

# **Bay Area Air Quality Management District**

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## **Permit Evaluation and Statement of Basis for Minor Revision to the**

# **MAJOR FACILITY REVIEW PERMIT**

**for  
Los Medanos Energy Center, LLC  
Facility #B1866**

**Facility Address:**  
750 East Third Street  
Pittsburg, CA 94565

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March, 2012

Application Engineer: Brian Lusher  
Site Engineer: Brian Lusher

Application: 22860

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## **Title V Statement of Basis**

### **A. Background**

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Volume 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, Major Facility Review because it is a major facility as defined by BAAQMD Regulation 2-6-212 and because it is an Phase II Acid Rain facility as defined by BAAQMD Regulation 2-6-217. It is a major facility because it has the “potential to emit,” as defined by BAAQMD Regulation 2-6-218, of more than 100 tons per year of a regulated air pollutant.

The gas turbines at the facility are also subject to the Acid Rain permit program in 40 CFR Part 72 and a Title V permit would be required even if the potential to emit did not exceed 100 tons per year.

Major Facility Operating permits (Title V permits) must meet specifications contained in 40 CFR Part 70 as contained in BAAQMD Regulation 2, Rule 6. The permits must contain all applicable requirements (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

In the Bay Area, state and District requirements are also applicable requirements and are included in the permit. These requirements can be federally enforceable or non-federally enforceable. All applicable requirements are contained in Sections I through VI of the permit.

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for this facility is B1866.

### **Current Permit Action**

Los Medanos Energy Center has applied for an Authority to Construct to upgrade the advanced gas path of combustion turbines S-1 and S-3. The upgrade is expected to improve the turbine efficiency and will reduce the emissions of CO<sub>2</sub> per MW of power output. The facility will continue to comply with all existing heat input and emissions limits. The increase in efficiency will be accomplished by increasing the firing temperature of the turbine, reducing clearances between parts in the compressor section, and by installing low pressure drop combustors. Replacement of the hot gas path components such as turbine blades, nozzles, and structural elements is required due to the increased firing temperature and the parts will be fabricated from temperature resistant alloys. In addition, some of the clearances in the compressor section will be reduced and tightened up in order to reduce leakage losses. The parts are functionally equivalent and the replacement of the hot gas path components is considered an alteration.

This permitting action will not require any changes to Condition No. 16676 or to the Conditions of Certification contained in the CEC license for the facility. The existing permit condition No. 16676 limits the firing rate of the gas turbine and duct burner combined to 2,225.1 MMBtu/hour. The turbine output will change from 170 MW to 190 MW as a result of the changes described above, without increasing the maximum turbine firing rate. The change in MW output required an amendment to the CEC license, which was approved in May 2011.

The changes to S-1 and S-3 described above are considered to be minor revisions.

- **Minor Permit Revision of Current Title V Permit**

The alteration of S-1 and S-3 combustion turbines is considered a minor revision under 2-6-215, since it does not meet the definition of an administrative permit amendment 2-6-201 or a significant permit revision under 2-6-226.

**2-6-226 Significant Permit Revision:** Any revision to a federally enforceable condition contained in a major facility review permit that can be defined as follows:

226.1 The incorporation of a change considered a major modification under 40 CFR Parts 51 (NSR) or 52 (PSD);

226.2 The incorporation of a change considered a modification under 40 CFR Parts 60 (NSPS), 61 (NESHAPS), or Section 112 of the Clean Air Act (HAP);

226.3 Any significant change or relaxation of any applicable monitoring, reporting or recordkeeping condition;

226.4 The establishment of or change to a permit term or condition allowing a facility to avoid an applicable requirement, including:

4.1 a federally enforceable emission limit assumed in order to avoid classification as a modification under any provision of Title I of the federal Clean Air Act, or

4.2 an alternative hazardous air pollutant emission limit pursuant to Section 112(i)(5) of the Clean Air Act;

226.5 The establishment of or change to a case-by-case determination of any emission limit or other standard;

226.6 The establishment of or change to a facility-specific determination for ambient impacts, visibility analysis, or increment analysis on portable sources; or

226.7 The incorporation of any requirement promulgated by the U. S. EPA under the authority of the Clean Air Act provided that three or more years remain on the permit term. (Amended 10/20/99)

The alteration of S-1 and S-3 is not a major modification under 40 CFR Part 51 or Part 52 or a modification under 40 CFR Part 60, 61, or Section 112. The permit action is not changing any applicable monitoring, reporting, or recordkeeping requirement. The permit conditions are not being revised to avoid an applicable requirement. This permitting action does not involve a case-by-case determination of any emission limit or other standard. The permitting action does not involve portable sources or requirements promulgated by the U. S. EPA under the authority the Clean Air Act.

**B. Facility Description**

The Los Medanos Energy Center is a combined-cycle cogeneration facility capable of producing a nominal electrical output of 520 MW and 75,000 pounds per hour of process steam. The primary steam customer is USS POSCO Industries. The facility was online and selling electricity to the grid in July of 2001.

There has been no significant change in emissions or equipment at the facility since the last renewal of the permit in 2011.

**C. Permit Content**

**I. Standard Conditions**

This section contains administrative requirements and conditions that apply to all facilities.

No changes to this section are proposed in this action.

**II. Equipment**

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S24).

Changes in this action

**Table II A – Permitted Sources**

Each of the following sources has been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. The capacities in this table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-301.

S-#	Description	Make or Type	Model	Capacity
1	Gas Turbine (natural gas), 1970 MW nominal	General Electric	Frame 7FA Model PG 7241	1,929 MM BTU/hr (HHV)
2	Heat Recovery Steam Generator (natural gas), 90 MW nominal			333 MM BTU/hr (HHV)
3	Gas Turbine (natural gas), 1970 MW nominal	General Electric	Frame 7FA Model PG 7241	1,929 MM BTU/hr (HHV)
4	Heat Recovery Steam Generator (natural gas), 90 MW nominal			333 MM BTU/hr (HHV)

**Table II A – Permitted Sources**

Each of the following sources has been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. The capacities in this table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-301.

S-#	Description	Make or Type	Model	Capacity
5	Auxiliary Boiler (natural gas)	Nebraska	N25-8/5-126	320 MM BTU/hr (HHV) 3-hour rolling average (provides backup steam only, not used to generate electricity)
6	Diesel Fire Pump Engine	Cummins	6CFA8.2-F3	300 bhp 2.1 MMBTU/hr (HHV) 504.5 cubic inch displacement
7	Natural-Gas Fired Emergency Generator	Waukesha, Turbocharged, Intercooled, Lean-Burn Internal Combustion Engine	Model VGF 36GL	925 bhp 7.1 MMBTU/hr (HHV) 2197 cubic inch displacement

**III. Generally Applicable Requirements**

This section of the permit lists requirements that generally apply to all sources at a facility including insignificant sources and portable equipment that may not require a District permit

No changes to this section are proposed in this action.

**IV. Source-Specific Applicable Requirements**

Section IV of the permit contains citations to all of the applicable requirements. The text of the requirements is found in the regulations, which are readily available on the District’s or EPA’s websites, or in the permit conditions, which are found in Section VI of the permit.

Complex Applicability Determinations

**PSD**

S-1 and S-3 greenhouse gas emissions expressed as CO2e are not expected to increase due to the changes in clearances in the compressor section, installation of the low pressure dry Low NOx combustors, and change out of the exhaust gas path components. These changes will make the gas turbines more efficient and will reduce the amount of CO2 produced per MW of power output.

The facility received an Authority to Construct and a PSD permit on 9/10/99. The District Permit to Operate was issued on 8/24/01. The changes to the changes in clearances in the

compressor section, installation of the dry Low NOx combustors, and change out of the exhaust gas path components are considered an administrative change under the 1985 policy memorandum from Darryl D. Tyler to EPA Air Division Directors dated July 5, 1985 regarding Revised Draft Policy on Permit Modifications and Extensions. The memorandum describes the policy towards administrative changes or amendments to the PSD permit after appropriate review has been conducted. The scope of these changes will not increase permitted emissions of any PSD pollutants (e.g. NO<sub>2</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, VOC, Lead, Fluorides, Sulfuric Acid Mist, Hydrogen Sulfide, Total Reduced Sulfur) and will not require any changes to permit conditions established during the original PSD permitting action. PSD does not apply to this permitting action.

## NSPS

The plant is currently subject to 40 CFR Part 60 Subpart A, Da, and GG. This permitting action does not change any permit conditions that are required to ensure compliance with these standards.

40 CFR Part 60 Subpart KKKK applies to gas turbines and duct burners which commenced construction, modification, or reconstruction after February 18, 2005. The changes described in this permitting action are not considered a modification since there is no increase in emissions to the atmosphere from these emissions units or for the source.

The definition of modification for is contained in 40 CFR Part 60.2.

*Modification* means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

Additionally the term modification is also defined in 40 CFR 60.14(a):

(a) Except as provided under paragraphs (e) and (f) of this section, any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act. Upon modification, an existing facility shall become an affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere.

This project will not increase emission rates to the atmosphere, and is not considered a modification under the New Source Performance Standards.

The term reconstruction is also defined in 40 CFR 60.15(b):

(b) "Reconstruction" means the replacement of components of an existing facility to such an extent that:

(1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and

(2) It is technologically and economically feasible to meet the applicable standards set forth in this part.

The new NSPS (40 CFR 60 Subpart KKKK) could apply if the turbine is considered reconstructed.

Calpine has indicated that the retrofit cost for each gas turbine is approximately 3 to 4 million dollars. The replacement cost of just the turbine is greater than 50 million dollars, so this project is not considered a reconstruction.

Other changes in this action

In Table IV-A corrected a typo, Condition 16676 Part 44 had a basis of Regulation 2-6-502 and the correct basis is Regulation 2-6-501. Table IV-A will be corrected as shown below.

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
BAAQMD Condition #16676			
part 44	Retention of records for five years (2-6-501 <del>2</del> )	Y	

**V. Schedule of Compliance**

A schedule of compliance is required in all Title V permits pursuant to BAAQMD Regulation 2-6-409.10 which provides that a major facility review permit shall contain the following information and provisions:

“409.10 A schedule of compliance containing the following elements:

- 10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;
- 10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and
- 10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.”

Permit Evaluation and Statement of Basis: Site B1866, Los Medanos Energy Center, LLC, 750 East Third Street, Pittsburg, CA 94565

Since the District has not determined that the facility is out of compliance with an applicable requirement, the schedule of compliance for this permit contains only sections 2-6-409.10.1 and 2-6-409.10.2.

No changes to this section are proposed in this action.

## **VI. Permit Conditions**

The regulatory basis is listed following each condition. The regulatory basis may be a rule or regulation. The District is also using the following terms for regulatory basis:

- **BACT:** This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- **Cumulative Increase:** This term is used for a condition imposed by the APCO which limits a source's operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.
- **Offsets:** This term is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.
- **PSD:** This term is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- **TRMP:** This term is used for a condition imposed by the APCO to ensure compliance with limits that arise from the District's Toxic Risk Management Policy.

All changes to existing permit conditions are clearly shown in "strike-out/underline" format in the proposed permit. When the permit is issued, all "strike-out" language will be deleted and all "underline" language will be retained, subject to consideration of comments received.

Additional monitoring has been added, where appropriate, to assure compliance with the applicable requirements.

### Changes in this action

There are no changes to the permit conditions.

**VII. Applicable Limits and Compliance Monitoring Requirements**

This section of the permit is a summary of numerical limits and related monitoring requirements for each source. The summary includes a citation for each monitoring requirement, frequency of monitoring, and type of monitoring. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

The District has reviewed all monitoring and has determined the existing monitoring is adequate with any exceptions noted in the Statement of Basis prepared for the Title V Renewal Application No. 6748.

**Discussion of Other Limits:**

The permit contains other limits, such as HAP limits, hours of operation, and heat input. There is adequate monitoring for these limits in the standards or permit conditions.

Changes in this action

A typo in Table VII-A will be corrected as shown below. This change is considered an administrative amendment.

**Table VII – A  
Applicable Limits and Compliance Monitoring Requirements  
S-1, S-3 GAS TURBINE  
S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
	NSPS, 40 CFR 60.332 (a)(1)	Y		75 ppmv, @ 15% O <sub>2</sub> , dry 4-hr average	40 CFR 60.334(c) and BAAQMD Condition <del>1667617154</del> , Part 35b	C	CEM

**VIII. Test Methods**

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. They are not applicable requirements.

If a rule or permit condition requires ongoing testing, the requirement will also appear in Section IV of the permit.

Table VIII in the Title V permit was not complete and the District has revised the Table as shown below. These changes are considered a minor revision to the Title V permit.

**Table VIII  
Test Methods**

<b>Applicable Requirement</b>	<b>Description of Requirement</b>	<b>Acceptable Test Methods</b>
BAAQMD 6-1-301	Ringelmann No. 1 Limitation	Manual of Procedures, Volume I, Evaluation of Visible Emissions, <u>or EPA Method 9</u>
BAAQMD 6-1-304	Tube Cleaning	Manual of Procedures, Volume I, Evaluation of Visible Emissions, <u>or EPA Method 9</u>
BAAQMD 6-1-310	Particulate Weight Limitation	Manual of Procedures, Volume IV, ST-15, Particulates Sampling, <u>or EPA Method 5, or EPA Method 201A, Determination of PM10 Emissions, plus EPA Method 202, Determination of Condensable Particulate Emissions from Stationary Sources</u>
BAAQMD 9-1-302	General Emission Limitation	Manual of Procedures, Volume IV, ST-19A, Sulfur Dioxide, Continuous Sampling, or ST-19B, Total Sulfur Oxides Integrated Sample
BAAQMD 9-3-303	New or Modified Heat Transfer Operation Limits	Manual of Procedures, Volume IV, ST-13A, Oxides of Nitrogen, Continuous Sampling, <u>or ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling</u>
BAAQMD 9-7-301.1	Performance Standard, NO <sub>x</sub> , Gaseous Fuel	Manual of Procedures, Volume IV, ST-13A, Oxides of Nitrogen, Continuous Sampling and ST-14, Oxygen, Continuous Sampling, <u>or ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling</u>
BAAQMD 9-7-301.2	Performance Standard, CO, Gaseous Fuel	Manual of Procedures, Volume IV, ST-6, Carbon Monoxide, Continuous Sampling and ST-14, Oxygen, Continuous Sampling, <u>or ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling</u>

**Table VIII  
Test Methods**

<b>Applicable Requirement</b>	<b>Description of Requirement</b>	<b>Acceptable Test Methods</b>
BAAQMD 9-9-301.3	Emission Limits- Turbines Rated $\geq 10$ MW w/SCR	Manual of Procedures, Volume IV, ST-13A, Oxides of Nitrogen, Continuous Sampling and ST-14, Oxygen, Continuous Sampling, <a href="#">or ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling</a>
<b>NSPS</b>		
Subpart Da	Standards of Performance for Electric Utility Steam Generating Units for Which Construction Is Commenced after September 18, 1978	
60.42Da (a)(1)	Particulate Limit	EPA Method 5, Determination of Particulate Emissions from Stationary Sources
60.42Da (b)	Opacity Limit	EPA Method 9, Visual Determination of the Opacity of Emissions from Stationary Sources
60.43Da (b)(2)	SO <sub>2</sub> limit	EPA Method 19, Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates
60.44Da (a)(1)	NO <sub>x</sub> limit	EPA Method 19, Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates
Subpart Db	Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	
60.44b (a)(4)	NO <sub>x</sub> Limit	EPA Method 19, Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates
Subpart GG	Standards of Performance for Stationary Gas Turbines	
60.332 (a)(1)	Performance Standard, NO <sub>x</sub>	EPA Method 20, Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines
60.333 (a)	SO <sub>2</sub> Volumetric Emission Limit	EPA Method 20, Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines
60.333 (b)	Fuel Sulfur Limit (gaseous fuel)	ASTM D 1072-80, Standard Method for Total Sulfur in Fuel Gases ASTM D 3031-81, Standard Test Method for Total Sulfur in Natural Gas by Hydrogenation
<a href="#">BAAQMD Condition #16676</a>		

**Table VIII  
Test Methods**

<b>Applicable Requirement</b>	<b>Description of Requirement</b>	<b>Acceptable Test Methods</b>
<a href="#">Part 21g</a>	<a href="#">SOx Limit</a>	<a href="#">Test Procedure, MOP Vol.4, ST-19A, Sulfur Dioxide, Continuous Sampling</a>
<a href="#">Part 21b</a>	<a href="#">NOx Limit</a>	<a href="#">Test Procedure ARB 100, Procedures for Continuous Gaseous Emission Stack Sampling</a>
<a href="#">Part 21e</a>	<a href="#">NH3 Limit</a>	<a href="#">BAAQMD Test Procedure ST-1B, Ammonia, Integrated Sampling</a>
<a href="#">Part 21d</a>	<a href="#">CO Limit</a>	<a href="#">Test Procedure ARB 100, Procedures for Continuous Gaseous Emission Stack Sampling</a>
<a href="#">Part 21f</a>	<a href="#">POC Limit</a>	<a href="#">Test Procedure ARB 100, Procedures for Continuous Gaseous Emission Stack Sampling</a>
<a href="#">Part 21h</a>	<a href="#">PM10 Limit</a>	<a href="#">EPA Method 5, or EPA Method 201A, Determination of PM10 Emissions, plus EPA Method 202, Determination of Condensable Particulate Emissions from Stationary Sources</a>
<a href="#">Part 34</a>	<a href="#">Formaldehyde Limit</a>	<a href="#">ARB Method 430, Determination of Formaldehyde and Acetaldehyde in Emissions from Stationary Sources</a>
<a href="#">Part 34</a>	<a href="#">Benzene Limit</a>	<a href="#">ARB Method 410A, Determination of Benzene from Stationary Sources (Low Concentration Gas Chromatographic Technique), or EPA Method TO-15 Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS). EPA Method TO-15 is an ambient air method modified for use on a stationary source.</a>
<a href="#">Part 34</a>	<a href="#">Polycyclic Aromatic Hydrocarbons Limit</a>	<a href="#">ARB Method 429, Determination of Polycyclic Aromatic Hydrocarbon (PAH) Emissions from Stationary Sources</a>

**IX. Permit Shield:**

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a major facility review permit explaining that specific federally enforceable regulations and standards do not apply to a source or group of sources, or (2) A provision in a major facility review permit explaining that specific federally enforceable applicable requirements for monitoring, recordkeeping and/or reporting are subsumed because other applicable requirements for monitoring, recordkeeping, and reporting in the permit will assure compliance with all emission limits.

The second type of permit shield is allowed by EPA’s White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program. The District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Title V permits. The District’s program does not allow other types of streamlining in Title V permits.

No changes to this section are proposed in this action.

**X. Revision History**

This section contains the details of issuance and revisions for each permit.

The following text will be added to the revision history section.

Title V Minor Revision Application No. 22860 TBD, 2012

- Changed the turbine output to 190 MW in Table II-A.
- Corrected typo in Table IV-A Condition 16676 Part 44 changed basis from Regulation 2-6-502 to 2-6-501.
- Corrected typo in Table VII-A. The NSPS NOx Limit monitoring requirement citation referred to Condition No. 17154 and this was corrected to Condition No. 16676.
- Updated Test Methods Table VIII.

**XI. Glossary**

This section contains terms that may be unfamiliar to the general public or EPA.

No changes to this section are proposed in this action.

**D. Alternate Operating Scenarios:**

No alternate operating scenario has been requested for this facility.

**F. Differences between the Application and the Proposed Permit:**

There are no differences between the application and the proposed permits.

## **APPENDIX A**

### **GLOSSARY**

**ACT**

Federal Clean Air Act

**APCO**

Air Pollution Control Officer

**ARB**

Air Resources Board

**BAAQMD**

Bay Area Air Quality Management District

**BACT**

Best Available Control Technology

**Basis**

The underlying authority which allows the District to impose requirements.

**CAA**

The federal Clean Air Act

**CAAQS**

California Ambient Air Quality Standards

**CAPCOA**

California Air Pollution Control Officers Association

**CEM**

Continuous Emission Monitor

**CEQA**

California Environmental Quality Act

**CFR**

The Code of Federal Regulations. 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

**CO**

Carbon Monoxide

**Cumulative Increase**

The sum of permitted emissions from each new or modified source since a specified date pursuant to BAAQMD Rule 2-1-403, Permit Conditions (as amended by the District Board on 7/17/91) and SIP Rule 2-1-403, Permit Conditions (as approved by EPA on 6/23/95). Cumulative increase is used to determine whether threshold-based requirements are triggered.

**District**

The Bay Area Air Quality Management District

**dscf**

Dry Standard Cubic Feet

**EPA**

The federal Environmental Protection Agency.

**Excluded**

Not subject to any District regulations.

**FDOC**

Final Determination of Compliance (FDOC), prepared pursuant to District Regulation 2, Rule 3, Power Plants.

**Federally Enforceable, FE**

All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60 (NSPS), Part 61 (NESHAPs), Part 63 (MACT), and Part 72 (Permits Regulation, Acid Rain), including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

**FP**

Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

**HAP**

Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by 40 CFR Part 63.

**HRSG**

Heat Recovery Steam Generator

**Major Facility**

A facility with potential emissions of: (1) at least 100 tons per year of regulated air pollutants, (2) at least 10 tons per year of any single hazardous air pollutant, and/or (3) at least 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity of hazardous air pollutants as determined by the EPA administrator.

**MFR**

Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Federal Clean Air Act and implemented by District Regulation 2, Rule 6.

**MOP**

The District's Manual of Procedures.

**NAAQS**

National Ambient Air Quality Standards

**NESHAPS**

National Emission Standards for Hazardous Air Pollutants. See in 40 CFR Parts 61 and 63.

**NMHC**

Non-methane Hydrocarbons (Same as NMOC)

**NMOC**

Non-methane Organic Compounds (Same as NMHC)

**NO<sub>x</sub>**

Oxides of nitrogen.

**NSPS**

Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Federal Clean Air Act, and implemented by 40 CFR Part 60 and District Regulation 10.

**NSR**

New Source Review. A federal program for pre-construction review and permitting of new and modified sources of pollutants for which criteria have been established in accordance with Section 108 of the Federal Clean Air Act. Mandated by Title I of the Federal Clean Air Act and implemented by 40 CFR Parts 51 and 52 and District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

**Offset Requirement**

A New Source Review requirement to provide federally enforceable emission offsets for the emissions from a new or modified source. Applies to emissions of POC, NO<sub>x</sub>, PM<sub>10</sub>, and SO<sub>2</sub>.

**Phase II Acid Rain Facility**

A facility that generates electricity for sale through fossil-fuel combustion and is not exempted by 40 CFR 72 from Titles IV and V of the Clean Air Act.

**POC**

Precursor Organic Compounds

**PM**

Particulate Matter

**PM<sub>10</sub>**

Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

**PSD**

Prevention of Significant Deterioration. A federal program for permitting new and modified sources of those air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

**PUC**

Public Utilities Commission (California)

**SIP**

State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Air Ambient Quality Standards. Mandated by Title I of the Act.

**SO<sub>2</sub>**

Sulfur dioxide

**THC**

Total Hydrocarbons (NMHC + Methane)

**Title V**

Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

**TOC**

Total Organic Compounds (NMOC + Methane, Same as THC)

**TPH**

Total Petroleum Hydrocarbons

**TRMP**

Toxic Risk Management Plan

**TSP**

Total Suspended Particulate

**VOC**

Volatile Organic Compounds

**Units of Measure:**

bhp	=	brake-horsepower
btu	=	British Thermal Unit
cfm	=	cubic feet per minute
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inches
max	=	maximum
m <sup>2</sup>	=	square meter
min	=	minute

mm	=	million
MMbtu	=	million btu
MMcf	=	million cubic feet
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scfm	=	standard cubic feet per minute
yr	=	year

## **APPENDIX B**

### **PERMIT EVALUATION FOR APPLICATION 22859**

**Engineering Evaluation  
Los Medanos Energy Center  
750 E. 3<sup>rd</sup> Street  
Pittsburgh, CA 94565  
Plant No. 11866  
Application No. 22859**

## **BACKGROUND**

Los Medanos Energy Center has applied for an Authority to Construct to upgrade the advanced gas path of combustion turbines S-1 and S-3. The upgrade is expected to improve the turbine efficiency and will reduce the emissions of CO<sub>2</sub> per MW of power output. The facility will continue to comply with all existing heat input and emissions limits. The increase in efficiency will be accomplished by increasing the firing temperature of the turbine, reducing clearances between parts in the compressor section, and by installing low pressure drop combustors. The change out of the hot gas path components such as turbine blades, nozzles, and structural elements is required due to the increased firing temperature and the parts will be fabricated from temperature resistant alloys. In addition, some of the clearances in the compressor section will be reduced and tightened up in order to reduce leakage losses. The parts are functionally equivalent and the replacement of the hot gas path components is considered an alteration.

This permitting action will not require any changes to Condition No. 16676 or to the Conditions of Certification contained in the CEC license for the facility. The existing permit condition No. 16676 limits the firing rate of the gas turbine and duct burner combined to 2,225.1 MMBtu/hour. The turbine output will change from 170 MW to 190 MW as a result of the changes described above. The change in MW output does require an amendment to the CEC license.

The work is scheduled to be completed sometime in the Spring of 2011 after CEC approval of the license amendment.

## **EMISSIONS SUMMARY**

The increased firing temperature at the gas turbines could potentially raise the unabated NO<sub>x</sub> emissions slightly, but the SCR system is expected to maintain abated emissions below applicable NO<sub>x</sub> permit limits for the turbine and HRSG exhaust of 2.5 ppmvd @ 15% O<sub>2</sub>, 0.009 lb/MMBtu, and 20 lb/hour. Abated actual emissions from the turbines and HRSGs should remain the same as present day operations with slightly more ammonia consumption required to constantly meet the current NO<sub>x</sub> permit limits. The facility is not expected to have an increase in ammonia slip emissions as a result of this alteration. The gas turbines and HRSGs will still be required to meet the ammonia slip limit of 10 ppmvd @ 15% O<sub>2</sub>.

There is no increase in permitted emissions (fugitive or from a defined emission point) associated with this application.

**Plant Cumulative Increase: (tons/year)**

There is no change to the plant cumulative increase due to this application.

**Toxic Risk Screening:**

There is no increase in toxic air contaminant emissions associated with this application. This application does not require a Risk Screening Analysis under Regulation 2 Rule 5.

**STATEMENT OF COMPLIANCE**

The owner/operator of S-1 and S-3 combustion turbines shall continue to comply with all applicable District Permit Conditions and all other applicable requirements.

The alteration of S-1 and S-3 combustion turbines is considered a minor revision under 2-6-215, since it does not meet the definition of an administrative permit amendment 2-6-201 or a significant permit revision under 2-6-226.

- 2-6-226 Significant Permit Revision:** Any revision to a federally enforceable condition contained in a major facility review permit that can be defined as follows:
- 226.1 The incorporation of a change considered a major modification under 40 CFR Parts 51 (NSR) or 52 (PSD);
  - 226.2 The incorporation of a change considered a modification under 40 CFR Parts 60 (NSPS), 61 (NESHAPS), or Section 112 of the Clean Air Act (HAP);
  - 226.3 Any significant change or relaxation of any applicable monitoring, reporting or recordkeeping condition;
  - 226.4 The establishment of or change to a permit term or condition allowing a facility to avoid an applicable requirement, including:
    - 4.1 a federally enforceable emission limit assumed in order to avoid classification as a modification under any provision of Title I of the federal Clean Air Act, or
    - 4.2 an alternative hazardous air pollutant emission limit pursuant to Section 112(i)(5) of the Clean Air Act;
  - 226.5 The establishment of or change to a case-by-case determination of any emission limit or other standard;
  - 226.6 The establishment of or change to a facility-specific determination for ambient impacts, visibility analysis, or increment analysis on portable sources; or
  - 226.7 The incorporation of any requirement promulgated by the U. S. EPA under the authority of the Clean Air Act provided that three or more years remain on the permit term. (Amended 10/20/99)

The alteration of S-1 and S-3 is not a major modification under 40 CFR Part 51 or Part 52 or a modification under 40 CFR Part 60, 61, or Section 112. The permit action is not changing any applicable monitoring, reporting, or recordkeeping requirement. The permit conditions are not being revised to avoid an applicable requirement. This permitting action does not involve a case-by-case determination of any emission limit or other standard. The permitting

action does not involve portable sources or requirements promulgated by the U. S. EPA under the authority of the Clean Air Act.

The project is considered to be ministerial under the District's CEQA regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 2.3)

The project is also categorically exempt from CEQA per 2-1-312.6 and 2-1-312.7.

**2-1-312 Other Categories of Exempt Projects:** In addition to ministerial projects, the following categories of projects subject to permit review by the District will be exempt from the CEQA review, either because the category is exempted by the express terms of CEQA (subsections 2-1-312.1 through 312.9) or because the project has no potential for causing a significant adverse environmental impact (subsections 2-1-312.10 and 312.11). Any permit applicant wishing to qualify under any of the specific exemptions set forth in this Section 2-1-312 must include in its permit application CEQA-related information in accordance with subsection 2-1-426.1. In addition, the CEQA-related information submitted by any permit applicant wishing to qualify under subsection 2-1-312.11 must demonstrate to the satisfaction of the APCO that the proposed project has no potential for resulting in a significant environmental effect in connection with any of the environmental media or resources listed in Section II of Appendix I of the State CEQA Guidelines.

312.1 Applications to modify permit conditions for existing or permitted sources or facilities that do not involve any increases in emissions or physical modifications.

312.2 Permit applications to install air pollution control or abatement equipment.

312.3 Permit applications for projects undertaken for the sole purpose of bringing an existing facility into compliance with newly adopted regulatory requirements of the District or of any other local, state or federal agency.

312.4 Permit applications submitted by existing sources or facilities pursuant to a loss of a previously valid exemption from the District's permitting requirements.

312.5 Permit applications submitted pursuant to the requirements of an order for abatement issued by the District's Hearing Board or of a judicial enforcement order.

312.6 Permit applications relating exclusively to the repair, maintenance or minor alteration of existing facilities, equipment or sources involving negligible or no expansion of use beyond that previously existing.

312.7 Permit applications for the replacement or reconstruction of existing sources or facilities where the new source or facility will be located on the same site as the source or facility replaced and will have substantially the same purpose and capacity as the source or facility replaced.

The project is not located within 1000 feet from a school and is not subject to the public notification requirements of Reg. 2-1-412.

***Best Available Control Technology:***

This application does not trigger BACT because there will be no increase in emissions.

**Offsets:** Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NOx. Based on the information above, offsets are not required for this application.

## **PSD**

S-1 and S-3 greenhouse gas emissions expressed as CO<sub>2</sub>e are not expected to increase due to the changes in clearances in the compressor section, installation of the low pressure dry Low NOx combustors, and change out of the exhaust gas path components. These changes will make the gas turbines more efficient and will reduce the amount of CO<sub>2</sub> produced per MW of power output.

The facility received an Authority to Construct and a PSD permit on 9/10/99. The District Permit to Operate was issued on 8/24/01. The changes to the changes in clearances in the compressor section, installation of the dry Low NOx combustors, and change out of the exhaust gas path components are considered an administrative change under the 1985 policy memorandum from Darryl D. Tyler to EPA Air Division Directors dated July 5, 1985 regarding Revised Draft Policy on Permit Modifications and Extensions. The memorandum describes the policy towards administrative changes or amendments to the PSD permit after appropriate review has been conducted. The scope of these changes will not increase permitted emissions of any PSD pollutants (e.g. NO<sub>2</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, VOC, Lead, Fluorides, Sulfuric Acid Mist, Hydrogen Sulfide, Total Reduced Sulfur) and will not require any changes to permit conditions established during the original PSD permitting action. PSD does not apply to this permitting action.

## **NSPS**

The plant is currently subject to 40 CFR Part 60 Subpart A, Da, and GG. This permitting action does not change any permit conditions that are required to ensure compliance with these standards.

40 CFR Part 60 Subpart KKKK applies to gas turbines and duct burners which commenced construction, modification, or reconstruction after February 18, 2005. The changes described in this permitting action are not considered a modification since there is no increase in emissions to the atmosphere from these emissions units or for the source.

The definition of modification for is contained in 40 CFR Part 60.2.

*Modification* means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

Additionally the term modification is also defined in 40 CFR 60.14(a):

(a) Except as provided under paragraphs (e) and (f) of this section, any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act. Upon modification, an existing facility shall become an affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere.

This project will not increase emission rates to the atmosphere, and is not considered a modification under the New Source Performance Standards.

The term reconstruction is also defined in 40 CFR 60.15(b):

(b) “Reconstruction” means the replacement of components of an existing facility to such an extent that:

- (1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and
- (2) It is technologically and economically feasible to meet the applicable standards set forth in this part.

The new NSPS (40 CFR 60 Subpart KKKK) could apply if the turbine is considered reconstructed.

Calpine has indicated that the retrofit cost for each gas turbine is approximately 3 to 4 million dollars. The replacement cost of just the turbine is greater than 50 million dollars, so this project is not considered a reconstruction.

## **NESHAPS**

The NESHAPs do not apply to this project.

## **PERMIT CONDITIONS**

This application does not require modifying permit conditions.

**RECOMMENDATION**

Approve the issuance of an Authority to Construct for the alteration of the following equipment:

- 1 Gas Turbine  
Turbine (190 MW), Electrical Generation, Natural gas, 7 days/wk
  
- 3 Gas Turbine  
Turbine (190 MW), Electrical Generation, Natural gas, 7 days/wk

**EXEMPTIONS**

None.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Brian Lusher  
Senior Air Quality Engineer