CALCULATIONS

- RTCs and Offsets

1. **NOx**

Under RECLAIM, RTCs are required for the four turbines and black start engine. As the numbers of RTCs required are different, calculations are performed for the commissioning year and a normal operating year.

a. ***Commissioning Year***

NOx, lbs/yr = [NOx per turbine] [4 turbines] + [NOx for ICE]

Turbines

[(3443 lbs for 156-hr commissioning) + (3.98 lb/hr @ 2.3 ppmvd BACT) (446 hr/yr, normal operation) + (129 start-ups/yr) (**10.09 lb/start-up**) + (129 shut-downs/yr) (**0.69** lb/shutdown)] [4 turbines]
= [**6,608.7** lb/yr-turbine] [4 turbines] = **26,435** lb/yr

ICE

(**12.06** lb/hr) (200 hr/yr) = **2,412** lb/yr

Total

26,435 lb/yr + **2,412** lb/yr = **28,847** lb/yr

b. ***Normal Operating Year***

NOx, lbs/yr = [NOx per turbine] [4 turbines] + [NOx for ICE]

Turbines

[(3.98 lb/hr @ 2.3 ppmvd BACT) (602 hr normal operation) + (129 start-ups/yr) (**10.09** lb/start-up) + (129 shut-downs/yr) (**0.69** lb/shutdown)] [4 turbines]
= [**3,786.6**lb/yr-turbine] [4 turbines] = **15,146** lb/yr

ICE

(**12.06** lb/hr) (200 hr/yr) = **2,412** lb/yr

Total

15,146 lb/yr + 2,412 lb/yr = 17,558 lb/yr

2. **ROG**

For a peaker plant, if the maximum total facility emissions for ROG for all years are less than 4 tpy, then offsets are not required. Calculations are performed for the commissioning year and a normal year to confirm the maximum emissions for both are less than 4 tpy.

a. Commissioning Year

ROG, lbs/yr = [ROG per turbine] [4 turbines] + [ROG for ICE]

Turbines

[(99 lbs for 156-hr commissioning) + (1.2 lb/hr @ 2.0 ppmvd BACT) (446 hr/yr, normal operation) + (129 start-ups/yr) (**0.79** lb/start-up) + (129 shut-downs/yr) (**0.27** lb/shutdown)] [4 turbines]

= [**770.94** lb/yr] [4 turbines] = **3,084** lb/yr

ICE

(0.05 lb/hr) (200 hr/yr) = 10 lb/yr

Total

3,084 lb/yr + 10 lb/yr = **3,094** lb/yr

b. Normal Operating Year

ROG, lbs/yr = [ROG per turbine] [4 turbines] + [ROG for ICE]

Turbines

[(1.2 lb/hr @ 2.0 ppmvd BACT) (602 hr/yr, normal operation) + (129 start-ups/yr) (**0.79** lb/start-up) + (129 shut-downs/yr) (**0.27** lb/shutdown)] [4 turbines]

= [**859.14** lb/yr] [4 turbines] = **3,437** lb/yr

ICE

(0.05 lb/hr) (200 hr/yr) = 10 lb/yr

Total

3,437 lb/yr + 10 lb/yr = **3,447** lb/yr

3. SOx

For a peaker plant, if the maximum total facility emissions for SOx for all years are less than 4 tpy, then offsets are not required. Calculations are performed for the commissioning year and a normal year to confirm the maximum emissions for both are less than 4 tpy.

a. Commissioning Year

SOx, lbs/yr = [SOx per turbine] [4 turbines] + [SOx for ICE]

Turbines

[(100 lbs for 156-hr commissioning) + (0.34 lb/hr @ 0.25 grains per 100 dscf) (446 hr/yr, normal operation) + (129 start-ups/yr) (**0.14** lb/start-up) + (129 shut-downs/yr) (**0.02** lb/shutdown)] [4 turbines]
= [**272.28** lb/yr-turbine] [4 turbines] = **1,089** lb/yr

ICE

(0.01 lb/hr) (200 hr/yr) = 2.0 lb/yr

Total

1,089 lb/yr + 2 lb/yr = **1,091** lb/yr

b. Normal Operating Year

SOx, lbs/yr = [SOx per turbine] [4 turbines] + [SOx for ICE]

Turbines

[(0.34 lb/hr @ 0.25 grains per 100 dscf) (602 hr/yr, normal operation) + (129 start-ups/yr) (**0.14** lb/start-up) + (129 shut-downs/yr) (**0.02** lb/shutdown)] [4 turbines]
= [**225.32**lb/yr-turbine] [4 turbines] = **901** lb/yr

ICE

(0.01 lb/hr) (200 hr/yr) = 2.0 lb/yr

Total

901 lb/yr + 2 lb/yr = **903** lb/yr

4. PM_{10}

Offsets are not required for PM_{10} for each turbine, because the facility-wide emissions for all years are less than 4 TPY. Calculations are performed for the commissioning year and a normal year to confirm the maximum emissions for both are less than 4 tpy.

a. Commissioning Year

PM_{10}, lbs/yr = [PM_{10} per turbine] [4 turbines] + [PM_{10} for ICE]

Turbines

[(468 lbs for 156-hr commissioning) + (3.00 lb/hr normal operation) (446 hr/yr, normal operation) + (129 start-ups/yr) (**1.29** lb/start-up) + (129 shut-downs/yr) (**0.18** lb/shutdown)] [4 turbines]

= **[1,995.63** lb/yr-turbine] [4 turbines] = **7,983** lb/yr

ICE

(0.05 lb/hr) (200 hr/yr) = 10 lb/yr

Total

7,983 lb/yr + 10 lb/yr = **7,993** lb/yr

b. Normal Operating Year

PM_{10}, lbs/yr = [PM_{10} per turbine] [4 turbines] + [PM_{10} for ICE]

Turbines

[(3.00 lb/hr normal operation) (602 hr/yr, normal operation) + (129 start-ups/yr) (**1.29** lb/start-up) + (129 shut-downs/yr) (**0.18** lb/shutdown)] [4 turbines]

= **[1,995.63**lb/yr-turbine] [4 turbines] = **7,983** lb/yr

ICE

(0.05 lb/hr) (200 hr/yr) = 10.0 lb/yr

Total

7,983 lb/yr + 66.0 lb/yr = **7,993** lb/yr