

# **Bay Area Air Quality Management District**

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## **Proposed Permit Evaluation and Statement of Basis For Initial**

### **MAJOR FACILITY REVIEW PERMIT**

for  
**Gateway Generating Station, LLC  
Facility #B8143**

**Facility Address:**  
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Antioch, CA 94509

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May 2013

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Application: 15777

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## **Title V Statement of Basis**

### **A. Background**

The Bay Area Air Quality Management District (BAAQMD or District) is proposing to issue an initial Title V Major Facility Review Permit to the Gateway Generating Station, LLC (GGS), a natural gas-fired power plant located in Antioch, California. The plant was approved by the California Energy Commission (CEC) in 2001, began construction in 2002, construction was halted in 2003, construction recommenced in 2007 and the facility has been operating since 2008. More details regarding the facility's location, operation and application history are provided in section B, below. For easier identification, the District assigns each facility in the Bay Area a facility number that consists of a letter and a 4-digit number. This number is also used to identify this Title V permit. The facility number for the Gateway Generating Station, LLC is **B8143**.

The Title V operating permit program arose out of Title V of the 1990 federal Clean Air Act Amendments (CAAA), which required the United States Environmental Protection Agency (EPA) to establish a national, federally enforceable operating program for certain significant stationary sources of pollution. Pursuant to the CAAA, the EPA adopted Title 40, Chapter 1, Part 70 of the Code of Federal Regulations (40 CFR Part 70), which required each state and local permitting authority, including the BAAQMD, to develop and submit for EPA approval a federally enforceable permit program. The District's Title V permit program, which is set forth in District Regulation 2, Rule 6 (Major Facility Review), satisfies the requirements of 40 CFR Part 70 and has been approved by the EPA.

A major goal of the Title V permit program is to consolidate all of the permitted facility's "applicable requirements" into one document to ensure that the facility understands all of its air quality obligations under District regulations, state law and the federal Clean Air Act. (The term "applicable requirements" is defined in BAAQMD Rule 2-6-202.) The Title V permit also serves the important purposes of informing the public about the emissions, monitoring, recordkeeping, and reporting requirements imposed on sources and allowing public participation in the permitting process.

The Gateway Generating Station is required to have a Title V permit because it is a "major facility," as defined by BAAQMD Regulation 2-6-212, with the "potential to emit," as defined by BAAQMD Regulation 2-6-218, more than 100 tons per year of NO<sub>x</sub>, CO, PM<sub>10</sub>, and ammonia. The facility is also a major facility since it emits more than 100,000 tons per year of greenhouse gases as CO<sub>2</sub> equivalents. This facility is also required to have a Title V permit since it is subject to the Title IV (Acid Rain) requirements of 40 CFR Part 72. The gas turbines are considered new affected utility units per 40 CFR Part 72.6(a).

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 addition, Phase II Acid Rain facilities must meet the requirements of Title IV of the federal Clean Air Act, Acid Rain, and the Acid Rain regulations in Parts 72 through 78 of Volume 40 of the Code of Federal Regulations. These regulations were adopted and incorporated by reference by BAAQMD Regulation 2, Rule 7, Acid Rain. The main provisions of the regulations for natural gas fired acid rain sources, such as the ones at this facility, are the requirement to obtain one SO<sub>2</sub> allowance for each ton of SO<sub>2</sub> that is emitted, stringent monitoring requirements for NO<sub>x</sub>, CO<sub>2</sub>, and SO<sub>2</sub>, and stringent recordkeeping and reporting requirements.

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.

### **Permit Time Line for the Gateway Generating Station**

1. The original Authority to Construct for this facility was issued to Mirant Delta, LLC for Contra Costa No. 8 on July 24, 2001. The facility started construction during the term of the original Authority to Construct.
2. Condition No. 18138 regulating the gas turbines and HRSGs was revised administratively by the District in May of 2002. Part 6 was revised to reflect that an Oxygen monitor was going to be installed at the facility and not a carbon dioxide monitor. Part 47 was revised to limit the fuel gas preheater to a maximum firing rate per day of 192 MMBtu. Part 47 previously limited the fuel gas preheater to 16 hours of operation.
3. The construction process was halted and the Authority to Construct was renewed in 2003, 2005, and 2007.
4. On January 4, 2007 the Authority to Construct was transferred to Pacific Gas & Electric Company. PG&E recommenced construction of the project on February 5, 2007. The plant first fired the gas turbines during November 2008.
5. The facility submitted an amendment to the CEC for a change of the air quality conditions in the CEC license in 2009. The CEC granted the Condition changes in August of 2009. The amendment changed:
  - the name of the facility to Gateway Generating Station;
  - removed the conditions for the exempt preheater from the Air Quality Conditions and relocated them to the staff conditions section of the Conditions of Certification;
  - eliminated references to steam augmentation mode (never installed);
  - allowed the use of an oxygen monitor as part of the Continuous Emission Monitor system;
  - removed references to the wet cooling tower (never installed, facility utilizes dry cooling which is exempt from District permit requirements);
  - added the diesel fire pump conditions to air quality conditions;
  - and revised the amount of offsets provided for particulate matter downward to account for removal of cooling tower which had 7.2 tons/year of particulate emissions.

6. On August 13, 2009 EPA Region IX issued a Notice of Violation for PSD permit non-compliance for this facility to PG&E.
7. The Permit to Operate issuance by the BAAQMD for this facility was postponed for two reasons: the delay in the construction of the plant and the pending PSD enforcement action. The PSD enforcement action has been resolved by an approved consent decree dated March 3, 2011 (Civil Action No. 09-4503 SI).
8. The facility submitted a second amendment to the CEC for a change of the air quality conditions in the CEC license in April of 2011. The CEC granted the Condition changes in September of 2011. The amendment changed:
  - corrected minor editorial issues with the air quality conditions;
  - added conditions as specified in the approved consent decree.
9. On September 13, 2011 the District issued the permit to operate for the gas turbines/heat recovery steam generators (HRSGs) and the diesel fire pump.

This facility submitted its initial Title V permit application on February 20, 2007.

## **B. Facility Description**

The Gateway Generating Station is a combined-cycle cogeneration facility capable of producing a nominal electrical output of 530 MW. The CEC approved a license for the facility in 2001<sup>1</sup>. The facility began construction in 2002. Construction was halted in 2003 and recommenced in 2007. The gas turbines started commissioning in November 2008. The facility was online and selling electricity to the grid in January of 2009.

The Gateway Generating Station generates electricity using a “combined cycle” system comprising two combustion turbine generators (CTGs) that work in concert with two heat recovery steam generators (HRSGs) and a steam turbine generator (STG). The CTGs generate electricity by burning natural gas, which drives combustion turbine compressors and electric generators. Instead of being vented (and wasted), the exhaust heat from the CTGs is routed to the HRSGs to produce steam to power the STG to generate additional electricity. Through the use of the two cycles in tandem, the facility is able to be more efficient and use approximately 30% less fuel to generate the same amount of energy as an older boiler or simple-cycle turbine.

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<sup>1</sup> Information on the CEC licensing documents is available at the CEC website, <http://www.energy.ca.gov/sitingcases/gateway/index.html>.

The actual emissions of criteria pollutants from the plant for 2009, 2010, 2011, and 2012 are shown below.

<b>Year</b>	<b>NOx (tons/year)</b>	<b>CO (tons/year)</b>	<b>POC (tons/year)</b>	<b>PM10 (tons/year)</b>	<b>SOx (tons/year)</b>
2009	77.7	13.9	6.4	17.5	6.4
2010	72.4	9.0	7.9	21.6	7.9
2011	67.7	10.0	6.8	18.6	6.8
2012	77.5	8.0	8.0	22.1	8.0

### **C. Permit Content**

The legal and factual basis for the permit follows. The permit sections are described in the order presented in the permit.

#### **I. Standard Conditions**

Section I of the Title V permit contains administrative requirements and conditions that apply to all facilities. This section also contains standard conditions I.L and I.K since this facility must comply with the Title IV (Acid Rain) requirements of 40 CFR Part 72 and the accidental release requirements of 40 CFR Part 68, respectively. Many of the standard conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

The standard conditions also contain references to BAAQMD Regulation 1 and Regulation 2. These are the District's General Provisions and Permitting rules.

#### **II. Equipment**

Section II of the Title V permit lists all permitted or significant sources and all abatement (control) devices that control emissions from permitted or significant sources. This section is considered to be part of the facility description. It contains information that is necessary for applicability determinations, such as fuel types and contents or sizes of tanks. This information forms part of the factual basis of the Title V permit.

Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302, whereas significant sources are sources that are exempt from District permit requirements but have the potential to emit significant sources of pollution (more than 2 tons per year of a "regulated air pollutant," as defined in BAAQMD Rule 2-6-222, or 400 pounds per year of a "hazardous air pollutant," as defined in BAAQMD Rule 2-6-210). Each source is identified by an S and a number (e.g., S-24). The Gateway Generating Station consists of five permitted sources (S-41, S-42, S-43, S-44, and S-47) and no significant sources. The facility operates the following exempt sources: S-45, a natural gas fired dewpoint heater, a dry cooling system, and an oil water separator. The potential to emit for S-45 is shown in Appendix C. The

permitted sources are listed in Table II A. By definition, each of the permitted sources at this facility has previously been issued a District permit to operate pursuant to the requirements of BAAQMD Regulation 2 (Permits). These District permits to operate are issued in accordance with state law and the District's regulations. The capacities listed in Table II A are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and BAAQMD Regulation 2-1-403.

Abatement devices are devices that control emissions from a source. Each abatement device whose primary function is to reduce emissions is identified by an A and a number (e.g., A-24). If a source is also an abatement device, such as when an engine controls VOC emissions, it will be listed in the abatement device table but will have an "S" number. An abatement device may also be a source (such as a thermal oxidizer that burns fuel) of secondary emissions. If the primary function of a device is to control emissions, it is considered an abatement (or "A") device. If the primary function of a device is a non-control function, the device is considered to be a source (or "S"). The Gateway Generating Station has four abatement devices (A-11 through A-14) that control emissions from the facility's two combustion gas turbines (CTGs S-41 and S-43) and two heat recovery steam generators (HRSGs S-42 and S-44). The abatement devices are listed in Table II B.

### **III. Generally Applicable Requirements**

Section III of the Title V permit lists requirements that apply generally to all sources at a facility. Some are applicable requirements (e.g., particulate, architectural coating, odorous substance, and sandblasting standards) that apply to all facilities.

If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV, Source-Specific Applicable Requirements, and the monitoring for that requirement will appear in Sections IV and VII of the Title V permit.

In addition, requirements that apply to insignificant or unpermitted sources at a facility (e.g., refrigeration units that use more than 50 pounds of an ozone-depleting compound) are placed in Section III.

Regulation 9, Rule 7 applies to the exempt dewpoint heater S-45 (6.5 MMBtu/hour) and will be added to Table 3. S-45 would be required to meet the NO<sub>x</sub> and CO limits contained in 9-7-307.2 by January 1, 2013. However, S-45 was manufactured during 2007 and per 9-8-308.1 has an effective date 10 years after the original manufacture date to meet the NO<sub>x</sub> and CO limits contained in 9-7-302.2. NO<sub>x</sub> will be limited to 15 ppmvd @ 3% O<sub>2</sub> and CO will be limited to 400 ppmvd @ 3% O<sub>2</sub>.

#### **IV. Source-Specific Applicable Requirements**

Section IV of the Title V permit contains a series of tables (Tables IV-A through IV-E) that identify the bases of all of the applicable requirements that apply to this facility's permitted sources. These applicable requirements are imposed on the facility by District, state and federal regulations and/or specific permit conditions. Applicable requirements include monitoring requirements (monitoring is discussed in further detail in Section C.VII of this permit evaluation and statement of basis).

Tables IV-A through IV-B contain citations only. Where the applicable requirement derives from a District or federal regulation, the full text of the regulation can be found on the District or EPA websites. Alternatively, if the applicable requirement derives from a permit condition, all of the permit conditions that apply to this facility are reproduced in full in Section VI of the Title V permit.

In the tables, the citations are listed in the following order:

- District Rules
- SIP Rules (if any) are listed following the corresponding District rules. SIP rules are District rules that have been approved by EPA for inclusion in the California State Implementation Plan. SIP rules are "federally enforceable" and a "Y" (yes) indication will appear in the "Federally Enforceable" column. If the SIP rule is the current District rule, separate citation of the SIP rule is not necessary and the "Federally Enforceable" column will have a "Y" for "yes". If the SIP rule is not the current District rule, the SIP rule or the necessary portion of the SIP rule is cited separately after the District rule. The SIP portion will be federally enforceable; the non-SIP version will not be federally enforceable, unless EPA has approved it through another program.
- Other District requirements, such as the Manual of Procedures, as appropriate.
- Federal requirements (other than SIP provisions).
- BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.

#### **Complex Applicability Determinations**

##### Accidental Release

Ammonia storage at this facility is subject to 40 CFR 68, Accidental Release, because more than 10,000 pounds of anhydrous (100%) ammonia is stored. The facility also has more than 20,000 pounds of aqueous ammonia (29% by weight, 20,000 gallon tank) onsite. The requirement is in Standard Condition I.K.

##### 112(j)

The facility is not subject to the case-by-case MACT determination requirement in 112(j) of the Clean Air Act because it is not a major facility for hazardous air pollutants (HAPs). The potential to emit for HAPs from the Final Determination of Compliance (FDOC) for the project can be found in Appendix D. Note that ammonia, propylene, and aluminum are not HAPs



pursuant to 112(b) of the Clean Air Act. Since, the FDOC was published the facility has added a diesel fire pump. The impact of emissions of toxic air contaminants from the diesel fire pump are evaluated as diesel particulate matter. The District calculated the HAP emissions from the diesel fire pump for completeness and these emission calculations are in Appendix E. Therefore, 40 CFR 63, Subpart YYYYY, NESHAP for Stationary Combustion Turbines does not apply to S-41 and S-43.

#### Compliance Assurance Monitoring (CAM) – 40 CFR Part 64

The potential to emit for the gas turbines and heat recovery steam generators combined is greater than 100 tons/year each for NO<sub>x</sub> and CO. The gas turbines are exempt from CAM requirements for NO<sub>x</sub> per 40 CFR Part 64.2(b)(iii) since the facility is subject to the acid rain permit program. The facility is subject to the Acid Rain program because it is a utility unit that serves a generator with a capacity than 25 MW in accordance with 40 CFR Part 72.6. Per 40 CFR 64.2(a), an emission unit is subject to 40 CFR 64, Compliance Assurance Monitoring, if the unit is subject to a federally enforceable requirement for a pollutant, the pollutant is controlled by an abatement device, and the emissions of the pollutant before abatement are more than 100% of the major source thresholds. The CO emissions from each gas turbine/heat recovery steam generator are not subject to CAM requirements, because the gas turbines/HRSGs meet the exemption contained in 40 CFR Part 64.2(b)(vi). This exemption applies to sources with a Part 70 operating permit that specifies a continuous compliance determination method as specified in Part 64.1. The CO CEMs meet this definition.

#### 40 CFR Part 60, Subpart Da

The natural gas fired heat recovery steam generators are greater than 250 MMBtu/hour in capacity (395 MMBtu/hour) and the facility is subject to Subpart Da per §60.40Da(e). The facility is expected to continue to comply with the requirements of this subpart. 60.42Da(b) contains the opacity standard that applies to the gas turbines and heat recovery steam generators. 60.49Da(a)(3) requires the owner/operator to perform periodic monitoring to demonstrate compliance with this standard. The EPA has recently promulgated changes to Subpart Da in direct final rule action (Federal Register, January 20, 2011) allowing the permitting authority to exempt owners/operators of affected facilities burning only natural gas from the opacity monitoring requirements contained in 60.49Da(a)(3). The District is exempting the facility from the opacity monitoring requirement contained in 60.49Da(a)(3).

### 40 CFR Part 60, Subpart GG

The gas turbines have a heat input at peak load that is greater than 10 MMBtu/hour and the facility is subject to Subpart GG per §60.330(a). 60.332(a)(1) has a NO<sub>x</sub> limit of nominally 75 ppm. The emissions units meet a permit limit of 2.5 ppm @ 15 % O<sub>2</sub> and therefore comply with the Subpart GG NO<sub>x</sub> limit.

Section 60.333(a) requires an owner/operator of stationary turbines to demonstrate compliance with either one of the following two conditions:

- Discharge SO<sub>2</sub> at less than or equal to 0.015% by volume at 15% oxygen on a dry basis  
or
- Combust fuel with sulfur content less than or equal to 0.8% by weight (8000 ppmw).

The typical annual average sulfur concentration of the PUC quality natural gas combusted in the turbines is 0.25 grains/100 scf. PG&E natural gas typically has a sulfur concentration of 1 grain/100 scf (See PG&E Gas Rule 21, Section C). The SO<sub>2</sub> content in the natural gas can be compared to Section 60.333(a) as follows:

$$\text{lb S/MMBtu} = 1 \text{ grains}/100 \text{ scf} \times \text{lb}/7000 \text{ grains} \times \text{scf}/1020 \text{ Btu} \times 1 \text{ E}06 \text{ Btu/MMBtu}$$

$$\text{lb S/MMBtu} = 1.4 \text{ E-}03$$

$$\text{lb SO}_2/\text{MMBtu} = 1.4 \text{ E-}03 \text{ lb/MMBtu} \times (64 \text{ lb SO}_2/\text{lb-mol}/32 \text{ lb S/lb-mol})$$

$$\text{lb SO}_2/\text{MMBtu} = 2.8 \text{ E-}03$$

### Gas Turbines and Heat Recovery Steam Generators

$$\text{SO}_2 \text{ lb/hour} = 2.8 \text{ E-}03 \text{ lb/MMBtu} \times 2,227 \text{ MMBtu/hour} = 6.23$$

$$\text{SO}_2 \text{ ppm} = (6.23 \text{ lb/hour} \times 1/64 \text{ lb/lb-mol} \times 386.8 \text{ scf/lb-mol}) / (8710 \text{ dscf/MMBtu} \times 2,227 \text{ MMBtu/hour} \times (20.95/(20.95 - 15))) \times 1 \text{ E}06$$

$$\text{SO}_2 \text{ ppm} = 0.6 \text{ ppm @ } 15\% \text{ O}_2$$

The calculations demonstrate that the gas turbines at the facility meet Section 60.333(a).

### 40 CFR Part 60 Subpart KKKK

The construction of the gas turbines and HRSGs commenced before February 18, 2005 and this subpart does not apply to this facility per §60.4305.

### 40 CFR Part 60 Subpart IIII

S-47 will comply with the NSPS for Compression Ignition Engines (40 CFR 60 Subpart IIII).

40 CFR 60, Subpart III, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines applies to stationary fire pump engines that were manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006. S-47 was manufactured after this date.

Table 3 to Subpart III of Part 60—Certification of stationary fire pump engines is required for engines greater than 750 hp beginning in 2008, engines between 175 and 750 (inclusive) beginning in 2009, engines = 100hp and less than 175 hp beginning in 2010, and engines less than 100 hp beginning in 2011. Per 60.4205(c), owners and operators of fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards in Table 4 to Subpart III of Part 60, for all pollutants.

Owner or operator of a CI fire pump engine that is manufactured prior to the model years in Table 3 to Subpart III of Part 60 (explained in the paragraph above) must comply with the emission standards specified in §60.4205(c) and demonstrate compliance according to one of the methods specified in paragraphs (1) through (5) below:

- (1) Purchasing an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.
- (2) Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.
- (3) Keeping records of engine manufacturer data indicating compliance with the standards.
- (4) Keeping records of control device vendor data indicating compliance with the standards.
- (5) Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in §60.4212, as applicable.

The owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to their fire pump engine power rating in Table 3 to Subpart III of Part 60 must comply with the emission standards specified in §60.4205(c) and must comply by purchasing an engine certified to the emission standards in §60.4205(c) for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's specifications.

This engine is model year 2010 and between 175 and 750 hp. It complies with Tier 3 emission standards and therefore complies with option (1) above and is compliant with NSPS requirements.

#### 40 CFR Part 63 Subpart ZZZZ

Table IV-B for the diesel fire pump includes 40 CFR Part 63 Subpart A and ZZZZ as applicable requirements. S-47 fire pump is an emergency engine. It is a compression ignition (CI), diesel fired, 311 HP engine that is subject to the emission or operating limitations in 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. S-47 is an emergency stationary reciprocating internal combustion engine that is subject to the requirements of Part 63.6590(c) since it is subject to 40 CFR Part 60 requirements (See NSPS Subpart III discussion), and is defined as a new stationary reciprocating engine pursuant to Part 63.6590(a)(2)(iii). S-47 is an affected

source under Part 63.6590(c)(1). S-47 will comply with the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII (see NSPS Subpart IIII discussion).

#### 40 CFR Part 72, Acid Rain Program

This facility is subject to the Acid Rain requirements of 40 CFR Part 72, because it employs gas turbines that are utility units that each serve a generator with a capacity greater than 25 MW pursuant to 40 CFR Part 72.6.

Part 72, Subpart A, establishes general provisions and operating permit program requirements for sources and affected units under the Acid Rain program, pursuant to Title IV of the Clean Air Act. The gas turbines are affected units subject to the program in accordance with 40 CFR Part 72, Subpart A, Section 72.6(a)(3)(i). The facility continues to meet 72.9 Standard Requirements which requires the submission of a complete acid rain permit application, meeting the monitoring requirements of part 75, and holding sufficient allowances, and comply with the acid rain SO<sub>2</sub> limit. The facility must hold sufficient SO<sub>2</sub> allowances by March 1 (February 29 of a leap year) of every year to offset each ton of SO<sub>2</sub> emitted for the previous calendar year. The facility is expected to comply with the excess emissions, recordkeeping and reporting requirements in 72.9(e) and 72.9(f).

Part 72, Subpart C, contains requirements for acid rain permit applications and compliance plans. The facility is expected to continue to meet these requirements.

Part 72, Subpart E, contains the requirements for the acid rain permit which must include all elements of a complete acid rain application.

#### 40 CFR Part 75, Continuous Emission Monitoring

Part 75, Subpart A, contains the applicability criteria, compliance dates, and prohibitions. The emissions units at the facility are subject to Part 72 and are therefore subject to Part 75. The NO<sub>x</sub> monitoring is subject to part 75 per 75.2(c). The facility is expected to continue to meet the compliance dates and prohibitions contained in part 75 Subpart A.

Part 75, Subpart B, contains specific monitoring provisions for each pollutant subject to part 75. The emissions units at this facility are required to meet the SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub> monitoring requirements contained in 75.10(a)(1), 75.10(a)(2), 75.10(a)(3) Opacity monitoring under 75.10(a)(4) is not required for gas fired units in accordance with 75.14(c). 75.10(b) requires each CEM to meet equipment, installation, and performance specification in part 75 Appendix A and quality assurance/quality control in Appendix B. 75.10(c) requires heat input rate monitoring to meet requirements contained in part 75 Appendix F. The facility is expected to continue to comply with the requirements contained in 75.10(b) and (c).

75.10(d) contains primary equipment hourly operating requirements that require the CEM to monitor emissions when the emissions unit combusts fuel except as specified in 75.11(e) and during periods of calibration, quality assurance, or preventive maintenance, performed pursuant to §75.21 and Appendix B of this part, periods of repair, periods of backups of data from the data acquisition and handling system, or recertification performed pursuant to §75.20. This section

also contains requirements for calculating hourly averages from four 15-minute periods and validity of data and data substitution. Emission concentrations for a given hour are not considered valid unless it is based on four valid measurements. The data substitution requirements are contained in Subpart D. The facility is expected to continue to comply with the requirements contained in 75.10(d). 75.10(f) specifies minimum measurement capability requirement for CEMs and 75.10(g) contains the minimum recordkeeping and reporting requirements. The facility is expected to continue to meet 75.10(f) and (g).

75.11 contains specific provisions for SO<sub>2</sub> monitoring. 75.11(d)(2) allows the use of Appendix D to monitor SO<sub>2</sub> emissions from gas fired units. The facility monitors sulfur content of the natural gas to meet Part 75 SO<sub>2</sub> monitoring requirements.

75.12 contains specific provisions for NO<sub>x</sub> emission rates. The facility uses a NO<sub>x</sub> CEM and an O<sub>2</sub> monitor to meet this requirement.

75.13 contains CO<sub>2</sub> monitoring requirements. The facility monitors CO<sub>2</sub> in accordance with this section using the procedures in part 75 Appendix G.

75.14 contains opacity monitoring requirements. The facility is exempt from opacity monitoring under part 75 per 75.14(c).

Part 75 Subpart C contains operation and maintenance requirements including certification and recertification of the CEMs, quality assurance/quality control requirements, reference test methods, and out-of-control periods and adjustment for system bias. The facility is expected to continue to meet these requirements.

Part 75, Subpart D (75.30 through 75.36) contains Missing Data Substitution Procedures for SO<sub>2</sub>, NO<sub>x</sub>, flowrate, CO<sub>2</sub>, and heat input procedures. The facility is expected to continue to meet these requirements.

Part 75, Subpart F contains the recordkeeping requirements including the contents of a part 75 monitoring plan. This subpart requires the facility to record the operating time, heat input rate, and load for each emissions unit. Additionally, the facility must record emissions data for SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, and O<sub>2</sub> along with quality assurance/quality control information.

Part 75, Subpart G contains the reporting requirements for affected facilities subject to part 75. The facility is expected to continue to meet these requirements.

#### Title 17 California Code of Regulations, Subchapter 10, Article 2

The facility is subject to the state mandatory greenhouse gas reporting and is expected to meet the state greenhouse gas reporting requirements.

## **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.”

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

## **VI. Permit Conditions**

The District has issued a number of authorities to construct (A/Cs) and permits to operate (P/O) to the Gateway Generating Station that contain permit conditions such as limits on operation, abatement requirements, and monitoring and recordkeeping requirements. Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 *et seq.*, an order of abatement pursuant to H&SC § 42450 *et seq.*, or as an administrative revision initiated by District staff. Each permit condition applies to a certain source or group of sources and is identified with a unique numerical identifier, up to five digits. (For example, permit condition #18138 applies to the gas turbines S-41 and S-43, HRSGs S-42 and S-44.) Section VI of the Title V permit sets out, in full, all of the permit conditions that apply to this facility. After issuance of the Title V permit, any changes to any permit condition in any underlying permit will be made according to the procedures in Regulation 2, Rule 6, Major Facility Review to ensure consistency between the Title V permit and the underlying permits.

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 requirements in Regulation 2-2-301.

- **Cumulative Increase:** This term is used for a condition imposed by the APCO that 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. This term has been superseded by BAAQMD Regulation 2, Rule 5 that is based in part upon the provisions of the TRMP.

All changes to existing permit conditions are clearly shown in "strike-out/underline" format in Section VI of 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.

#### Changes to Permit Conditions

Condition No. 18138 regulates the gas turbines and HRSGs and contains annual emission limits for the gas turbines and HRSGs and the diesel fire pump. Condition No. 18138 references the Toxics Risk Management Policy (TRMP) as a basis for condition parts that regulate toxic air contaminant and HAP emissions. The references to TRMP will be changed to Regulation 2, Rule 5 in the condition. The changes are shown in strikethrough/lineout in the draft Title V permit.

Condition No. 18138 includes four parts (CD-1, CD-2, CD-3 and CD-4) that were required to be added to the District permit by the Consent Decree (Civil Action No. 09-4503 SI). The basis for these conditions is voluntary.

Condition No. 18183 also includes an additional condition for annual ammonia source testing (AM-1). This condition has been added to ensure adequate monitoring for demonstrating compliance with part 20e of Condition No. 18138. The basis for this condition is Regulation 2, Rule 1, Section 403.

#### **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 the limits for which there is no monitoring required and has determined that additional monitoring is not required. The District has also examined the monitoring for other limits and has determined that the monitoring is adequate to provide a

reasonable assurance of compliance. Calculations for potential to emit are provided in the discussion when no monitoring is proposed due to the size of a source.

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

These factors are the same as those historically applied by the District in developing monitoring for applicable requirements. It follows that, although Title V calls for a re-examination of all monitoring, there is a presumption that these factors have been appropriately balanced and incorporated in the District's prior rule development and/or permit issuance. It is possible that, where a rule or permit requirement has historically had no monitoring associated with it, no monitoring may still be appropriate in the Title V permit if, for instance, there is little likelihood of a violation. Compliance behavior and associated costs of compliance are determined in part by the frequency and nature of associated monitoring requirements. As a result, the District will generally revise the nature or frequency of monitoring only when it can support a conclusion that existing monitoring is inadequate.

### NO<sub>x</sub> Sources

<b># &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD 9-3-303	125 ppm	CEM
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD 9-9-301.1.3	9 ppmv @ 15% O <sub>2</sub> , dry	CEM and annual source test
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD 9-9-301.2	5 ppmv @ 15% O <sub>2</sub> , dry or 0.15 lbs/MW-hr	CEM
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	SIP 9-9-301.3	9 ppmv @ 15% O <sub>2</sub> , dry	CEM and annual source test
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	NSPS 40 CFR 60.44Da (a)(1)	0.2 lb/MMBtu	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	NSPS 40 CFR 60.44Da (d)(1)	1.6 lb/MW-hr (rolling 24-hr average)	CEM and load monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	NSPS Subpart GG 40 CFR 60.332 (a)(1)	75 ppmv @ 15% O <sub>2</sub> , dry	CEM



<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 11	8400 lb/day and 400 lb/hr for all turbines combined during commissioning, including startup and shutdown of turbine without catalyst	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 20a	20 lb/hr or 0.0090 lb/MMBtu except during turbine startup or shutdown	CEM and fuel monitoring, annual source test
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 20b	2.5 ppmv @ 15% O <sub>2</sub> , dry, 1-hr average except during turbine startup or shutdown	CEM, annual source test
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 21	452 lb/event for each turbine, cold startup	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 21	189 lb/event for each turbine, hot startup	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 21	59 lb/event for each turbine, shutdown	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138 part 23a	1994 lb/day (as NO <sub>2</sub> ) for turbines and HRSGs combined, including startup and shutdown	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs and S-47 diesel fire pump	BAAQMD condition #18138, part 24a	174.3 tons per year (as NO <sub>2</sub> ) for turbines, HRSGs, and diesel fire pump combined, including startup or shutdown	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part CD-3	139.2 tons per year (as NO <sub>2</sub> ) for turbines and HRSGs combined, including startup or shutdown	CEM and fuel monitoring

**NO<sub>x</sub> Discussion:**

The turbines are subject to the NO<sub>x</sub> emission limitations in District Regulation 9, Rule 9 (Monitoring and Recordkeeping Requirements). This facility has a stationary gas turbine with a heat input rate greater than 150 MMBtu/hr and operates more than 4000 hours in a 36-month period. Therefore it is required to have Continuous Emission Monitoring (CEM) and to complete an annual source test (BAAQMD Regulation 9-9-501). Each turbine and HRSG is also required to have a NO<sub>x</sub> CEM in accordance with Regulation 1-520.

The CEM is used to demonstrate compliance with the NO<sub>x</sub> concentration permit limits on a continuous basis. An annual relative accuracy test audit (RATA) is required on the NO<sub>x</sub> CEM to ensure accuracy (40 CFR Part 75, BAAQMD MOP Volume V). NO<sub>x</sub> mass emissions are calculated using NO<sub>x</sub> and O<sub>2</sub> CEM data, and the fuel heat input rate (from fuel flow meter). The District has determined that no additional monitoring is required.

### CO Sources

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 11	13,000 lb/day and 584 lb/hr for turbines and HRSGs combined during commissioning, including startup and shutdown of turbine without catalyst	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD Condition #18138 Part 20c	29.22 lb/hr or 0.013 lb/MMBtu except during turbine startup or shutdown	CEM and fuel monitoring, annual source test
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD Condition #18138 Part 20d	6 ppmv @ 15% O <sub>2</sub> , dry 3-hr average except during turbine startup or shutdown	CEM and annual source test
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 21	990 lb/event for each turbine, cold startup	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 21	291 lb/event for each turbine, hot startup	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 21	73 lb/event for each turbine, shutdown	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part 23b	3,602 lb/day for turbines and HRSGs combined including startup and shutdown	CEM and fuel monitoring
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs and S-47 diesel fire pump	BAAQMD condition #18138, part 24b	259.1 tons per year for turbines, HRSGs, and diesel fire pump combined, including startup or shutdown	CEM and fuel monitoring

#### **CO Discussion:**

The turbines are subject to the CO emission limitations shown above. The CO limit prescribed in condition #18138 Part 20d is 6 ppmv @ 15% O<sub>2</sub>. The gas turbines/HRSGs have a potential to emit of CO that exceed major source thresholds. Therefore, the gas turbines/HRSGs are required to have a CO CEM and are required to conduct an annual source test.

The CEM is used to demonstrate compliance with the CO concentration permit limits on a continuous basis. An annual relative accuracy test audit (RATA) is required on the CO CEM to ensure accuracy (40 CFR Part 75, BAAQMD MOP Volume V). CO mass emissions are calculated using CO and O<sub>2</sub> CEM data, and the fuel heat input rate (from fuel flow meter). The District has determined that no additional monitoring is required.

**PM Sources**

<b># &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs, S-47 Diesel Fire Pump	BAAQMD Regulation 6-1-301	Ringelmann 1.0	None
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs, S-47 Diesel Fire Pump	SIP Regulation 6-301	Ringelmann 1.0	None
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	NSPS 40 CFR 60.42Da(b)	≤20% Opacity (six-minute average); except for one 6-minute period per hour of not more than 27% opacity	None
S-47 Fire Pump Diesel Engine	BAAQMD Regulation 6-1-303.1	< Ringelmann No. 2, except for no more than 3 minutes in any hour	None
S-47 Fire Pump Diesel Engine	SIP Regulation 6-303.1	< Ringelmann No. 2, except for no more than 3 minutes in any hour	None
S-42, S-44, HRSGs	BAAQMD Regulation 6-1-304 Tube Cleaning	< Ringelmann 2.0, except for 3 min/hour	None
S-42, S-44, HRSGs	SIP Regulation 6-304 Tube Cleaning	< Ringelmann 2.0, except for 3 min/hour	None
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs, S-47 Fire Pump Diesel Engine,	BAAQMD Regulation 6-1-310	0.15 gr/dscf	None
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs, S-47 Fire Pump Diesel Engine	SIP Regulation 6-310	0.15 gr/dscf	None
S-42, S-44, HRSGs	BAAQMD Regulation 6-1-310.3	0.15 gr/dscf @ 6%O <sub>2</sub>	None
S-42, S-44, HRSGs	SIP Regulation 6-310.3	0.15 gr/dscf @ 6%O <sub>2</sub>	None
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	NSPS 40 CFR 60.42Da(a)(1)	0.03 lb/MMBtu	None

### PM Sources

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 20h	11.0 lb/hr, for each turbine and HRSG combined (duct burners not in operation) 13.0 lb/hr, for each turbine and HRSG combined (duct burners in operation)	Annual source test at maximum load
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 20h	0.00588 lb/MMBTU, for each turbine and HRSG combined (duct burners not in operation) 0.00584 lb/MMBTU, for each turbine and HRSG combined (duct burners not in operation)	Annual source test at maximum load
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 23d	624 lb/day for turbines and HRSGs combined	Records, calculations
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs, S-47 Fire Pump Diesel Engine	BAAQMD condition #18138, part 24d	105 ton/yr for turbines, HRSGs, and diesel fire pump combined (includes emissions from commissioning period)	Records, calculations

**PM Discussion:**

BAAQMD Regulation 6, Rule 1 “Particulate Matter and Visible Emissions”

Visible Emissions, 6-1-301, 6-1-303.1, 6-1-304, NSPS Subpart Da

BAAQMD Regulation 6, Rule 1 and NSPS Subpart Da (40 CFR Part 60.42Da(b)) requirements limit visible emissions from these sources. Visible emissions are normally not associated with combustion of gaseous fuels, such as natural gas. Sources S-41, S-43 Gas Turbines and S-42, S-44 HRSGs burn natural gas exclusively; therefore, per the EPA's June 24, 1999 agreement with CAPCOA and ARB titled "Summary of Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", no monitoring is required to ensure compliance with these limits for these sources.

S-42 and S-44 are subject to BAAQMD Regulation 6-1-304 Tube Cleaning that requires during tube cleaning, and except for three minutes in any one hour, a person shall not emit from any heat transfer operation using fuel at a rate of not less than 148 GJ (140 million BTU) per hour, a visible emission as dark or darker than No. 2 on the Ringelmann Chart. Tube cleaning of sources does not normally create any visible emissions and no monitoring is required during these periods since all of these sources are fired on natural gas.

EPA's June 24, 1999 agreement with CAPCOA and ARB entitled "Summary of Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP" states that no monitoring will be required for opacity for diesel standby and emergency reciprocating engines if California diesel or other low-sulfur fuels are used. The reason is that the use of low-sulfur fuels reduces particulates. Also, these engines are used infrequently and therefore, are not large sources of particulate emissions. Because the S-47 Fire Pump Diesel Engine will utilize "California" diesel fuel, no monitoring is required to ensure compliance with the visible emissions limitation of Regulation 6-1-303.1.

### Particulate Weight Limitation

BAAQMD Regulation 6-1-310 (6-310 SIP) limits filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. This is a "grain loading" standard.

Exceedances of the grain loading standards are normally not associated with combustion of gaseous fuels, such as natural gas. Sources S-41, S-43 Gas Turbines and S-42, S-44 HRSGs burn natural gas exclusively, therefore, per the EPA's July 2001 agreement with CAPCOA and ARB entitled "CAPCOA/CARB/EPA Region IX Recommended Periodic Monitoring for Generally Applicable Grain Loading Standards in the SIP: Combustion Sources: Summary of Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", no monitoring is required to ensure compliance with this limit for these sources.

EPA's July 2001 agreement with CAPCOA and ARB entitled "CAPCOA/CARB/EPA Region IX Recommended Periodic Monitoring for Generally Applicable Grain Loading Standards in the SIP: Combustion Sources: Summary of Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", proposes the following monitoring for the grain loading standard for non-utility distillate-oil-fueled emergency piston-type IC Engines: Maintain records of all engine usage (such as time or fuel meter readings) and maintenance. S-47 Fire Pump Diesel Engine is subject to such monitoring.

### PM Emission Calculations

Regulation 6-1-310 allows 0.15 grains PM/dscf and Regulation 6-1-310.3 allows 0.15 grains PM/dscf @ 6% O<sub>2</sub>. As shown below, combined gas turbine and HRSG emissions are expected to be well below the limit (at approximately 0.003 gr/dscf @ 6% O<sub>2</sub>). Accordingly, monitoring is not warranted to insure compliance by the gas turbines and HRSGs with this regulation.

#### S-41 & S-43 Gas Turbine Emissions

The gas turbines are limited by permit condition to a PM<sub>10</sub> emission rate of 11 lb/hr. Source testing has shown that the gas turbines have met this limit by a comfortable margin. Therefore, the following calculation is conservative.

The corresponding PM<sub>10</sub> emission factor is therefore:

$$(11 \text{ lb PM}_{10}/\text{hr})/(1,970 \text{ MM BTU}/\text{hr}) = \mathbf{0.00558 \text{ lb PM}_{10}/\text{MM BTU}}$$

The following stack data will be used to calculate the grain loading at standard conditions for full load gas turbine operation without duct burner firing to determine compliance with BAAQMD Regulation 6-1-310.3.

PM<sub>10</sub> mass emission rate: 11 lb/hr  
flow rate: 402,271 dscfm @ 6% O<sub>2</sub>

Converting to grains/dscf:

$$(11 \text{ lb PM}_{10}/\text{hr})(1 \text{ hr}/60 \text{ min})(7000 \text{ gr}/\text{lb})/(402,271 \text{ dscfm}) = 0.00319 \text{ gr}/\text{dscf @ 6\% O}_2$$

#### S-41 & S-43 Gas Turbine and S-42 & S-44 HRSG Duct Burner Combined Emissions

The PM<sub>10</sub> emission limit for each gas turbine/HRSG is 13 lb/hr at the maximum combined firing rate of 2,227 MM BTU/hr during duct burner firing.

The corresponding PM<sub>10</sub> emission factor is therefore:

$$(13 \text{ lb PM}_{10}/\text{hr})/(2,227 \text{ MM BTU}/\text{hr}) = \mathbf{0.00584 \text{ lb PM}_{10}/\text{MM BTU}}$$

The following stack data will be used to calculate the grain loading for simultaneous CTG and HRSG operation at standard conditions to determine compliance with BAAQMD Regulation 6-1-310.3.

PM<sub>10</sub> mass emission rate: 13 lb/hr  
typical flow rate: 454,750 dscfm @ 6% O<sub>2</sub>

Converting to grains/dscf:

$$(13 \text{ lb PM}_{10}/\text{hr})(1 \text{ hr}/60 \text{ min})(7000 \text{ gr}/\text{lb})/(454,750 \text{ dscfm}) = 0.0033 \text{ gr}/\text{dscf}$$

#### Particulate Mass Limits and Mass per Unit Fuel Fired Limits

BAAQMD Condition 18138 part 20h limits the PM<sub>10</sub> (all PM is expected to be PM<sub>10</sub>) to 11 lb/hour without the duct burners and 13 lb/hour with the duct burners. This corresponds to 0.00588 lb/MMBtu and 0.00584 lb/MMBtu, respectively. Condition 18138 part CD-1 limits PM-10 from each gas turbine/HRSG to 7.5 lb/hour without the duct burners and 9.0 lb/hour with the duct burners in operation. This corresponds to 0.004 lb/MMBtu. These permit limits are an order of magnitude lower than the NSPS Standard in 40 CFR 60.42Da(a)(1) and no ongoing monitoring is required to demonstrate compliance with this limit. The gas turbines and HRSGs are required to be source tested on an annual basis for PM<sub>10</sub>. The annual source test results are used to develop emission factors on a lb PM per MMBtu basis. The particulate emission factors and the fuel usage

data allow the facility to calculate particulate emissions on an hourly, daily, monthly, and annual basis.

PM emissions from the diesel fire pump are based on the ARB emissions certification and the hours of operation. The PM emissions from the diesel fire pump are calculated on a monthly and annual basis.

The use of source test derived emission factors and fuel usage data is adequate to demonstrate compliance with the particulate mass limits and mass per unit fuel fired limits. There is no EPA approved continuous emission monitor for particulate matter and compliance with the particulate matter pound per hour limit must be demonstrated using a labor intensive manual source test method. Particulate emissions from natural gas combustion are lower on mass per unit fuel consumed basis than for any other fossil fuel (oil, coal, etc.).

### SO<sub>2</sub> Sources

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs, S-47 Diesel Fire Pump	BAAQMD 9-1-301	Ground level concentrations of SO <sub>2</sub> shall not exceed: 0.5 ppm for 3 consecutive minutes AND 0.25 ppm averaged over 60 consecutive minutes AND 0.05 ppm averaged over 24 hours	None
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD 9-1-302	300 ppm (dry)	None
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	NSPS 40 CFR 60.43Da (b)(2)	0.2 lb/MM BTU, 24 hr average except during startup, or shutdown	None
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	NSPS 40 CFR 60.333	0.015% (vol) @15% O <sub>2</sub> (dry) or total sulfur content of fuel less than or equal to 0.8% sulfur by weight (8,000 ppmw)	Monthly fuel sulfur analysis
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 44	Fuel sulfur content of 1 gr/100 scf	Fuel testing
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, CD-4	Fuel sulfur content of 1 gr/100 scf	Fuel testing
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 20g	6.18 lb/hr, for turbine and HRSG combined	Source test at maximum load

### SO<sub>2</sub> Sources

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 20g	0.0028 lb/MM BTU, for turbine and HRSG combined	Source test at maximum load
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 23e	297 lb/day for turbines and HRSGs combined	Records, calculations
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs, S-47 Fire Pump Diesel Engine	BAAQMD condition #18138, part 24e	48.5 ton/yr for turbines and HRSGs combined (includes emissions from commissioning period)	Records, calculations
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs	BAAQMD condition #18138, part CD-3	18.5 ton/yr for turbines and HRSGs combined (includes emissions from commissioning period)	Records, calculations
S-47 Diesel Fire Pump	BAAQMD 9-1-304	Fuel Sulfur Limit 0.5%	Vendor Certification

#### **SO<sub>2</sub> Discussion:**

##### BAAQMD Regulation 9-1-301

Area monitoring to demonstrate compliance with the ground level SO<sub>2</sub> concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). This facility does not have equipment that emits large amounts of SO<sub>2</sub> and therefore is not required to have ground level monitoring by the APCO.

All facility combustion sources are subject to the SO<sub>2</sub> emission limitations in District Regulation 9, Rule 1 (ground-level concentration and emission point concentration). In EPA's June 24, 1999 agreement with CAPCOA and ARB, "Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", EPA has agreed that natural-gas-fired combustion sources do not need additional monitoring to verify compliance with Regulation 9, Rule 1, since violations of the regulation are unlikely. Therefore, no monitoring is necessary for this requirement.

##### NSPS 40 CFR 60.43Da(b)(2)

The sulfur content of the natural gas is limited by Condition No. 18138 part 44 to 1.0 grain per 100 scf which corresponds to 0.0028 lb/MMBtu. Therefore, the facility meets the sulfur limit contained in 40 CFR 60.43Da(b)(2) of 0.2 lb/MMBtu and no additional monitoring is necessary to demonstrate compliance with this limit.

##### NSPS 40 CFR 60.333



This federal regulation requires that the total sulfur content of fuel used at the gas turbines be less than or equal to 0.8% sulfur by weight (8,000 ppmw). The natural gas combusted at the facility is pipeline quality. PG&E Gas Rule 21, Section C specifies a maximum total sulfur content of less than 1.0 grains of sulfur per 100 scf, which is equivalent to 17 ppmw<sup>2</sup>. The maximum grain loading in pipeline natural gas is several orders of magnitude less than 8,000 ppmw. Therefore, no monitoring is required to ensure compliance with this limit.

#### Permit Limit of 1 grain per 100 scf

The District Condition 18183 parts 44 and CD-4 limit the sulfur content of the fuel to 1 grain per 100 scf. The facility combusts PG&E gas that is required to meet PG&E Gas Rule 21, which specifies a maximum total sulfur content of less than 1 grain per 100 scf. The facility also monitors the sulfur content of the fuel monthly to ensure that the limit of 1 grain per 100 scf is not exceeded. According to the PG&E California Gas Transmission Pipe Ranger website ([http://www.pge.com/pipeline/operations/sulfur/sulfur\\_info.shtml](http://www.pge.com/pipeline/operations/sulfur/sulfur_info.shtml)) the average sulfur content in the PG&E system is well below 0.25 grains per 100 scf for the last several years. The maximum sulfur content observed in the PG&E system was 0.68 grains per 100 scf for the last several years. Monthly monitoring is adequate to demonstrate compliance with this limit.

#### Maximum Hourly, Daily, and Annual Mass Emissions

Condition 18138 part 20g limits the SO<sub>2</sub> maximum hourly emissions to 6.18 lb/hour and 0.0028 lb/MMBtu. Condition 18138 part 23e limits the SO<sub>2</sub> daily emissions from the gas turbines and HRSGs combined to 297 lb/day. Condition 18138 part 24e limits the SO<sub>2</sub> annual emissions from the gas turbines/HRSGs and the diesel fire pump to 48.5 tons per year. Condition 18138 part CD-3 limits the SO<sub>2</sub> annual emissions to 18.5 tons per year.

The monthly sulfur fuel analysis data is used to calculate the gas turbines/HRSGs SO<sub>2</sub> emissions on an hourly, daily, monthly, and annual basis.

The diesel fire pump combusts ARB diesel exclusively which is limited to 15 ppm sulfur. The SO<sub>2</sub> emissions from the diesel fire pump are estimated using the maximum sulfur content of the fuel to develop an emissions factor per bhp-hr and the hours of operation.

In addition, the gas turbines/HRSGs are source tested on an annual basis to demonstrate compliance with the hourly limit and the lb/MMBtu limit.

The monthly sulfur fuel analysis data and corresponding emission calculations are adequate to demonstrate compliance with all of the SO<sub>2</sub> mass limits. SO<sub>2</sub> emissions from natural gas combustion are extremely low when compared to other fossil fuels on a mass per unit fuel combusted basis. The concentration in the gas turbine/HRSG exhaust is less than one ppm by volume. At these low concentrations measuring the sulfur content of the fuel is more accurate than measuring the SO<sub>2</sub> concentration at the stack with a continuous emission monitor.

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<sup>2</sup> See PG&E Natural Gas Rule 21, Section C at: [http://www.pge.com/pipeline/operations/sulfur/sulfur\\_info.shtml](http://www.pge.com/pipeline/operations/sulfur/sulfur_info.shtml).

**POC Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 20f	5.6 lb/hr (as CH4) for each turbine, and HRSG combined except during turbine startup, shutdown, or steam turbine cold start-up	Annual source test at maximum load
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 20f	0.0025 lb/MM BTU (as CH4) for each turbine, and HRSG combined except during turbine startup, shutdown, or steam turbine cold start-up	Annual source test at maximum load
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 21	26 lb/turbine during start-up	Records, calculations
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 21	6 lb/turbine during shutdown	Records, calculations
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 21	109 lb/turbine during steam turbine cold start-up	Records, calculations
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, part 23c	468 lb/day (as CH4) for turbines and HRSGs combined	Records, calculations
S-41, S-43 Gas Turbines, S-42, S-44, HRSGs, S-47 Fire Pump Diesel Engine	BAAQMD condition #18138, part 24c	46.6 ton/yr for turbines, HRSGs, and diesel fire pump combined (includes emissions from commissioning period)	Records, calculations

**POC Discussion:**

**Maximum Hourly, Daily, and Annual Mass Emissions**

Precursor organic compound (POC) emissions from each gas turbine shall not exceed 5.6 lb/hr or 0.0025 lb/MMBtu, except during periods of startup and shutdown as defined in this permit. BAAQMD Permit Condition 23c also limits POC emissions from each gas turbine to 468 lbs/day. BAAQMD Permit Condition 24c also limits POC emissions from each gas turbine to 46.6 tons/year. The gas turbines and HRSGs are required to be source tested on an annual basis for POC. The annual source test results are used to develop emission factors on a lb POC per MMBtu basis. The POC emission factors and the fuel usage data allow the facility to calculate particulate emissions on an hourly, daily, monthly, and annual basis.

The emissions during a cold startup, startup, shutdown were measured during the initial source testing conducted on the gas turbine/HRSGs. These source test results were used to develop emission factors on a pound per MMBtu basis. These emission factors and the number of startup and shutdown events are used to estimate emissions on a daily, monthly, and annual basis.

POC emissions from the diesel fire pump are based on the ARB emissions certification and the hours of operation. The POC emissions from the diesel fire pump are calculated on a monthly and annual basis.

The use of source test derived emission factors and fuel usage data is adequate to demonstrate compliance with the POC mass limits and mass per unit fuel fired limits. The concentration of POC in the turbine exhaust when the gas turbine is in compliance with permit limits is less than 2 ppmvd @15% O<sub>2</sub>. POC continuous emission monitors are not as reliable as monitors for other pollutants such as NO<sub>x</sub> and CO. POC emissions from the gas turbines/HRSGs are abated by the use of an oxidation catalyst. The POC emissions from the gas turbines/HRSGs are not monitored continuously. However, the CO continuous emission monitor serves as a good indicator that the oxidation catalyst is functioning properly and that POC emissions are not at an elevated level. If the dry Low NO<sub>x</sub> combustor in the gas turbine or the duct burner was malfunctioning and emitting large amounts of POC it is likely that the CO emissions would also be at an elevated level.

### **NH<sub>3</sub> Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Enforceable Emission Limit</b>	<b>Monitoring</b>
S-41, S-43 Gas Turbines, S-42, S-44 HRSGs	BAAQMD condition #18138, Part 20e	5 ppmv, @ 15% O <sub>2</sub> , dry, averaged over 3 hrs for each turbine and HRSG combined except during turbine startup or shutdown	Ammonia injection rate monitor and annual source test

### **NH<sub>3</sub> Discussion:**

#### Maximum Concentration Limits

Ammonia (NH<sub>3</sub>) emissions from each gas turbine shall not exceed 5 ppmvd @ 15% O<sub>2</sub>, except during periods of startup and shutdown as defined in this permit. The NH<sub>3</sub> monitoring is based on the source test and NH<sub>3</sub> to NO<sub>x</sub> ratio at the inlet to SCR.

Condition 18143 did not require annual source testing for ammonia. The District has determined that additional source testing for ammonia is required to demonstrate compliance. The District has added part AM-1 to condition 18143 to require ammonia testing on an annual basis. This testing will demonstrate compliance with the ammonia slip limit and be used to update the ammonia slip calculation and correction factor.

The annual source test and ongoing monitoring of the ammonia injection rate is adequate to ensure compliance with the ammonia permit limits. There is no EPA approved ammonia continuous emission monitor available with appropriate quality assurance/quality control protocols.

**HAP Sources**  
S-41, S-42, S-43, S-44,  
Gas Turbines/HRSGs

<b>HAP</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
Formaldehyde	BAAQMD condition #18138 part 25.1	4,102 pounds/year for all turbines and HRSGs combined	Source Test at Startup and biennial thereafter
Benzene	BAAQMD condition #18138 part 25.1	506 pounds/year for all turbines and HRSGs combined	Source Test at Startup and biennial thereafter
Specified PAH's	BAAQMD condition #18138 part 25.1	38 pounds/year for all turbines and HRSGs combined	Source Test at Startup and biennial thereafter
Hexane	BAAQMD condition #18138 part 25.2	20,000 pounds/year for all turbines combined	Source Test at Startup and biennial thereafter

**Hazardous Air Pollutant (HAP) Discussion:**

**BAAQMD Regulation 2, Rule 5**

Emissions of formaldehyde, benzene, specified PAH's, and hexane are source tested within 60 days of startup and biennially thereafter. If three consecutive biennial tests demonstrate that the emissions are less than the respective threshold levels in BAAQMD condition #18138 part 32, future testing for that pollutant may be discontinued.

The biennial source testing for HAP is adequate to ensure compliance with permit limits. There are no continuous emission monitors available to monitor toxic air contaminants and hazardous air pollutants. The gas turbines/HRSGs are abated by an oxidation catalyst which abates organic HAP. The catalyst also abated CO emissions from the gas turbines/HRSGs. The CO continuous emission monitor is a good indicator that the oxidation catalyst is functioning properly and that organic emissions are low. Elevated organic emissions would typically correspond to elevated CO emissions.

**VIII. Test Methods**

Section VIII of the Title V 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” as defined by Regulation 2-6-202.

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

## **IX. Acid Rain**

The facility is subject to the Acid Rain Permit requirements of 40 CFR Part 72 because it is a utility unit as defined by 40 CFR 72.5. The facility is a Phase II Acid Rain Facility pursuant to Regulation 2, Rule 6, Section 217. Pursuant to 40 CFR 72.9(c)(i), the facility must hold SO<sub>2</sub> allowances for each emission unit in an amount not less than the total annual SO<sub>2</sub> emissions from the unit for the previous calendar year.

The Acid Rain permit for the Gateway Generating Station is contained in section IX of the Title V permit. The Acid Rain Permit Application is attached to the permit in Section XIII.

## **X. Permit Shield**

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a Title V 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 Title V 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. Streamlining is the practice of employing the most stringent monitoring, recordkeeping, or reporting requirement when multiple requirements apply to a given source.

This facility has no permit shields.

This permit has no streamlining.

## **XI. Revision History**

This section will contain the details the revision history of the facility's Title V permit. The section has a placeholder for the initial Title V permit issuance.

## **XII. Glossary**

A glossary of terms used in the Title V permit is provided in Section XI of the permit.

## **XIII Title IV Permit Application**

The Acid Rain permit application for the facility is part of the Title V permit and is included here.

## **D. Alternate Operating Scenarios**

No alternate operating scenario has been requested for this facility.

**E. Compliance Status**

No ongoing non-compliance issues have been identified to date.

## **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 rule or regulation that gives the District authority to impose requirements

**CAA**

The federal Clean Air Act

**CAAQS**

California Ambient Air Quality Standards

**CAPCOA**

California Air Pollution Control Officers Association

**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.

**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.

**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

**PM10**

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.

**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**

### **BAAQMD Compliance Report**

**COMPLIANCE & ENFORCEMENT DIVISION**

**Inter-Office Memorandum**

**April 15, 2013**

TO: JIM KARAS – DIRECTOR OF ENGINEERING *J. Karas*

FROM: WAYNE KINO – DIRECTOR OF COMPLIANCE & ENFORCEMENT *W. Kino*

SUBJECT: REVIEW OF COMPLIANCE RECORD OF:

**GATEWAY GENERATING STATION, LLC; B8143**

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**Background**

This review was initiated as part of the District evaluation of an application by GATEWAY GENERATING STATION, LLC for a Title V Permit. The review is to ensure that any non-compliance problems identified, have been adequately addressed, or, if non-compliance persists, that a schedule of compliance is properly incorporated into the Title V permit. In addition the Compliance and Enforcement Division, checks for patterns of recurring violation that may be addressed by additional permit terms to improve compliance.

GATEWAY GENERATING STATION, LLC is a power generation facility using natural-gas to fire two Combustion Turbine Generators. Continuous Emission Monitors are in place to measure applicable pollutants.

**Compliance Review**

Compliance records were reviewed for the time period from November 2008 through April 2013. The results of this review are summarized as follows.

**1. Violation History**

Staff reviewed GATEWAY GENERATING STATION, LLC Annual Compliance Certifications and found no ongoing non-compliance and no recurring pattern of violations.

Staff also reviewed the District compliance records for the review period. During this period GATEWAY GENERATING STATION, LLC activities known to the District include:

District-issued 2 Notice of Violation(s):

**Gateway Generating Station – SITE #B8143**

Date 4/15/13

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NOV#	Regulation	Date Occur	# of Days	Comments	Disposition
A49323	2-1-301	5/13/2008	1	Installation of fire pump w/o authority to construct	Resolved 9/1/2010
A49324	2-1-307	3/16/2009	1	NOx CEM excess >2.5ppm @15% O2	Resolved 7/14/2011

**2. Complaint History**

The District received 1 air pollution complaint alleging GATEWAY GENERATING STATION, LLC as the source.

**3. Reportable Compliance Activity**

Reportable Compliance Activity (RCA), also known as "Episode" reporting, is the reporting of compliance activities involving a facility as outlined in District Regulations and State Law. Reporting covers breakdown requests, indicated monitor excesses, pressure relief device releases, inoperative monitor reports and flare monitoring.

Within the review period, the District received 12 notifications for RCA's. 1 NOV was issued as a result of these RCA's.

The District received 12 notifications for Reportable Compliance Activities (RCA).

Episode	Date Occur	# of Days	Comments	Disposition
05K65	1/15/2009	1	NOx hourly limit Excess	No Excess/No Action
05K75	1/17/2009	3	Thermo Electron Model 42I-LS Breakdown	No Action
05K76	1/17/2009	3	NOx hourly limit Excess	No Excess/No Action
05L38	3/16/2009	1	Parametric NOx monitor Breakdown	Issued NOV #A49324
05L39	3/16/2009	1	NOx hourly limit Excess	Issued NOV #A49324
05N16	7/10/2009	1	Thermo Electron Breakdown	No Action
05N40	7/9/2009	2	Inoperative Monitor	No Action
05N64	8/7/2009	1	DAHS Software Collection Breakdown	Breakdown Relief Granted
05N65	8/7/2009	1	NOx hourly limit Excess	No Action
05Q83	12/5/2009	2	Inoperative CEM	No Action
05Q84	12/5/2009	2	Inoperative CEM	No Action
05U94	7/12/2010	1	Ammonia Forwarding System Breakdown	No Action

**Gateway Generating Station – SITE #B8143**

Date 4/15/13

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**4. Enforcement Agreements, Variances, or Abatement Orders**

Gateway Generating Station operated under a compliance agreement between May 1, 2009 and September 13, 2011. The need for the compliance agreement was related to EPA's federal enforcement lawsuit involving violations of federal PSD permitting requirements, which was resolved with a Consent Decree entered by the federal district court on March 3, 2011. Because of EPA's claims that Gateway was in violation of federal PSD requirements, the District was not able to issue a permit to operate for the facility pursuant to District Regulation 2-1-304, which prohibits issuance of a permit for any facility that may be in violation of any District, state or federal air quality regulatory requirement. Regulation 2-1-304 prohibited issuance of a District permit to operate for the Gateway Generating Station until the outstanding federal PSD violation was resolved. The District entered into a compliance agreement to allow the facility to continue operating without a permit while Gateway was working to resolve the issue with EPA, in part because the facility was not in violation of any District regulations (other than not having received a permit because of Regulation 2-1-304), and also because EPA was continuing to allow the facility to operate while the outstanding federal PSD violation was resolved. The facility operated without a District permit under this compliance agreement from May 1, 2009, through September 13, 2011, when EPA had finally resolved the PSD violations and the District was able to issue the permit to operate consistent with Regulation 2-1-304.

Gateway Generating Station also operated a backup firepump engine during part of this period under a compliance agreement that arose out of a settlement of NOV 49323. That NOV was issued because the facility did not install the correct type of engine, in violation of its permit requirements. As part of the settlement, the facility agreed to install a new, compliant firepump engine. Under the settlement agreement and a subsequent compliance agreement, the District allowed the facility to continue operating the original, non-compliant firepump engine while it was obtaining and installing the compliant replacement. The District also allowed the facility to install the new replacement engine without a formal authority to construct, as the District was prohibited from issuing any permits for the facility while the PSD violations were being resolved because of Regulation 2-1-304, as discussed above. The firepump replacement issue was eventually rolled into the overall facility compliance agreement, so that there was a single compliance agreement that authorized both operation of the facility as a whole and the firepump replacement project. All of these issues were finally resolved on September 13, 2011 when the District was finally able to issue a permit for the facility after the outstanding federal PSD non-compliance issues were resolved.

There were no variances or abatement orders for GATEWAY GENERATING STATION, LLC over the review period.



**Gateway Generating Station – SITE #B8143**

Date 4/15/13

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**Conclusion**

Following its review of all available facility and District compliance records from November 2008 through April 2013, the District's Compliance and Enforcement Division has determined that GATEWAY GENERATING STATION, LLC was in intermittent compliance from the initial permit period through the present. GATEWAY GENERATING STATION, LLC has demonstrated no evidence of ongoing noncompliance and no recurring pattern of violations that would warrant consideration of a Title V permit compliance schedule for this facility.

Based on this review and analysis of all the violations for the review period, the District has concluded that no schedule of compliance or change in permit terms is necessary beyond what is already contained in the facility's current Title V permit.

RJS 4/15/13

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## **APPENDIX C**

### **Potential to Emit for Natural Gas Fired Dew Point Heater S-45**

Gateway Generating Station  
BAAQMD November 2011

Exempt Dewpoint Heater

Maximum Firing Rate = 6.5 MMBtu/hour, 56,940 MMBtu/year  
Maximum Hours = 8760 for Heater

Emissions One Unit

	Firing Rate	EF	EF	Emissions	Emissions	Emissions	Emissions
	MMBtu/hour	ppmvd@3%O2	lb/MMBtu	lb/hour	lb/day	lb/year	ton/year
NOx	6.5	50	6.10E-02	3.97E-01	9.52E+00	3.47E+03	1.74E+00
CO	6.5	40	2.95E-02	1.92E-01	4.60E+00	1.68E+03	8.40E-01
POC	6.5	5.5	2.32E-03	1.51E-02	3.62E-01	1.32E+02	6.61E-02
PM10	6.5		0.0074	4.81E-02	1.15E+00	4.21E+02	2.11E-01
SO2	6.5		0.0028	1.82E-02	4.37E-01	1.59E+02	7.97E-02

Notes: Emissions in lb/hour based upon vendor specifications for NOx, CO, and POC. PM from AP-42 Section 1-4.  
SO2 estimated from worst case sulfur content of natural gas (1 gr/100 scf).

## **APPENDIX D**

### **Potential to Emit for Gas Turbines/HRSGS for Toxic Air Contaminants from Final Determination of Compliance**

Table 2 below is from the original Final Determination of Compliance for the project.

**Table 2** is a summary of the maximum facility toxic air contaminant (TAC) emissions from new sources. These emissions are used as input data for air pollutant dispersion models used to assess the increased health risk to the public resulting from the project. The ammonia emissions shown are based upon a worst-case ammonia emission concentration of 10 ppmvd @ 15% O<sub>2</sub> due to ammonia slip from the A-11 and A-13 SCR Systems.

**Table 2**  
**Maximum Facility Toxic Air Contaminant (TAC) Emissions**

Toxic Air Contaminant	Pounds/year	Risk Screening Trigger Level <sup>a</sup> (lb./yr-source)
<b>S-41, S-42, S-43, and S-44 Combined</b>		
Acetaldehyde <sup>b</sup>	2558	72
Acrolein	884	3.9
Ammonia <sup>c</sup>	518,242	19,300
Benzene <sup>b</sup>	506	6.7
1,3-Butadiene <sup>b</sup>	4	1.1
Ethylbenzene	670	193,000
Formaldehyde <sup>b</sup>	4102	33
Hexane	20,000	83,000
Naphthalene	62	270
PAHs <sup>b</sup>	38	0.043
Propylene	39,214	none specified
Propylene Oxide <sup>b</sup>	1780	52
Toluene	2706	38,600
Xylenes	1078	57,900
<b>Cooling Tower Emissions, S-46<sup>d</sup></b>		
Arsenic <sup>b</sup>	0.016	0.024
Beryllium	0.041	0.014
Cadmium <sup>b</sup>	0.00010	0.046
Chromium VI <sup>b</sup>	0.018	0.0014
Copper	0.024	463
Lead <sup>b</sup>	0.003	16
Manganese	0.15	77
Mercury	0.00007	57.9
Nickel	0.023	73
Selenium	0.002	97
Zinc	0.017	6,760
<b>Fuel Pre-Heater, S-45</b>		
Acetaldehyde <sup>b</sup>	0.025	72
Arsenic	0.00056	0.024

Toxic Air Contaminant	Pounds/year	Risk Screening Trigger Level <sup>a</sup> (lb./yr-source)
Benzene	0.025	6.7
Beryllium	3.37E-5	0.014
Cadmium <sup>b</sup>	0.0031	0.046
Chromium VI <sup>b</sup>	0.040	0.0014
Copper	0.0024	463
Formaldehyde	0.624	33
Hexane	5.08	83,000
Manganese	0.0011	77
Mercury	0.0007	57.9
Naphthalene	0.0017	270
Nickel	0.006	73
PAHs, Total	0.00005	0.043
Selenium	0.00005	97
Toluene	0.0097	38,600
Zinc	0.082	6,760

<sup>a</sup>pursuant to BAAQMD Toxic Risk Management Policy

<sup>b</sup>carcinogenic compound

<sup>c</sup>based upon the worst-case ammonia slip of 10 ppmvd @ 15% O<sub>2</sub> from the A-11 and A-13 SCR systems with ammonia injection

<sup>d</sup>based on San Joaquin River water analysis and cooling tower drift rate.

Table A-2 is from Appendix A of the Final Determination of Compliance.

### Toxic Air Contaminants

The following toxic air contaminant emission factors were used to calculate worst-case emissions rates used for air pollutant dispersion models that estimate the resulting increased health risk to the maximally exposed population. To ensure that the risk is properly assessed, the emission factors are conservative and may overestimate actual emissions.

**Table A-2  
TAC Emission Factors<sup>a</sup> for Gas Turbines and HRSG Duct Burners**

Contaminant	Emission Factor (lb/MM scf)
Acetaldehyde <sup>c</sup>	6.86E-02
Acrolein	2.37E-03
Ammonia <sup>b</sup>	13.7

Benzene <sup>c</sup>	1.36E-02
1,3-Butadiene <sup>c</sup>	1.27E-04
Ethylbenzene	1.8E-02
Formaldehyde <sup>c</sup>	1.10E-01
Hexane	1.75
Naphthalene	1.7E-03
PAHs <sup>c</sup>	1.0E-03
Propylene	1.05
Propylene Oxide <sup>c</sup>	4.78E-02
Toluene	7.26E-02
Xylene	2.89E-02

<sup>a</sup>California Air Toxics Emission Factors (CATEF) Database as compiled by California Air Resources Board under the Air Toxics Hotspot Program or Ventura County APCD (VCAPCD, 1995).

<sup>b</sup>based upon maximum allowable ammonia slip of 10 ppmv, dry @ 15% O<sub>2</sub> for A-11 and A-13 SCR Systems

<sup>c</sup>carcinogenic compound

Hexane, in particular, is overstated because the source tests this emission factor was derived from are from three gas turbines that were tested in Ventura County in 1994. A review of these tests disclosed that in all cases Hexane was non-detect (below the instrument range). The emission factor was apparently calculated assuming the detection limit as the concentration. This is a very conservative approach and can be expected to overstate the emissions. The permitting implication is that the annual hexane emissions in Table B-6 are shown to be 33 tons/year, above the federal MACT trigger of 10 tons/year. The applicant is confident hexane emissions are less than 10 tons/year and has agreed to a Permit Condition with that limit. The level of hexane emissions will be verified by source test.

It should be noted that the ammonia emission factor shown here is twice what is expected because it is based on the originally proposed concentration of 10 ppmvd and the applicant has agreed to operate with an ammonia concentration no more than 5 ppmvd.

Comments on the Information from the Final Determination of Compliance

Please note that the cooling tower was never built. The fuel preheater was planned to be 12 MMBtu/hour and the unit that was installed is 6.5 MMBtu/hour. The emissions in Table 2 for the fuel preheater 46% higher than the actual PTE for the fuel preheater. The ammonia slip limit was reduced from 10 ppmvd to 5 ppmvd. The diesel fire pump HAP emissions are shown in Appendix D.

## **APPENDIX E**

### **Potential to Emit for Fire Pump for Toxic Air Contaminants**



Permit Evaluation and Statement of Basis: Site B8143, Gateway Generating Station, LLC, 3225 Wilbur Avenue, Antioch, CA 94509

Gateway Generating Station  
 BAAQMD November 2011  
 Diesel Fire Pump TAC Emissions

Maximum Hourly Fuel Usage 16.8 gallons per hour  
 Maximum Annual Fuel Usage 8,400 gallons per year based on 500 hours/year of operation

Emission Factors from the ARB CATEF Database (<http://www.arb.ca.gov/ei/catef/catef.htm>)

HAPs from CATEF

SOURCEID	SYSTEM	MATERIAL	SCC	TYPE	DESCRIPTION	CAS	SUBSTANCE	MEAN	UNIT	Annual HAP Emissions
3246	Internal Combustion Engine	Diesel	20200102	None	O2>13%	106-99-0	1,3-Butadiene	5.41E-03	lbs/Mgal	4.54E-02 lb/year
3251	Internal Combustion Engine	Diesel	20200102	None	O2>13%	75-07-0	Acetaldehyde	1.07E-01	lbs/Mgal	8.99E-01 lb/year
3252	Internal Combustion Engine	Diesel	20200102	None	O2>13%	107-02-8	Acrolein	1.30E-02	lbs/Mgal	1.09E-01 lb/year
3256	Internal Combustion Engine	Diesel	20200102	None	O2>13%	71-43-2	Benzene	1.22E-01	lbs/Mgal	1.02E+00 lb/year
3220	Internal Combustion Engine	Diesel	20100102	None	O2>13%	50-32-8	Benzo(a)pyrene	3.35E-03	lbs/Mgal	2.81E-02 lb/year
3222	Internal Combustion Engine	Diesel	20100102	None	O2>13%	205-99-2	Benzo(b)fluoranthene	6.70E-03	lbs/Mgal	5.63E-02 lb/year
3226	Internal Combustion Engine	Diesel	20100102	None	O2>13%	207-08-9	Benzo(k)fluoranthene	6.70E-03	lbs/Mgal	5.63E-02 lb/year
3227	Internal Combustion Engine	Diesel	20100102	None	O2>13%	218-01-9	Chrysene	3.58E-03	lbs/Mgal	3.01E-02 lb/year
3229	Internal Combustion Engine	Diesel	20100102	None	O2>13%	53-70-3	Dibenz(a,h)anthracene	3.49E-03	lbs/Mgal	2.93E-02 lb/year
3235	Internal Combustion Engine	Diesel	20100102	None	O2>13%	50-00-0	Formaldehyde	1.11E+00	lbs/Mgal	9.32E+00 lb/year
3238	Internal Combustion Engine	Diesel	20100102	None	O2>13%	193-39-5	Indeno(1,2,3-cd)pyrene	3.46E-03	lbs/Mgal	2.91E-02 lb/year
3240	Internal Combustion Engine	Diesel	20100102	None	O2>13%	91-20-3	Naphthalene	5.64E-02	lbs/Mgal	4.74E-01 lb/year
3286	Internal Combustion Engine	Diesel	20200102	None	O2>13%	108-88-3	Toluene	5.50E-02	lbs/Mgal	4.62E-01 lb/year
3289	Internal Combustion Engine	Diesel	20200102	None	O2>13%	1330-20-7	Xylene (Total)	3.59E-02	lbs/Mgal	3.02E-01 lb/year
									Total	1.29E+01 lb/year

Emissions of Diesel Particulate Matter

Diesel Particulate Matter lb/year = 311 bhp x 500 hours/year x 0.1193 g/bhp-hr x lb/453.59 g = 40.9 lb/year