APPENDIX 8.1D

LAER/BACT Determination

APPENDIX 8.1D

LAER/BACT Determination

Evaluation of Lowest Achievable Emission Rate/Best Available Control Technology

To evaluate BACT for the proposed simple cycle turbines, the SCAQMD LAER/BACT guideline for large gas turbines was reviewed. The relevant LAER/BACT determinations for this analysis are shown in Table 8.1D-1.

TABLE 8.1D-1
SCAQMD LAER/BACT Guideline For Large Gas Turbines

Pollutant	Achieved in Practice or Contained in SIP	Technologically Feasible
NO_x	2 ppmvd, 1 hr avg, excluding startup and shutdown. SCR or equal and natural gas fuel.	2 ppmvd, 1 hr avg, excluding startup and shutdown. SCR or equal and natural gas fuel
SO_2	1. PUC-regulated natural gas or	1. PUC-regulated natural gas or
	2. Non-PUC-regulated gas with no more than 0.75 g S/100 dscf.	2. Non-PUC-regulated gas with no more than 0.75 g S/100 dscf
		3. LPG
CO	3.0 ppmv	3 ppmv
	Oxidation catalyst and natural gas fuel	Oxidation catalyst and natural gas fuel or LPG
VOC	2.0 ppmv and natural gas fuel*	2.0 ppmv and natural gas fuel*
PM_{10}	Air inlet filter cooler, lube oil vent coalescer and natural gas fuel	Air inlet cooler/filter, lube oil vent coalescer and natural gas fuel or LPG
Ammonia	5 ppmvd*	5 ppmvd*

* SCAQMD BACT policy (Section D) and the CARB September 1999 *Guidance for Power Plant Sitting and Best Available Control Technology* list 2 ppmvd as the VOC BACT level. In Section D of its BACT Policy Guidelines, the SCAQMD lists 5 ppmvd ammonia slip as the BACT level.

The EPA RACT-BACT-LAER Clearinghouse (RBLC) was also consulted to review recent permitting decisions for simple cycle gas-fired gas turbines. These recent LAER/BACT decisions are shown in Attachment 8.1D-A for CO and NO_x. The RBLC database does not strictly adhere to the definition of simple cycle and when a search is conducted for simple cycle natural gas-fired turbines over 25 megawatts (MW), the resulting data is mostly combined cycle installations. While there are a few true simple cycle installations with low NOx or CO emissions presented, the great majority of the search results are projects with heat recovery steam generators operated without duct burners firing. Of the projects appearing on the list with NOx emissions below 3.5 ppmvd, Summit Vineyard, Keyspan Energy, Umatilla Generating Company, Lake Road Generating Company, Sithe Heritage Station, Allegheny Energy Supply, Mantua Creek Generating Facility, Garnet Energy, Genpower Rincon, SCE&G – Jasper County Generating Facility, and Whiting Clean Energy

are combined cycle facilities and would not be relevant to a true simple cycle facility. Several facilities were permitted with dual NOx limits – 3 ppmvd for combined cycle and 9 ppmvd for simple cycle. These included Connective Energy and Entergy Hawkeye Generating. The SEI Texas Bosque Plant appears in the USEPA Region IV national turbine data base as a simple cycle Frame 7 that is not equipped with a catalyst and is permitted at 9 ppmvd. Lambie Energy Center and PPL Wallingford are both simple cycle LM 6000s and do have permit limits of 2.5 ppmvd. Draft SCAQMD BACT listings were prepared in 2004 for both the Lambie Energy Center and the PPL Wallingford projects, but final versions are not currently listed in the SCAQMD's BACT Guidelines (see Attachment 8.1D-B for copies of the SCAQMD BACT Guidelines). The Lambie Energy Center listing has source test results documenting performance at full load at 2.5 ppmvd. No partial load operation was documented and the February 2004 BACT listing indicates that all operation is at full load. The PPL Wallingford listing indicates full load operation with NOx and NH_3 emissions occasionally exceeding the permit limits by small amounts.

The CO-RBLC search for natural gas-fired simple cycle turbines larger than 25 MW was similar to the NOx search results. Most of the listed projects are combined cycle and are the same projects as presented in the NOx search results. The Competitive Power Venture Project has been cancelled. The WEPCO-Paris Generating Station appears to be a Frame 7 operating without an oxidation catalyst. The Entergy Hawkeye Generating Plant has a combined cycle CO limit of 5 ppmvd and a simple cycle limit of 9 ppmvd. The value for the Wisconsin Electric Company Germantown Plant doesn't appear correct as the project appears in USEPA Region IV national turbine data base with a 25 ppmvd CO limit and the other CO RBLC listings for the two turbines at this facility do not conform to the 1.8 ppmvd value. Attachment 8.1D-A presents a listing of the RBLC search results for emission limits at or below those proposed by the Applicant, and the LAER/BACT determinations prepared by the SCAQMD.

The ARB's BACT Clearinghouse Database was also reviewed for recent BACT decisions regarding large simple cycle gas turbine projects in California. There are no listed projects above 50 MW. The two LM 6000 projects that are listed are the EI Colton Project in the South Coast and the Lambie Energy Project in the Bay Area. Both projects have CO limits of 6 ppmvd. EI Colton has a NOx limit of 3.5 ppmvd, while the Lambie project has a NOx limit of 2.5 ppmvd. However, note that the listed Lambie NH3 slip level is 10 ppmvd, which is double the allowable SCAQMD limit.

Finally, the ARB's 1999 Guidance for Power Plant Sitting and Best Available Control Technology and the November 2001 Guidance for the Permitting of Electrical Generation Technologies were also reviewed. The relevant LAER/BACT levels recommended in the ARB power plant guidance documents for simple cycle turbines are summarized in Table 8.1D-2.

The Project proposes to use the new LMS 100 low NOx combustors with water injection and selective catalytic reduction technology to achieve a NO_x exhaust concentration of 3.5 ppmvd or less (1-hour average). While several recent projects using LM 6000s and another LMS 100 project have elected to use 2.5 ppmvd as the NOx BACT/LAER level, this project believes that is premature at this time for the LMS 100. This is a brand new turbine and the first commercial unit has not begun operation. Further, AES desires to maintain the flexibility of operating the turbines down to 50% load and not merely as an on/off plant, typical for most

peaking plants. CO exhaust concentration will be controlled to 6 ppmvd (3-hour average) through use of natural gas fuel, modern combustors, good combustion practices and oxidizing catalysts. The gas turbines will be fueled with natural gas to minimize SO_2 and PM_{10} emissions. VOC levels are inherently very low for the turbines (i.e., 2 ppmv) and comply with LAER/BACT, as measured using the SCAQMD's modified TO-12 source testing methodology. The AESH will be exclusively natural gas fired and will employ emission controls on the cooling tower (0.0005 percent drift eliminators), inlet air conditioning (filtration and moisture conditioning), and mist eliminators on lube oil system vents. The SCR systems will also be designed to achieve an ammonia slip of 5 ppmvd (1-hour average). These pollutant levels will achieve emission reductions consistent with the SCAQMD LAER/BACT guidelines and the ARB BACT guideline for power plants. A more detailed top down analysis for BACT for NO_x and CO emissions will be included in the NSR/Title V Permit Application being submitted to SCAQMD under a separate cover. Table 8.1D-3 presents the project's proposed LAER/BACT emission limits.

TABLE 8.1D-2
ARB BACT Guidance for Simple Cycle Power Plants

Pollutant	BACT
NO_x	5.0 ppmv @ 15% O2 (3-hour average)
SO_2	Fuel sulfur limit of 1.0 grains/100 scf
CO	Nonattainment areas: 6 ppmv @ 15% O2 (3-hour average) Attainment areas: District discretion
VOC	2 ppmv @ 15% O2 (3-hour average)
Ammonia	5 ppmv @ 15% O2 (3-hour average)
PM_{10}	Fuel sulfur limit of 1.0 grains/100 scf

TABLE 8.1D-3
AES Highgrove Project Proposed LAER/BACT Emission Limits

NO_x	CO	VOC	PM_{10}	SO_x
3.5 ppmvd @ 15% O_2, 1-hour rolling average	6 ppmvd @ 15% O_2, 3-hour rolling average	2 ppmvd @ 15% O_2, 1-hour rolling average	Primary use of natural gas fuel limited to 4 ppm sulfur*	Primary use of natural gas fuel limited to 4 ppm sulfur[a]

* Natural gas provided by the Southern California Gas Company is limited to 16 ppm in the South Coast by Rule 431.1.

ATTACHMENT 8.1D-A

EPA RACT/BACT/LAER Determinations for Simple-Cycle Gas Turbine Projects

U.S. Environmental Protection Agency

Technology Transfer Network
Clean Air Technology Center
RACT/BACT/LAER Clearinghouse

RBLC Ranking Report

Help

Your search has found **246** facilities that match your search criteria. You can view details for one or more facilities by clicking on the highlighted RBLC identifier or the process description in the list below. To create a report, select one of the standard output formats from the list of reports at the bottom of this page. Only facilities that are checked in the table below will be included in your report. Click on the check box next to any facility to switch between checked and unchecked or use the "Check" or "Un-Check" all facilities buttons at the top of the list to check or uncheck all records in the list.

Search Criteria

Pollutant: Carbon Monoxide
Process Category: Large Combustion Turbines (> 25 MW)
Process Type: 15.110
Process Name: Natural Gas
Permit Date Between 05/22/1996 And 05/22/2006

Check | Un-Check **ALL Facilities** | New Search

	RBLCID	PERMIT DATE	CORPORATE/COMPANY NAME & FACILITY NAME	STANDARD EMISSION LIMIT
☑	TX-0400	12/20/1999	SEI TEXAS, LLC SEI BOSQUE PLANT	0.0160 LB/MMBTU
☑	UT-0067	01/06/2005	SUMMIT VINEYARD LAKE SIDE POWER PLANT	0.0370 LB/MMBTU
☑	WI-0177	06/26/2000	WISCONSIN ELECTRIC COMPANY - GERMANTOWN WISCONSIN ELECTRIC COMPANY - GERMANTOWN	1.8 PPM @ 15% O2

☑	NY-0086	09/07/2001	KEY SPAN ENERGY RAVENSWOOD GENERATING STATION	2 PPM @ 15% O2
☑	VA-0261	09/06/2002	COMPETITIVE POWER VENTURE CPV CUNNINGHAM CREEK	2 PPM @ 15% O2
☑	ID-0010	10/19/2001	GARNET ENERGY LLC MIDDLETON FACILITY	2 PPM @ 15% O2
☑	GA-0098	03/24/2003	GENPOWER RINCON LLC RINCON POWER PLANT	2 PPM @ 15% O2
☑	OR-0043	05/11/2004	UMATILLA GENERATING COMPANY, L.P. UMATILLA GENERATING COMPANY, L.P.	2 PPM @ 15% O2
☑	SC-0060	04/03/2000	SANTEE COOPER RAINEY GENERATING STATION	2.3 PPM @ 15% O2
☑	NJ-0044	06/26/2001	MANTUA CREEK GENERATING FACILITY MANTUA CREEK GENERATING FACILITY	2.34 PPMVD @ 15% O2
☑	NJ-0044	06/26/2001	MANTUA CREEK GENERATING FACILITY MANTUA CREEK GENERATING FACILITY	2.42 PPMVD @ 15% O2
☑	NJ-0044	06/26/2001	MANTUA CREEK GENERATING FACILITY MANTUA CREEK GENERATING FACILITY	2.51 PPMVD @ 15% O2
☑	CT-0148	06/22/1999	LAKE ROAD GENERATING COMPANY LAKE ROAD GENERATING COMPANY	3 PPM @ 15% O2
☑	AZ-0049	09/04/2003	ALLEGHENY ENERGY SUPPLY LLC LA PAZ GENERATING FACILITY	3 PPM @ 15% O2
☑	NY-0087	11/01/2000	SITHE HERITAGE STATION GENERATING FACILITY HERITAGE POWER LLC	3 PPM@ 15% O2
☑	MI-0327	04/21/2004	INDECK ENERGY INDECK-NILES, LLC	4 PPM @ 15% O2
☑	PA-0166	03/29/1999	AES IRONWOOD	5 PPM @ 15% O2
☑	IA-0060	07/23/2002	ENTERGY HAWKEYE GENERATING, LLC	5 PPM @ 15% O2
☑	CA-0952	05/18/2001	LA DEPT OF WATER & POWER LA DEPT OF WATER & POWER	6 PPM @ 15% O2
☑	FL-0261	10/26/2004	CITY OF TALLAHASSEE ARVAH B. HOPKINS GENERATING STATION	6 PPM @ 15% O2
☑	CA-1098	12/15/2002	LAMBIE ENERGY CENTER LAMBIE ENERGY CENTER	6 PPM @ 15% O2
☑	CA-1095	01/10/2003	EI COLTON, LLC EI COLTON, LLC	6 PPM @ 15% O2
☑	CA-0951	07/13/2001	INDIGO ENERGY FACILITY INDIGO ENERGY FACILITY	6 PPM @ 15% O2
☑	CA-0953	10/18/2001	ALLIANCE COLTON--CENTURY ALLIANCE COLTON--CENTURY	6 PPM @ 15% O2
☑	IL-0080	12/08/2000	ZION ENERGY LLC ZION ENERGY LLC	7 PPM @ 15% O2
	AR-0042	05/04/2001	GENPOWER - KEO, LLC.	7 PPM @ 15% O2

U.S. Environmental Protection Agency

Technology Transfer Network
Clean Air Technology Center
RACT/BACT/LAER Clearinghouse

RBLC Ranking Report

Help

Your search has found **251** facilities that match your search criteria. You can view details for one or more facilities by clicking on the highlighted RBLC identifier or the process description in the list below. To create a report, select one of the standard output formats from the list of reports at the bottom of this page. Only facilities that are checked in the table below will be included in your report. Click on the check box next to any facility to switch between checked and unchecked or use the "Check" or "Un-Check" all facilities buttons at the top of the list to check or uncheck all records in the list.

Search Criteria

Pollutant: Nitrogen Oxides (NOx)
Process Category: Large Combustion Turbines (> 25 MW)
Process Type: 15.110
Process Name: Natural Gas
Permit Date Between 05/22/1996 And 05/22/2006

Check | Un-Check **ALL Facilities** | New Search

	RBLCID	PERMIT DATE	CORPORATE/COMPANY NAME & FACILITY NAME	STANDARD EMISSION LIMIT
☑	UT-0067	01/06/2005	SUMMIT VINEYARD LAKE SIDE POWER PLANT	0.0170 LB/MMBTU
☑	TX-0400	12/20/1999	SEI TEXAS, LLC SEI BOSQUE PLANT	0.03 LB/MMBTU
☑	CT-0148	06/22/1999	LAKE ROAD GENERATING COMPANY LAKE ROAD GENERATING COMPANY	2 PPM @ 15% O2

☑	NY-0087	11/01/2000	SITHE HERITAGE STATION GENERATING FACILITY HERITAGE POWER LLC	2 PPM @ 15% O2
☑	AZ-0049	09/04/2003	ALLEGHENY ENERGY SUPPLY LLC LA PAZ GENERATING FACILITY	2 PPM @ 15% O2
☑	NY-0086	09/07/2001	KEY SPAN ENERGY RAVENSWOOD GENERATING STATION	2 PPM @ 15% O2
☑	OR-0043	05/11/2004	UMATILLA GENERATING COMPANY, L.P. UMATILLA GENERATING COMPANY, L.P.	2 PPM @ 15% O2
☑	CT-0143	06/10/2001	PPL WALLINGFORD ENERGY, LLC PPL WALLINGFORD ENERGY, LLC	2.5 PPM @ 15% O2
☑	NJ-0044	06/26/2001	MANTUA CREEK GENERATING FACILITY MANTUA CREEK GENERATING FACILITY	2.5 PPMVD @ 15% O2
☑	NJ-0044	06/26/2001	MANTUA CREEK GENERATING FACILITY MANTUA CREEK GENERATING FACILITY	2.5 PPMVD @ 15% O2
☑	SC-0064	05/23/2002	SCE&G SCE&G - JASPER COUNTY GENERATING FACILITY	2.5 PPMV @ 15% O2
☑	GA-0098	03/24/2003	GENPOWER RINCON LLC RINCON POWER PLANT	2.5 PPM @ 15% O2
☑	CA-1098	12/15/2002	LAMBIE ENERGY CENTER LAMBIE ENERGY CENTER	2.5 PPM @ 15% O2
☑	ID-0010	10/19/2001	GARNET ENERGY LLC MIDDLETON FACILITY	2.5 PPM @ 15% O2
☑	NJ-0044	06/26/2001	MANTUA CREEK GENERATING FACILITY MANTUA CREEK GENERATING FACILITY	2.5 PPM @ 15% O2
☑	IN-0092	07/20/2000	WHITING CLEAN ENERGY, INC. WHITING CLEAN ENERGY, INC.	3 PPM @ 15% O2
☐	MS-0040	12/31/1998	MISSISSIPPI POWER PLANT (PLANT DANIEL)	3.5 PPM @ 15% O2
☐	NM-0042	12/29/2000	DUKE ENERGY LUNA DEMING ENERGY FACILITY	3.5 PPM @ 15% O2
☐	AR-0040	12/29/2000	DUKE ENERGY HOT SPRINGS DUKE ENERGY HOT SPRINGS	3.5 PPM @ 15% O2
☐	PA-0229	03/05/2001	ORION POWER MIDWEST, L.P. BRUNOT ISLAND POWER STATION	3.5 PPM @ 15% O2
☐	MI-0327	04/21/2004	INDECK ENERGY INDECK-NILES, LLC	3.5 PPM @ 15% O2
☐	CA-1095	01/10/2003	EI COLTON, LLC EI COLTON, LLC	3.5 PPM @ 15% O2
☐	OK-0070	06/13/2002	GENOVA OKLAHOMA LLC GENOVA OK I POWER PROJECT	3.5 PPM @ 15% O2
☐	OK-0067	05/29/2002	ENERGETIX LAWTON ENERGY COGEN FACILITY	3.5 PPM @ 15% O2
☐	NC-0095	05/28/2002	MIRANT GASTONIA LLC MIRANT GASTONIA POWER FACILITY	3.5 PPM @ 15% O2
	OK-0072	05/06/2002	REDBUD ENERGY LP	3.5 PPM @ 15% O2

ATTACHMENT 8.1D-B

SCAQMD BACT Guideline Listings for Simple Cycle Turbines, Including Draft Listings for the Lambie and PPL Wallingford Projects

Section I: AQMD BACT Determinations

Application No.: 383044

Equipment Category – Gas Turbine

1. GENERAL INFORMATION

DATE: 12/18/2001

A. MANUFACTURER: General Electric

B. TYPE: Simple Cycle

C. MODEL: LM6000 (Enhanced Sprint)

D. STYLE: Includes inlet air evaporative cooling and steam or water injection for NOx control

E. APPLICABLE AQMD REGULATION XI RULES:

F. COST: $ (2000) SOURCE OF COST DATA:

G. OPERATING SCHEDULE: 22 HRS/DAY 7 DAYS/WK 52 WKS/YR

2. EQUIPMENT INFORMATION

APP. NO.: 383044

A. FUNCTION: Power Generation (one of three identical)

B. MAXIMUM HEAT INPUT: 450 MMBtu/hr

C. MAXIMUM THROUGHPUT: 45 MW

D. BURNER INFORMATION: NO.: TYPE: Can-Annular

E. PRIMARY FUEL: Natural Gas

F. OTHER FUEL:

G. OPERATING CONDITIONS: Peaking Service

3. COMPANY INFORMATION

APP. NO.: 383044

A. NAME: Indigo Energy Facility (Wildflower Energy LP)

B. SIC CODE: 4911

C. ADDRESS: 19th Ave., West of N. Indian Ave.
CITY: North Palm Springs STATE: CA ZIP:

D. CONTACT PERSON: James Cough

E. PHONE NO.: 713-374-3919

4. PERMIT INFORMATION

APP. NO.: 383044

A. AGENCY: SCAQMD

B. APPLICATION TYPE: new construction

C. AGENCY CONTACT PERSON: Knut Beruldsen

D. PHONE NO.: 909-396-3136

E. PERMIT TO CONSTRUCT/OPERATE INFORMATION: P/C NO.: 383044 (A/N) ISSUANCE DATE: 7-13-01
☐ CHECK IF NO P/C P/O NO.: ISSUANCE DATE:

F. START-UP DATE: Units 1 and 2: July 26, 2001. Unit 3: Expected September 2001.

5. EMISSION INFORMATION

APP. NO.: 383044

A. PERMIT

A1. PERMIT LIMIT: PPMVD@15%O2: NOx-5(1-hr), CO-6(1-hr), VOC-2(1-hr), NH3-5(1-hr). PM: .01gr/scf and 11 lb/hr. Monthly mass limits on NOx, SOx, and PM10.

A2. BACT/LAER DETERMINATION: Above limits on NOx, CO, VOC and NH3 were believed to represent BACT for simple-cycle gas turbines.

5. EMISSION INFORMATION

APP. NO.: 383044

A3. BASIS OF THE BACT/LAER DETERMINATION: CARB Guidance Document for Power Plant Sitings--except that the CARB document recommends 3-hr averaging for NOx, CO and VOC.

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: Engelhard

B2. TYPE: SCR System and oxidation Catalyst

B3. DESCRIPTION: NOXCAT-VNX-HT, high-temperature SCR catalyst, with tempering air system to control gas temperature entering catalyst. Aqueous ammonia (max. 20 wt. %) is used.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: 383044 (A/N) ISSUANCE DATE: 7/13/2001
P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE:
ACTUAL CONTAMINANT LOADING: BLOWER HP:

B6. WARRANTY: Catalysts are waranteed for 3 years from startup or 4500 hours of operation, not to exceed 42 months after installation.

B7. PRIMARY POLLUTANTS: NOx, CO, VOC, PM, SOx

B8. SECONDARY POLLUTANTS: NH3

B9. SPACE REQUIREMENT: SCR Catalyst: 790 cu. ft; CO Catalyst: 85 cu. ft

B10. LIMITATIONS: SCR catalyst temperature must not exceed 871 deg F.

B11. UNUSED

B12. OPERATING HISTORY:

B13. UNUSED

B14. UNUSED

C. CONTROL EQUIPMENT COSTS

C1. CAPITAL COST: ☐ CHECK IF INSTALLATION COST IS INCLUDED IN EQUIPMENT COST
EQUIPMENT: $ INSTALLATION: $ (2000) SOURCE OF COST DATA:

C2. ANNUAL OPERATING COST: $ (2000) SOURCE OF COST DATA:

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERMFORMING FIELD EVALUATION:
ENGINEER'S NAME: INSPECTOR'S NAME: DATE:

D2. COMPLIANCE DEMONSTRATION: CEMS for NOx and CO, annual RATA, annual NH3 test, source test every 3 years.

D3. VARIANCE: NO. OF VARIANCES: DATES:
CAUSES:

D4. VIOLATION: NO. OF VIOLATIONS: DATES:
CAUSES:

D5. MAINTENANCE REQUIREMENTS:

D6. UNUSED

D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:
DATE OF SOURCE TEST: within 60 days after startup CAPTURE EFFICIENCY:
DESTRUCTION EFFICIENCY: OVERALL EFFICEINCY:
SOURCE TEST/PERFORMANCE DATA:
OPERATING CONDITIONS:
TEST METHODS:

6. COMMENTS

APP. NO.: 383044

Permit requirements here are consistent with CARB Guidance for Power Plant Sitings with the exception that 1-hr averaging is required here versus 3-hr averaging recommended by CARB. It was the permitting team's opinion that 1-hr averaging, which is more stringent, was appropriate in this case. Type of emission monitoring and control as well as load following requirements should be considered in determining the appropriate averaging time. It should be noted that the permit emission limits have not yet been verified by performance data.

Section I: AQMD BACT Determinations

Application No.: 374502

Equipment Category – Gas Turbine

1. GENERAL INFORMATION

DATE: 12/18/2001

A. MANUFACTURER: General Electric

B. TYPE: Simple Cycle

C. MODEL: LM6000 (Enhanced Sprint)

D. STYLE: Includes inlet air evaporative cooling and steam or water injection for NOx control.

E. APPLICABLE AQMD REGULATION XI RULES:

F. COST: $ (2000) SOURCE OF COST DATA:

G. OPERATING SCHEDULE: 24 HRS/DAY 7 DAYS/WK 50 WKS/YR

2. EQUIPMENT INFORMATION

APP. NO.: 374502

A. FUNCTION: Power Generation

B. MAXIMUM HEAT INPUT: 466.8 MMBtu/hr

C. MAXIMUM THROUGHPUT: 47.4 MW

D. BURNER INFORMATION: NO.: TYPE: Can-Annular

E. PRIMARY FUEL: Natural Gas

F. OTHER FUEL: LOW-N, LOW-S DIESEL

G. OPERATING CONDITIONS: Peaking Service

3. COMPANY INFORMATION

APP. NO.: 374502

A. NAME: Los Angeles Dept of Water & Power

B. SIC CODE: 4940

C. ADDRESS: 11801 Sheldon Street
CITY: Sun Valley STATE: CA ZIP: 91352

D. CONTACT PERSON: Bruce Moore

E. PHONE NO.: 213-367-3772

4. PERMIT INFORMATION

APP. NO.: 374502

A. AGENCY: SCAQMD

B. APPLICATION TYPE: new construction

C. AGENCY CONTACT PERSON: Chris Perri

D. PHONE NO.: 909-396-2696

E. PERMIT TO CONSTRUCT/OPERATE INFORMATION: P/C NO.: 374502 (A/N) ISSUANCE DATE: 5-18-01
☐ CHECK IF NO P/C P/O NO.: ISSUANCE DATE:

F. START-UP DATE: 8/8/01

5. EMISSION INFORMATION

APP. NO.: 374502

A. PERMIT

A1. PERMIT LIMIT: PPMVD @ 15% O2: NOx-5 (3-hr), CO-6 (3-hr), VOC-2, NH3-5 (1-hr), PM-.01 gr/dscf. Max. S in oil-15 ppm. Monthly mass limits on CO, VOC, PM10 and SOx (calculated based on fuel use).

A2. BACT/LAER DETERMINATION: Above limits on NOx, CO, VOC and NH3 were believed to represent prior BACT for simple-cycle gas turbines.

5. EMISSION INFORMATION

APP. NO.: 374502

A3. BASIS OF THE BACT/LAER DETERMINATION: The NOx, CO, VOC and NH3 limits were based on CARB's Guidance Document for Power Plant Sitings.

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: Engelhard

B2. TYPE: SCR System and Oxidation Catalyst

B3. DESCRIPTION: SCR System includes an aqueous (29%) ammonia system and injectors and titania-vanadia high-temperature SCR catalyst (NOXCAT-VNX-HT). The CO catalyst is platinum on alumina.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: 374502 (A/N) ISSUANCE DATE: 5-18-01
P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE:
ACTUAL CONTAMINANT LOADING: BLOWER HP:

B6. WARRANTY: 5000 hrs operation or 2.5 yrs after delivery, whichever expires first.

B7. PRIMARY POLLUTANTS: NOx, CO, VOC, PM, SOx

B8. SECONDARY POLLUTANTS: NH3

B9. SPACE REQUIREMENT: SCR catalyst: 790 cu. ft, CO catalyst: 85 cu. ft. Total system plan area: approx. 52' x 48'.

B10. LIMITATIONS: Minimum temperature for NH3 injection: 800 deg F. Max. allowable catalyst temperature: 871 deg F.

B11. UNUSED

B12. OPERATING HISTORY:

B13. UNUSED

B14. UNUSED

C. CONTROL EQUIPMENT COSTS

C1. CAPITAL COST: ☐ CHECK IF INSTALLATION COST IS INCLUDED IN EQUIPMENT COST
EQUIPMENT: $ INSTALLATION: $ (2000) SOURCE OF COST DATA:

C2. ANNUAL OPERATING COST: $ (2000) SOURCE OF COST DATA:

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERMFORMING FIELD EVALUATION:
ENGINEER'S NAME: INSPECTOR'S NAME: DATE:

D2. COMPLIANCE DEMONSTRATION: CEMS for NOx and CO. Continuous calculation of NH3 slip based on measurements of NOx upstream of catalyst and NH3 injection rate. NH3 tests quarterly first year, annually thereafter.

D3. VARIANCE: NO. OF VARIANCES: DATES:
CAUSES:

D4. VIOLATION: NO. OF VIOLATIONS: DATES:
CAUSES:

D5. MAINTENANCE REQUIREMENTS: Periodic replacement of catalysts; maintenance of NH3 storage and injection system.

D6. UNUSED

5. EMISSION INFORMATION

APP. NO.: 374502

D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:

DATE OF SOURCE TEST: Within 60 days after first full-load operation or 180 days after startup. Tests to be conducted at 100, 75 and 50 percent max. load.

CAPTURE EFFICIENCY:

DESTRUCTION EFFICIENCY:

OVERALL EFFICEINCY:

SOURCE TEST/PERFORMANCE DATA:

OPERATING CONDITIONS:

TEST METHODS:

6. COMMENTS

APP. NO.: 374502

This is an example of BACT for a simple-cycle gas turbine using oil as a backup fuel. The NOx, CO, VOC and NH3 ppm limits apply on both gas and oil operation. Oil operation is permitted only in the event of an interruption in gas service plus as required for CEMS certification and RATA tests and up to 30 minutes per months oil-readiness testing. It should be noted that the permit emission limits have not yet been verified by performance data.

Section II: Other LAER/BACT Determinations

Application No.: 6510

Equipment Category – Gas Turbine

1. GENERAL INFORMATION

DATE: 2/11/2004

A. MANUFACTURER: General Electric

B. TYPE: Simple Cycle

C. MODEL: LM6000PC

D. STYLE:

E. APPLICABLE AQMD RULES:

F. COST: $ (NA) SOURCE OF COST DATA:

G. OPERATING SCHEDULE: HRS/DAY DAYS/WK WKS/YR

2. EQUIPMENT INFORMATION

APP. NO.: 6510

A. FUNCTION: Merchant power plant selling power on the grid (peaking power plant).

B. MAXIMUM HEAT INPUT: 500 MMBtu/hr

C. MAXIMUM THROUGHPUT: 49.9 MW

D. BURNER INFORMATION: NO.: TYPE:

E. PRIMARY FUEL: Natural Gas

F. OTHER FUEL: None

G. OPERATING CONDITIONS: Operates during peak demand hours when power-vs.-fuel price differential is favorable.

3. COMPANY INFORMATION

APP. NO.: 6510

A. NAME: Lambie Energy Center

B. SIC CODE: 4911

C. ADDRESS: 5975 Lambie Road

CITY: Suisun City STATE: CA ZIP: 94585

D. CONTACT PERSON: Diane Tullos

E. PHONE NO.: 530-821-2074

4. PERMIT INFORMATION

APP. NO.: 6510

A. AGENCY: BAAQMD

B. APPLICATION TYPE: new construction

C. AGENCY CONTACT PERSON: Dennis Jang

D. PHONE NO.: 415-749-4707

E. PERMIT TO CONSTRUCT/OPERATE INFORMATION: P/C NO.: 6510 ISSUANCE DATE: 12/15/2002

☐ CHECK IF NO P/C P/O NO.: 6510 ISSUANCE DATE: 6/5/2003

F. START-UP DATE: December 2002

5. EMISSION INFORMATION

APP. NO.: 6510

A. PERMIT

A1. PERMIT LIMIT: Concentration limits (ppmvd@15%O2): NOx-2.5 (3-hr), CO-6 (3-hr), VOC-2, NH3-10. Maximum mass emission rates (lb/hr): PM10-3.0 and SOx-1.39. Limits on pollutant concentration and mass emission rates do not apply during startup (limited to 60 minutes) or shutdown (limited to 30 minutes). Daily and 12-month limits on mass emissions of NOx, CO, VOC, PM10 and SOx. Hourly, daily and 12-month limits on heat input to the gas turbine. CEMS for NOx, CO, O2 and CO2. Initial and annual source tests.

A2. BACT/LAER DETERMINATION: Above concentration limits on NOx, CO and VOC.

A3. BASIS OF THE BACT/LAER DETERMINATION: The concentration limit on NOx was volunteered by the applicant. The concentration limit on CO was more stringent than BAAQMD BACT, but is consistent with 1999 CARB guidelines for power plants. The concentration limit on VOC was based on BAAQMD BACT and is consistent with the 1999 CARB guidance.

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: Stack and add-on pollution control devices were supplied by Nooter Erickson (Kansas City)

B2. TYPE: Water Injection to Gas Turbine (included in General Electric scope of equipment) and add-on controls consisting of SCR system (aqueous ammonia) and Oxidation Catalyst

B3. DESCRIPTION: Ammonia injection rate regulated based on outlet NOx concentration. Gas temperature entering catalysts controlled to 750F maximum using tempering air. Catalyst can perform down to 550F.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: ISSUANCE DATE:
P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE:
ACTUAL CONTAMINANT LOADING: BLOWER HP:

B6. WARRANTY: Gas turbine was guaranteed not to exceed 25 ppmvd@15%O2. Catalyst system was guaranteed to reduce NOx to 2.5 ppmvd and CO to 6.0 ppmvd and to achieve 33% oxidation of VOC. Catalyst effectiveness was guaranteed for three years from startup.

B7. PRIMARY POLLUTANTS: NOx, CO, VOC, PM10

B8. SECONDARY POLLUTANTS: NH3

B9. SPACE REQUIREMENT:

B10. LIMITATIONS:

B11. UNUSED

B12. OPERATING HISTORY: First fire was in December 2002. Source tested January 2003. Operation hours to date have been: 93 in Q1 2003, 25 in May, 51 in June, 95 in July, 38 in August, 42 in September, 26 in October, 2 in November-December. All operation has been at full load.

B13. UNUSED

B14. UNUSED

C. CONTROL EQUIPMENT COSTS

C1. CAPITAL COST: ☐ CHECK IF INSTALLATION COST IS INCLUDED IN EQUIPMENT COST
EQUIPMENT: $ INSTALLATION: $ (NA) SOURCE OF COST DATA:

C2. ANNUAL OPERATING COST: $ (NA) SOURCE OF COST DATA:

5. EMISSION INFORMATION

APP. NO.: 6510

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERMFORMING FIELD EVALUATION:

ENGINEER'S NAME: INSPECTOR'S NAME: Cliff Senello DATE:

D2. COMPLIANCE DEMONSTRATION: BAAQMD records show that there have been three exceedances of permit limits-one due to CEMS malfunction and two due to fuel flow control malfunction. The inspector reports that the fuel flow control malfunctions caused the water injection to shut off , leading to NOx exceedances-one of which extended long enough to result in a violation. The causes of the fuel flow control malfunctions were traced to programming errors, which have been corrected.

D3. VARIANCE: NO. OF VARIANCES: None DATES:

CAUSES:

D4. VIOLATION: NO. OF VIOLATIONS: 1 DATES:

CAUSES: NOx exceedance caused by software programming error, which was corrected.

D5. MAINTENANCE REQUIREMENTS: D6. UNUSED

D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:

DATE OF SOURCE TEST: 1/16-17/2003 CAPTURE EFFICIENCY:

DESTRUCTION EFFICIENCY: OVERALL EFFICIENCY:

SOURCE TEST/PERFORMANCE DATA:

Date	1/16	1/16	1/17
Load, MW	50.0	50.0	50.0
O2, % (dry)	15.50	15.52	15.55
SCR Inlet NOx, ppmvd	27.7	27.4	17.3
SCR Outlet, ppmvd@15%O2:			
NOx	2.49	2.51	2.34
CO	1.73	1.91	1.49
VOC	0.60	0.19	1.03
NH3	1.31	1.42	1.77

OPERATING CONDITIONS:

TEST METHODS: Each test was a one-hour test (1/2-hr for ammonia). NOx was highly stratified. Sampling for NOx and CO was at eight lowest-O2 (highest NOx) points from a 50-point duct traverse. The following methods were used: Multi-Point Traverse--EPA-1/CARB-1, O2/CO2--EPA 3A/CARB 100, CO--EPA 10/CARB 100, NOx/O2--EPA 20/CARB 100, NMHC--EPA TO-12, NH3--BAAQMD ST-1B. Test was approved by BAAQMD source test group.

6. COMMENTS

APP. NO.: 6510

Section II: Other LAER/BACT Determinations

Application No.: 189-0195

Equipment Category – Gas Turbine, Simple Cycle

1. GENERAL INFORMATION

DATE: 11/10/2004

A. MANUFACTURER: General Electric/S&S Energy Products

B. TYPE:

C. MODEL: LM6000-PC-E-Sprint

D. STYLE:

E. APPLICABLE AQMD RULES:

F. COST: $ (NA) SOURCE OF COST DATA:

G. OPERATING SCHEDULE: 6 HRS/DAY 5 DAYS/WK 12 WKS/YR

2. EQUIPMENT INFORMATION

APP. NO.: 189-0195

A. FUNCTION: Peaking power plant. This is Unit No. 2 of five identical gas turbine/generators.

B. MAXIMUM HEAT INPUT: 461.2 MMBtu/hr

C. MAXIMUM THROUGHPUT: 50 MW

D. BURNER INFORMATION: NO.: 1 TYPE: Low NOx

E. PRIMARY FUEL: Natural Gas

F. OTHER FUEL: None

G. OPERATING CONDITIONS: Intermittent

3. COMPANY INFORMATION

APP. NO.: 189-0195

A. NAME: PPL Wallingord Energy LLC

B. SIC CODE: 4911

C. ADDRESS: 195 East Street
CITY: Wallingford STATE: CT ZIP:

D. CONTACT PERSON: Linda Boyer

E. PHONE NO.: 610-774-4400

4. PERMIT INFORMATION

APP. NO.: 189-0195

A. AGENCY: Connecticut Dept. of Environmental Protection

B. APPLICATION TYPE: new construction

C. AGENCY CONTACT PERSON: Ernest Bouffard

D. PHONE NO.: 860-424-4152

E. PERMIT TO CONSTRUCT/OPERATE INFORMATION: P/C NO.: 189-0195 ISSUANCE DATE: 7/28/2000

☐ CHECK IF NO P/C P/O NO.: 189-0195 ISSUANCE DATE: 6/10/2001

F. START-UP DATE: 4th quarter 2001

5. EMISSION INFORMATION

APP. NO.: 189-0195

A. PERMIT

A1. PERMIT LIMIT: Operation limits: 4000 hrs and 1,844,800,000 cu. ft. fuel (12-mo. rolling averages). Maximum input: 461.2 MMBtu/hr. Fuel sulfur: .0025 lb/MMBtu. Emission limits, lb/MMBtu (ppmvd@15%O2): NOx-.00932 (2.5), CO-.0364, VOC-.0107 as methane, SOx-.0027, PM10-.026 (filter + probe). NH3 limit-6.0 ppmvd@15%O2. Source test required every five years. CEMS for NOx, CO, O2 and NH3. Startup/shutdown emission limits to be developed based on 18 months of data.

A2. BACT/LAER DETERMINATION: NOx-2.5 ppmvd@15%O2, NH3-6.0 ppmvd@15%O2, CO-.0364 lb/MMBtu, VOC-.0107 lb/MMBtu as methane, SOx-.0027 lb/MMBtu, PM10-.026 lb/MMBtu (filter + probe).

A3. BASIS OF THE BACT/LAER DETERMINATION: The BACT limits on NOx, CO, VOC and SOx were based on vendor guarantees; and the BACT limit on PM10 was based on AP-42. The ammonia BACT limit was negotiated.

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: Deltak (system), Engelhard (catalysts)

B2. TYPE: Low-NOx Burner, water injection, selective catalytic reduction (SCR) of NOx and oxidation catalyst for CO and VOC reduction.

B3. DESCRIPTION: SCR: aqueous ammonia is injected and mixed with flue gas upstream of SCR catalyst. Catalyst causes selective reaction between ammonia and NO, forming N2 and H2O. Turbine design exhaust temperature at full load is 753F.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: ISSUANCE DATE:
P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE:
ACTUAL CONTAMINANT LOADING: NOx-25 ppmvd@15%O2 (design) BLOWER HP:

B6. WARRANTY: Suppliers guaranteed the following: 2.5 ppmvd@15%O2 NOx, 16.8 lb/hr CO, 4.95 lb/hr VOC, 1.26 lb/hr SOx.

B7. PRIMARY POLLUTANTS: NOx, CO, VOC, SOx, PM10

B8. SECONDARY POLLUTANTS: NH3

B9. SPACE REQUIREMENT:

B10. LIMITATIONS: B11. UNUSED

B12. OPERATING HISTORY: Planned operation is 6-8 hrs/day, weekdays, summer months. However, it has been less than this.

B13. UNUSED B14. UNUSED

C. CONTROL EQUIPMENT COSTS

C1. CAPITAL COST: ☐ CHECK IF INSTALLATION COST IS INCLUDED IN EQUIPMENT COST
EQUIPMENT: $ INSTALLATION: $ (NA) SOURCE OF COST DATA:

C2. ANNUAL OPERATING COST: $ (NA) SOURCE OF COST DATA:

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERMFORMING FIELD EVALUATION:
ENGINEER'S NAME: INSPECTOR'S NAME: DATE:

5. EMISSION INFORMATION

APP. NO.: 189-0195

D2.	COMPLIANCE DEMONSTRATION:			
D3.	VARIANCE:	NO. OF VARIANCES: None	DATES:	
	CAUSES:			
D4.	VIOLATION:	NO. OF VIOLATIONS: 1	DATES:	
	CAUSES: Related to SOx reporting.			
D5.	MAINTENANCE REQUIREMENTS:			D6. UNUSED

5. EMISSION INFORMATION

APP. NO.: 189-0195

D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:

DATE OF SOURCE TEST: May and Sept 2002, Aug 2003, July 2004 CAPTURE EFFICIENCY:

DESTRUCTION EFFICIENCY: OVERALL EFFICIENCY:

SOURCE TEST/PERFORMANCE DATA:

May 2002 (Source Test):

Unit	5	5	4	4
Date	5/28	5/29	5/30	5/31
Time	1330-1814	1650-2148	1150-1705	0900-1548
THC, lb/MMBtu (ppmvd)	<.0008 (<0.5)		.0036 (2.4)	
NH3, ppmvd@15%O2		5.7		4.8

September 2002 (RATA):

Unit	1	2	3	4	5
Date	9/16	9/20	9/19	9/18	9/17
NOx, lb/MMBtu	.0084	.0102	.00934	.00934	.00885
NH3 ppmvd@15%O2	6.6	5.7	6.9	6.9	6.6
CO, lb/MMBtu	.005	.001	.003	.002	.003

August 2003 RATA:

Unit	1	2	3	4	5
Date	8/21	8/20	8/19	8/20	8/19
NOx, lb/MMBtu	.0090	.0084	.0090	.0073	.0075
NH3 ppmvd@15%O2	3.1	4.1	3.9	5.2	4.3
CO, lb/MMBtu	.0024	.0028	.0039	.0028	.0033

July 2004 RATA:

Unit	1	2	3	4	5
Date	7/16	7/20	7/21	7/21	7/22
NOx, lb/MMBtu	.0097	.0098	.0091	.0087	.0090
NH3 ppmvd@15%O2	5.1	6.1	---	---	6.2
CO, lb/MMBtu	----	.0033	.0026	.0019	.0024

OPERATING CONDITIONS: May 2002: 45.7-47.4 MW, 389-398 MMBtu/hr, 14.3% O2, 854-860F stack temperature. September 2002: 44.1-46.4 MW. August 2003: 45.9-48.9 MW. July 2004: 45.1-47.2 MW.

TEST METHODS: USEPA Methods 18 and 25A for methane and THC, resp.; and USEPA Conditional Method 027 for ammonia (ion chromatography). In source test, all tests were triplicates. Each RATA consisted of nine 20-min. tests.

6. COMMENTS

APP. NO.: 189-0195

The continuous ammonia measurement utilizes an ammonia-to-NO converter and an NOx analyzer. The apparent ammonia concentration is the difference between the NO measurement registered by this analyzer and the measurement registered by the NOx CEMS. This ammonia CEMS measurement is compared to Conditional Method 027 annually at the time of the CEMS RATA and has passed RATA each time.

Engines capable of meeting these emission limits may not be available in all sizes.

Section I: AQMD BACT Determinations

Application No.: 406065

Equipment Category – Gas Turbine

1. GENERAL INFORMATION

DATE: 2/10/2004

A. MANUFACTURER: General Electric

B. TYPE: Simple Cycle

C. MODEL: LM6000 (Enhanced Sprint)

D. STYLE: Includes inlet air evaporative cooling and water injection for NOx Control

E. APPLICABLE AQMD RULES:

F. COST: $ (NA) SOURCE OF COST DATA:

G. OPERATING SCHEDULE: 24 HRS/DAY 7 DAYS/WK 52 WKS/YR

2. EQUIPMENT INFORMATION

APP. NO.: 406065

A. FUNCTION: Power Generation

B. MAXIMUM HEAT INPUT: 456.5 MMBtu/hr

C. MAXIMUM THROUGHPUT: 48.7 MW

D. BURNER INFORMATION: NO.: TYPE: Can-Annular

E. PRIMARY FUEL: Natural Gas

F. OTHER FUEL:

G. OPERATING CONDITIONS: Peaking and/or Baseload Service

3. COMPANY INFORMATION

APP. NO.: 406065

A. NAME: EI Colton, LLC

B. SIC CODE: 4911

C. ADDRESS: 2040 Aqua Mansa Rd.
CITY: Colton STATE: CA ZIP: 92324

D. CONTACT PERSON: Wayne Murray

E. PHONE NO.: 909-841-6880

4. PERMIT INFORMATION

APP. NO.: 406065

A. AGENCY: SCAQMD

B. APPLICATION TYPE: new construction

C. AGENCY CONTACT PERSON: John Dang

D. PHONE NO.: 909-396-2427

E. PERMIT TO CONSTRUCT/OPERATE INFORMATION: P/C NO.: 406065 ISSUANCE DATE: 1/10/2003
☐ CHECK IF NO P/C P/O NO.: ISSUANCE DATE:

F. START-UP DATE: 5/12/03

5. EMISSION INFORMATION

APP. NO.: 406065

A. PERMIT

A1. PERMIT LIMIT: PPMVD@15% O2: NOx-3.5 (3-hr), CO-6.0(3-hr), VOC-2.0(3-hr), NH3-5.0(3-hr), PM: .01 gr/scf and 11 lb/hr. Monthly mass limits on CO, VOC, SOX, and PM10.

5. EMISSION INFORMATION

APP. NO.: 406065

A2. BACT/LAER DETERMINATION: Above limits on CO, VOC and NH3 were believed to represent BACT for simple cycle gas turbines. NOx concentration of 5 ppmvd @ 15% O2 is currently considered LAER however, limit of 3.5 ppmvd NOx was proposed by the applicant for the purposes of determining required emission offsets.

A3. BASIS OF THE BACT/LAER DETERMINATION:

CARB Guidance Document for Power Plant Sitings. Additionally, SCAQMD BACT guidelines website page contained one listing for similar equipment (Indigo Energy Facility [Wildflower Energy LP]) which however, was not considered to be achieved in practice at the time of BACT determination. Other recently permitted GE LM6000 simple cycle power plants include LADWP Harbor, City of Glendale, City of Pasadena, City of Burbank, and THUMS Long Beach Company and are permitted with the same or similar emission concentrations for CO, VOC, NH3 and NOx. However, this equipment was not considered to be achieved in practice at the time of BACT determination. Permit concentration limit for NOx, which is more stringent than current BACT, was suggested by applicant for the purpose of determining required emission offsets.

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: Engelhard

B2. TYPE: SCR system and oxidation catalyst.

B3. DESCRIPTION: High temperature (825F design) SCR catalyst with tempering air system to control gas temperature entering catalyst. Aqueous ammonia (max. 19 wt. %) is used.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: 406068 ISSUANCE DATE: 1/10/2003
P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE:
ACTUAL CONTAMINANT LOADING: BLOWER HP:

B6. WARRANTY: 3 years of operation or 3.5 years after delivery, whichever occurs first. Guaranteed to meet permit limits on NOx, CO, VOC, NH3.

B7. PRIMARY POLLUTANTS: NOx, CO, VOC, PM, SOx

B8. SECONDARY POLLUTANTS: NH3

B9. SPACE REQUIREMENT: SCR Catalyst:

B10. LIMITATIONS: SCR Catalyst: 1180 cu. ft; CO Catalyst: 65 cu. ft.

B11. UNUSED

B12. OPERATING HISTORY: Hours in 2003-2004: June-57, July 290, Aug-221, Sep-163, Oct-173, Nov-1, Dec-30, Jan-0.

B13. UNUSED

B14. UNUSED

C. CONTROL EQUIPMENT COSTS

C1. CAPITAL COST: ☐ CHECK IF INSTALLATION COST IS INCLUDED IN EQUIPMENT COST
EQUIPMENT: $ INSTALLATION: $ (NA) SOURCE OF COST DATA:

C2. ANNUAL OPERATING COST: $ (NA) SOURCE OF COST DATA:

5. EMISSION INFORMATION

APP. NO.: 406065

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERMFORMING FIELD EVALUATION:

ENGINEER'S NAME: INSPECTOR'S NAME: Martha Thomas DATE: Inspections done in June, July, Aug, Oct 2003 and Jan 2004--facility doing very well.

D2. COMPLIANCE DEMONSTRATION: CEMS for NOx and CO, annual RATA, annual NH3 test, source test for SOX, VOC, and PM every three years.

D3. VARIANCE: NO. OF VARIANCES: None DATES:

CAUSES:

D4. VIOLATION: NO. OF VIOLATIONS: 1 DATES: 10/20/2003

CAUSES: NOx>3.5 ppmvd@15%O2, operator error

D5. MAINTENANCE REQUIREMENTS:

D6. UNUSED

D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:

DATE OF SOURCE TEST: 6/12-16/03, 10/08/03 (VOC) CAPTURE EFFICIENCY:

DESTRUCTION EFFICIENCY: OVERALL EFFICIENCY:

SOURCE TEST/PERFORMANCE DATA:

Load, MW	43.8	33.8	22.4
PPMVD@15%O2:			
NOx	3.11	3.12	3.27
CO	3.63	3.29	3.19
VOC	1.52	1.61	1.91
NH3	2.3	2.7	2.2

OPERATING CONDITIONS:

TEST METHODS: AQMD Methods 1.1 (multi-point traverse), 4.1 (moisture), 100.1 (NOx, CO, O2), 207.1 (NH3), USEPA Method TO-12 (VOC). Test reports were approved by AQMD's Source Test Engineering group.

6. COMMENTS

APP. NO.: 406065

Permit requirements here are consistent with CARB Guidance for Power Plant Sitings document, with the exception that the NOx concentration limit as proposed by the applicant is more stringent. Initial compliance source test report was reviewed and accepted by the AQMD on November 6, 2003. It is significant that the emission limits are met down to approximately 50% load.