

Bay Area Air Quality Management District

939 Ellis Street
San Francisco, CA 94109
(415) 771-6000

Permit Evaluation and Statement of Basis for RENEWAL of

MAJOR FACILITY REVIEW PERMIT

for

**East Bay Municipal Utility District
Facility #A0591**

Facility Address:

2020 Wake Avenue
Oakland, CA 94607

Mailing Address:

PO Box 24055 MS #704
Oakland, CA 94607

Application Engineer: Irma Salinas
Site Engineer:

Application: 21441

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Title V Statement of Basis

A. Background

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

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.

Pursuant to Regulation 2, Rule 6, section 416, the District has reviewed the terms and conditions of this Major Facility Review permit and determined that they are still valid and correct. This review included an analysis of applicability determinations for all sources, including those that have been modified or permitted since the issuance of the initial Major Facility Review Permit. The review also included an assessment of all monitoring in the permit for sufficiency to determine compliance. The statement of basis documents for permit revisions that have occurred since the initial Major Facility Review permit was issued are hereby incorporated by reference and are available upon request.

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

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for this facility is A0591.

This facility received its initial Title V permit on July 1, 1997. The permit was renewed on July 26, 2005. This application is for a permit renewal. Although the current permit expired on July 25, 2010, it continues in force until the District takes final action on the permit renewal. The proposed permit shows all changes to the permit in strikeout/underline format.

B. Facility Description

The East Bay Municipal Utility District (EBMUD) is a publicly owned treatment works (POTW) facility that provides wastewater collection, treatment and disposal services to the residents and businesses of parts of Alameda and Contra Costa County. The sources that are permitted include liquid and semi-liquid wastewater process sources, support systems such as a gasoline dispensing station, and a number of combustion sources to convert the plant produced digester gas into electricity and hot water to supply the plant energy needs. Liquid sources include preliminary treatment, primary treatment, secondary treatment, clarification, disinfection, sludge handling, and sludge digestion. Combustion operations include a hot water boiler, emergency standby diesel generator sets, digester gas emergency flares, and cogeneration engine generators.

Average dry weather wastewater flow capacity is approximately 120,000,000 gal/day. Average wet weather flow capacity is approximately 325,000,000 gal/day. The wastewater processes at EBMUD are similar to any other “traditional” municipal wastewater treatment facility. The wastewater plant receives flows from a number of satellite pump stations throughout the aforementioned service area. Plant processes render the influent homogeneous, allow for physical separation to occur and hasten the occurrence of normal biological processes. The liquid and semi-solid wastes are processed such that the process resulting sludge is converted into digester gas fuel with residual biomass for offsite disposal. Effluent water outflow meets regional water quality control board standards for discharge or reuse.

The criteria pollutant emissions from the combustion processes, specifically the NO_x and CO have the potential to emit more than 100 tons per year, hence East Bay Municipal Utility District's requirement for a Federal Title V Major Facility Permit.

The emission changes for the site are summarized below.

Table 1. Emission Changes for Site # A0591

	2005 Actual Emissions	2012 Actual Emissions	Emission Changes
	tons/year	tons/year	tons/year
PM ₁₀	4.4	4.6	0.2
POC	38.3	29.5	- 8.8
NO _x	49.0	53.2	4.2
SO ₂	25.3	31.9	6.6
CO	163.5	152.2	-11.3

There are no changes in the permit from the previous revision per A/N 18480 which was completed in December 28, 2010. Emission changes from the revision in 2005 are the result of a diesel generator being added, replacement of a hot water boiler S-5 with a newer one S-55, modification of sludge handling processes and the addition of a turbine engine S-56. In addition, the facility some time ago back in 2000 hardwired S-52 so it no longer is a portable engine but a stationary one. Hours of operation for this engine have been restricted to 20 hours for testing and maintenance. There has been no significant change in emissions.

C. Permit Content

The legal and factual basis for the permit follows. The permit sections are described in the order presented in the permit. Routine changes to the standard permit text in Section I “Standard Conditions”, Section III “Generally Applicable Requirements”, and Section XI “Glossary” are not considered part of the Title V permit renewal process, but may be made at the discretion of the District during the term of this permit.

Changes to Permit, Title Page:

- The Facility Contact information was corrected.
- The BAAQMD Contact information was corrected.

I. Standard Conditions

This section contains administrative requirements and conditions that apply to all facilities. If the Title IV (Acid Rain) requirements for certain fossil-fuel fired electrical generating facilities or the accidental release (40 CFR § 68) programs apply, the section will contain a standard condition pertaining to these programs. This permit does not include Title IV or accidental release provisions.

Many of these 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.

Changes to permit:

- The dates of adoption and approval of rules in Standard Condition 1.A have been updated.
- The bases of Standard Condition I.B.1, I.B.11, I.E.2, and I.F were corrected.
- Editorial corrections were made to Standard Conditions I.E and I.F and I.G.

II. Equipment

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S24). Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302. Each of the permitted sources has previously been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with state law and the District’s regulations. The capacities in the permitted sources table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-403. The permitted sources are listed in Table II-A.

Significant sources are those sources that have a potential to emit of 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). This facility has no unpermitted significant sources.

All abatement (control) devices that control permitted or significant sources are listed. 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 District is adding an exempt equipment list to this section to clarify the status of various sources and operations. Table II-C will identify any equipment or operations that are located at this facility but that are exempt from Title V permitting requirements. Typically, this table will include equipment or operations that are exempt from the District requirement to have a permit to operate pursuant to BAAQMD Regulation 2, Rule 1, Sections 103, 105, or 113-128 and that are not significant sources. However, it may also include equipment or operations that are required to have a District permit to operate but that are exempt from BAAQMD Regulation 2, Rule 6, Major Facility Review pursuant to Regulation 2, Rule 6, Sections 110-114. The applicable exemption will be identified in Table II-C. Although equipment listed in Table II-C is not required to be identified in the Title V permit, this exempt equipment must still comply with any applicable District, state, or federal regulations.

The equipment section is considered to be part of the facility description. It contains information that is necessary for applicability determinations, such as fuel types, contents or sizes of tanks, etc. This information is part of the factual basis of the permit.

Following are explanations of the differences in the equipment list between the time that the Title V permit was last revised (December 2010) and the permit proposal date. Sources S-57 was not placed in service so it was removed and S-56 was installed and operating and it is now a current source. Source S-49 and S-52 are portable diesel engines that was previously listed in Table II-A. They are now removed from Table II-A and inserted in Table II-C as it is exempt from Title V permitting per Regulation 2-6-114.

Changes to permit: (Section II)

- Corrections to devices capacity S-37, S-38 and S-39
- Added description of above ground tank of S-48
- Deleted S-59 as it is a portable engine
- Modified description of S-52 as it is now a stationary engine
- Added displacement for S-54
- District archived S-57 which was part of Authority to Construct #17749 as facility decided not to install turbine. Deleted S-57 from this table.
- District issued Permit to Operate for S-56 Digester Gas Fired Turbine.

- The District is adding Section II.C, Exempt Equipment List, to clarify the status of non-road engines and other types of sources or operations that are exempt from Title V permitting requirements. Sources S-49 and S-52 are both portable diesel engines and are non-road engines that are exempt from major facility review pursuant to BAAQMD Regulation 2-6-114 Exemption, Non-Road Engines, which states: “Engines as defined by 40 CFR Part 89 are exempt from this regulation.” From 40 CFR Part 89.2, a nonroad engine is defined below:

Nonroad engine means:

- (1) Except as discussed in paragraph (2) of this definition, a nonroad engine is any internal combustion engine:
 - (i) In or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers); or
 - (ii) In or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or
 - (iii) That, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.
- (2) An internal combustion engine is not a nonroad engine if:
 - (i) the engine is used to propel a motor vehicle or a vehicle used solely for competition, or is subject to standards promulgated under section 202 of the Act; or
 - (ii) the engine is regulated by a federal New Source Performance Standard promulgated under section 111 of the Act; or
 - (iii) the engine otherwise included in paragraph (1)(iii) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two years) and that operates at that single location approximately three months (or more) each year. This paragraph does not apply to an engine after the engine is removed from the location.

III. Generally Applicable Requirements

This section of the permit lists requirements that generally apply to all sources at a facility including insignificant sources and portable equipment that may not require a District permit. If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV and the monitoring for that requirement will appear in Sections IV and VII of the permit. Parts of this section apply to all facilities (e.g., particulate, architectural coating, odorous substance, and sandblasting standards). In addition, standards 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 this section.

Unpermitted sources are exempt from normal District permits pursuant to an exemption in BAAQMD Regulation 2, Rule 1. They may, however, be specifically described in a Title V permit if they are considered “significant sources” as defined in BAAQMD Rule 2-6-239.

Changes to permit: Section III:

- The dates of adoption or approval of the rules and their “federal enforceability” status in Table III have also been updated.
- For Table III, the District is amending dates of adoption or approval of the rules, correcting the "federal enforceability" status for these rules, and adding or deleting rules and standards to conform to current practice. The rules that are being amended, added, or removed are listed below:
 - Regulation 1, General Provisions and Definitions
 - SIP Regulation 2, Rule 1, General Requirements
 - BAAQMD Regulation 5, Open Burning
 - BAAQMD Regulation 8, Rule 3, Organic Compounds- Architectural Coatings
 - SIP Regulation 8, Rule 3, Organic Compounds- Architectural Coatings
 - BAAQMD Regulation 8, Rule 15, Organic Compounds- Emulsified and Liquid Asphalts
 - BAAQMD Regulation 8, Rule 16, Organic Compounds- Solvent Cleaning Operations
 - BAAQMD Regulation 8, Rule 40-116, Exemption, Small Volume
 - BAAQMD Regulation 8, Rule 40-117, Exemption- Accidental Spills
 - BAAQMD Regulation 8, Rule 51, Organic Compounds- Adhesive and Sealant Products
 - EPA Regulation 40 CFR Part 82, Protection of Stratospheric Ozone

IV. Source-Specific Applicable Requirements

This section of the permit lists the applicable requirements that apply to permitted or significant sources. These applicable requirements are contained in tables that pertain to one or more sources that have the same requirements. The order of the requirements is:

- 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)
- California Requirements (such as ATCMs, CARB Executive Orders for GDFs)
- BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.

- Federal permit conditions. The text of Federal permit conditions, if any, is found in Section VI of the permit.

Section IV of the permit contains citations to all of the applicable requirements. The text of the requirements is found in the regulations, which are readily available on the District or EPA websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements. A discussion of monitoring is included in Section C.VII of this permit evaluation/statement of basis.

Complex Applicability Determination:

NSPS or NESHAP Applicability for Multi-fuel Cogeneration Engines (S-37, S-38 and S-39)

The NSPS for Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII) - not applicable as these engines were installed in 1985 and the displacement is greater than 30 liters per cylinder. NSPS is not applicable for these sources as construction commenced prior to July 11, 2005.

The NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR, Part 63, Subpart ZZZZ) applies to reciprocating IC engines (RICE) located at major and area sources of HAP. This facility is not a major source of HAP, but it is an area source of HAP. All four sources are CI engines the use digester fuel. These engines is considered to be an existing RICE, because the engine commenced construction prior to June 12, 2006 (40 CFR Part 63.6590(a)(1)(iii)). In accordance with 40 CFR Part 63.6595(a)(1), existing stationary compression-ignition (CI) RICE must comply with the applicable emission and operating limitations of Subpart ZZZZ by no later than May 3, 2013. Section 63.6603(a) identifies the location of the applicable emissions and operating limitations for existing stationary RICE located at area sources of HAP. For these sources, the applicable limitations are in Table 2d. For digester gas CI engines, these limitations include only engine maintenance criteria (frequencies of inspections and oil and filter changes, inspect spark plugs every 1440 hours of operation, inspect all hoses) and do not include any emission limitations. All applicable Subpart ZZZZ requirements for these sources are identified in Tables IV-A and B, and the operating limitations are summarized in Table VII-A and B.

NESHAP for GDF Applicable (S-48 GDF #9008)

Source S-48 is subject to 40 CFR Part 63 Subpart CCCCCC as this is an area source per 63.11111(a) and throughput is 10,000 gallons per month or more but less than 100,000 gallons per month. Facility is subject to 63.1111(c). Facility is complying with requirements of 63.11116 and 63.11117. Facility is subject and complying with requirements 63.11120 Testing and monitoring requirements. As meeting Vapor Recovery Test Procedure TP-201.1E- Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves. Equivalent to BAAQMD Regulation 8-7 test procedures for phase I and phase II. Facility complying with records and reporting requirements per 63.11124.

NSPS or NESHAP Applicability for Stationary IC Engines (S-50, S-51, S-52, S-53 and S-54)

The NSPS for Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII) is potentially applicable to any stationary compression ignition engines at a site. Sources S-50, S-51, S-52 and S-53 were loss of exemptions- sources existed prior to April 2002. Per 40 CFR Part 60 Subpart IIII section 60.4200(a)(2), sources S-50, S-51 and S-53 are not subject to subpart IIII. For source S-54, this emergency diesel generator was issued an A/C in May of 2006, however the engine is a 2005 model year. Engine was not manufactured after April 1, 2006 and therefore 40 CFR Part 60 Subpart IIII section 60.4200(a)(2)(i) is not applicable. All four sources are not subject to NSPS subpart IIII.

The NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR, Part 63, Subpart ZZZZ) applies to reciprocating IC engines (RICE) located at major and area sources of HAP. This facility is not a major source of HAP, but it is an area source of HAP. All four sources are Emergency Back-Up Generator Diesel Engines. These engines is considered to be an existing RICE, because the engine commenced construction prior to June 12, 2006 (40 CFR Part 63.6590(a)(1)(iii)). In accordance with 40 CFR Part 63.6595(a)(1), existing stationary compression-ignition (CI) RICE must comply with the applicable emission and operating limitations of Subpart ZZZZ by no later than May 3, 2013. Section 63.6603(a) identifies the location of the applicable emissions and operating limitations for existing stationary RICE located at area sources of HAP. For these sources, the applicable limitations are in Table 2d. For emergency CI engines, these limitations include only engine maintenance criteria (frequencies of inspections and oil and filter changes) and do not include any emission limitations. Therefore, the testing requirements in Sections 63.6612, 63.6615, and 63.6620 and Tables 1b, 2b, 3, and 4 do not apply. The diesel fuel usage requirements of Section 63.6604 (i.e. the engine must use diesel fuel that complies with 40 CFR 80.510(b)) do not apply to emergency CI RICE. Section 64.6605 applies to all engines subject to this subpart. Other applicable monitoring, operating, and administrative requirements are contained in Sections 63.6625, 63.6630, 63.6635, 63.6640, 63.6645, 63.6650, 63.6655, 63.6660, and 63.6665. All applicable Subpart ZZZZ requirements for these sources are identified in Tables IV-E and F, and the operating limitations are summarized in Table VII-E and F.

Applicability of 40 CFR 63 Subpart YYYY, NESHAP for Combustion Turbines (MACT) -S-56
East Bay Municipal Utility District is not subject to MACT standards for Combustion Turbines because it is not a major source of Hazardous Air Pollutants (HAPs).

NSPS for Stationary Gas Turbines (40 CFR Part 60 Subpart GG)- source S-56.
Facility is subject to 40 CFR Part 60 Subpart GG.

Applicability of CAA 112 (j), Equivalent Emission Limitation by Permit

This section ensures control of HAP emissions even if the EPA should miss a scheduled NESHAP promulgation date. If the EPA misses a scheduled promulgation date by 18 months, major sources in that category must submit to their respective State (or local) agencies a permit application proposing source-specific MACT. Conditions of the MACT determination must be incorporated into the Title V operating permit. Section 112(j) is commonly referred to as the "MACT hammer."

East Bay Municipal Utility District is not subject to CAA Section 112 (j) because it is not a major source of Hazardous Air Pollutants (HAPs).

Applicability of 40 CFR Part 63, Subpart VVV -POTW NESHAP

This NESHAP was evaluated to determine if East Bay Municipal Utility District was subject to the MACT emission control requirements. The NESHAP requires MACT controls at POTWS which are major sources for HAP which are defined thusly: ...any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate 10 tons per year (tpy) or more of any HAP or 25 tpy or more of any combination of HAP.

The District has reviewed the wastewater borne emissions potential of the most frequently seen HAPs and concluded that East Bay Municipal Utility District is not a major source for HAP emissions or for combined HAP emissions. A conservative estimate of HAP emissions may be obtained by using the 80th % factors as developed by the BAAT-AMSA – CWEA studies in the 1990s. This procedure is the most conservative of the 7 accepted procedures developed for calculating emissions from wastewater processes. Most conservatively, the total plant throughput would have to be over 177 million gallons per dry-weather day on an ongoing basis to be a major source for HAP, based on the 80th percentile (most conservative) calculation basis. The East Bay Municipal Utility District maximum dry weather flow rate is 120 million gallons per day and the average daily flow rate (annualized) is 80 MM gpd. Therefore, we conclude the facility is not a major source for HAP.

In addition, this POTW is an existing POTW that has not been reconstructed (as defined by 40 CFR 63.1595). Furthermore, the East Bay Municipal Utility District is not an Industrial POTW as defined by 40 CFR 63.1595. East Bay Municipal Utility District processes strictly domestic wastewater streams.

Applicability of Regulation 8 Rules to Digester Gas Combustion -S-180

The anaerobic digesters S-180 produce digester gas, which is principally combusted in the digester gas engines or hot water boiler, and secondarily in the digester gas flares. The composition of the digester gas is roughly 64% methane, 36% carbon dioxide, with about 21 ppmv of non methane organic compounds as hexane. The District evaluated whether the digester S-180 as well as the associated digester gas energy recovery sources and digester gas flares were subject to Regulation 8-1-110.3 (exemption from Regulation 8 Rules) or to 8-2-301 (Organic Compounds – Miscellaneous Operations). This discussion of applicability follows.

Regulation 8-1-110.3 states

8-1-110 Exemptions: The following shall be exempted from the provisions of this regulation:

110.1 Any structure designed and used exclusively as a dwelling for not more than two families, provided that this exclusion does not apply to the application of an architectural coating.

110.2 Any internal combustion engine.

110.3 Any operation or group of operations which are related to each other by being a part of a continuous process, or a series of such operations on the same process material, which are subject to Regulation 8, Rule 2 or Rule 4, and for which emissions of organic compounds are reduced at least 85% on a mass basis. Where such reduction is achieved by incineration, at least 90% of the organic carbon shall be oxidized to carbon dioxide.

Regulation 8-2-301 states:

8-2-301 Miscellaneous Operations: A person shall not discharge into the atmosphere from any miscellaneous operation an emission containing more than 6.8 kg. (15 lbs.) per day and containing a concentration of more than 300 PPM total carbon on a dry basis.

Organic compounds are defined in 8-1-201 as “any compound of carbon excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate”. The District has performed a conservative calculation (see Appendix C) to estimate the NMOC emissions potential from digester gas. The use of NMOC emissions potential is conservative since this includes all compounds of carbon with the exception of methane and carbon dioxide. EBMUD has estimated a maximum daily digester gas production rate (highest month average) of 3,800,000 cu ft, with a conservative maximum concentration of 82 micrograms NMOC per liter of digester gas (16 ppmv). While it is expected that the destruction efficiency of NMOC in the heat recovery sources would easily exceed 90% it cannot be assured in any of the digester gas combustion devices. This is due to the very low inlet concentration (16 ppmv) of NMOC that upon combustion at 90% efficiency would result in an outlet concentration less than 2 ppm NMOC. It is difficult to ensure outlet concentrations at such low levels and to source test for NMOC at concentration levels near the error limits of the test methods. Based on these findings the District concludes 8-1-110.3 is not applicable to digester gas sources and combustion (abatement) devices.

We conclude the 8-2-301 is applicable to the digester gas sources and combustion devices. Based on the aforementioned calculation presented in Appendix C, and assuming all digester gas is vented at the maximum NMOC concentration gives a daily uncontrolled emission rate of approximately 19 lb per day (controlled emissions estimated as 1.9 lb/day), at an maximum concentration of 16 ppmv. Since the controlled emission level of NMOC from digester gas is less than both the daily limit and the emission stream concentration limit (on both molar and mass basis) as specified in 8-2-301, we conclude that the digester S-180 and the respective digester gas fired engines, boiler and flares are subject to and will comply with Reg 8-2-301. Regulation 8-2-301 will be included Table IV, Applicable Requirements for S-180 Anaerobic Digester as well as all combustion devices burning or abating digester gas.

New Applicability Determinations:

Applicability of 40 CFR Part 64, Compliance Assurance Monitoring

Sources at Title V facilities may be subject to the Compliance Assurance Monitoring (CAM) requirements in 40 CFR, Part 64. The District has reviewed applicability of the Compliance Assurance Monitoring (CAM) requirements in 40 CFR, Part 64, for this facility. Three criteria specified in 40 CFR Part 64.2(a)(1-3) must be met for CAM to apply:

- The source must be subject to a federally enforceable emission limit for a regulated air pollutant, other than an exempt limitation.
- The source must use a control device to achieve compliance with this emission limitation.
- The pre-controlled emissions of the specific pollutant being controlled must be greater than the major facility emissions threshold for that pollutant.

The applicability of compliance assurance monitoring (CAM) must be considered at this facility because the facility uses emission control devices to achieve compliance with a federally enforceable emission limit.

The control devices in use are flares A-190, A-191, A-192 and A-193. In addition, the boiler (S-55), cogeneration engines (S-37, S-38, and S-39), and proposed gas turbine (S-56) burn digester gas to make power and heat and therefore control emissions of digester gas. The flares and other combustion devices control emissions from the anaerobic digesters S-180, and are subject to the requirements of SIP Regulation 8, Rule 2-301 (see discussion above). This section prohibits the discharge of an emission containing more than 15 lbs/day and a concentration of more than 300 ppm total carbon.

In the Statement of Basis for the 2005 Title V permit renewal, the District performed a conservative calculation to estimate the NMOC emissions potential from digester gas. The calculation includes all compounds of carbon with the exception of methane and carbon dioxide. EBMUD has a historical maximum daily digester gas production rate of 2,160,000 cu ft (theoretical maximum of 3,800,000 cu ft/day), with a maximum concentration of 82 micro-grams NMOC per liter (16 ppmv), of digester gas. Assuming all digester gas is vented at the maximum NMOC concentration gives a daily uncontrolled emission rate of approximately 19 lb per day. CAM only applies if the uncontrolled emissions are more than 100 tpy. Since the maximum potential annual uncontrolled emissions are 3.5 ton (6,935 lb/yr), CAM is not required.

For the emergency diesel engines sources (S-50, S-51, S-52, S-53 and S-54), they are subject to NESHAP 40 CFR Part 63 subpart ZZZZ. In addition, these engines do not have an abatement device, as such they are not subject to CAM as there is no add on control- abatement device.

For S-48 GDF G-9008, the condition limits them with a throughput of 334,000 gallons per year. For above ground tanks Scenario 1 with a submerged fill only and having no controls emission factor is 19.5 lbs/1000 gallons.

$(19.5 \text{ lbs}/1000) * (334,000) = 6513 \text{ lbs}/\text{yr}$ or 3.26 tons/yr. This is less than 100 tons/yr, facility is not subject to CAM for Gasoline Dispensing Facility as it does not meet the third CAM applicability criteria- 40 CFR Part 64.2(a)(3). Emission factors were taken from CAPCOA (Air Toxics-“Hot Spots” Program) Gasoline Service Station Industry Wide Risk Assessment Guidelines Dec 1997 document.

For the cogeneration engines sources S-37,S-38, S-39, the hot water boiler S-55, and the gas turbine engine S-56 these sources are not subject to CAM per 40 CFR Part 64.2(a)(2), as no abatement device is attached to each of these sources.

Changes to permit, Section IV:

- The dates of adoption or approval of the rules and their “federal enforceability” status have been updated
- Added language for description of regulations

- Table IV-E for sources S-49 and S-52 were deleted. S-49 is a portable engine and is exempt from Title V permitting per 2-6-114 (non-road engine).
- Table IV-E Source S-52 was removed and added to the revised table of IV-F with other diesel engines and is now in Table IV-E
- Table IV-F for Sources S-50, S-51 and S-53 was renumbered as Table IV-E.
- Tables IV-G for Source S-54 was renumbered as Table IV-F
- Table IV-H for Source S-55 was renumbered as Table IV-G
- Table IV-I for source S-56 was renumbered Tables IV-H, in addition, S-57 was removed.
- Table IV-J for source S-100,120 was renumbered as Table IV-I
- Table IV-K for source S-110 was renumbered as Table IV-J
- Tables IV-L,M,N were renumbered as Tables IV-K, L, M
- In Tables IV-A, B, C, E, F, G, H, I, J, K, L, and M, the District removed SIP regulations where language was verbatim as the District regulations.
- In Table IV-A, IV-B, IV-E and IV-F, the District is adding a new NESHAP requirement (40 CFR Part 63 Subpart A and Subpart ZZZZ) that applies to stationary reciprocating engines.
- In Table IV-E, condition limits were added for S-52.
- In Table IV-D the District is adding a new NESHAP requirement (40 CFR Part 63 Subpart A and Subpart CCCCC) gasoline dispensing facilities.
- In Table IV-D, additional sections of the SIP Regulation 8-5 were added
- In Table IV-D additional sections of BAAQMD Regulation 8, Rule 7 were added and or deleted along with additional descriptions were also included.
- In Table IV-D, CARB Executive Order G-70-17AD, G-70-161, G-70-52AM and VR-301-D were added
- In Table IV-D, permit condition has been corrected due to the District's adoption of BAAQMD Regulation 2, Rule 5 in 2005, which replaced the District's Toxic Risk Management Policy.
- In Table IV-D, permit condition #16516 was replaced with 25107 and description changed- Annual Leak Test 9 Regulation 8-7-407).
- In Table IV-E, the District added additional sections of Regulation 6 Rule 1 and District regulations 8 Rule 1 and Regulation 9, Rule 8.
- In Table IV-E, District deleted old condition #19040 and replaced it with condition #22830 and language for sources S-50 and S-53. The District added condition #22850 to source S-51 as this engine is a diesel generator and the conditions need to remain consistent.
- In Tables IV-E and IV-F, the District corrected date and added additional sections of CARB ATCM (CCR, Title 17, Section 93115) that applies to stationary compression-ignition engines.
- Tables IV-E and IV-F additional language for SIP 6 was added, and BAAQMD Regulation 8-1 was added for exemption of IC engines.
- In Table IV-F, old condition #24733 was replaced with generic condition #22850.
- In Table IV-G, additional District and SIP regulation sections were added for Regulation 9, Rule 7.
- In Table IV-G, condition #20651, part 19 was modified to reference Regulation 2-6-409.2.

- In Table IV-H, the District corrected the description by removing S-57 turbine.
- In Table IV-H, additional District and SIP regulations were added. Also sections were removed if compliance date had already passed and was no longer applicable.
- In Table IV-H, Section 9-1-304 was added because this turbine uses diesel oil as a pilot fuel.
- In Table IV-H SIP Regulation 9, Rule 9 adoption date has been revised to 12/15/97.
- In Table IV-H, the District is adding a new NSPS requirement (40 CFR Part 60 Subpart A and Subpart GG) that applies to stationary gas turbines.
- In Tables IV-A, IV-B, IV-G and IV-H, Condition # 18860 was added to sources S-37, S-38, S-39, S-55 and S-56.

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.”

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

The BAAQMD Compliance and Enforcement Division has conducted a review of the compliance record of this facility and has determined that East Bay Municipal Utility District has been in intermittent compliance during the previous 7 years. The Compliance and Enforcement Division has noted no evidence of on-going non-compliance and no recurring pattern of violations that would warrant consideration of a compliance schedule. The compliance status is discussed in more detail in Section E, and the compliance report is contained in Appendix A of this permit evaluation and statement of basis.

Changes to Permit, Section V:

- The District is not proposing any changes to this section.

VI. Permit Conditions

During the Title V permit development, the District has reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. Each permit condition is identified with a unique numerical identifier, up to five digits.

When necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting requirements have been added to the permit.

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

The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). 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. After issuance of the Title V permit, permit conditions will be revised using the procedures in Regulation 2, Rule 6, Major Facility Review.

Conditions that are obsolete or that have no regulatory basis have been deleted from the permit.

Conditions have also been deleted due to the following:

- Redundancy in recordkeeping requirements.
- Redundancy in other conditions, regulations and rules.
- The condition has been superseded by other regulations and rules.
- The equipment has been taken out of service or is exempt.
- The event has already occurred (i.e. initial or start-up source tests).

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

- **BACT:** This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- **Cumulative Increase:** This term is used for a condition imposed by the APCO 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 policy was replaced by Regulation 2, Rule 5 in 2005.

Changes to permit, Section VI:

Source S-49 is a portable diesel engines and thus not subject to Title V permitting per 2-6-114 (non-road engine). Therefore, Condition # 19058 has been deleted. In addition for sources 51 and 54 standard condition 24850 replaced condition # 24733. In a previous revision, the permit engineer had replaced the generic condition 22850 with condition #24733. The condition 22850 is a common condition used in describing emergency diesel engines. Other changes include addition of condition # 22820 for source S-52 as it no longer is a portable engine.

Summary of Changes to Operating Conditions

The following table lists the sources in order with their previous and future (final) condition status. The condition changes will be discussed in the numerical order of the conditions.

Source Number	Current Condition #	Proposed Permit Condition #(s)
37	20651	18860, 20651
38	20651	18860, 20651
39	20651	18860, 20651
43	2409	2409
45	2409	2409
47	2409	2409
48	25107	25107, 21663
50	19040	22830
51	21921	22850
52	19058	22820
53	21924	19040
54	N/A	22850
55	N/A	18860, 20651
56	N/A	18860, 24050
100	21759	21759
110	17335	17335
170	18006	18006
180	18860	18860

A summary of the proposed changes to permit conditions in Section VI of the permit are given below in numerical order as they appear in the permit.

Changes to Permit, Section VI:

- Condition 21663 changed from 16516. Also TRMP changed to Regulation 2-5-302.
- Replaced condition #16516 with 25107. Same Language
- Condition #18860, replaced TRMP with Regulation 2-5-302.
- Condition# 18860, deleted source S-57 from condition.
- Deleted condition #19040 for sources S-50, S-51 and S-53.
- Deleted condition #19058 for sources S-49 and S-52- for portable generators.
- Added condition #22820 for S-52 as it is now a stationary emergency diesel engine.
- For Condition 20651, part 10, replaced 140 ppmv with 70 ppmv for sources S-37 and S-39.
- For Condition 20651, part 13, replaced 19.8 MM Btu/hr with 25 MM Btu/hr based on AN 17749 stating this was a typo.
- Added condition #22830 for sources S-50 and S-53- emergency backup generators.
- Added condition #22850 for sources S-51 and S-54- emergency backup generators.
- Deleted condition #24733 as this was replaced by 22850 for S-54.
- Condition #24050, deleted source S-57 Digester Gas Turbine #2 as this source was never installed.
- Condition #24050, parts 1-4, deleted language that references source S-57.

VII. Applicable Limits and Compliance Monitoring Requirements

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

The District has reviewed all monitoring and has determined the existing monitoring is adequate with the following exceptions.

The tables below contain only the limits for which there is no monitoring or inadequate monitoring in the applicable requirements. The District has examined the monitoring for other limits and has determined that monitoring is adequate to provide a reasonable assurance of compliance. Calculations for potential to emit will be 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 requirements only when it can support a conclusion that existing monitoring is inadequate.

NOx Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Periodic Monitoring
S-55 Hot Water Boiler	BAAQMD 9-7-307.7	30 ppm@3%O ₂	None

NOx Emissions Discussion

The Hot Water Boiler S-55 has a federally enforceable 30 ppm @3% O₂ NOx limit from 2 applicable requirements (9-7-301.1 and condition #20651 part 5). A previous permit revision requires annual source test for S-55, therefore this should also be sufficient to satisfy 9-7-307.7.

S-55. The measured digester gas heat content (per during the same tests gave a result of 687.4 Btu/scf. The heat content evaluation was based on ASTM Method D-1945-81, in conjunction with ASTM D-3588-89 as specified by 9-7-605. This value is on the upper end of an expected heat content range for digester gas. To be conservative, a value of 700 Btu/scf will be used in this analysis. Digester gas is typically 60 – 65% methane and 35 – 40% CO₂, producing a more typical heating value of 600 – 650 Btu/scf. Based on 235 scfm at 700 Btu/scf gives the following modified maximum heat input for boiler S-5:

$$\text{Modified Maximum Heat Input} = (235 \text{ scf/min})(700 \text{ Btu/scf})(60 \text{ min/hr})(\text{MM Btu}/1,000,000 \text{ Btu}) = 9.87 \text{ MM Btu/hr.}$$

Since the capacity of the boiler is less than 10 MM Btu/hour, this boiler is required (per 9-7-304) to either operate with a stack gas oxygen content not to exceed 3% or to have an annual tuning by a technician according to the requirements of 9-7-604. There is no NOx limit for boiler S-5. EBMUD has chosen to perform the annual tuning, which has been written into the new operating conditions.

$$\text{NOx PTE, S-5: } (100 \text{ lb NOx}/1\text{E}6 \text{ scf})(\text{scf}/1013 \text{ Btu})(9.87\text{E}6 \text{ Btu/hr})(8760 \text{ hr/yr}) = 8,535 \text{ lb/yr}$$

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-55 Hot Water Boiler	BAAQMD 9-7-307	400 ppm @3% O ₂	None
	BAAQMD Condition 20651, part 5	50 ppm @3% O ₂	Annual Source Condition 20651, part 19

CO Monitoring Discussion

The Hot Water Boiler S-55 has federally enforceable CO limits of 400 ppm @3% O₂ and 50 ppm @3% O₂ as noted above. There is annual source test for S-55 under Condition 20651, part 19. A previous permit revision requires annual source test for S-55, therefore this should also be sufficient to satisfy 9-7-307.7.

SO₂ Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3 Digester Gas Flare A-190 Digester Gas Flare A-191 Digester Gas Flare A-192 S-50 Diesel Engine BUG, 238 HP S-51 Diesel Engine BUG, 268 HP S-52 Diesel Engine BUG, 280 HP S-53 Diesel Engine BUG, 277 HP S-54 Diesel Engine BUG, 1114 HP S-55 Hot Water Boiler 20.4MM Btu/hr S-56 Gas Turbine 44.5 MM Btu/hr	Regulation 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

SO₂ Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-38 Multi-Fuel Cogeneration Engine #2, Digester Gas Flare A-190 Digester Gas Flare A-191 Digester Gas Flare A-192 S-55 Hot Water Boiler 20.4 MM Btu/hr	Regulation 9-1-302	300 ppm SO ₂ from any source	Digester gas sulfur monitoring
S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3 S-56 Gas Turbine 44.5 MM Btu/hr	Regulation 9-1-304	Sulfur content of fuel < 0.5% by weight	none

SO₂ Monitoring Discussion

BAAQMD Regulation 9-1-301 (Ground-Level SO₂ Concentration Limitations)

Area monitoring to demonstrate compliance with the ground level SO₂ 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 SO₂ and therefore is not required to have ground level monitoring by the APCO.

Standby Generator Diesel Engines (Sources S-50, S-51, S-52, S-53 and S-54)

Diesel Engines are fired exclusively on California low-sulfur diesel fuel (15 ppmw sulfur) and is operated infrequently during power outages and equipment testing. Therefore, monitoring for ground-level SO₂ concentrations is not justified for this source.

Cogeneration Engines, Hot Water Boiler and Turbine Engine (Sources S-37, S-38, S-39, S-55 and S56)

Digester Gas Combustion: Area monitoring to demonstrate compliance with the ground level SO₂ concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). Based on an hourly digester gas production rate of 159,000 cu ft/hr at 300 ppmv sulfide level the resulting SO₂ emission rate at a single combustion emission point would be 7.9 lb/hr (0.99 g/sec). Using conservative meteorology in conjunction with conservative exhaust rates gives an absolute worst-case BEEST modeled fence line (worst-case) concentration of 0.02 ppm of SO₂, which is less than the 0.05 ppmv averaged over 24 hours (9-1-301). We conclude no ground level monitoring is needed.

BAAQMD Regulation 9-1-302 (300 ppmv maximum, from any vapor stream)

This regulation prohibits the discharge of any stream containing SO₂ in excess of 300 ppm (liquid or solid fuel burning sources are exempt).

Digester Gas Combustion for sources S-38 and S-55

The digester gas is limited to 1500 ppm H₂S (sulfide). This is less than the calculated level which would directly produce an exhaust stream of 300 ppmv SO₂. Digester gas sulfide levels are typically less than 200 ppmv, hence the 300 ppmv standard is not expected to be approached from 100% digester gas combustion. Therefore, monitoring for this standard is not necessary.

S-55: Hot Water Boiler; S-38: Cogeneration Engine

This digester gas fired equipment is subject to SIP Regulation 9-1-302, which limits exhaust SO₂ emissions to 300 ppmv. Condition 18860 part 3 limits the total sulfur content of digester gas used as fuel to 340 ppmv. This limits SO₂ emissions from the combustion equipment to 58.4 ppmv as follows:

For digester gas (64% methane, 36% CO₂); the stoichiometric combustion factor is 5.82 cu ft dry reactants per cu ft fuel (5.82 cu ft FG/cu ft DG).

$$\begin{aligned} \text{SO}_2 &= [(340 \text{ E-6 cu ft S/cu ft DG})(\text{cu ft SO}_2/\text{cu ft S})]/(5.82 \text{ cu ft FG/cu ft DG}) \\ &= 5.84 \text{ E-5 cu ft SO}_2/\text{cu ft FG} \\ &= 58.4 \text{ ppmv} \end{aligned}$$

The BAAQMD concludes that a demonstration of compliance with the digester gas fuel sulfur limit also demonstrates compliance with the SO₂ limit of SIP Regulation 9-1-302. Therefore, monitoring for this standard is not necessary.

BAAQMD Regulation 9-1-304 (Sulfur Content of Liquid & Solid Fuels) for Cogeneration Engines and Turbine (Sources S-37, S-38, S-39, and S-56)

This section only applies when these sources are using liquid fuels. In this case, these sources may use diesel oil for very short periods of time as pilot fuel. CARB diesel oil fuel sulfur content restrictions (0.0015% by weight) are far below the Regulation 9-1-304 limit (0.5% by weight). Since these sources may only use CARB diesel fuel, no monitoring is required.

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-55 Hot Water Boiler S-56 Digester Gas Turbine	BAAQMD Regulation 6-1-301 SIP 6-301	Ringelmann 1.0	None
S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel	BAAQMD Regulation 6-1-303 and SIP 6-303	Ringelmann 2.0	None, operated infrequently

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3, A-190, A-191, A-192, A-193 Digester Gas Flares, Diesel Fired Emergency Backup Engines (S-50, S-51, S-52, S-53, S-54 Generators)			
S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3, A-190, A-191, A-192, A-193 Digester Gas Flares, Diesel Fired Emergency Backup Generators (S-50, S-51, S-52, S-53, S-54) S-55 Hot Water Boiler, S-56 Digester Gas Turbine	BAAQMD Regulation 6-1-310 and SIP 6-310	0.15 gr/dscf	None

PM Emissions Discussion

Regulation 6-1-301 Visible Emissions (Sources S-55 and S-56)

BAAQMD Regulation 6-1-301 limits visible emissions to a Federally enforceable limit of Ringelmann 1.0 for 3 minutes in any hour. Visible emissions from gaseous fuel combustion are not expected to exceed this limitation. This includes emissions from all sources burning digester gas, including the hot water boiler S-55 and the turbine engine S-56. There are no visible emissions from the liquid wastewater sources. Since there are no gaseous fuel derived visible emissions expected, periodic monitoring to ensure compliance with Regulation 6-301 from liquid sources as well as combustion sources burning digester gas is not required. No monitoring for visible emissions from the digester gas combustion is necessary.

Regulation 6-1-303 Visible Emissions (Emergency Backup Generator Engines - sources S-50, S-51, S-52, S-53, S-54, digester gas sources - (S-37,S-38, S-39)

SIP Regulation 6-303 applies to the diesel fired emergency standby generators at the facility and limits visible emissions to Ringelmann 2.0 for 3 minutes in any hour. Although there may be a potential for some visible emissions from diesel engine operation, we do not expect the intermittent and brief operation of the diesel engines to necessarily exceed the Ringelmann 2.0

standard, particularly since the engines are all required to use ultra low sulfur fuel ($\leq 0.0015\%$). No monitoring for visible emissions from or diesel combustion sources is recommended.

Regulation 6-1-310 Particulate Weight Limitation

BAAQMD Regulation 6-1-310 limits filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. Section 310.3 limits filterable particulate emissions from “heat transfer operations” to 0.15 gr/dscf at 6% O₂. These are the “grain loading” standards. There are no sources burning gaseous fuel (digester gas) that would ever be expected to have emissions near this limitation.

On a routine basis, there are no sources which could approach the limit of 6-310, since only gaseous fuels are typically combusted. The only sources that could potentially exceed these limits are the standby diesel generators. The standby diesel generators include sources S-50, S-51, S-52, S-53 and S-54 as well as the cogeneration engines S-37, S-38, and S-39, which would be operated as emergency backup generators in the event of an emergency.

Backup Diesel Generators Sources S-50, S-51, S-52, S-53

BAAQMD Regulation 6-1-310 limits PM emissions to 0.15 gr/dscf, if it is assumed that the diesel engine exhaust gases contain 15% excess oxygen under normal operating conditions, the Regulation 6-1-310 limit can be compared to the expected emissions from the generators as follows:

From 40 CFR 60, Appendix A, Method 19, Table 19-1, a stoichiometric dry gas combustion factor of 9,190 dscf/MMBTU is given for distillate oil combustion. At 15% excess O₂ this factor becomes:

$$9,190 \times [21\% / (21\% - 15\%)] = 32,165 \text{ dscf (combustion products) / MMBTU}$$

The conversion of 0.15 gr/dscf @ 15% O₂ to lb/MMBTU is then:

$$(32,165 \text{ dscf / MMBTU}) \times (0.15 \text{ gr / dscf}) \times (\text{lb} / 7,000 \text{ gr}) = 0.689 \text{ lb / MMBTU}$$

The manufacturer’s PM emission rate for S-54 (0.14 g/bhp-hr) is converted to lb/MMBTU as follows:

$$[(0.14 \text{ g / bhp-hr} \times 1114 \text{ bhp}) / 453.6 \text{ g / lb}] / [(54.8 \text{ gal diesel / hr}) \times (0.137 \text{ MMBTU / gal diesel})] \\ = 0.046 \text{ lb / MMBTU}$$

Since the manufacturer’s PM emission factor for all emergency diesel generators is less than the converted Regulation 6-1-310 limit, compliance is assumed. Standby Generator Diesel Engine is fired exclusively on California low-sulfur diesel fuel with a maximum sulfur content of 15 ppmw. Therefore, particulate emissions are expected to be minimal and monitoring for this emission limit is not justified.

Per A/N 14243- S-55 Hot Water Boiler, and A/N 17749 S-56 Digester Gas turbine

PM-10 Emissions: $[20.41 \text{ MMBtu/hr}][7796 \text{ hr/yr}][3.167\text{E-}03 \text{ lb/MM Btu}] = 504 \text{ lb/yr}$ (1.4 lb/day annual average)

Highest day emissions = $[[504 \text{ lb/yr}]/[7796 \text{ hr/yr}]]*24\text{hr/day}] = 1.6 \text{ lb/day} = 584 \text{ lbs/yr}$ (0.292 tons/yr)

and A/N 17749 S-56 Digester Gas turbine

The applicant supplied a total PM emission factor of 0.03 lb/MM Btu Fuel input which includes all condensables including water in the factor.

Total PM - $(0.03 \text{ lb/MM Btu})(44.5 \text{ MM Btu/hr})(24 \text{ hours/day})(365 \text{ days/yr}) = 5.8 \text{ tons/yr}$

Based on AP-42, water typically accounts for about 70% of the particulate on a weight basis. Therefore, non-condensables = $(.3*5.8 \text{ tons/yr}) =$

PM, PTE for turbine engine S-56 : 1.7 tons/year (9.5 lbs/day or 0.4 lb/hr)

PM PTE for each cogeneration Engines (S-37, S-38, S-39) PM: $(0.085 \text{ g/bhp-hr})(2980 \text{ bhp})(7,796 \text{ hr/yr})(\text{lb}/454 \text{ g}) = 4,350 \text{ lb/yr}$
(2.2 tpy) per engine

POC Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S,56 Gas Turbine, S-55 Hot Water Boiler, S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3, S-100 Wastewater Plant, S-180 Anaerobic Digesters A-190, A-191, A-192, A-193 Digester Gas Flares, S-47 Scum Thickening Building, S-43 Wet Weather Primary Sludge Thickeners, S-45 Aerated Grit Tanks, S-100 Municipal	BAAQMD 8-2-301	15 lb/day and greater than 300 ppm total carbon	none

POC Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
Wastewater Treatment Plant S- 100 Headworks, IPS Barscreens, S-120 Primary Treatment S- 130 Secondary Treatment, S-140 Disfection,S-170 Sludge Handlings, S-180 Anaerobic Digesters			

POC Emissions Discussion:

Potential POC emission sources include the combustion sources as a result of incomplete combustion of any organics that may be in the digester gas (trace amounts) and the precursor organics that may result from the wastewater processes. Conservative digester gas sampling indicates the precursor organic levels are less than 82 microgram/liter (5.1 lb/MM cu ft). For the purposes of this PTE calculation, we will estimate uncontrolled emissions as well as worst case un-combusted organics assuming a conservative 90% destruction efficiency.

Digester Gas Combustion: The PTE is based on the estimated maximum digester gas production rate of 159,000 cu ft/hr (maximum digester production rate)

$$\text{PTE, organics from digester gas, uncontrolled} = (159,000 \text{ scf DG/hr})(8760 \text{ hr/yr})(5.1 \text{ lb}/1\text{E}6 \text{ scf DG}) = 7,103 \text{ lb/yr} (19.5 \text{ lb/day})$$

$$\text{PTE, organics from digester gas, after abatement} = (7,103 \text{ lb/yr})(0.1) = 710 \text{ lb/yr} (1.9 \text{ lb/day})$$

Since the potential to emit POC from all digester gas combustion sources is less than 15 lb/day, comply with SIP Regulation 8-2-301. No monitoring is recommended.

Since the potential to emit POC from digester gas combustion sources is less than 100 ton per yr, no compliance assurance monitoring of POC emissions from digester gas sources is needed.

Wastewater POC Sources: The PTE for organics from the wastewater sources is based on emission factors developed from the AB-2588 programs for sewage treatment plants. The maximum plant liquid flow rate is 120 MM gpd with an uncontrolled POC emission factor of 243 lb/yr per million gallon per day (BAAT-AMSA 80% Conservative Emission Factor). The PTE for POCs from the wastewater processes is:

$$\text{PTE} = (120 \text{ E6 gpd})(243 \text{ lb/yr-1E6 gpd}) = 29,160 \text{ lb/yr (80 lb/day throughout wastewater sources, all locations combined)}$$

The emissions of POCs occur at various locations, at numerous liquid sources throughout the wastewater processes and are typically represented in high volume, highly dilute vapor streams, spread out over many processes that are difficult to capture and control. Modern grassroots POTWs are increasingly designed to be covered and vented to high efficiency control systems, but the costs associated with such retroactive controls are not cost effective. There are no conditions to control and/or monitor POC emissions from any of the liquid wastewater sources. We do not expect any wastewater POC emission source to have a concentration approaching 300 ppmv, hence no monitoring is needed.

Miscellaneous Operations Standards

BAAQMD Regulation 8, Rule 2 Miscellaneous Operations is the 'back-stop' organic compound emission regulation in that if no other rule in Regulation 8 applies, Rule 2 does. Sludge Gas Flares, turbines, engines and hot water boiler combusts the digester gas from the water treatment plant. Combustion is a very effective means of reducing organic emissions. The sanitary water treatment plant (S100 series) and the industrial water treatment plant (S200 series) are expected to be charged with feeds streams very low in organic material. Therefore, no monitoring is required to assure compliance with this limit for these sources.

Discussion of Other Pollutants:

Changes to permit, Section VII:

- In Table VII, all citations of BAAQMD Regulation 6 will be changed to citations of SIP Regulation 6 and Regulation 6, Rule 1 will be added. This is due to a renumbering of the BAAQMD Regulation 6.
- In Table VII-A and VII-B, 140 changed to 70 ppmv for NO_x.
- In Table VII-E and VII-F, the District is adding the applicable operating limitations from the CARB ATCM for Stationary Compression Ignition Engines that was adopted in 2004 and amended in 2011.
- In Tables VII-A, VII-B, VII-E, VII-F, the District is including the applicable operating and idle time limits and the required maintenance provisions from the 40 CFR, Part 63, Subpart ZZZZ RICE NESHAP that was adopted in 2010.
- In Tables VII-A and VII-B, removed monitoring requirements for SO₂, as condition #20651 was deleted.
- In Tables VII-C, VII-D, VII-G, VII-H, VII-I, VII-J and VII-K replaced POCs with Organics for the type of limit.
- In Table VII-C, included condition #2409.

- In Table VII-D, additional BAAQMD 8-7 citations were included along with CARB Executive Orders for Phase I and Phase II vapor recovery of GDF facilities.
- In Table VII-D for the S-48 Gasoline Dispensing Facility, the District is incorporating the Regulation 8, Rule 5 amendments approved in 2006. S-48 is exempt from BAAQMD Regulation 8, Rule 5. Therefore, only SIP Regulation 8, Rule 5 applies to S-55 at this time. The District is also adding a missing gas tight limit for the pressure vacuum valve on the above ground gasoline from SIP Regulation 8, Rule 5.
- Table VII-D, NESHAP for GDFS Subpart CCCCCC is included in the table along with limitations and other monitoring requirements.
- In Table VII-D, condition #16516 was deleted and replaced with 25107. Both conditions have the exact same wording.
- In Table VII-E and VII-F, additional limits have been included for monitoring, along with references to ATCM for diesel engines and NESHAP ZZZZ.
- In Table VII-E, added hours of operation for S-52.
- In Table VII-E condition # 19040 has been replaced with condition #22830. Additional corrections to ATCM citations have been fixed. Condition # 22850 added for S-51.
- In Table VII-F, additional limits have been included.
- The District is deleting Table VII-E for sources S-49 and S-52 because these are portable engines and not subject to Regulation 2-6.
- In Table VII-G, additional limitations are included for stack gas temperature, insulation requirements. Correction to regulation citations were fixed for CO. Future effective dates were deleted once the date had occurred. Heat input included along with condition reference 20651 part 3b.
- In Table VII-G, type of limit PM was changed to FP to retain consistency in document.
- The District is renumbering Tables VII-E through VII-L respectively, as Tables VII-E through VII-K.
- In Table VII-H, removal of S-57 as this was never installed. Addition of NSPS Subpart GG was included for Gas Turbine Engines. Replaced PM with FP for consistency in document. The 9-1-304 limit that applies during diesel oil use was added.

VIII. Test Methods

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

Changes to permit

- Test methods will be added and deleted as shown in Table VIII of the proposed permit revision in accordance with the changes to other sections of the permit that have previously been discussed.

IX. Permit Shield:

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

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

This facility has no permit shields.

X. Revision History

This section of the permit summarizes each revision to the permit.

Changes to Permit, Section X:

- The proposed changes for this permit renewal (Application # 21441) have been added to this section.

XI. Glossary

This section of the permit defines and explains acronyms, abbreviations, and other terms that are used in this permit.

Changes to Permit, Section XI:

- The District is updating the Section XI Glossary by clarifying explanations and adding numerous new terms.

D. Alternate Operating Scenarios:

No alternate operating scenario has been requested for this facility.

E. Compliance Status:

A September 5, 2012 office memorandum from the Director of Compliance and Enforcement, to the Director of Permit Services, presents a review of the compliance record of East Bay

Municipal Utility District (Site #: A0591). The Compliance and Enforcement Division staff has reviewed the records for East Bay Municipal Utility District for the period between July 26, 2005 through August 31, 2012. This review was initiated as part of the District evaluation of an application by East Bay Municipal Utility District for a Title V permit. During the period subject to review, activities known to the District include:

- The District issued fourteen (14) Notices of Violation during this review period. 13 violations were for violation of H₂S in the digester gas collection unit. These violations have been addressed through equipment repair, operating procedures, uninterruptible power supply system and adjusting ferric chloride feed rates. The other violation was for the digester removed from service for cleaning.
- The District received five (5) alleged complaints of which two (2) were confirmed.
- The facility is not operating under a Variance or an Order of Abatement from the District Board.
- The District received twenty (20) notifications for Reportable Compliance Activity (RCA). 14 RCAs received NOV's, of which 11 were for H₂S excesses, the other 3 RCAs that received NOV's were for equipment failures resulting in gas release (digester roof tilted, digester hose break and digester surge tank pipe coupling failure). Of the 5 RCAs where no action was taken; 2 were for digester gas release due to PG&E power failure; 2 RCAs were for the P-trap fluid seal of digester lost and 1 RCA was for hose break of digester. 1 RCA was for late reporting and the facility received a Notice to Comply (NTC). There were monitor excesses and equipment breakdowns reported or documented by District staff.
- The facility is not operating under an Enforcement Agreement, a Variance, or an Order of Abatement

The responsible official certified that all equipment was operating in compliance on July 23, 2012. The District's Compliance and Enforcement Division has determined that East Bay Municipal Utility District was in intermittent compliance. East Bay Municipal Utility District 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.

F. Differences between the Application and the Proposed Permit:

The Title V permit application was originally submitted on December 30, 2009. This version is the basis for constructing the proposed Title V permit.

In addition, the District has proposed numerous updates to the standard permit language, regulatory descriptions, and regulatory amendment dates throughout the permit to reflect regulatory changes, to clarify limits and other applicable requirements, to explain permit terminology, to remove obsolete requirements, and to correct permit errors.



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APPENDIX A
BAAQMD COMPLIANCE REPORT

COMPLIANCE & ENFORCEMENT DIVISION

Inter-Office Memorandum

September 5, 2012

TO: JIM KARAS - ACTING DIRECTOR OF ENGINEERING 
FROM: RICHARD LEW – ACTING DIRECTOR OF ENFORCEMENT 
SUBJECT: REVIEW OF COMPLIANCE RECORD OF:

EAST BAY MUNICIPAL UTILITY DISTRICT; SITE #A0591

Background

This review was initiated as part of the District evaluation of an application by the East Bay Municipal Utility District (EBMUD) for a Title V Permit Renewal. It is standard practice of the Compliance and Enforcement Division to undertake a compliance record review in advance of a renewal of a Title V Permit to Operate. The purpose of this review is to ensure that any non-compliance problems identified during the prior year permit term have been adequately addressed, or, if non-compliance persists, that a schedule of compliance is properly incorporated into the Title V permit compliance schedule. In addition, the review checks for patterns of recurring violation that may be addressed by additional permit terms. Finally, the review is intended to recommend, if necessary, any additional permit conditions and limitations to improve compliance.

Compliance Review

Compliance records were reviewed for the time period from July 26, 2005 through August 31, 2012. The results of this review are summarized as follows.

1. Violation History

Staff reviewed the East Bay Municipal Utility District Annual Compliance Certifications and found no ongoing non-compliance. A recurring pattern of violation of H₂S in the digester gas collection unit has resulted in the issuance of 13 violations (All except NOV# A47527 listed below). These violations have been addressed through adjusting ferric chloride feed rates, the implementation of new operating procedures, equipment repairs and installation of an uninterruptible power supply system.

REVIEW OF COMPLIANCE RECORD OF:
East Bay Municipal Utility District – SITE #A0591
 September 5, 2012
 Page 2 of 4

District-issued fourteen (14) Notice of Violation(s):

NOV#	Regulation	Date Occur	# of Days	Comments	Disposition
A47527	2-1-307	2/14/06	1	Digester removed from service, cleaned out	Resolution
A47529	2-6-307	7/23/06	1	Increased ferric chloride	Resolution
A47530	2-6-307	10/19/06	1	Increased ferric chloride cleaned out sludge line	Resolution
A47535	2-6-307	7/18/07	1	Increased ferric chloride	Resolution
A50753	2-6-307	7/10/09	1	Increased ferric chloride	Pending
A50755	2-6-307	10/30/09	1	Increased ferric chloride	Pending
A50758	2-6-307	2/6/10	1	Increased ferric chloride cleaned out sludge line	Pending
A50759	2-6-307	2/10-12/10	3	Increased ferric chloride cleaned out sludge line and restarted scheduled cleanings	Pending
A50761	2-6-307	4/3-4/10	2	Increased ferric chloride equipment repaired	Pending
A50763	2-6-307	8/13/10	1	Increased ferric chloride	Pending
A50764	2-6-307	1/9/11	1	Equipment repaired	Pending
A50765	2-6-307	4/19/11	1	Increased ferric chloride cleaned out sludge line	Pending
A50766	2-6-307	8/8/11	1	Increased ferric chloride resume operating old and new ferric chloride feed systems	Pending
A50769	2-6-307	3/16/12	1	Surge tank lateral pipe supported and coupling tightened and secured	Pending

REVIEW OF COMPLIANCE RECORD OF:
East Bay Municipal Utility District – SITE #A0591
 September 5, 2012
 Page 3 of 4

2. Complaint History

The District received five (5) air pollution complaints alleging the EBMUD as the source. Two (2) of these complaints were confirmed.

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 permit period, July 26, 2005 through August 31, 2012, the District received twenty (20) notifications for RCA's. Fourteen (14) NOV's were issued as a result of these RCA's.

Episode	Date Occur	Comments	Disposition
04S74	2/14/06	Digester roof tilted - gas released	NOV# A47527
04W11	7/23/06	H2S Excess	NOV# A47529
04X26	10/19/06	H2S Excess	NOV# A47530
04Z24	2/14/07	Digester - Dystor hose broke resulting in gas release	No Action
05B23	7/18/07	H2S Excess	NOV# A47535
05G11	6/5/08	Digester – lost the p-trap fluid seal	No Action
05H02	7/20/08	Digester – lost p-trap fluid seal	NTC# A41952 for late reporting
05N20	7/10/09	H2S Excess	NOV# A50753
05Q05	10/30/09	H2S Excess	NOV# A50755
05R99	2/6/10	H2S Excess	NOV# A50758
05S06	2/10-12/10	H2S Excess	NOV# A50759
05S76	4/3-4/10	H2S Excess	NOV# A50761
05V24	8/13/10	H2S Excess	NOV# A50763

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REVIEW OF COMPLIANCE RECORD OF:
East Bay Municipal Utility District – SITE #A0591
 September 5, 2012
 Page 4 of 4

Episode	Date Occur	Comments	Disposition
05Y05	1/9/11	Digester - temporary gas hose broke resulting in gas release	NOV# A50764
05Z40	4/19/11	H2S Excess	NOV# A50765
06B13	8/8/11	H2S Excess	NOV# A50766
06D54	2/9/12	Digester - gas release due to PG&E power failure	No Action
06D89	2/28/12	Digester - P-trap hydrostatic seal lost resulting gas release to under drain system	No Action
06E29	3/16/12	Digester - surge tank pipe coupling failure resulting in gas release	NOV# A50769
06E71	4/15/12	Digester - gas release due to PG&E power failure	No Action

4. Enforcement Agreements, Variances, or Abatement Orders

There were no enforcement agreements, variances, or abatement orders for EBMUD over the period of the initial permit period or thereafter.

Conclusion

Following its review of all available facility and District compliance records from July 26, 2005 to August 31, 2012, the District's Compliance and Enforcement Division has determined that East Bay Municipal Utility District was in intermittent compliance from the initial permit period through the present. However, East Bay Municipal Utility District 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 this review period, the District has concluded that no changes in the permit terms is necessary beyond what is already contained in the facility's current Title V permit.

APPENDIX B

GLOSSARY

ACT
Federal Clean Air Act

AP-42
An EPA Document “Compilation of Air Pollution Emission Factors” that is used to estimate emissions from numerous source types. It is available electronically from EPA’s web site at: <http://www.epa.gov/ttn/chief/ap42/index.html>

APCO
Air Pollution Control Officer: Head of Bay Area Air Quality Management District

API
American Petroleum Institute

ARB
Air Resources Board

ASTM
American Society for Testing and Materials

ATCM
Airborne Toxic Control Measure

BAAQMD
Bay Area Air Quality Management District

BACT
Best Available Control Technology

Basis
The underlying authority which allows the District to impose requirements.

C1
An organic chemical compound with one carbon atom, for example: methane

C3
An organic chemical compound with three carbon atoms, for example: propane

C5
An organic chemical compound with five carbon atoms, for example: pentane

C6
An organic chemical compound with six carbon atoms, for example: hexane

C₆H₆
Benzene

CAA
The federal Clean Air Act

CAAQS
California Ambient Air Quality Standards

CAM

Compliance Assurance Monitoring per 40 CFR Part 64

CAPCOA

California Air Pollution Control Officers Association

CARB

California Air Resources Board (same as ARB)

CCR

The California Code of Regulations

CEC

California Energy Commission

CEQA

California Environmental Quality Act

CEM

A “continuous emission monitor” is a monitoring device that provides a continuous direct measurement of some pollutant (e.g. NO_x concentration) in an exhaust stream. **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.

CH₄ or CH₄

Methane

CI

Compression Ignition

CIWMB

California Integrated Waste Management Board

CO

Carbon Monoxide

CO₂ or CO₂

Carbon Dioxide **CO₂e**

Carbon Dioxide Equivalent. A carbon dioxide equivalent emission rate is the emission rate of a greenhouse gas compound that has been adjusted by multiplying the mass emission rate by the global warming potential of the greenhouse gas compound. These adjusted emission rates for individual compounds are typically summed together, and the total is also referred to as the carbon dioxide equivalent (CO₂e) emission rate.

CT

Combustion Zone Temperature

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). Used to determine whether threshold-based requirements are triggered.

District

The Bay Area Air Quality Management District

E6, E9, E12

Very large or very small number values are commonly expressed in a form called scientific notation, which consists of a decimal part multiplied by 10 raised to some power. For example, 4.53E6 equals $(4.53) \times (10^6) = (4.53) \times (10 \times 10 \times 10 \times 10 \times 10 \times 10) = 4,530,000$. Scientific notation is used to express large or small numbers without writing out long strings of zeros.

EG

Emission Guidelines

EO

Executive Order

EPA

The federal Environmental Protection Agency.

Excluded

Not subject to any District Regulations.

FE, Federally Enforceable,

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 (HAP), and Part 72 (Permits Regulation, Acid Rain), and also 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.

FR

Federal Register

GDF

Gasoline Dispensing Facility

GHG

Greenhouse Gas

GLC

Ground Level Concentration

GLM

Ground Level Monitor

Grains

1/7000 of a pound

GRS

Gas Recovery Systems, Inc.

GWP

Global Warming Potential. A comparison of the ability of each greenhouse gas to trap heat in the atmosphere relative to that of carbon dioxide over a specific time period.

H₂S or H₂S

Hydrogen Sulfide

H₂SO₄ or H₂SO₄

Sulfuric Acid

H&SC

Health and Safety Code

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.

Hg

Mercury

HHV

Higher Heating Value. The quantity of heat evolved as determined by a calorimeter where the combustion products are cooled to 60 °F and all water vapor is condensed to liquid.

LEA

Local Enforcement Agency

LFG

Landfill gas

LHV

Lower Heating Value. Similar to the higher heating value (see HHV) except that the water produced by the combustion is not condensed but retained as vapor at 60°F.

Long ton

2200 pounds

Major Facility

A facility with potential emissions of regulated air pollutants greater than or equal to 100 tons per year, greater than or equal to 10 tons per year of any single hazardous air pollutant, and/or greater than or equal to 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity as determined by the EPA administrator.

MAX or Max.

Maximum

MFR

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

MIN or Min.

Minimum

MOP

The District's Manual of Procedures.

MSDS

Material Safety Data Sheet

MSW

Municipal solid waste

MW

Molecular weight

N2 or N₂

Nitrogen

NA

Not Applicable

NAAQS

National Ambient Air Quality Standards

NESHAPs

National Emission Standards for Hazardous Air Pollutants. See 40 CFR Part 61.

NMHC

Non-methane Hydrocarbons

NMOC

Non-methane Organic Compounds (Same as NMHC)

NO₂

Nitrogen Dioxide

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 Act, and implemented by both 40 CFR Part 60 and District Regulation 10.

NSR

New Source Review. A federal program for preconstruction review and permitting of new and modified sources of air pollutants for which criteria have been established in accordance with Section 109 of the Federal Clean Air Act. Mandated by Title I of the Clean Air Act and implemented by 40 CFR Parts 51 and 52 as well as District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

O2 or O₂

Oxygen

Offset Requirement

A New Source Review requirement to provide federally enforceable emission offsets at a specified ratio 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.

PERP

Portable Equipment Registration Program

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 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.

PTE

Potential to Emit as defined by BAAQMD Regulation 2-6-218

PV or P/V Valve or PRV

Pressure / Vacuum Relief Valve

RICE

Reciprocating Internal Combustion Engine

RMP

Risk Management Plan, as defined in 40 CFR Part 68.

RWQCB

Regional Water Quality Control Board

S

Sulfur

SCR

A "selective catalytic reduction" unit is an abatement device that reduces NO_x concentrations in the exhaust stream of a combustion device. SCRs utilize a catalyst, which operates within a specific temperature range, and injected ammonia to promote the conversion of NO_x compounds to nitrogen gas.

Short ton

2000 pounds

SIP

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

SO₂ or SO₂

Sulfur dioxide

SO₃ or SO₃

Sulfur trioxide

SSM

Startup, Shutdown, or Malfunction

SSM Plan

A plan, which states the procedures that will be followed during a startup, shutdown, or malfunction, that is prepared in accordance with the general NESHAP provisions (40 CFR Part 63, Subpart A) and maintained on site at the facility.

TAC

Toxic Air Contaminant

TBACT

Best Available Control Technology for Toxics

THC

Total Hydrocarbons (NMHC + Methane)

therm

100,000 British Thermal Units

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

TSP

Total Suspended Particulate

TVP

True Vapor Pressure

VOC

Volatile Organic Compounds

VMT

Vehicle Miles Traveled

Symbols:

<	=	less than
>	=	greater than
≤	=	less than or equal to
≥	=	greater than or equal to

Units of Measure:

atm	=	atmospheres
bbl	=	barrel of liquid (42 gallons)
bhp	=	brake-horsepower
Btu	=	British Thermal Unit
°C	=	degrees Centigrade
cfm	=	cubic feet per minute
dscf	=	dry standard cubic feet
°F	=	degrees Fahrenheit
ft ³	=	cubic feet
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
gr	=	grains
hp	=	horsepower
hr	=	hour
in	=	inches
kW	=	kilowatt
lb	=	pound
in	=	inches
lbmole	=	pound-mole
max	=	maximum
m ²	=	square meter
m ³	=	cubic meters
min	=	minute
MM	=	million
MM BTU	=	million BTU

MMcf	=	million cubic feet
Mg	=	mega grams
M scf	=	one thousand standard cubic feet
MW	=	megawatts
ppb	=	parts per billion
ppbv	=	parts per billion, by volume
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 dry cubic feet
scfm	=	standard cubic feet per minute
yd	=	yard
yd ³	=	cubic yards
yr	=	year

APPENDIX C

Emission Inventory for Years 2005 and 2011

Plant # 591 Emissions: CURRENT CALCULATION (2011 DATA)

S#	SOURCE NAME	MATERIAL	SOURCE CODE	THROUGHPUT	DATE	PM	EMISSIONS IN LBS/DAY		
							ORG	NOx	S02

37	Multi-Fuel Cogeneration Engine #1								
	Diesel fuel		C72BG098						
	12.8 thou gal/yr		12/31/11		.1	.5	.9	.0	3.0
	Natural gas		C72BG189						
	.0 therms/yr		12/31/11		.0	.0	.0	.0	.0
	Digester gas		C72BG493						
	196403.0 thou cu ft/yr		12/31/11		5.4	35.6	59.3	28.5	193.7

	SOURCE TOTAL:		lbs/day		5.5	36.1	60.3	28.5	196.7
38	Multi-Fuel Cogeneration Engine #2								
	Diesel fuel		C72BG098						
	21.6 thou gal/yr		12/31/11		.2	.7	1.3	.0	5.3
	Natural gas		C72BG189						
	.0 therms/yr		12/31/11		.0	.0	.0	.0	.0
	Digester gas		C72BG493						
	209974.0 thou cu ft/yr		12/31/11		5.8	32.3	51.9	39.7	224.4

	SOURCE TOTAL:		lbs/day		6.0	33.0	53.2	39.7	229.7
39	Multi-Fuel Cogeneration Engine #3								
	Diesel fuel		C72BG098						
	21.9 thou gal/yr		12/31/11		.2	.6	1.8	.0	5.1
	Natural gas		C72BG189						
	.0 therms/yr		12/31/11		.0	.0	.0	.0	.0
	Digester gas		C72BG493						
	148335.0 thou cu ft/yr		12/31/11		4.1	18.8	52.9	20.7	146.3

	SOURCE TOTAL:		lbs/day		4.3	19.3	54.7	20.7	151.4
43	Wet Weather Primary Sludge Thickeners (2)								
	Waste water - other/		G7280443						
	19710.0 thou gallo/yr		12/31/11		.0	.0	.0	.0	.0
45	Aerated Grit Tanks (8)								
	Waste water - other/		G7210443						
	24470.0 thou gallo/yr		12/31/11		.0	.0	.0	.0	.0
47	Scum Thickening Building								
	Waste water - other/		G7280443						
	696.0 thou gallo/yr		12/31/11		.0	.0	.0	.0	.0
48	GDF #9008		TC000000						
**** Unable to compute ****									
49	Backup Generator: Diesel Engine, Portable								
	Diesel fuel		C22AG098						
	.0 thou gal/yr		12/31/11		.0	.0	.0	.0	.0
50	Emergency Standby Generator Set: north side of PGS								
	Diesel fuel		C22AH098						
	.0 thou gal/yr		12/31/11		.0	.0	.0	.0	.0
51	Emergency Standby Generator Set: Dechlor								
	Diesel fuel		C22AG098						
	.2 thou gal/yr		12/31/11		.0	.0	.2	.0	.1
52	Emergency Generator Diesel Engine Generac, 280 HP								
	Diesel fuel		C22AG098						
	.5 thou gal/yr		12/31/11		.0	.0	.7	.0	.1
53	Emergency Standby Generator Set: Admin Building								
	Diesel fuel		C2250098						
	.0 thou gal/yr		12/31/11		.0	.0	.1	.0	.0
54	Backup Generator Set, East Bayshore Recycled Water Facility								

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Diesel fuel	C22BG098						
.3 thou gal/yr	12/31/11	.0	.0	.2	.0	.0	
55 Hot Water Boiler, W28-HHW-BLR-001							
Digester gas	C1240493						
104646.0 thou cu ft/yr	12/31/11	.9	.9	31.6	16.5	10.0	
56 Digester Gas Turbine #1							
Digester gas	C7140493						
599000.0 thou cu ft/yr	09/01/08	8.5	4.9	90.6	69.3	246.2	
100 Municipal Wastewater Treatment Plant; 120 MMGD Dry Weather A							
Municipal sewage	G7200562						
24470.0 million ga/yr	12/31/11	.0	67.4	.0	.0	.0	
110 Headworks; IPS, Barscreens							
Municipal sewage	G7210562						
24470.0 million ga/yr	12/31/11	.0	.0	.0	.0	.0	
120 Primary Treatmnt; 16 Sedimentation Tanks							
Municipal sewage	G7220562						
24470.0 million ga/yr	12/31/11	.0	.0	.0	.0	.0	
130 Secondary Treatment;8 HPO Activated Sludge UNits C/V,Influen							
Municipal sewage	G7240562						
24010.0 million ga/yr	12/31/11	.0	.0	.0	.0	.0	
140 Secondary Clarifiers;12 clarifiers,(mixed liquor)Influent;Ch							
Municipal sewage	G7250562						
24010.0 million ga/yr	12/31/11	.0	.0	.0	.0	.0	
160 Disinfection;Chlorination Contact Tanks,nonducted,effluent c							
Municipal sewage	G7270562						
24470.0 million ga/yr	12/31/11	.0	.0	.0	.0	.0	
170 Sludge Handling, 3 WAS GBTs, 6 Dewatering Centrifuges							
Municipal sewage	G7280562						
224.0 million ga/yr	12/31/11	.0	.0	.0	.0	.0	
180 Anaerobic Digesters-11; Covers: 7 Float, 2 Fixed, 2 Dystor							
Municipal sewage	G7290562						
248.9 million ga/yr	12/31/11	.0	.0	.0	.0	.0	
=====							
PLANT TOTAL:	lbs/day	25.2	161.7	291.6	174.7	834.2	
	tons/day	.0	.1	.1	.1	.4	
	tons/year	4.6	29.5	53.2	31.9	152.2	

Plant #591 Emissions: TITAL V RENWEAL YEAR CALCULATIONS (2005)

S#	SOURCE NAME	SOURCE CODE	EMISSIONS IN LBS/DAY	CO			
MATERIAL	THROUGHPUT	DATE	PM	ORG	NOx	S02	CO
5	Hot Water Boiler, 90E3 therms/yr						
Natural gas	C1150189						
.0 therms/yr	12/31/05	.0	.0	.0	.0	.0	
Distillate oil	C1150315						
.0 thou gal/yr	12/31/05	.0	.0	.0	.0	.0	
Digester gas	C1160493						
334.3 thou cu ft/yr	12/31/05	.0	.0	.0	.0	.0	

SOURCE TOTAL:	lbs/day	.0	.0	.0	.0	.0	
37 Multi-Fuel Cogeneration Engine #1							
Diesel fuel	C7240098						
9.1 thou gal/yr	12/31/05	.1	.3	.7	.2	2.1	
Natural gas	C7240189						
.0 therms/yr	12/31/05	.0	.0	.0	.0	.0	

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Digester gas	C7240493						
265200.0 thou cu ft/yr	12/31/05	7.3	48.1	79.9	38.5	261.6	

SOURCE TOTAL:	lbs/day	7.3	48.4	80.6	38.7	263.7	
38 Multi-Fuel Cogeneration Engine #2							
Diesel fuel	C7240098						
9.8 thou gal/yr	12/31/05	.1	.3	.6	.2	2.4	
Natural gas	C7240189						
.0 therms/yr	12/31/05	.0	.0	.0	.0	.0	
Digester gas	C7240493						
289148.0 thou cu ft/yr	12/31/05	7.9	44.5	71.3	54.7	309.0	

SOURCE TOTAL:	lbs/day	8.0	44.8	71.9	54.9	311.4	
39 Multi-Fuel Cogeneration Engine #3							
Diesel fuel	C7240098						
11.0 thou gal/yr	12/31/05	.1	.3	.9	.2	2.6	
Natural gas	C7240189						
.0 therms/yr	12/31/05	.0	.0	.0	.0	.0	
Digester gas	C7240493						
322633.0 thou cu ft/yr	12/31/05	8.8	40.8	114.9	45.1	318.2	

SOURCE TOTAL:	lbs/day	8.9	41.1	115.8	45.3	320.8	
49 Backup Generator: Diesel Engine, Portable							
Diesel fuel	C2250098						
.0 thou gal/yr	12/31/05	.0	.0	.0	.0	.0	
50 Emergency Standby Generator Set: north side of PGS							
Diesel fuel	C2250098						
.0 thou gal/yr	12/31/04	.0	.0	.0	.0	.0	
51 Emergency Standby Generator Set: Dechlor							
Diesel fuel	C2250098						
.1 thou gal/yr	12/31/05	.0	.0	.1	.0	.0	
52 Emergency Generator Diesel Engine Generac, 280 HP							
Diesel fuel	C2250098						
.0 thou gal/yr	12/31/05	.0	.0	.0	.0	.0	
53 Emergency Standby Generator Set: Admin Building							
Diesel fuel	C2250098						
.1 thou gal/yr	12/31/05	.0	.0	.1	.0	.0	
100 Municipal Wastewater Treatment Plant; 120 MGD Dry Weather A							
Municipal sewage	G7200562						
27375.0 million ga/yr	12/31/05	.0	75.4	.0	.0	.0	
110 Headworks; IPS, Barscreens							
Municipal sewage	G7210562						
27375.0 million ga/yr	12/31/05	.0	.0	.0	.0	.0	
120 Primary Treatmnt; 16 Sedimentation Tanks							
Municipal sewage	G7220562						
27375.0 million ga/yr	12/31/05	.0	.0	.0	.0	.0	
130 Secondary Treatment;8 HPO Activated Sludge UNits C/V,Influen							
Municipal sewage	G7240562						
.0 million ga/yr	12/31/05	.0	.0	.0	.0	.0	
140 Secondary Clarifiers;12 clarifiers,(mixed liquor)Influent;Ch							
Municipal sewage	G7250562						
.0 million ga/yr	12/31/05	.0	.0	.0	.0	.0	
160 Disinfection;Chlorination Contact Tanks,nonducted,effluent c							
Municipal sewage	G7270562						
27375.0 million ga/yr	12/31/05	.0	.0	.0	.0	.0	
170 Sludge Handling, 3 WAS GBTs, 6 Dewatering Centrifuges							
Municipal sewage	G7280562						
.0 million ga/yr	12/31/05	.0	.0	.0	.0	.0	
180 Anaerobic Digesters-11; Covers: 7 Float, 2 Fixed, 2 Dystor							
Municipal sewage	G7290562						
.0 million ga/yr	12/31/05	.0	.0	.0	.0	.0	

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PLANT TOTAL:	lbs/day	24.3	209.8	268.5	138.9	895.9
	tons/day	.0	.1	.1	.1	.4
	tons/year	4.4	38.3	49.0	25.3	163.5