

Bay Area Air Quality Management District

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Permit Evaluation and Statement of Basis for Initial

MAJOR FACILITY REVIEW PERMIT

for
Russell City Energy Company, LLC
Facility #B8136

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Title V Statement of Basis

This document is the Statement of Basis for a Title V Operating Permit that the Bay Area Air Quality Management District (BAAQMD or Air District) is proposing for the Russell City Energy Center in Hayward, California. The Statement of Basis documents the reasoning and analysis underlying the Air District's proposal to issue this Title V Operating Permit. The Statement of Basis also provides background information for interested members of the public about the facility, about the Title V Operating Permit requirements, and about how the Air District's proposal conforms to the applicable regulatory requirements governing Title V permits.

In addition, as the Air District is currently at the proposal stage with respect to issuing a Title V Operating Permit for the Russell City Energy Center, the Statement of Basis provides members of the public with information about the proposal so that they can inform themselves and submit comments if they desire. Interested members of the public are invited to do so, and more information about how to submit comments is provided in the public notice being published concurrently with this Statement of Basis.

This Statement of Basis should be read in conjunction with the proposed Title V Operating Permit, which is being published along with this document. The Statement of Basis provides further information to explain what is included in the permit and why. The Statement of Basis starts with background information on the Title V Operating Permit program (in Section A), and on the Russell City Energy Center facility (in Section B). This information is followed by a detailed description of all of the elements set forth in the permit (in Section C), with a section-by-section discussion of the information provided in each section of the permit. The Statement of Basis also addresses any potential alternate operating scenarios (in Section D), although that section is not directly relevant for this permit because there are no such alternate operating scenarios for the Russell City facility. Finally, the Statement of Basis also summarizes the facility's compliance status (in Section E); as explained in that section, the facility is currently in compliance with applicable regulatory requirements.

A. BACKGROUND

The Air District is proposing to issue a Title V Operating Permit for the Russell City Energy Center, a natural gas-fired power plant located in Hayward, California. 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 Russell City Energy Center is **B8136**.

The Title V Operating Permit is not a pre-construction approval that the facility needs to obtain in order for it to be sited or constructed. The facility has already obtained all such approvals, which included a license from the California Energy Commission, an Authority to Construct and Permit to Operate from the Air District, and a federal Prevention of Significant Deterioration required under the regulations of the US Environmental Protection Agency, all of which imposed stringent requirements to ensure that the facility complies with applicable clean air regulatory requirements. Based on the authorizations provided in those approvals, the facility's owner, the Russell City Energy Company, LLC, constructed the facility and has been operating it since 2013.

The purpose of the Title V Operating Permit is to consolidate all of the various requirements set forth in the all of the facility's pre-construction permitting documents, as well all other requirements applicable under various air quality laws and regulations, and to set them forth in a single document to make it easier for all involved to understand exactly what requirements apply to the facility. Doing so improves transparency, promotes compliance and aids in enforcement, as it makes clear to the facility operators, to Air District inspectors, and to interested members of the public all of the various regulatory requirements that apply to the facility. Accordingly, the Title V Operating Permit does not impose any new substantive requirements to limit the facility's air emissions. Instead, the function of the Title V permit is to collect all of the existing substantive requirements imposed by other authorities into a single, comprehensive, public document. The Title V permit also ensures that there are sufficient measures in place to make sure that the facility will maintain compliance with all such requirements, including monitoring, reporting and recordkeeping requirements.

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 Russell City Energy Center is subject to Title V permitting requirements 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 each of NO_x and CO. 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 SO₂ allowance for each ton of SO₂ that is emitted, stringent monitoring requirements for NO_x, CO₂, and SO₂, 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.

Title V Permit Time Line for the Russell City Energy Center

This facility submitted its initial Title V permit application on August 11, 2015.

B. FACILITY DESCRIPTION

The Russell City Energy Center is a combined-cycle cogeneration power generation facility capable of producing a nominal electrical output of 600 MW. The California Energy Commission (CEC) issued a license for the facility on October 2, 2007¹. The Air District issued the Authority to Construct authorizing construction under the Air District's regulations on November 1, 2007, and subsequently issued a federal Prevention of Significant Deterioration permit authorizing construction under the US Environmental Protection Agency's regulations on February 3, 2010. The facility began construction in the summer of 2011 and was completed in 2013. The facility was online and selling electricity to the grid in August of 2013.

The Russell City Energy Center 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.

The actual emissions of criteria pollutants from the plant for calendar year 2014 are shown below.

Year	NO_x (tons/year)	CO (tons/year)	POC (tons/year)	PM₁₀ (tons/year)	SO_x (tons/year)
2014	51.1	57.0	1.5	22.6	1.5

¹ Information on the CEC licensing documents is available at the CEC website.

C. PERMIT CONTENT

This section of the Statement of Basis describes each of the elements of the Title V permit and the legal and factual basis for them. 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" and "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 a significant amount of air 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-2).

The Russel City Energy Center consists of six permitted sources (S-1 and S-3 Gas Turbines, S-2 & S-4 HRSGs, S-5 Cooling Tower, and S-6 Fire Pump Diesel Engine). The facility also has seven exempt sources (S-7 through S-11 Circuit Breakers), which are not "significant" sources because they do not have the potential to emit air pollutants at levels above the thresholds outlined in the preceding paragraph.

The permitted sources are listed in Table II A in the Title V permit. 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 or reduce emissions from a source. Each abatement device whose function is to reduce emissions is identified by an A and a number (e.g., A-2). Some of the abatement devices at this facility are also sources of secondary emissions (i.e., the Selective Catalytic Reduction (SCR) systems, which use ammonia to reduce NOx emissions and emit a small amount of ammonia that is not consumed during the reduction of NOx emissions. Since the primary function of these devices is to control emissions, they are considered abatement (or "A") devices. This designation distinguishes them from devices whose primary function is not to control or reduce emissions. These are referred to as sources and are designated with an "S" number.

The Russell City Energy Center has four abatement devices (A-1 through A-4) that control emissions from the facility's two combustion gas turbines (S-1 and S-3) and two heat recovery steam generators (HRSGs S-2 and S-4). The abatement devices are listed in Table II B of the Title V permit.

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.

IV. Source-Specific Applicable Requirements

Section IV of the Title V permit contains four tables (Tables IV-A through IV-D) that list all of the "applicable requirements" that apply to this facility's permitted sources. "Applicable requirements" are all air quality related regulatory requirements imposed on the facility by District, state and federal regulations and/or specific permit conditions. Applicable requirements also include monitoring requirements (monitoring is discussed in further detail in Section C.VII of this permit evaluation and statement of basis). These tables provide a comprehensive picture of all of the various legal requirements that the facility is subject to. For each requirement, the tables list the regulatory citation for the requirement (i.e., the specific regulation that contains the requirement); the title of the regulation (or a brief description of what the regulation requires); an

indication of whether the requirement is federally enforceable or not; and in cases where the requirement is not yet effective, the date upon which it will take effect.

Tables IV-A through IV-D 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 District 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

With respect to some of the more complex regulatory requirements, the following evaluations document why certain regulations do or do not apply to this facility. This discussion provides the basis for why these regulations are or are not included in Tables IV-A through IV-D.

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 section 112(j) of the Clean Air Act because its potential to emit (PTE) for hazardous air pollutants (HAPs) is less than the major source thresholds of 10 tons per single HAP or 25 tons of any combination of HAPs. The facility PTE for HAPs from the Final Determination of Compliance (FDOC) for the project can be found in Tables B-1 and B-2 of Appendix B.

Therefore, 40 CFR 63, Subpart YYYYY, NESHAP for Stationary Combustion Turbines does not apply to S-1 and S-3 Gas Turbines.

Compliance Assurance Monitoring (CAM) – 40 CFR Part 64

The potential to emit NO_x and CO is each greater than 100 tons/year for each combined pair of gas turbines and heat recovery steam generators.

The gas turbines are exempt from CAM requirements for NO_x 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 used to monitor the emissions from each gas turbine/HRSG power train combined stack meet the federal definition of “continuous compliance determination method”.

40 CFR Part 60, Subpart Da - Standards of Performance for Electric Utility Steam Generating Units

Because the natural gas fired heat recovery steam generators each have a heat input rating of less than 250 MM BTU/hour (each is rated at 200 MM BTU/hour) they are not subject to Subpart Da per §60.40Da(e)(1).

40 CFR Part 60, Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

The natural gas fired heat recovery steam generators are exempt from the requirements of Subpart Db pursuant to 40 CFR Subpart KKKK, section 60.4305(b) because they are subject to the requirements of Subpart KKKK pursuant to 60.4305(a).

40 CFR Part 60 Subpart KKKK - Standards of Performance for Stationary Combustion Turbines

Because the construction of the gas turbines and HRSGs at the Russell City Energy Center commenced after February 18, 2005 and the gas turbines have a heat input greater than 10 MM Btu per hour, they are subject to Subpart KKKK pursuant to §60.4305(a).

40 CFR Part 60 Subpart GG - Standards of Performance for Stationary Combustion Turbines

Pursuant to 40 CFR Subpart KKKK, section 60.4305(b) the gas turbines are exempt from the requirements of Subpart GG because they are subject to subpart KKKK.

40 CFR Part 60 Subpart III - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

S-6 Fire Pump Diesel Engine will comply with the NSPS for Compression Ignition Engines (40 CFR 60 Subpart III).

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-6 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 - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Table IV-C for the diesel fire pump includes 40 CFR Part 63 Subpart A and ZZZZ as applicable requirements. S-6 Fire pump diesel engine is an emergency engine. It is a compression ignition (CI), diesel fired, 300 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-6 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-6 is an affected source under Part 63.6590(c)(1). S-6 will comply with the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart III (see NSPS Subpart III 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 SO₂ limit. The facility must hold sufficient SO₂ allowances by March 1 (February 29 of a leap year) of every year to offset each ton of SO₂ 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_x 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 SO₂, NO_x, CO₂ 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 SO₂ monitoring. 75.11(d)(2) allows the use of Appendix D to monitor SO₂ emissions from gas fired units. The facility monitors sulfur content of the natural gas to meet Part 75 SO₂ monitoring requirements.

75.12 contains specific provisions for NO_x emission rates. The facility uses a NO_x CEM and an O₂ monitor to meet this requirement.

75.13 contains CO₂ monitoring requirements. The facility monitors CO₂ 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 SO₂, NO_x, flowrate, CO₂, 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 SO₂, NO_x, CO₂, and O₂ 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. However, these requirements are not cited in the permit in accordance with current District policy. Because the federal greenhouse gas reporting requirements (40 CFR Part 98) do not meet the definition of “applicable requirement” in the Title V regulation 40 CFR Part 70, we are not including part 98 in the permit. By the same reasoning, the District has concluded that the state GHG reporting requirements do not qualify as applicable requirements for the purposes of Title V permitting.

V. Schedule of Compliance

Section V of the Title V permit contains the schedule of compliance element of the permit. This element of the permit serves two purposes. First, for all facilities, the schedule of compliance establishes a legal requirement that the facility must comply with all applicable requirements in the permit; and for any new requirements that become effective during the permit term, that the facility must comply with such requirements as they become effective. Second, for a facility that is currently out of compliance with any applicable requirements (which is not the case here), the schedule of compliance establishes a compliance plan setting forth specific steps that the facility must take to get back into compliance, along with deadlines for each step and requirements for the facility to document its progress. The schedule of compliance section is governed by 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 determined that the facility is not 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. (See also Section E of this Statement of Basis below, discussing the facility’s compliance status.)

VI. Permit Conditions

Section VI of the Title V permit sets out, in full, all of the permit conditions that apply to this facility. These permit conditions include conditions that have been imposed by the Air District in its authority to construct and permit to operate for the Russell City Energy center, as well as conditions from the federal Prevention of Significant Deterioration (PSD) permit issued on behalf of the US Environmental Protection Agency. These permit conditions contain requirements such as limits on operation, abatement requirements, and monitoring and recordkeeping requirements.

The conditions imposed in the Air District's authority to construct and permit to operate are designated under Condition No. 23763. The conditions imposed in the federal PSD permit are designated under Condition No. 26117. Both of these conditions are set forth in Section VI of the Title V permit. The federal PSD permit requirements in Condition No. 26117 were modeled after the Air District's requirements in Condition No. 23763, and so the conditions are largely the same. Some elements of the Air District's permit condition were not required under the federal PSD regulations, however, and so the federal PSD permit excluded certain requirements of the Air District's permit. In those cases, the elements that were excluded from the federal PSD permit are shown in ~~strike through~~ format in Condition No. 26117.

Each permit condition (the Air District permit condition, Condition No. 23763, and the federal PSD permit condition, Condition No. 26117) contains multiple numbered parts. The regulatory basis for each part is listed following the text of that part. The regulatory basis may be a rule or regulation. The District uses the following terms to describe the regulatory basis:

- BACT: This term is used for a condition imposed to ensure compliance with the Best Available Control Technology requirements in Regulation 2-2-301.
- Cumulative Increase: This term is used for a condition 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 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 to ensure compliance with a Prevention of Significant Deterioration permit.
- TRMP: This term is used for a condition imposed 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.
- Voluntary Greenhouse Gas BACT Requirement: This term is used to describe certain requirements pertaining to greenhouse gas emissions that the Russell City Energy Company, LLC, voluntarily agreed to comply with in the PSD permitting process even though they were not legally required under EPA's PSD regulations in effect at the time. These requirements were therefore incorporated into the PSD permit with the approval of the Russell City Energy Company, LLC, and were made binding permit requirements. (Now that they are permit requirements, they are mandatory and legally enforceable and the facility must comply with them. The term "voluntary" in the regulatory basis description simply refers to the fact that Russell City Energy Company, LLC, voluntarily agreed to accept them as legally binding commitments at the time of permitting.)

The Title V permit will include all applicable permit conditions that have been imposed as of the time of issuance. After issuance of the Title V permit, any changes to any permit condition in any

underlying permits will be incorporated into the Title V permit according to the procedures in Regulation 2, Rule 6, to ensure consistency between the Title V permit and the underlying District permits.

VII. Applicable Limits and Compliance Monitoring Requirements

Section VII of the Title V permit provides a summary of monitoring requirements for each source at the facility. Section VII includes four tables corresponding to each source or group of similar sources (Tables VII-A through VII-D), which list the emissions limits that apply to the source or group of sources and the monitoring requirements that have been imposed to ensure compliance. For each emissions limit that the source is subject to, the tables provide a citation for each monitoring requirement, an indication of the frequency of the monitoring, and a description of type of monitoring. These applicable requirements for monitoring are also set forth in Sections IV (Source-Specific Applicable Requirements) and VI (Permit Conditions) of the permit, but they are also set for specifically in Section VII so that they can be identified easily.

The Air District has examined the monitoring requirements for all of the emissions limits in the facility's permit requirements and has determined that the monitoring is adequate to provide a reasonable assurance of compliance. The conclusions of these evaluations are summarized below for each pollutant involved. In certain cases, there is no monitoring specified for a given emissions limit. In these cases, the Air District has reviewed the limits for which there is no monitoring required and has determined that additional monitoring is not necessary or appropriate in order to ensure ongoing compliance. These situations are also addressed in the discussions below. Where the conclusion that no monitoring is required because of the small size of a source, the discussion provides calculations of the source's potential to emit.

Analysis of Monitoring Requirements:

For each emissions limit that the facility is subject to, the Air District evaluated the existing monitoring requirements imposed under the Air District's authority to construct and permit to operate (Condition No. 23763) and federal PSD permit (Condition No. 26117). The purpose of this review was to evaluate whether the existing monitoring requirements are adequate to provide a reasonable assurance of ongoing compliance, or whether additional monitoring requirements should be imposed through the Title V permit.

The evaluation of whether monitoring requirements are adequate to provide a reasonable assurance of ongoing compliance is based on a balancing of several different factors, including: 1) the likelihood of a violation given the characteristics of normal operation, 2) the 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.

The Air District followed this approach with respect to the monitoring requirements applicable to the sources at the Russel City Energy Center. The Air District’s conclusions on the monitoring requirements for each pollutant addressed by the facility’s emissions limits are outlined below.

NOx Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD 9-3-303	125 ppm	CEM
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD 9-9-301.1.3	9 ppmv @ 15% O ₂ , dry	CEM and annual source test
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD 9-9-301.2	5 ppmv @ 15% O ₂ , dry or 0.15 lbs/MW-hr	CEM
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	SIP 9-9-301.3	9 ppmv @ 15% O ₂ , dry	CEM and annual source test
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	NSPS Subpart Db 40 CFR 60.44b(a)(4)	0.2 lb/MM BTU, 30-day rolling average	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	NSPS Subpart GG 40 CFR 60.332(a)(1)	75 ppmv @ 15% O ₂ , dry	CEM
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 19a and Federal PSD Permit Condition #26117, part 19a	16.5 lb/hr or 0.00735 lb/MM Btu except during turbine startup, shutdown, or combustor tuning	CEM and fuel monitoring, annual source test
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 19b and Federal PSD Permit Condition #26117, part 19b	2.0 ppmv @ 15% O ₂ , dry, 1-hr average except during turbine startup, shutdown, or combustor tuning	CEM, annual source test
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20 and Federal PSD Permit Condition #26117, part 20	480 lb/event for each turbine cold startup or combustor tuning	CEM and fuel monitoring

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20 and Federal PSD Permit Condition #26117, part 20	95 lb/event for each turbine hot startup	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20 and Federal PSD Permit Condition #26117, part 20	125 lb/event for each turbine warm startup	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20 and Federal PSD Permit Condition #26117, part 20	40 lb/event for each turbine shutdown	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763 part 22a and Federal PSD Permit Condition #26117, part 22a	1,453 lb/day (as NO ₂) for turbines and HRSGs combined, including startup and shutdown	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763 part 22b	1,225 lb/day (as NO ₂) for turbines and HRSGs combined, including startup and shutdown during ozone season	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 23a and Federal PSD Permit Condition #26117, part 23a	127 tons per year (as NO ₂) for turbines, HRSGs, and diesel fire pump combined, including startup or shutdown	CEM and fuel monitoring

NO_x Discussion:

The turbines are subject to the NO_x 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 MM Btu/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_x CEM in accordance with Regulation 1-520.

The CEM is used to demonstrate compliance with the NO_x concentration permit limits on a continuous basis. An annual relative accuracy test audit (RATA) is required on the NO_x CEM to ensure accuracy (40 CFR Part 75, BAAQMD MOP Volume V). NO_x mass emissions are

calculated using NO_x and O₂ CEM data, and the fuel heat input rate (from fuel flow meter). The District has determined that no additional monitoring is required.

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD Condition #23763 Part 19c and Federal PSD Permit Condition #26117, part 19c	10 lb/hr or 0.0045 lb/MM Btu except during turbine startup, shutdown, or combustor tuning	CEM and fuel monitoring, annual source test
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD Condition #23763 Part 19d and Federal PSD Permit Condition #26117, part 19d	2.0 ppmv @ 15% O ₂ , dry 3-hr average except during turbine startup, shutdown, or combustor tuning	CEM and annual source test
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20 and Federal PSD Permit Condition #26117, part 20	2514 lb/event for each turbine cold startup or combustor tuning	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20 and Federal PSD Permit Condition #26117, part 20	891 lb/event for each turbine hot startup	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20 and Federal PSD Permit Condition #26117, part 20	2514 lb/event for each turbine warm startup	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20 and Federal PSD Permit Condition #26117, part 20	100 lb/event for each turbine, shutdown	CEM and fuel monitoring

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 22c and Federal PSD Permit Condition #26117, part 22c	7,360 lb/day for turbines and HRSGs combined including turbine startup, shutdown, or combustor tuning	CEM and fuel monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	BAAQMD condition #23763, part 23b and Federal PSD Permit Condition #26117, part 23b	330 tons per year for turbines, HRSGs, and diesel fire pump combined, including turbine startup, shutdown, or combustor tuning	CEM and fuel monitoring

CO Discussion:

The turbines are subject to the CO emission limitations shown above. The CO limit prescribed in condition #23763, Part 19d is 2.0 ppmv @ 15% O₂. 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 O₂ CEM data, and the fuel heat input rate (from fuel flow meter). The District has determined that no additional monitoring is required.

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	BAAQMD Regulation 6-1-301	Ringelmann 1.0	None
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	SIP Regulation 6-301	Ringelmann 1.0	None
S-1, S-3 Gas Turbines, S-2, S-4, 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-6 Fire Pump Diesel Engine	BAAQMD Regulation 6-1-303.1	< Ringelmann No. 2, except for no more than 3 minutes in any hour	None

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-6 Fire Pump Diesel Engine	SIP Regulation 6-303.1	< Ringelmann No. 2, except for no more than 3 minutes in any hour	None
S-2, S-4, HRSGs	BAAQMD Regulation 6-1-304 Tube Cleaning	< Ringelmann 2.0, except for 3 min/hour	None
S-2, S-4, HRSGs	SIP Regulation 6-304 Tube Cleaning	< Ringelmann 2.0, except for 3 min/hour	None
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	BAAQMD Regulation 6-1-310	0.15 gr/dscf	None
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	SIP Regulation 6-310	0.15 gr/dscf	None
S-2, S-4, HRSGs	BAAQMD Regulation 6-1-310.3	0.15 gr/dscf @ 6%O ₂	None
S-2, S-4, HRSGs	SIP Regulation 6-310.3	0.15 gr/dscf @ 6%O ₂	None
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 19h and Federal PSD Permit Condition #26117, part 19h	7.5 lb/hr, for each turbine and HRSG combined	Annual source test at maximum load
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 19h and Federal PSD Permit Condition #26117, part 19h	0.0036 lb/MM Btu, for each turbine and HRSG combined	Annual source test at maximum load
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 22e and Federal PSD Permit Condition #26117, part 22e	413 lb/day for turbines, HRSGs, and fire pump diesel engine combined	Records, calculations
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	BAAQMD condition #23763, part 23d and Federal PSD Permit Condition #26117, part 23d	71.8 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

BAAQMD Regulation 6, Rule 1 requirements limit visible emissions from these sources. Visible emissions are normally not associated with combustion of gaseous fuels, such as natural gas. Sources S-1, S-3 Gas Turbines and S-2, S-4 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” (hereinafter, the “EPA 1999 Monitoring Recommendations”), no monitoring is required to ensure compliance with these limits for these sources.

S-2 and S-4 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.

The 1999 EPA Monitoring Recommendations state 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-6 Fire Pump Diesel Engine will utilize low-sulfur 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-1, S-3 Gas Turbines and S-2, S-4 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 Recommended Periodic Monitoring document further provides that monitoring for the grain loading standard for non-utility distillate-oil-fueled emergency piston-type IC Engines should be implemented by maintaining records of all engine usage (such as time or fuel meter readings) and maintenance. S-6 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% O₂. As shown below, combined gas turbine and HRSG emissions are expected to be well below the limit (at approximately 0.00205 gr/dscf @ 6% O₂). Accordingly, monitoring is not warranted to insure compliance by the gas turbines and HRSGs with this regulation.

Each Gas Turbine and HRSG Combined Emissions

As required under Part 19(h) of the facility's permit conditions, the maximum PM₁₀ emissions rate from the gas turbines and HRSGs is **7.5 lb/hr**

The following stack data will be used to calculate the grain loading at standard conditions for full load gas turbine operation with duct burner firing to determine compliance with BAAQMD Regulation 6-310.3.

PM ₁₀ mass emission rate:	7.5 lb/hr
flow rate:	4,038,946 lb/hr @ 11.8% O ₂ and 180°F
moisture content:	8.7% by volume

Converting flow rate to standard conditions:

$$(4,038,946 \text{ lb/hr})(1 \text{ hr}/60 \text{ min})(385.3 \text{ cf/lb mol})(1 \text{ mol}/28.39) = 915,556 \text{ acfm}$$
$$(915,556 \text{ acfm})([70 + 460 \text{ }^\circ\text{R}]/[180 + 460 \text{ }^\circ\text{R}])(1 - 0.087) = 692,232 \text{ dscfm}$$

Converting to grains/dscf:

$$(7.5 \text{ lb PM}_{10}/\text{hr})(1 \text{ hr}/60 \text{ min})(7000 \text{ gr/lb})/(692,232 \text{ dscfm}) = 0.00126 \text{ gr/dscf}$$

Converting to 6% O₂ basis:

$$(0.00126 \text{ gr/dscf})[(20.95 - 6)/(20.95 - 11.8)] = \mathbf{0.00205 \text{ gr/dscf @ 6\% O}_2}$$

Gas Turbine

The PM₁₀ emission factor is based upon 3 lb/hr as the HRSG PM₁₀ emission rate. The corresponding PM₁₀ emission factor is therefore:

$$((7.5-3) \text{ lb PM}_{10}/\text{hr})/(2038.6 \text{ MM Btu/hr}) = \mathbf{0.0022 \text{ lb PM}_{10}/\text{MM Btu}}$$

Particulate Mass Limits and Mass per Unit Fuel Fired Limits

BAAQMD Condition 23763 part 19h limits the PM₁₀ (all PM is expected to be PM₁₀) emissions from the gas turbines and duct burners combined to 7.5 lb/hour. This corresponds to 0.0036 lb/MM Btu. The gas turbines and HRSGs are required to be source tested on an annual basis for PM₁₀. The annual source test results are used to develop emission factors on a lb PM per MM Btu 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.).

SO₂ Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	BAAQMD 9-1-301	Ground level concentrations of SO ₂ 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-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD 9-1-302	300 ppm (dry)	None
S-1, S-3 Gas Turbines, S-2, S-4 HRSGs	NSPS 40 CFR 60.333	0.015% (vol) @ 15% O ₂ (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-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 12	Fuel sulfur content of 1 gr/100 scf	Fuel testing
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 19g	6.18 lb/hr, for turbine and HRSG combined	Source test at maximum load
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 19g	0.0028 lb/MM Btu, for turbine and HRSG combined	Source test at maximum load
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 22f	297 lb/day for turbines and HRSGs combined	Records, calculations
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	BAAQMD condition #23763, part 23e	48.5 ton/yr for turbines and HRSGs combined (includes emissions from commissioning period)	Records, calculations
S-6 Diesel Fire Pump	BAAQMD 9-1-304	Fuel Sulfur Limit 0.5%	Vendor Certification

SO₂ Discussion:

BAAQMD Regulation 9-1-301

All facility combustion sources are subject to the SO₂ emission limitations in District Regulation 9, Rule 1 (ground-level concentration and emission point concentration). This facility does not have equipment that emits large amounts of SO₂ and therefore is not likely to cause any exceedances of the ground-level SO₂ concentration limits set forth in Regulation 9-1-301. The Air District has therefore not required ground level SO₂ monitoring in the facility's permit. Furthermore, the 1999 EPA Monitoring Recommendations provide 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 for the sources at this facility that are fired on natural gas. S-6 Fire Pump Diesel Engine is fired on ARB diesel fuel with a maximum sulfur content of 15 ppmw or 0.0015 % by weight. Therefore, S-6 is not expected to contribute significantly to ground level SO₂ concentration.

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.² 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 permit condition 23763, part 12 limits 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) 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 23763, part 19g limits the SO₂ maximum hourly emissions to 6.21 lb/hour and 0.0028 lb/MM BTU. Condition 23763, part 22f limits the SO₂ daily emissions from the gas turbines and HRSGs combined to 292 lb/day. Condition 23763, part 23e limits the SO₂ annual emissions from the gas turbines/HRSGs and the diesel fire pump to 12.2 tons per year.

² See PG&E Natural Gas Rule 21, Section C at: http://www.pge.com/pipeline/operations/sulfur/sulfur_info.shtml.

The monthly sulfur fuel analysis data is used to calculate the gas turbines/HRSGs SO₂ 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 SO₂ 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/MM BTU limit.

The monthly sulfur fuel analysis data and corresponding emission calculations are adequate to demonstrate compliance with all of the SO₂ mass limits. SO₂ 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 SO₂ concentration at the stack with a continuous emission monitor.

POC Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 19f	2.86 lb/hr (as CH ₄) for each turbine, and HRSG combined except during turbine startup, shutdown, or steam turbine cold start-up	Annual source test at maximum load
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 19f	0.00128 lb/MM BTU (as CH ₄) for each turbine, and HRSG combined except during turbine startup, shutdown, or steam turbine cold start-up	Annual source test at maximum load
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20	35.36 lb/turbine during Hot start-up	Records, calculations
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20	16 lb/turbine during shutdown	Records, calculations
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20	83 lb/turbine during steam turbine cold start-up or combustor tuning	Records, calculations
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 20	79 lb/turbine during warm start-up	Records, calculations
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, part 22d	295 lb/day (as CH ₄) for turbines and HRSGs combined	Records, calculations

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs and S-6 Fire Pump Diesel Engine	BAAQMD condition #23763, part 23c	28.5 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

BAAQMD Permit Condition 23763, part 19f limits precursor organic compound (POC) emissions from each gas turbine to 2.86 lb/hr and 0.00128 lb/MM BTU, except during periods of startup and shutdown as defined in this permit. BAAQMD Permit Condition 23763, part 22d limits POC emissions from the facility to 295 lb/day. BAAQMD Permit Condition 23763, part 23c limits total facility POC emissions 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 MM BTU basis. The POC emission factors and the fuel usage data allow the facility to calculate POC 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 MM BTU 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 emission 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% O₂. POC continuous emission monitors are not as reliable as monitors for other pollutants such as NO_x 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_x 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.

NH₃ Sources

S# & Description	Emission Limit Citation	Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, Part 19e	5 ppmv, @ 15% O ₂ , 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

NH₃ Discussion:

Maximum Concentration Limits

Ammonia (NH₃) emissions from each gas turbine shall not exceed 5 ppmvd @ 15% O₂, except during periods of startup and shutdown as defined in this permit. The NH₃ monitoring is based on the source test and NH₃ to NO_x ratio at the inlet to SCR.

Condition 26763, part 29 requires annual source testing for ammonia. The District has determined that additional source testing for ammonia is required to demonstrate compliance. 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-1 & S-3 Gas Turbines
S-2 & S-4 HRSGs

HAP	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
Formaldehyde	BAAQMD condition #23763 part 25	10,912 pounds/year for all turbines and HRSGs combined	Source Test at Startup and biennial thereafter
Benzene	BAAQMD condition #23763 part 25	226 pounds/year for all turbines and HRSGs combined	Source Test at Startup and biennial thereafter
Specified PAHs	BAAQMD condition #23763 part 25	1.8 pounds/year for all turbines and HRSGs combined	Source Test at Startup and biennial thereafter

Hazardous Air Pollutant (HAP) Discussion:

BAAQMD Regulation 2, Rule 5

Emissions of formaldehyde, benzene, and specified PAHs 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 #23763 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.

GHG Sources

S# & Description	Emission Limit Citation	Enforceable Emission Limit	Monitoring
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, Part 53	Heat Rate efficiency of each turbine shall not exceed 7,730 Btu/kWh	Annual source testing
S-1, S-3 Gas Turbines, S-2, S-4, HRSGs	BAAQMD condition #23763, Parts 50, 51, and 52	CO ₂ E mass emission rate limits (hourly, daily, and annual)	Fuel Usage Recordkeeping
S-6 Fire Pump Diesel Engine	Federal PSD Permit Condition #26117, Part 56	CO ₂ E mass emission rate limit (rolling 12-month average)	Fuel Usage Recordkeeping
S-7 through S-11 Circuit Breakers	Federal PSD Permit Condition #26117, Part 59	CO ₂ E mass emission rate limit (rolling 12-month average)	Dielectric Fluid Recordkeeping

GHG Discussion:

The gas turbines and HRSGs are subject to hourly, daily, and annual GHG emission limits. Compliance with these limits is monitored by monitoring the amount of natural gas burned in the turbines and HRSGs (in MMBtu of heat input). There is a direct correlation between the amount of natural gas burned and the amount of GHG emissions generated, so monitoring the amount of gas burned gives an accurate picture of the amount of GHGs emitted. The fuel usage is monitored on an hourly, daily, and annual basis, which ensures compliance with the hourly, daily, and annual GHG emission limits.

In addition, the facility is subject to a limit on its efficiency in generating electricity, which the District imposed as part of the facility's federal PSD permit. The District imposed this limit through a permit condition specifying that the gas turbines cannot exceed a heat rate of 7,730 Btu/kWh (HHV). This heat rate limit corresponds to a design efficiency of 56.4%, with an appropriate margin of compliance to ensure that the limit can be met over the entire life of the facility. The facility is required to conduct a heat rate performance test annually according to the requirements of the American Society of Mechanical Engineers Performance Test Code on Overall Plant Performance, ASME PTC 46-1996. This testing frequency is sufficient to ensure compliance, as any degradation in heat rate over time will occur gradually. This means that if any potential problems start developing, there will be sufficient time to detect and address them before the turbine degrades beyond the permit limit.

The firepump diesel engine is subject to a GHG emissions limit of 7.62 metric tons of CO_{2e} per rolling 12-month period. Compliance with this limit is monitored by monitoring the amount of diesel fuel used. As with the turbines and HRSGs, there is a direct correlation between the amount of fuel burned and the amount of GHG emissions generated, so monitoring the amount of gas burned gives an accurate picture of the amount of GHGs emitted.

Finally, the facility's circuit breakers are subject to a limit of 39.3 metric tons of CO_{2e} per rolling 12-month period. GHG emissions from the circuit breakers occur if any of the dielectric fluid used in the breakers leaks out, which allows SF₆ in the fluid to escape into the atmosphere. The facility is required to monitor whether any dielectric fluid has escaped (and how much) by monitoring the amount of any replacement dielectric fluid that has to be added. Measuring the amount of fluid that needs to be replaced gives an accurate picture of the amount of SF₆ emitted.

As the monitoring in the PSD permit conditions provides an adequate assurance of compliance with the GHG emissions limits, no additional monitoring requirements need to be added through the Title V permit.

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

Section IX of the Title V permit sets forth the regulatory requirements related to addressing acid rain as required under Title IV of the federal Clean Air Act and related regulations. Acid rain is principally associated with power plants that burn coal, and the Russel City Energy Center is allowed to burn only low-sulfur natural gas. The facility is nevertheless subject to certain acid-rain related requirements as specified in Section IX of the Title V permit.

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. The principal requirement that applies to this facility is that it must hold SO₂ allowances for each emission unit in an amount not less than the total annual SO₂ emissions from the unit for the previous calendar year pursuant to 40 CFR 72.9(c)(i).

The Acid Rain permit for the Russell City Energy Center 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

Section IX of the Title V permit addresses “permit shields” that are included in some Title V permits. Permit shields are elements included in a Title V permit that provide that if the facility is in compliance with the provisions of the permit, then it is conclusively in compliance with any applicable regulatory requirement covered by the permit shield. Such regulatory requirements can include regulations or standards that do not apply to the facility, as well as monitoring, recordkeeping and reporting requirements set forth in applicable regulations that are subsumed within specific permit conditions set forth in the permit.

There are no permit shields in the proposed Title V Operating Permit for the Russell City Energy Center.

XI. Revision History

Section IX of the Title V permit documents the permit’s revision history. This section will list the initial issuance of the permit, and will also list the details the revision history if and when the permit is revised in the future. This section has a placeholder in the proposed permit document for the initial Title V permit issuance.

XII. Glossary

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

D. ALTERNATE OPERATING SCENARIOS

No alternate operating scenario has been requested for this facility, and the Air District has not included one in the proposed Title V permit.

E. COMPLIANCE STATUS

The Air District has determined that the facility is currently in compliance with all applicable requirements. Although there have been some violations of permit conditions in the past, these

have been remedied as of the date of the proposal to issue the Title V permit for the facility. This conclusion is based on (i) the certification of Eugene Fahey, the Responsible Official for the facility, submitted pursuant to District Regulation 2, Rule 6, Section 405.7, certifying that the facility is in compliance with all applicable requirements; (ii) investigations to follow up on past violations to confirm that they have been remedied; and (iii) ongoing periodic inspections of the entire facility, which have not uncovered any new violations that have not been corrected.

In addition, Mr. Fahey has further certified pursuant to District Regulation 2, Rule 6, Section 405.7, that the facility will continue to comply with currently applicable requirements and will comply with any new requirements that become effective during the permit term. This certification, along with the fact that there are no current or ongoing violations and that the facility is subject to comprehensive compliance monitoring requirements to ensure compliance, provides the basis to conclude that the facility will continue to maintain compliance absent unforeseen circumstances. As there are no additional steps that the facility needs to implement to maintain a reasonable assurance of ongoing compliance, the Air District is not proposing to include a Schedule of Compliance in the permit. (See also Section B.V. of this Statement of Basis above, discussing the Schedule of Compliance section of the permit.)

The Air District will continue its regular inspection efforts, which will be augmented by the applicable monitoring and reporting requirements that require the facility to self-report any violations. Should the Air District discover any non-compliance, either through the facility's reporting or through its own periodic inspections, the Air District will take appropriate enforcement action at that time.

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_x

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_x, PM₁₀, and SO₂.

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.

SO₂

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 ²	=	square meter
min	=	minute
mm	=	million
MM Btu	=	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

Toxic Air Contaminant Potential to Emit for Gas Turbines, HRSGs, and Cooling Tower

(Excerpted from Final Determination of Compliance)

Table B-1 below is from the original Final Determination of Compliance for the project.

Table B-1 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 5 ppmvd @ 15% O₂ due to ammonia slip from the A-1 and A-3 SCR Systems. The chronic and acute screening trigger levels shown are per Table 2-5.1 of Regulation 2, Rule 5. Note: The term “Toxic Air Contaminant” is used interchangeably with the term “Hazardous Air Pollutant”.

Table B-1 Maximum Facility Toxic Air Contaminant (TAC) Emissions				
Toxic Air Contaminant	Total Project Emissions (lb/yr)	Chronic Trigger Level (lb/yr-project)	Total Project Emissions (lb/hr)	Acute (1 hour max.) Trigger Level (lb/hr)
Turbines/HRSGs				
Acetaldehyde	2.33E+03	6.4E+01		
Acrolein	3.21E+02	2.3E+00	4.03E-02	4.2E-04
Ammonia	1.21E+05	7.7E+03	1.52E+01	7.1E+00
Benzene	2.26E+02	6.4E+00	2.84E-02	2.9E+00
1,3-Butadiene	2.16E+00	1.1E+00		
Ethylbenzene	3.04E+02	7.7E+04		
Formaldehyde	1.56E+04	3.0E+01	1.96E+00	2.1E-01
Hexane	4.40E+03	2.7E+05		
Naphthalene	2.82E+01	1.1E-02		
Total PAHs	1.80E+00	1.1E-02		
Propylene	1.31E+04	1.2E-02		
Propylene Oxide	8.13E+02	4.9E+01	1.02E-01	6.8E+00
Toluene	1.21E+03	1.2E+01	1.51E-01	8.2E+01
Xylenes	4.08E+02	2.7E+04		
Cooling Tower				
Ammonia	1.86E+02	7.7E+03	2.12E-02	7.1E+00
Arsenic	1.55E-01	1.2E-02	1.77E-05	4.2E-04
Cadmium	2.48E-01	4.5E-02		
Hexavalent chromium	1.27E+00	1.3E-03		
Copper	1.88E+00	9.3E+01		
Lead	5.88E-01	5.4E+00	6.71E-05	2.2E-01
Manganese	2.58E+00	7.7E+00		
Mercury	1.86E-03	5.6E-01		
Nickel	1.45E+00	7.3E-01	1.66E-04	1.3E-02
Selenium	2.16E-01	7.7E+02		
Zinc	5.94E+00	1.4E+03		
Firepump Diesel Engine				

Toxic Air Contaminant	Total Project Emissions (lb/yr)	Chronic Trigger Level (lb/yr-project)	Total Project Emissions (lb/hr)	Acute (1 hour max.) Trigger Level (lb/hr)
Diesel Exhaust Particulate	4.0E+00	5.8E-01		
Total Facility Combined HAP PTE*	3.88E+04			

*ammonia and diesel exhaust particulate matter are not included because these contaminants are not considered to be HAPs for the purposes of the Clean Air Act. 38,800 lb/year = 19.4 ton/year

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

Contaminant	Emission Factor (lb/MM scf)
Acetaldehyde ^d	6.86E-02
Acrolein	2.37E-02
Ammonia ^c	6.63
Benzene ^d	1.36E-02
1,3-Butadiene ^d	1.27E-04
Ethylbenzene	1.79E-02
Formaldehyde ^d	9.17E-01
Hexane	2.59E-01
Naphthalene	1.66E-03
PAHs ^{b,d}	1.06E-04
Propylene	7.70E-01
Propylene Oxide ^d	4.78E-02
Toluene	7.10E-02
Xylene	2.61E-02

^aCalifornia Air Toxics Emission Factors (CATEF) Database as compiled by California Air Resources Board under the Air Toxics Hotspot Program, mean values.

^bCARB CATEF II Database does not include an emission factor for PAH. The emission rate from the most recent turbine application is used and reflects abatement by oxidation catalyst.

^cbased upon maximum allowable ammonia slip of 5 ppmv, dry @ 15% O₂ for A-1 and A-3 SCR Systems

^dcarcinogenic 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.

APPENDIX C

Potential to Emit Toxic Air Contaminants for Fire Pump and Cooling Tower

Table B-6 Worst-Case Toxic Air Contaminant Emissions for Fire Pump Diesel Engine		
Toxic Air Contaminant	Emission Factor (lb/MM BTU)	Annual Emissions^a (lb/yr)
Benzene	9.33E-04	0.0942
Toluene	4.09E-04	0.0413
Xylenes	2.85E-04	0.0288
Propylene	2.58E-03	0.2606
1,3-Butadiene	3.91E-05	0.0039
Formaldehyde	1.18E-03	0.1192
Acetaldehyde	7.67E-04	0.0775
Acrolein	9.25E-05	0.0093
Total PAHs	1.68E-04	0.0170
Diesel particulate	3.93E-02	3.97

^a based upon assumed maximum rated heat input of 2.02 MM BTU/hr and maximum 50 operating hours per year

The projected toxic air contaminant emissions from S-5 Cooling Tower are summarized in **Table B-8**. The emissions are based upon a water circulation rate of 141,352 gpm and 8,760 hours of operation per year.

Table B-8 Worst-Case TAC Emissions for Cooling Tower			
Toxic Air Contaminant	Emission Factor (lb/hr)	Annual Emission Rate	
		(lb/yr)	(ton/yr)
Ammonia	2.12E-02	185.71	9.29E-02
Arsenic	1.77E-05	0.16	7.75E-05
Cadmium	2.83E-05	0.25	1.24E-04
Chromium (Hex)	1.45E-04	1.27	6.35E-04
Copper	2.15E-04	1.88	9.42E-04
Lead	6.71E-05	0.59	2.94E-04
Manganese	2.94E-04	2.58	1.29E-03
Mercury	2.12E-07	0.00	9.29E-07
Nickel	1.66E-04	1.45	7.27E-04
Selenium	2.47E-05	0.22	1.08E-04
Zinc	6.78E-04	5.94	2.97E-03