Bay Area Air Quality Management District

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Permit Evaluation
and
Statement of Basis
for
RENEWAL of

MAJOR FACILITY REVIEW PERMIT

for

Gas Recovery Systems, Inc.
Facility #B1670

Facility Address:
1804 Dixon Landing Road
San Jose, CA 95134

Mailing Address:
5087 Junction Road
Lockport, NY 14094

Application Engineer: Tamiko Endow
Site Engineer: Tamiko Endow

Application 14578

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Title V Statement of Basis for:
Renewal of Major Facility Review Permit, Site #B1670
Application # 14578

A. Background

Gas Recovery Systems, Dixon Landing Road, 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.

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 B1670. This facility received its initial Title V permit on November 30, 2001. A minor permit revision was issued on July 15, 2002. This Application 14578 for a permit renewal was received on April 28, 2006. Although the current permit expired on October 31, 2006, it continues in force until the District takes final action on the permit renewal.

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 all 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 the sufficiency of all monitoring for determination of compliance with applicable requirements. The statements of basis 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. The proposed permit shows all changes to the permit in strikeout/underline format. These changes are discussed in this Statement of Basis.

B. Facility Description

The Gas Recovery Systems, Inc. (GRS) operates several landfill gas to energy facilities in the Bay Area. This facility, located at the Newby Island Landfill on Dixon Landing Road in San Jose, includes 4 rich burn internal combustion engines (S-2, S-3, S-4, and S-5), 3 lean burn internal combustion engines (S-8, S-9, and S-11), and one storage tank (S-21). The engines at this site are fired on landfill gas exclusively, which is supplied by the Newby Island Landfill. The Newby Island Landfill is operated by International Disposal Corporation (Facility A9013); it is also subject to Title V permitting requirements and is operating under a separate Title V permit since it is under separate ownership and control.

Since issuance of the initial Title V permit in 2001, there have been two permitted changes at this facility. A storage tank, S-18, was removed in May 2005, and in 2007, GRS applied for and received approval for a change of permit conditions, increasing the permitted landfill gas condensate throughput at storage tank, S-21, from 357,000 gallons to 750,000 gallons per year. Landfill gas condensate is primarily water, with only approximately 3% alcohols and other volatile organic compounds (VOC), so the emission increase associated with this increase in permitted throughput was negligible. The unabated emissions from this tank, calculated using EPA's TANKS emission model, were 10 lbs/year prior to the throughput increase and 21 lbs/year after the increase. GRS voluntarily abates the emissions from this tank with an activated carbon adsorption system, A-5, so the maximum abated emissions from this tank are estimated at less than 2 lbs/year.

The actual emissions for each source at this facility, based on the reported 2008 operating data, have been summarized in Table 1, below.

Table 1
2008 Emissions
Site #B1670, Gas Recovery Systems, Newby Island/Dixon Landing Road

Source Number/Description	Emissions (tons/year)				
	PM10	VOC	NOx	SO2	CO
S-2, Internal Combustion Engine	0.49	0.20	12.8	0.42	16.8
S-3, Internal Combustion Engine	0.49	0.20	16.3	0.42	31.5
S-4, Internal Combustion Engine	0.49	0.20	18.4	0.42	38.3
S-5, Internal Combustion Engine	0.49	0.20	9.4	0.42	24.1
S-8, Internal Combustion Engine	0.73	0.29	5.2	0.62	31.6
S-9, Internal Combustion Engine	0.68	0.27	5.4	0.57	21.7
S-11, Internal Combustion Engine	0.71	0.29	5.7	0.60	21.2
S-21, LFG Condensate Storage Tank	0	0.02	0	0	0
Total Facility Emissions	**4.1**	**1.7**	**73.2**	**3.5**	**185.2**

In July 2010, a fire occurred at this site. The building that housed the lean burn engines and all the equipment located inside the building were destroyed in the fire. GRS is currently evaluating how to proceed, as the remaining rich-burn engines will not comply with the upcoming reductions in emission limits in District Regulation 9, Rule 8, effective 2012. For the purposes of the public notice for this renewal, all sources remain listed in the proposed permit while GRS decides on a course of action.

C. Permit Content

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

Changes to the Permit, Title page:

- The mailing address, Responsible Official, Facility Contact, Air Pollution Control Officer, and District Engineer have been updated.

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. 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 the Permit, Section I:

- The dates of adoption and approval of rules in Standard Condition 1.A have been updated. In addition Regulation 2, Rule 5 and the SIP version of Regulation 2, Rule 6 have been added.
- The bases of Standard Condition I.B.1, I.B.11, E, and F were corrected.
- The following language was added to Standard Condition I.B.1: "If the permit renewal has not been issued by [the permit expiration date], but a complete application for renewal has been submitted in accordance with the above deadlines, the existing permit will continue in force until the District takes final action on the renewal application." This is standard language implements the "application shield" pursuant to BAAQMD Regulation 2-6-407.
- The following text was added to Standard Condition I.B.10: "... or the potential to emit ..." to clarify the calculation methods that may be used in the application's emission inventory.

- The following language was added as Standard Condition I.B.12: "The permit holder is responsible for compliance, and certification of compliance, with all conditions of the permit, regardless whether it acts through employees, agents, contractors, or subcontractors. (Regulation 2-6-307)." The purpose is to reiterate that the Permit Holder is responsible for ensuring that all activities at the facility comply with all applicable requirements.
- The dates for the semi-annual monitoring reports in Standard Condition F have been changed per the Permit Holder's request. The new reporting period will be on a calendar year basis January through June and July through December. The Permit Holder has indicated this new schedule will be easier for them to track and maintain, as they operate several sites. The first reporting period following issuance of this permit renewal may require more than one report to conform the site's reporting schedule onto this basis.
- The compliance certification period in Standard Condition G has also been changed to a calendar year basis per the Permit Holder's request. The new certification period will be January through December with the certification due on January 31st of each year.

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., S-24). 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. No new permitted sources have been added to this facility since issuance of the initial Title V permit.

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). No significant sources have been reported at this facility.

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 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.

Changes to the Permit, Section II:

- One source, S-18, has been removed from the site and will therefore be deleted from Table II-A.
- The abatement devices, A-1 through A-4, will be deleted from Table II-B, as they were removed several years ago. This is discussed under more detail under Section IV. Note that the CO emission limits remain in effect and apply to the rich-burn engines, but the engines no longer need to use these abatement devices to meet the CO limits.
- The abatement requirement for tank S-21/A-5 was removed as it is not required by regulation. The abatement device is still listed in the permit, but identified as optional.

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 the Permit, Section III:

- Language has been added to Section III to clarify that this section contains requirements that may apply to temporary sources. This provision allows contractors that have "portable" equipment permits that require them to comply with all applicable requirements to work at the facility on a temporary basis, even if the permit does not specifically list the temporary source. Examples are temporary sand-blasting or soil-vapor extraction equipment.
- EPA's web address for the District's SIP approved rules has been added to this section.
- The dates of adoption or approval of the rules and their "federal enforceability" status in Table III have been updated.
- The following rules and standards have been added to conform to current practice:
    - SIP Regulation 2, Rule 1, General Requirements and SIP Regulation 2-1-429, Federal Emissions Statement
    - BAAQMD Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants
    - SIP Regulation 5, Open Burning
    - BAAQMD Regulation 6, Particulate Matter and Visible Emissions has been renamed and renumbered as Regulation 6, Rule 1, Particulate Matter - General Requirements
    - SIP Regulation 6, Particulate Matter and Visible Emissions

- BAAQMD and SIP Regulation 8, Rule 2, Organic Compounds - Miscellaneous Operations
- BAAQMD and SIP Regulation 8, Rule 3, Organic Compounds – Architectural Coatings
- BAAQMD Regulation 8, Rule 4, Organic Compounds – General Solvent and Surface Coating Operations
- BAAQMD and SIP Regulation 8, Rule 5, Organic Compounds – Storage of Organic Liquids
- BAAQMD Regulation 8, Rule 15, Organic Compounds –Emulsified and Liquid Asphalts
- BAAQMD and SIP Regulation 8, Rule 40, Organic Compounds - Aeration of Contaminated Soil and Removal of Underground Storage Tanks
- BAAQMD and SIP Regulation 8, Rule 47, Organic Compounds - Air Stripping and Soil Vapor Extraction Operations
- SIP Regulation 8, Rule 51, Organic Compounds - Adhesive and Sealant Products
- BAAQMD and SIP Regulation 9, Rule 1, Inorganic Gaseous Pollutants – Sulfur Dioxide
- SIP Regulation 12, Rule 4, Miscellaneous Standards of Performance – Sandblasting
- California Health and Safety Code Section 41750 et seq., Portable Equipment
- California Health and Safety Code Section 93115, Airborne Toxic Control Measure for Stationary Compression Ignition Engines
- California Health and Safety Code Section 93116, Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater
- California Health and Safety Code Sections 95100-95109, Mandatory Greenhouse Gas Emissions Reporting
- 40 CFR Part 61, Subpart M, National Emission Standards for Hazardous Air Pollutants – National Emission Standard for Asbestos

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)
- 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.

Changes to the Permit, Section IV:

- EPA's web address for the District's SIP-approved rules was added to this section and editorial corrections were made to the text in this section.
- The dates of adoption or approval of the rules and their "federal enforceability" status have been updated.
- Future effective dates which have since passed, as well as expired requirements, have been deleted.
- SIP Regulation 1 sections have been added where the version of the section in the BAAQMD Regulation 1 is not federally enforceable.
- Regulation 6 citations have been updated to the new numbering and name (now Regulation 6, Rule 1). A SIP citation of Regulation 6 has been added since the current District rule has been renumbered. Note that the standards are the same in both versions.
- All of the applicable sections in BAAQMD Regulation 8, Rule 34 are now federally enforceable, so the SIP citations of the rule have been deleted.
- The temperature monitoring requirements, Regulation 8-34-501.3 and 8-34-507, have been deleted and replaced with a monitoring of an alternate key emission control system parameter under Regulation 8-34-501.11 and 8-34-509 for the engines, as discussed below.
- Regulation 9, Rule 8 has been revised since the issuance of the initial Title V permit to this site. The citation of applicable Regulation 9, Rule 8 sections has therefore been expanded to include the numerical emission limits, as some sections now contain both current and future effective emission limits. The future effective emission limits have been noted with the effective dates. Also the new rule sections regarding the compliance schedule, initial and quarterly demonstrations of compliance, and associated recordkeeping have been added.
- 40 CFR Part 60, Subparts A and Cc and 40 CFR Part 62 have been removed from the permit. EPA issued an applicability determination that clarified that end users of treated landfill gas are not subject to Subpart Cc requirements. Since GRS does not operate the landfill and only operates engines that burn treated landfill gas, Subpart Cc does not apply to their operation. Since Subpart Cc does not apply, Subpart A and 40 CFR Part 62 also do not apply.

- Obsolete regulatory citations have been removed as the bases of several permit conditions and from Tables IV-A, IV-B, and IV-C of this section.
- The proposed new parts of Conditions #16669, #347, #3017 were added to Tables IV-A, IV-B, and IV-C, respectively.
- The original Table IV-D for S-18 has been deleted, since this source has been removed from service.
- Table IV-E for S-21 was renumbered as Table IV-D.
- The daily throughput limit for S-21 has been deleted, since there is no basis for a daily limit for this source.
- In the basis of Condition # 10625, Part 4 for S-21, the regulatory citation related to toxic NSR requirements was corrected.

New Complex Applicability Determinations:
Since issuance of the initial Title V permit for this site, two new federal rules have been promulgated that apply to internal combustion engine: 40 CFR Part 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines and 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. These new rules have been reviewed, and neither rule applies to the engines at this site, as explained below. In addition, 40 CFR Part 64, Compliance Assurance Monitoring (CAM) has been reviewed; it has been found to be not applicable. This determination is also discussed below with a proposed change in monitoring to satisfy the requirements of Regulation 8, Rule 34.

Applicability of 40 CFR Part 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines
40 CFR Part 60, Subpart JJJJ applies to owners and operators of stationary spark ignition internal combustion engines that commenced construction, modification, or reconstruction after 6/12/06. The engines at this site were all installed and operated prior to 6/12/06 and have not been modified or reconstructed since that date. Therefore, this rule does not apply.

Applicability of 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
40 CFR Part 63, Subpart ZZZZ applies to stationary reciprocating internal combustion engines located at both major and area sources of HAP emissions. Each type of affected source is listed in Section 63.6590. An existing stationary reciprocating internal combustion engine (RICE) located at an area source of HAP emissions is defined as a source for which construction or reconstruction was commenced before 6/12/06. Therefore, since this facility is an area source of HAP emissions and since all of the engines were constructed before 6/12/06, the engines at this site are considered existing engines under this rule.

However, Section 63.6590(b)(3) specifies that the following types of engines do not have to meet the requirements of Subparts A or ZZZZ of Part 63:

- an existing spark ignition 4-stroke rich burn stationary RICE located at an area source
- an existing spark ignition 2- or 4-stroke lean burn stationary RICE

- an existing stationary RICE that combusts landfill gas equivalent to 10% or more of the gross heat input on an annual basis.

This section also specifies that no initial notification is required. The four rich burn engines and the three lean burn engines operated at this site each meet one or more of these criteria, and therefore none of the engines at this site are subject to the requirements of Subparts A or ZZZZ of Part 63.

Applicability of 40 CFR Part 64, Compliance Assurance Monitoring

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 an 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.

Rich Burn Landfill Gas-Fired Engines, S-2, S-3, S-4, and S-5

The four rich burn internal combustion engines (S-2, S-3, S-4, and S-5) are subject to federally enforceable emission limits for particulate matter (PM_{10}), volatile organic compounds (VOC), nitrogen oxides (NO_x), sulfur dioxide (SO_2), and carbon monoxide (CO) and therefore meet the first of the CAM applicability criteria.

The $PM_{10,}$ VOC, NO_x, and SO_2, emissions from S-2, S-3, S-4, and S-5 are not controlled with any abatement device. Further, the unabated potential emissions of $PM_{10,}$ VOC, NO_x, and SO_2 from these engines are less than the major facility emissions threshold (100 tons/year) for these pollutants. Since neither the second nor the third CAM applicability criteria is met, 40 CFR Part 64.2(a)(2 and 3), sources S-2, S-3, S-4, and S-5 are not subject to CAM for $PM_{10,}$ VOC, NO_x, and SO_2.

When originally permitted in 1983, the emissions from S-2, S-3, S-4, and S-5 were controlled with a catalytic converter system. However impurities in the landfill gas caused a series of catalyst failures, so the site was forced to develop a different emission control strategy. The facility found that operating the engines in a fuel-rich mode reduced the combustion temperature and thereby minimized formation of NO_x adequately to allow the engines to meet the permitted NO_x emission limit. Operating the engines fuel rich, however, resulted in higher CO emissions, so "thermal oxidizing reactors" were developed to control the excess CO emissions.

The "thermal oxidizing reactors" consisted of insulated lengths of exhaust duct into which air was injected. Since the oxidation of CO to carbon dioxide (CO_2) releases heat, the addition of air and the residence time in the ducting allowed for thermal oxidization of CO to carbon dioxide (CO_2). No additional fuel was consumed to heat the thermal oxidizing reactors to drive this reaction.

Use of these thermal oxidizing reactors to abate the excess CO emissions would potentially subject these sources to the CAM requirements, however, the air injection to these "abatement devices" was discontinued in association with the adoption of NO_x and CO emission standards in District Regulation 9, Rule 8. Since NO_x and CO emissions from engines are inversely related, the District Regulation 9, Rule 8 rulemaking process, which established a NO_x emission limit for waste gas fired IC engines, included the establishment of a higher corresponding CO emission limit. The owner/operator of the Guadalupe Energy Facility at that time discontinued the air injection to the thermal oxidizing reactors and installed new air to fuel ratio controllers on the rich-burn engines instead. The air to fuel ratio controllers proved adequate to meet both the new NO_x limit and the new CO emission limit. (Note however that these four rich-burn engines will not comply with the most recent amendments to the NO_x emission limits in Regulation 9, Rule 8, which become effective in January 2012. Consequently, the four rich-burn engines will be removed from service by that date.)

Since the abatement action of the four thermal oxidizing reactors (A-1, A-2, A-3, and A-4) depended only on air injection into the post combustion air stream, and since the current owner/operator has confirmed that this air injection no longer occurs, the CO emissions from the rich-burn engines are no longer controlled by any abatement devices. Since the CO emissions are not controlled by any abatement devices, the second CAM criteria is not met and the rich-burn engines (S-2, S-3, S-4, and S-5) are not subject to CAM for CO per 40 CFR Part 64.2(a)(2).

Lean Burn Landfill Gas-Fired Engine, S-8, S-9, and S-11

The three lean burn internal combustion engines (S-8, S-9, and S-11) are subject to federally enforceable emission limits for PM_{10}, VOC, NO_x, SO_2, and CO. However, these sources are not abated by a control device to achieve compliance with these limits, and the uncontrolled PM_{10}, VOC, NO_x, SO_2, and CO emissions from these engines are less than the major facility emissions threshold (100 tons/year) for these pollutants. Since S-8, S-9, and S-11 do not meet either the second or the third CAM applicability criteria - 40 CFR Part 64.2(a)(2 and 3), these engines are not subject to CAM.

Landfill Gas Condensate Storage Tank, S-21

The landfill gas condensate storage tank (S-21) is subject to a federally enforceable emission limit for VOC. The facility voluntarily abates this source with an activated Carbon Adsorption System, A-5, but this abatement is not required by any regulation due to the low emissions from this source. The abatement system is not required to achieve compliance with the applicable VOC limit, and the uncontrolled emissions from this tank are less than the major facility emissions threshold (100 tons VOC/year). Since S-21 does not meet either the second or the third CAM applicability criteria - 40 CFR Part 64.2(a)(2 and 3), this storage tank is not subject to CAM.

<u>Regulation 8, Rule 34 - Proposed Change to Existing Monitoring</u>

Regulation 8, Rule 34 requires the establishment of a surrogate to demonstrate ongoing compliance with a minimum non-methane organic compound (NMOC) destruction efficiency of 98% by weight or an outlet concentration of 120 ppmv NMOC, expressed as methane at 3% oxygen, dry. The current Title V permit requires monitoring of exhaust gas temperature to

demonstrate compliance with this NMOC limit. GRS has commented that, for an engine, exhaust gas temperature can be affected by parameters including the ambient air temperature and engine load, which are unrelated to combustion efficiency. Also, unlike a flare, the exhaust temperature from an engine cannot be controlled, therefore monitoring of exhaust gas temperature is not a useful surrogate for the NMOC destruction efficiency of internal combustion engines.

AP-42 Chapter 3.2 "Natural Gas-Fired Reciprocating Engines," Section 3.2.3.2 states the following concerning organic compound emissions:

> *"Partially burned hydrocarbons result from poor air-to-fuel mixing prior to, or during combustion, or incorrect air-to-fuel ratios in the cylinder during combustion due to maladjustment of the engine fuel system. Also, low cylinder temperature may yield partially burned hydrocarbons due to excessive cooling through the walls, or early cooling of the gases by expansion of the combustion volume caused by piston motion before combustion is completed."*

Based on this, fuel-to-air ratio is a parameter that can be used to monitor complete combustion for a natural gas-fired internal combustion engine. This is supported by an applicability determination from USEPA Region VII that outlines an approved compliance protocol for internal combustion engines that uses fuel-to-air ratio as an indication of NMOC destruction efficiency (Control #9900021, dated May 19, 1999). However, while the correlation between exhaust gas temperature, oxygen content, and fuel to air ratio are useful for fuels of consistent composition, discussions with GRS has determined that these parameters are not useful surrogates of NMOC destruction efficiency for landfill gas.

In the case of this facility, the engines are fuelled with landfill gas, which by nature varies in composition and fuel quality (heat capacity), affected by a number of variables – the local climate, the composition of waste in the landfill, the age of the landfill, the method in which the landfill gas collection system is operated, and in this case, the quantity of landfill gas provided by this landfill to a separate landfill gas end user. The engine operators manually adjust the air to fuel ratio to maintain efficient combustion at each engine. The air to fuel ratio which results in efficient combustion during the summer months is different from the ratio necessary to produce efficient combustion in the winter months, due to variations in ambient temperature, humidity, as well as landfill gas quality. So for this facility, maintaining a constant air to fuel ratio is not a valid method to ensure efficient NMOC destruction.

The District completed a study on the emissions from landfill gas-fired engines in 2009 which found a correlation between exhaust CO emissions and NMOC destruction efficiency. The results of this study have been documented in the white paper "Revisiting BACT for Lean Burn Landfill Gas Fired Internal Combustion Engines" (reference (h) in the District's BACT Guidelines, Document 96.2.2, 3/5/2009). While the focus of this document was primarily the development of appropriate NO_x/CO BACT emission limits for landfill gas-fired engines, the paper also included analysis of CO monitoring, currently used as a surrogate for NMHC destruction at an existing facility.

As temperature monitoring and air to fuel ratio are not useful surrogates for NMOC destruction for landfill gas-fired engines, the District is proposing to replace the temperature monitoring in the Title V permit with periodic monitoring of CO emissions to track NMOC destruction. This monitoring will supplement the existing quarterly CO monitoring required by Regulation 9, Rule 8 and the direct NMOC measurement during the annual source test required by the Regulation 8, Rule 34. The proposed additional CO monitoring would be performed each calendar month if the measured CO emissions do not exceed 80% of the permitted limit. If the measured CO emissions exceed 80% of the permitted limit, the proposed monitoring will increase in frequency to weekly monitoring.

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 the facility has been in intermittent compliance, with one Notice of Violation due to failure of a District-administered source test on July 9, 2009. The Notice of Violation was subsequently cleared when the source underwent a follow up source test and was determined to be in compliance. 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 report is contained in Appendix A of this permit evaluation and statement of basis.

Changes to the Permit, Section V:

- The District is proposing to remove the phrase "… on a timely basis." from the standard preamble text for Section V.

VI. Permit Conditions

Each permit condition is identified with a unique numerical identifier, up to five digits. 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.

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.

During the initial Title V permit development, the District reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. When necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting requirements was added to the permit. No changes have occurred to the facility operations since the initial permit was issued, except for the increase in permitted throughput at S-21. The Permit Holder was required to maintain throughput records for S-21 prior to the change and is still required to do so. The permit conditions have been reviewed again for this permit renewal and proposed changes to the permit conditions are summarized below.

Changes to the Permit, Section VI:

- A number of editorial corrections are proposed to make the permit conditions easier to read and more consistent with other Title V permits.

- References to initial source tests or effective start-up dates have been removed, where those tests have been completed and the start-up dates have passed.
- The calculation of heat input to the internal combustion engines has been modified due to flow meter reliability issues. The thermal mass meters have experienced operational problems, including physical plugging of the meters by landfill gas contaminants and water vapor. Also the values could not be corrected for the water vapor in the landfill gas. GRS has found through testing and field measurements that the heat input is more accurately calculated based on the quantity of energy sold, as measured at the PG&E meter, adjusted for internal plant losses and engine efficiencies. GRS has therefore proposed empirically derived calculations for determining compliance with the heat input limits (see Condition #347, Part 7, Condition #3017, Part 8, and Condition #16669, Part 7).
- The temperature monitoring for the internal combustion engines for the purpose of demonstrating ongoing compliance with the NMOC limits in Regulation 8-34 has been replaced with monthly or weekly monitoring of exhaust CO and oxygen as discussed above (see Condition #347, Part 9, Condition #3017, Part 10, Condition #16669, Part 13).
- Part 4 of Condition #3017, which applies to the lean burn internal combustion engines, included a statement that the NMOC emission limit in the part would be replaced with the NMOC limit in Regulation 8-34-301.4, effective July 1, 2002. This statement has been deleted since the existing limit is based on ensuring the emissions from the engines do not exceed the emissions represented at the time of permitting (basis - cumulative increase); this limit continues to apply in addition to the applicable limit in Regulation 8-34-301.4. Note that the NMOC emission limit in Regulation 8-34-301.4 is more stringent than the Part 4 NMOC limit.
- The District is proposing to delete all of Condition #10713, which applied to the S-18 storage tank, because this tank was removed from service after the issuance of the initial Title V permit for this site.
- The annual throughput limit in Condition #16025, Part 1 that applies to the landfill gas condensate tank S-21 was updated to reflect the permit condition change issued under Application 16436 which was processed since issuance of the initial Title V permit to this site.
- The daily throughput limit in Condition #16025, Part 2 has been proposed for deletion as there is no basis to limit daily emissions from this source.
- An asterisk was added to Part 4 of Condition #16025 since basis of this condition was the District's Toxics Risk Management Policy, which is not federally enforceable. The TRMP was replaced by Regulation 2, Rule 5 in 2005. Citations were corrected for consistency with the current toxic NSR regulation.

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.

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.

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**.**

The tables below list only the emission limits for which there is no monitoring in the applicable requirements. For each emission limit without corresponding monitoring, the analysis of the individual source compliance status has been documented. If a determination of inadequate monitoring was found, additional monitoring would be proposed through this permit renewal. However, in the cases identified below, no additional monitoring is being recommended for the reasons identified. The District has examined the monitoring for all other emission limits and has determined that monitoring is adequate to provide a reasonable assurance of compliance.

Table 2
SO_2/H_2S Emission Limits with No Associated Monitoring
Site #B1670, Gas Recovery Systems, Dixon Landing Road

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-2, S-3, S-4, S-5, S-8, S-9, S-11 Internal Combustion Engines	BAAQMD 9-1-301	Ground Level Concentrations of SO_2: $\leq$ 0.5 ppm for 3 consecutive minutes AND $\leq$ 0.25 ppm averaged over 60 consecutive minutes AND $\leq$ 0.05 ppm averaged over 24 hours	Not Recommended
S-2, S-3, S-4, S-5, S-8, S-9, S-11 Internal Combustion Engines	BAAQMD 9-2-301	Property Line Ground Level Limits for H_2S: $\leq$ 0.06 ppm averaged over 3 minutes AND $\leq$ 0.03 ppm averaged over 60 minutes	Not Recommended

SO_2 Discussion:
Burning of fuel that contains sulfur compounds will result in emissions of sulfur dioxide (SO_2) as a product of that combustion. The landfill gas burned in the engines at this facility contains small levels of sulfur compounds so each of the engines will contribute to ground level concentrations of SO_2.

BAAQMD Regulation 9-1-301
Area monitoring to demonstrate compliance with the ground level SO_2 concentration limitations of Regulation 9-1-301 is required at the discretion of the APCO (per BAAQMD Regulation 9-1-501). Since the ground level monitoring is expensive, such monitoring is not required if the expected levels of SO_2 emissions are low, resulting in a large expected margin of compliance with the emission limit.

Modeling analyses performed for other landfill sites has shown that compliance with the Regulation 9-1-302 limit of 300 ppmv of SO_2 in the engine exhaust is not expected to result in exceedance of the ground level concentration limits in BAAQMD Regulation 9-1-301. With issuance of the initial Title V permit, conditions were added requiring landfill gas analysis of total reduced sulfur content, because compliance with a 1300 ppmv limit on the concentration of total reduced sulfur (TRS) compounds in the landfill gas was shown to ensure compliance with an outlet concentration of 300 ppmv of SO_2 in the engine exhaust (the emission limit in BAAQMD and SIP Regulation 9-1-302). The landfill gas analyses have shown no exceedances

of the TRS limit. Since monitoring of TRS content ensures compliance with the 300 ppmv SO_2 exhaust limit, and compliance with this exhaust limit is expected to assure compliance with the ground level SO_2 concentrations, the additional expense of SO_2 area monitoring is not justifiable for this site. Therefore, no additional SO_2 monitoring is recommended.

H_2S Discussion:

BAAQMD Regulation 9-2-301
Area monitoring to demonstrate compliance with the ground level H_2S concentration limitations of Regulation 9-1-301 is required at the discretion of the APCO (per BAAQMD Regulation 9-1-501). The H_2S emissions near this site are primarily a result of fugitive emissions from the landfill and not from the residual H_2S emissions that are emitted from the GRS internal combustion engines. Therefore, although this regulation is generally applicable, the GRS facility expected to have insignificant H_2S emissions and will not be required to perform ground level H_2S monitoring.

Table 3
PM Emission Limits with No Associated Monitoring
Site #B1670, Gas Recovery Systems, Dixon Landing Road

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-2, S-3, S-4, S-5, S-8, S-9, S-11 Internal Combustion Engines	BAAQMD Regulation 6-1-301, SIP Regulation 6-301	≤ Ringelmann 1.0 for 3 minute in any hour	Not Recommended
S-2, S-3, S-4, S-5, S-8, S-9, S-11 Internal Combustion Engines	BAAQMD Regulation 6-1-310, SIP Regulation 6-310	≤ 0.15 gr/dscf	Not Recommended

PM Discussion:

BAAQMD Regulation 6, Rule 1 "Particulate Matter – General Requirements"
SIP Regulation 6, "Particulate Matter and Visible Emissions"
BAAQMD Regulation 6-1-301 and SIP Regulation 6-301 limit visible emissions to no darker than 1.0 on the Ringelmann Chart, except for periods or aggregate periods less than 3 minutes in any hour. Visible emissions are not normally associated with proper combustion of gaseous fuels, such as landfill gas. Sources S-2, S-3, S-4, S-5, S-8, S-9, and S-11 burn landfill gas exclusively, therefore, no monitoring is required to assure compliance with this limit for these sources.

BAAQMD Regulation 6-1-310 and SIP Regulation 6-301 limit filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. Using EPA's AP-42 emission factor for landfill gas combustion (48 lbs/MMdscf methane), the worst methane content (45%), and the worst case landfill gas flue gas factor (4.395 dscf flue gas/scf LFG), the particulate emission rate from the engines is expected to be 0.0344 gr/dscf at 0% oxygen, which is far less than the Regulation 6-1-310 limit. Therefore no monitoring is necessary to assure compliance with the limit for these sources.

Changes to the Permit, Section VII:

- The standard language at the beginning of the section has been updated to clarify that this section is a summary of the limits and monitoring, and that in the case of a conflict between Sections I-VI and Section VII, the preceding sections take precedence.
- Symbols ($\leq$ or $\geq$, as applicable) have been added to all Section VII tables to clarify limits.
- For limits with no monitoring, "NA" (not applicable) has been added to the Monitoring Requirement Citation column and "none" has been added to the Monitoring Type column for consistency with other Title V permits.
- The "type of limit" has been changed to "FP" for BAAQMD Regulation 6-1-310, since this limit is a filterable particulate standard.
- Citation of the SIP version of Regulation 6 has been added, since the District Regulation 6 has been renumbered to Regulation 6, Rule 1. Note that both rules contain the same standards.
- Expired future effective dates, expired sections, and obsolete monitoring requirements have been deleted.
- In Tables VII-A, VII-B, and VII-C for the landfill gas fired engines, the SIP citations of Regulation 8-34 have been removed since all requirements in this rule are also in the SIP-approved version of this rule.
- For these engines, monthly/weekly monitoring of exhaust gas CO and O_2 concentrations has been added, and the temperature limits and monitoring were removed.
- The quarterly monitoring of the engine exhaust for NO_x, CO, and O_2 concentrations using portable analyzers (Regulation 9-8-503) has been added to Tables VII-A -C.
- The future effective NO_x limits from Regulation 9, Rule 8 have been added to Tables VII-A-C.
- Citations of 40 CFR Part 60, Subpart A have been deleted, since EPA has clarified that they do not apply to end users of treated landfill gas.
- Table VII-D for S-18 has been deleted, since this source has been removed from service.
- Table VII-E for S-21 was renumbered as Table VII-D.
- The annual throughput limit for S-21 was updated as discussed earlier.
- The unnecessary daily throughput limit for S-21 was deleted.
- A permit condition citation for S-21 was corrected.

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 the Permit, Section VIII:

- The Regulation 6, Rule 1 reference has been updated.
- The EPA methods for determining visible emissions and filterable particulate matter were added.
- The source testing procedures for the TOC limits in Regulation 8-2-301 were added.
- The citation for Regulation 8-34-114 has been deleted, since the section no longer applies.
- The citations for SIP Regulation 8-34 have been deleted, since all requirements in this rule are in the SIP.
- The citation for 40 CFR Part 60.8 has been deleted, since it does not apply.
- The source test procedures for demonstrating compliance with the Regulation 8-34-301.4 NMOC emission limits were clarified.
- The portable CO and O_2 monitoring procedures for the Regulation 8, Rule 34 key emission control system operating parameter were added.
- The obsolete sulfur dioxide source test method, ST 19B, was removed
- For engines, the portable analyzer monitoring procedures for NO_x, CO, and O_2 have been added for Regulation 9, Rule 8 limits and applicable permit conditions.
- The new calculation procedure for determining compliance with heat input limits to the IC engines has been added. Procedures associated with the old calculation method have been removed.
- The obsolete test method for the NMOC destruction efficiency determination for the condensate injection/oxidation system has been removed.

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.

Changes to the Permit, Section IX:

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

X. Revision History

Changes to the Permit, Section X:

- Application numbers were added to the previous revisions of this permit.
- Descriptions of the revisions contained in this proposed permit renewal were added to the revision history.

XI. Glossary

Changes to the Permit, Section XI:

- Some additional standard terms have been added to the permit glossary and a section for commonly used symbols.

XII. Applicable State Implementation Plan

Changes to the Permit, Section XII:

- This section of the permit has been deleted. The address for EPA's website is now cited in Sections III and IV.

D. Alternate Operating Scenarios:

No alternate operating scenarios have been requested for this facility.

E. Compliance Status:

A July 12, 2010 memorandum from the Director of Compliance and Enforcement, to the Director of Engineering, details a review of the compliance record of Gas Recovery Systems, Dixon Landing Road (Site #B1670). The Compliance and Enforcement Division staff has reviewed the records for Gas Recovery Systems as part of the District's evaluation of Gas Recovery Systems application for renewal of their Title V permit. During the period subject to review, activities known to the District include:

- One Notice of Violation issued during this review period.
- The District did not receive any complaints alleging Gas Recovery Systems as the source.
- The facility is not operating under a Variance or an Order of Abatement from the District Board.
- There were no notifications for Reportable Compliance Activities at this facility.

The responsible official for Gas Recovery Systems certified that all equipment was operating in compliance on April 26, 2006. The one Notice of Violation was issued in July 9, 2009 for failure of a District-administered source test but was cleared in September 2009 through a follow-up source test. No subsequent non-compliance issues have been identified to date.

F. Differences Between the Application and the Proposed Permit:

The application for renewal of the Title V permit was originally submitted on April 28, 2006. The only permit change that has occurred since that date was the increase in permitted throughput approved for S-21, the landfill gas storage tank under Application 16436 in 2007. This throughput increase has been incorporated into the proposed permit renewal.

Other permit changes requested by the applicant include the following:

- A change in responsible official, plant contact, and mailing address.
- A change in the periods covered by the semi-annual monitoring reports and the annual compliance certification.
- Deletion of the temperature monitoring requirement and replacement with monitoring of exhaust CO emissions.
- Deletion of the abatement devices for the rich-burn engines, as those devices were removed from service.
- Removal of S-18, which was shut down in 2005.
- Deletion of the requirement to operate thermal mass meters due to operational reliability issues and replacement with a calculation of heat input to the internal combustion engines based on the quantity of energy sold, as measured at the PG&E meter and adjusted for internal plant losses and engine efficiencies.

The District has incorporated all of the requested changes into 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, incorporate new monitoring requirements, add other applicable requirements, to explain permit terminology, and to correct permit errors. The District has also added quarterly NO_x, CO and O_2 monitoring pursuant to Regulation 9, Rule 8. In addition, the District is proposing to delete Section XII from the permit, as the data has been added to Sections III and IV.

APPENDIX A

BAAQMD COMPLIANCE REPORT

APPENDIX B
GLOSSARY

ACT
Federal Clean Air Act

APCO
Air Pollution Control Officer

ARB
Air Resources Board

ATCM
Airborne Toxic Control Measure

BAAQMD
Bay Area Air Quality Management District

BACT
Best Available Control Technology

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

CAA
The federal Clean Air Act

CAAQS
California Ambient Air Quality Standards

CARB
California Air Resources Board (same as ARB)

CCR
The California Code of Regulations

CEM
A "continuous emission monitor" is a monitoring device that provides a continuous direct measurement of some pollutant (e.g. NOx 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.

CI
Compression Ignition

CO
Carbon Monoxide

CO_2
Carbon Dioxide

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) x (106) = (4.53) x (10x10x10x10x10x10) = 4,530,000. Scientific notation is used to express large or small numbers without writing out long strings of zeros.

EPA
The federal Environmental Protection Agency.

Excluded
Not subject to any District regulations.

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

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

FR
Federal Register

Grains
1/7000 of a pound

GRS
Gas Recovery Systems, Inc.

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.

H2S
Hydrogen Sulfide

H&SC
Health and Safety Code

Hg
Mercury

LFG
Landfill gas

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

Max
Maximum

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

Min
Minimum

MOP
The District's Manual of Procedures.

NA
Not Applicable

NAAQS
National Ambient Air Quality Standards

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

NMHC
Non-methane Hydrocarbons

NMOC
Non-methane Organic Compounds (same as NMHC)

NO2
Nitrogen Dioxide

NOx
Oxides of nitrogen.

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

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

O2
Oxygen

Offset Requirement
A New Source Review requirement to provide federally enforceable emission offsets for the emissions from a new or modified source. Applies to emissions of POC, NOx, PM10, and SO2.

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

POC
Precursor Organic Compounds

PM
Particulate Matter

PM10
Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns.

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

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

SO2
Sulfur dioxide

TAC
Toxic Air Contaminant

TBACT
Best Available Control Technology for Toxics

THC
Total Hydrocarbons include all non-methane hydrocarbons plus methane and are the same as TOC.

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 include all non-methane organic compounds plus methane and are the same as THC.

TRMP
Toxic Risk Management Policy. The District's TRMP was replaced by Regulation 2, Rule 5 in 2005.

TRS
Total Reduced Sulfur, which is a measure of the amount of sulfur-containing compounds in a gas stream, typically a fuel gas stream, including, but not limited to, hydrogen sulfide. The TRS content of a fuel gas determines the concentration of SO2 that will be present in the combusted fuel gas, since sulfur compounds are converted to SO2 by the combustion process.

TSP
Total Suspended Particulate

TVP
True Vapor Pressure

VOC
Volatile Organic Compounds

Symbols:

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

Units of Measure:

atm	=	atmospheres
bhp	=	brake-horsepower
btu or BTU	=	British Thermal Unit
^{o}C	=	degrees Centigrade
cfm	=	cubic feet per minute
dscf	=	dry standard cubic feet
^{o}F	=	degrees Fahrenheit
ft3	=	cubic feet
g	=	grams

gal	=	gallon
gpm	=	gallons per minute
gr	=	grains
hp	=	horsepower
hr	=	hour
in	=	inches
kW	=	kilowatt
lb	=	pound
max	=	maximum
m^2	=	square meter
m^3	=	cubic meter
min	=	minute
mm	=	millimeter
MM	=	million
MM BTU	=	million Btu
MW	=	megawatts
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scf	=	standard cubic feet
scfm	=	standard cubic feet per minute
sdcf	=	standard dry cubic feet
sdcfm	=	standard dry cubic feet per minute
yd3	=	cubic yards
yr	=	year