Bay Area Air Quality Management District

375 Beale Street, Suite 600
San Francisco, CA 94105
(415) 771-6000

Permit Evaluation
and
Statement of Basis
for
RENEWAL and SIGNIFICANT REVISION
of
MAJOR FACILITY REVIEW PERMIT

for

San Jose/Santa Clara
Water Pollution Control
Facility #A0778

Facility Address:
700 Los Esteros Road
San Jose, CA 95134

Mailing Address:
700 Los Esteros Road
San Jose, CA 95134

Application Engineer: Ryan Atterbury

Site Engineer: Ryan Atterbury

Applications: 27151, 27354, 28956, 29983, 31365

February 2022

TABLE OF CONTENTS

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 the following regulated air pollutants: oxides of nitrogen, carbon monoxide, and volatile organic compounds.

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.

Pursuant to Regulation 2, Rule 6, section 416, the District has reviewed the terms and conditions of the 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 last renewal 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.

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 A0778.

This facility received its initial Title V permit on October 5, 2001. The permit was renewed on June 26, 2007 and March 6, 2017. This application is for the third renewal of the permit.

The revisions based on several applications will be included in this action. Following is a table listing the District applications, the Title V applications, and a description of the changes.

Title V Application #	BAAQMD Application #	Project Description
27151	27020	Four 3-MW Emergency Diesel Engines
27354	27353	A500, Iron Salts Injection abating S110, Preliminary Treatment and S210, Anaerobic Digesters A501, Polymer Injection abating S120, Primary Treatment
29983	28651	12-MW cogeneration plant consisting of four 4,834-hp lean-burn engines fueled by a blend of natural gas and digester gas
28956	27366	Modification to S210, Digesters, addition of two new flares, two odor control systems
28956	28954	Increases in H2S limits at A406 and A407, Flares, and various changes to condition 17741
29983	28811	Paint spray booths
29983	29724	Two 15 MMbtu/hr digester gas/natural gas boilers
28956	30725	Increase in H2S limit at S120 and S200

~~Application 28651 is for a significant revision~~Title V application 29983 is the significant revision for NSR applications 28651 and 29724. NSR application 28811 is also part of Title V application 29983, but was a minor revision to the Title V permit. The other applications are for minor revisions.

The proposed permit will show all proposed changes to the permit in strikeout/underline format. The BAAQMD applications above are attached in the appendices and form part of this Statement of Basis.

B. Facility Description

The San Jose/Santa Clara Water Pollution Control Plant is one of the largest advanced wastewater treatment facilities in California. It treats and cleans the wastewater produced by over 1,500,000 people that live and work in the 300-square mile area encompassing San Jose, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Saratoga, and Monte Sereno.

The Water Pollution Control Plant has the capacity to treat 167,000,000 gallons of wastewater per day. It is located in Alviso, at the southernmost tip of the San Francisco Bay. Originally constructed in 1956, the Plant had the capacity to treat 36,000,000 gallons of water per day and only provided primary treatment. In 1964, the Plant added a secondary treatment process to its system. In 1979, the Plant upgraded its wastewater treatment process to an advanced, tertiary system.

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 boilers, emergency standby diesel generator sets, digester gas emergency flares, and cogeneration engine generators.

Following are the estimated emission increases from the applications included in this application:

Application #	PM, tpy	POC, tpy	NOX , tpy	SO2, tpy	CO, tpy
27020	0.018	-	0.376	-	0.011
27353	-	-	-	-	
28651	9.313	6.488	5.288	1.832	44.176
27366	0.048	0.032	0.418	-	1.655
28954	-	-	-	-	-
28811	0.088	0.006	0.104	0.001	0.044
29724	3.614	1.882	3.598	1.76	5.476
30725	-	-	-	-	-
Total	13.081	8.408	9.784	3.593	51.362

Following are approximate reductions from the shutdowns based on their last year of operation:

Source #	PM, tpy	POC, tpy	NOX, tpy	SO2, tpy	CO, tpy
5	0.183	0.5	4.4	0.7	9.1
7	0.274	0.9	6.6	1.0	13.3
12	0.237	2.6	2.6	1.3	19.2
13	0.237	2.7	2.7	1.3	20.1
14	0.219	2.6	2.6	1.2	18.1
16	0.000	0.0	0.0	0.0	0.0
36	0.237	12.0	8.8	0.5	9.5
37	0.584	30.1	21.2	1.5	23.4
54	0.566	28.5	19.0	1.8	21.9
55	0.000	0.0	0.0	0.0	0.0

57	0.000	0.0	0.0	0.0	0.0
Total	2.5	79.9	67.7	9.3	134.5

The replacement of many older combustion sources with four new cogeneration engines and two boilers will ultimately result in an overall reduction in emissions. It is likely that there will also be a real reduction in particulate, because the actual emissions of particulate of the older sources are likely underestimated.

The detail~~s~~ of changes in toxic air contaminants is included in the permit evaluations that are attached to this statement of basis.

C. Permit Content

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

Title Page

The title of the responsible official has been updated.

The facility contact and the BAAQMD Permit Division Contacts 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.

<u>Changes to permit:</u>
The adoption dates of the regulations in Paragraph I.A were updated.

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.

Exempt sources are those sources that are exempt from major facility review permitting pursuant to the requirements of BAAQMD Regulation 2, Rule 6: Permits, Major Facility Review.

Registered portable engines and non-road engines are exempt from BAAQMD Regulation 2, Rule 6 pursuant to BAAQMD Regulation 2-6-113 and 2-6-114, respectively, even though these engines may be required to have a BAAQMD permit to operate pursuant to BAAQMD Regulation 2, Rule 1: Permits, General Requirements.

Significant sources are those sources that have a potential to emit 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).

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., A24). 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. The equipment list has been revised to clarify the equipment names or description to remove portions of the description that are obsolete.

Each of the permitted sources has previously been issued an Authority to Construct or 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.

Following are explanations of the differences in the equipment list between the time that the current Title V permit was renewed on March 6, 2017, and the permit proposal date:

Devices removed from service or archived since the permit was renewed on March 6, 2017:

- S5, S7, S12, S13, S14, S36, S37, S54, S55, S57, Engines
- S16, Paint Spraying Building
- S218, S219, Portable Engines
- A401, Flare
- A402, Flare
- A403, Flare
- A403, Flare

Devices added since the permit was renewed on March 6, 2017:

- S67, S68, S69, S70, 4834-hp Digester Gas/Natural Gas Cogeneration Engines
- S71, Enclosed Paint Booth with Natural Gas Heater
- S72, S73, Digester Gas/Natural Gas Boilers
- S222, S223, S224, S225, 4376-hp Emergency Diesel Generators
- A3, Chlorine Injection System
- A5, Odor Control System 1, Biotrickling Filter
- A6, Odor Control System 2, Carbon Absorption
- A7, Paint Arrestors
- A9, Gas Treatment System, Iron Sponge
- A10, Selective Catalytic Reduction
- A11, Oxidation Catalyst
- A12, Selective Catalytic Reduction
- A13, Oxidation Catalyst
- A14, Selective Catalytic Reduction
- A15, Oxidation Catalyst
- A16, Selective Catalytic Reduction
- A17, Oxidation Catalyst
- A18, Gas Treatment System, Activated Carbon
- A406, Flare
- A407, Flare
- A500, Iron Salts Injection
- A501, Polymer Injection

District permit applications not included in this proposed permit:

- Application 30244, Digester Gas Holder Replacement
- Application 30879, New Digested Sludge Dewatering Process

Changes to permit:
Engines S9 through S11 no longer burn landfill gas.

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:
The dates of the regulations were updated.

The following regulations were added:

- SIP Regulation 8, Rule 3, Architectural Coatings
- BAAQMD Regulation 11, Rule 18, Reduction of Risk from Air Toxic Emissions at Existing Facilities
-

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.

Complex applicability determinations

Regulation 6, Section 6-1-310.2, 6-1-311.2, and 6-1-504, for S67, S68, S69, S70, Cogeneration Engines, and S72, S73, Boilers

In Application 28651, the potential to emit for PM10, including filterable and condensable particulate, for each engine was estimated to be 3.269 tons/yr or 2,972 kg/yr. How much is filterable particulate is not known, but it is likely over 1,000 kg, the threshold for

applicability of the lowered grain loading standards in Section 6-3-310.2. This standard is not federally-enforceable.

In Application 29724, the potential to emit for PM10, including filterable and condensable particulate, for each boiler was estimated to be 1.807 tons/yr or 1642 kg/yr. How much is filterable particulate is not known, but it is likely over 1,000 kg, the threshold for applicability of the lowered grain loading standards in Section 6-3-310.2. This standard is not federally-enforceable.

The process weight standard in Section 6-1-311.2 does not apply to fuels.

Section 6-1-504 requires a source test every five years for sources between 2,000 and 8,000 kg/yr. This requirement will apply to the engines but not the boilers.

Regulation 6, Rule 1, Particulate Matter for A404, A405, A406, and A407, Flares, abating S210, Digesters

The citations for 6-1-301 and 6-1-310 have been added to Table IV-K for the flares.

Since the facility has a condition that restricts digester gas combustions to engines and boilers where possible, the potential to emit of the flares was estimated using actual usage during 2021. The actual usage was 16,616 thousand cubic feet/yr. Using the Webfire emission factor of 5.30E-5 lb/scf, the estimated emissions are 881 lb/yr. Since the Section 6-1-310.2 standard applies only to sources that have a potential to emit over 2,200 lb/yr, the standard does not apply to the flares. This standard is not federally-enforceable.

Digester Gas Combustion, Applicable Regulation 8 Rule 2: The anaerobic digesters S210 produce digester gas, which is principally combusted in the digester gas engines or boilers, and secondarily in the digester gas flares. The composition of the digester gas is roughly 62% methane, 38% carbon dioxide, 0.4% nitrogen with about 63 ppmv of non-methane organic compounds as hexane. The District evaluated whether the digester S210 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 B) to estimate the NMOC potential emissions from digester gas. The use of NMOC potential emissions is conservative since this includes all compounds of carbon with the exception of methane and carbon dioxide. San Jose/Santa Clara Water Pollution Control has estimated a daily digester gas production rate of about 1.5 million cu ft, with a conservative maximum concentration of 63 micro-grams NMOC per liter of digester gas (63 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 (13 ppmv) of NMOC, which, 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 J, and assuming all digester gas is vented at the maximum NMOC concentration gives a daily uncontrolled emission rate of approximately 5.9 lb per day (controlled emissions estimated as 0.6 lb/day), at a maximum concentration of 2 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 S210 and the respective digester gas fired engines and flares are subject to and will comply with Regulation 8-2-301. Regulation
8-2-301 will be included in Table IV, Applicable Requirements for S210 Anaerobic Digester as well as all combustion devices burning or abating digester gas.

S38, S39, S72, S73, Boilers and 9-7-312

Following are the requirements of 9-7-312:

In addition, pursuant to Regulation 9-7-312, no person shall operate a boiler or steam generator with a stack temperature that exceeds the following.

Table 14. Regulation 9-7 Stack Gas Temperature Limits Review	
Heater Design	**Maximum Temperature (°F), Highest Limit**

Fire-Tube	100°F over saturated steam temperature (steam boiler); 100°F over hot water temperature (water boiler); or, 250°F greater than combustion air temperature.
Water-Tube	150°F over saturated steam temperature (steam boiler); 150°F over hot water temperature (water boiler); or, 250°F greater than combustion air temperature.

However, the aforementioned gas temperature requirements do not apply to devices certified by the Air-Conditioning, Heating and Refrigeration Institute (AHRI) as having a thermal efficiency of 80% or more.

The facility states that S38 and S39 are firetube boilers with thermal efficiencies over 80%. Therefore, the requirements of Regulation 9-7-312 do not apply to S38 and S39.

The manufacturer of S72 and S73 expects a thermal efficiency of 82%. Therefore, the requirements of Regulation 9-7-312 do not apply to S72 and S73.

Compliance Assurance Monitoring: Compliance assurance monitoring (CAM) is applicable when there is emission control device used to achieve compliance with a federally enforceable emissions limit and the unabated emission exceeds 100 tons per year. The applicability of CAM must be considered at this facility because the facility uses an emission control device to achieve compliance with a federally enforceable emission limit. The control devices in use are flares A404, A405, A406, and A407. In addition, cogeneration engines S4 through S14 and S67 through S70 and boilers S72 and S73 burn digester gas to make power and heat and therefore control emissions of digester gas. These flares and other combustion devices control emissions from the anaerobic digesters S210, and are subject to the requirements of 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 Appendix B, 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. San Jose/Santa Clara Water Pollution Control has a daily digester gas production rate of about 1,500,000 cu ft, with a maximum concentration of 63 micro-grams NMOC per liter (63 ppmv), of digester gas. Assuming all digester gas is vented at the maximum NMOC concentration gives a daily uncontrolled emission rate of approximately 5.9 lb per day (see Appendix B for calculation). CAM only applies if the uncontrolled emissions are more than 100 tpy. Since the maximum potential annual uncontrolled emissions are about 1.1 ton (2151 lb/yr), CAM is not required.

NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE):

The existing stationary RICE S9 through S14 and S55 are subject to the Code of Federal Regulation, Title 40, Part 63, subpart ZZZZ – NESHAP for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. Per 40 CFR 63.6590(a)(1)(iii), the subpart ZZZZ applies to existing stationary RICE located at an area source of HAP emissions. The listed engines are considered “existing” because the

construction or reconstruction was commenced before 6/12/06. Therefore, the engines are subject to Subpart ZZZZ.

112 (j) Case by Case MACT: This requirement does not apply because there are no major sources for HAP, nor does the facility qualify as a major facility for HAP.

Changes to permit:
The following sources have been removed:

- S5, S7, S12, S13, S14, S36, S37, S54, S55, S57, Engines
- S71, Paint Spraying Building

The following sources have been added:

- S67, S68, S69, S70, 4834-hp Digester Gas/Natural Gas Cogeneration Engines
- S71, Enclosed Paint Booth with Natural Gas Heater
- S72, S73, Digester Gas/Natural Gas Boilers
- S222, S223, S224, S225, 4376-hp Emergency Diesel Generators

S9 through S11, Engines
These engines no longer burn landfill gas. Therefore, the requirements of Regulation 8, Rule 34, Solid Waste Disposal Sites, have been removed.

The requirements of Regulation 9, Rule 2, Hydrogen Sulfide, have been added.

S15, S16, S71, Paint Spraying
Table IV-C and Condition 1826 for S15 and S16, Paint Spraying, were modified. S16 was deleted. A new source S71, Paint Spray Booth with Natural Gas Heater and Paint Arresters was added. A prohibition against using materials containing methylene chloride, chromium, lead, manganese, nickel, or cadmium was added to ensure that the sources would not be subject to 40 CFR 63, Subpart HHHHHH, National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources. The throughputs were not increased.

S38, S39, Natural Gas Boilers
The requirements of Regulation 8, Rule 2, Miscellaneous Operations, have been removed because they do not apply to sources that only use natural gas.

S66, Diesel Emergency Standby Engine
The number of hours allowed by the CARB ATCM has been corrected in Table IV-J. This 2008 engine is considered to be new for the purposes of the ATCM. Because the emission rate for diesel particulate is 0.13 g/bhp-hr, the engine is allowed 50 hours/year of use for maintenance and testing. In Sections VI and VII, the number of hours allowed is correct.

S210, Digesters
The citations for 6-1-301 and 6-1-310 have been added to Table IV-K for the flares. The flare numbers have been added to the title of the table.

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."

Changes to permit:

S67-S70, Cogeneration Engines

The testing for PM10/PM2.5, ammonia and formaldehyde at new cogeneration engines, S67 through S70, has not been approved. Therefore, the District permit cannot be issued. The Schedule of Compliance will include provisions requiring resolution of this issue and will include reports of progress every three months.

Title V permit

Regulation 2, Rule 6, Sections 307 and 404, and 40 CFR 70.7(b) state that a facility should not operate after expiration of the Title V permit if the renewal application has not been submitted in a timely manner. The Title V renewal application was due by September 5, 2021. It was submitted on September 15, 2021. This occurred because the deadline was incorrect in Section I.B.1 of the permit that was issued on March 6, 2017. Nonetheless, the facility is technically out of compliance with the requirement. The Schedule of Compliance will include provisions requiring resolution of this issue and will include reports of progress every three months. This section will be removed when the permit is issued.

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.

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.

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

Changes to permit:
S9 through S11, Engines, S12 through S14, Decommissioned Engines
These engines no longer burn landfill gas. Therefore, the requirements of Regulation 8, Rule 34, Solid Waste Disposal Sites, have been removed.

S12, S13, and S14, have been removed from Condition 17899 because the engines have been decommissioned.

A requirement for records of hours of operation was added in part 10f of Condition 17899 was added because source tests are required after every 8,760 hours of operation, not annually.

S210, Digestors

Condition 17741 has been amended to add the requirements of Applications 27366 and 28954, to add and delete combustion sources, and to add sulfur monitoring methods.

Part 8 of condition 17741 has been amended to clarify that the 1.22 lb H2S/hr limit applies to all digesters combined.

S38, S39, Natural Gas Boilers
The boilers shared a combined NOx and SO2 limit with S36 and S37, Engines. These engines have been demolished. The limit will be lowered using the basis in the original 1986 application 28990 of 44.6 lb NOx/day and 14.0 lb SO2/day.

Paint Spraying
Condition 1826 for S15 and S16, Paint Spraying, was modified. S16 was deleted. A new source S71, Paint Spray Booth with Natural Gas Heater and Paint Arresters was added. A prohibition against using materials containing methylene chloride, chromium, lead, manganese, nickel, or cadmium was added to ensure that the sources would not be subject to 40 CFR 63, Subpart HHHHHH, National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources. The throughputs were not increased.

S67 through S70, Engines
A requirement for records of hours of operation was added in part 22f of Condition 26639 was added because source tests are required after every 8,760 hours of operation, not annually.

The sulfur monitoring methods were added.

S120, Primary Treatment and Condition 26312
The condition has been corrected to show that the source is S120, Primary Treatment, not S110, Preliminary Treatment. The H2S limit has been raised from 0.05 ppmv to 1.5 ppmv.

S200, Sludge Handling and Condition 26313
The H2S limit has been raised from 0.05 ppmv to 1.5 ppmv.

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.

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	Monitoring
S9, S10, S11, S67, S68, S9, S70, Natural Gas/ Digester Gas Engines	Regulation 9-8-301.2 (natural gas)	65 ppm @ 15% O2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner
S9, S10, S11, S67, S68, S9, S70, Natural Gas/ Digester Gas Engines	Regulation 9-8-302.2 (digester gas or digester gas/natural gas mixture)	70 ppm @ 15% O2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner
S9, S10, S11, S67, S68, S9, S70, Natural Gas/ Digester Gas Engines	SIP Regulation 9-8-301.2 (natural gas)	140 ppm @ 15% O2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner

NOx Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S9, S10, S11, S67, S68, S9, S70, Natural Gas/ Digester Gas Engines	SIP 9-8-302.1 (digester gas or digester gas/natural gas mixture)	140 ppm @ 15% O2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner
S9, S10, S11, Natural Gas/ Digester Gas Engines	Condition 17899, Part 2	126 ppm @ 15% O2, dry	Source test every 8760 hours or every three years, whichever is sooner or every three years, whichever is sooner
S39, S38, Boilers	Condition 17900, Part 16	44.6 lb/24 hr combined emissions from S38, S39	Annual source test and records
S38, S39, Boilers	Regulation 9-7-307.3	15 ppm @ 3% O2, dry	Annual source test
S67, S68, S69, S70, Natural Gas/ Digester Gas Engines	BAAQMD Condition #26639, Part 10	0.124 g/bhp-hr or 11 ppmv @ 15% O_2, dry	Source test every 8760 hours or every three years, whichever is sooner or every three years, whichever is sooner
	BAAQMD Condition # 26639, Part 10	0.124 g/bhp-hr or 11 ppmv @ 15% O_2, dry	Portable monitor every 720 hours of operation
	BAAQMD Condition # 26639, Part 10	23.15 tons per year for all four engines combined	Source test and calculations
S72, S73, Boilers	Regulation 9-7-307.3	15 ppm @ 3% O2, dry when firing natural gas only	Annual source test
S72, S73, Boilers	BAAQMD Regulation 9-7-307.7	30 ppmv, dry at 3% O_2 when firing digester gas only	Annual source test
	BAAQMD Regulation 9-7-307.9	Weighted average of natural gas and digester gas limit when firing both fuels	Annual source test
	SIP 9-7-301.1	30 ppmv, dry at 3% O_2	Annual source test
	SIP 9-7-302.1	40 ppmv, dry at 3% O_2	Annual source test

NOx Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
	BAAQMD Condition #27140, Part 4.a.i	9 ppmv, dry at 3% O_2 when firing natural gas only	Annual source test
	BAAQMD Condition #27140, Part 4.a.ii	20 ppmv, dry at 3% O_2 when firing digester gas only	Annual source test
	BAAQMD Condition # 27140, Part 4.a.iii	Weighted average of natural gas and digester gas limit in condition 17140, parts 4.a.i and 4.a. ii when firing both fuels	Annual source test
A406, Flare	BAAQMD Condition # 17741, Part 14	0.06 lb/MMbtu	Source test every 8760 hours or every three years, whichever is sooner or every five years, whichever is sooner

NOx Discussion:

The monitoring is adequate for all sources with NOx limits.

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S9, S10, S11, S67, S68, S9, S70, Natural Gas/ Digester Gas Engines	Regulation 9-8-301.3 (natural gas)	2000 ppm @ 15% O2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner
S9, S10, S11, S67, S68, S9, S70, Natural Gas/ Digester Gas Engines	Regulation 9-8-302.3 (digester gas or digester gas/natural gas mixture)	2000 ppm @ 15% O2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S9, S10, S11, S67, S68, S9, S70, Natural Gas/ Digester Gas Engines	SIP Regulation 9-8-301.3 (natural gas)	2000 ppm @ 15% O2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner
S9, S10, S11, S67, S68, S9, S70, Natural Gas/ Digester Gas Engines	SIP 9-8-302.3 (digester gas or digester gas/natural gas mixture)	2000 ppm @ 15% O2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner
S9, S10, S11, Natural Gas/ Digester Gas Engines	BAAQMD Condition # 17899, Part 3	1620 ppmv @ 15% O_2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner
S38, S39, Boilers	Regulation 9-7-307.3	400 ppmv, dry at 3% O_2	Annual source test
	SIP 9-7-301.2	400 ppmv, dry at 3% O_2	Annual source test
S67, S68, S69, S70, Natural Gas/ Digester Gas Engines	BAAQMD Condition # 26639, Part 10	0.89 g/bhp-hr or 130 ppmv @ 15% O_2, dry	Quarterly monitoring with portable analyzer, source test every 8760 hours of operation or every three years, whichever is sooner
S67, S68, S69, S70, Natural Gas/ Digester Gas Engines	BAAQMD Condition # 26639, Part 10	166.17 tons per year for all four engines	Source test and calculations
S72, S73, Boilers	Regulation 9-7-307.3	400 ppmv, dry at 3% O_2	Annual source test
S72, S73, Boilers	BAAQMD Regulation 9-7-307.7	400 ppmv, dry at 3% O_2	Annual source test

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S72, S73, Boilers	BAAQMD Regulation 9-7-307.9	400 ppmv, dry at 3% O_2	Annual source test
S72, S73, Boilers	SIP 9-7-301.1	400 ppmv, dry at 3% O_2	Annual source test
S72, S73, Boilers	SIP 9-7-302.1	400 ppmv, dry at 3% O_2	Annual source test
	BAAQMD Condition #27140, Part 4.c.i	50 ppmv, dry at 3% O_2	Annual source test
A406, Flare	BAAQMD Condition # 17741, Part 147	0.2 lb/MMbtu	Source test every 8760 hours or every three years, whichever is sooner or every five years, whichever is sooner

CO Discussion:

The monitoring is adequate for all sources with CO limits.

SO_2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S9, S10, S11, Engines; S38, S39, Boilers; S56, S66 Standby Diesel Engines; S67, S68, S69, S70, Cogen Engines, S72, S73, Boilers; S222, S223, S224, S225, Standby Diesel Engines	BAAQMD 9-1-301	Ground level concentrations of SO2 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
S9, S10, S11, Engines; S38, S39, Boilers; S67, S68, S69, S70, Cogen Engines, S72, S73, Boilers	BAAQMD 9-1-302	300 ppm (dry)	Monitoring of digester gas sulfur content
S56, S66, S222, S223, S224, S225, Standby Diesel Engines	BAAQMD 9-1-304	Sulfur content of fuel < 0.5% by weight	None

SO_2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S38, S39, Boilers	BAAQMD Condition # 17900 Part 17	14 lbs/24 hr combined emissions from S38 and S39	Records
S210	BAAQMD Condition # 17741, Part 4	12.722 tons/yr	Daily digester gas sulfur and production monitoring
S67, S68, S69, S70, Cogen Engines	BAAQMD Condition # 26639, Part 4	50 ppm S in digester gas	Monthly monitoring of digester gas sulfur content

SO2 Discussion:

BAAQMD Regulation 9-1-301

Area monitoring to demonstrate compliance with the ground level SO_2 concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). This facility does not have equipment that emits large amounts of SO_2 and therefore is not required to have ground level monitoring by the APCO.

All facility combustion sources are subject to the SO2 emission limitations in District Regulation 9, Rule 1 (ground-level concentration and emission point concentration). In EPA's June 24, 1999 agreement with CAPCOA and ARB, "Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", EPA has agreed that natural-gas-fired combustion sources do not need additional monitoring to verify compliance with Regulation 9, Rule 1, since violations of the regulation are unlikely. Therefore, no monitoring is necessary for this requirement.

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 burning sources are exempt).

Gaseous Fueled Engines, S9 through S14, S36, S37, S67, S68, S69, S70, S72 and s73:
The SO2 concentration depends on the sulfur content of the fuel. Pipeline natural gas is limited to 5 grains/100 scf, which is about 140 ppm, so the burning of natural gas cannot cause an exceedance of the standard.

The digester gas has a limit of 350 ppm sulfur. In the future, the limit will be 315 ppm. Since the sulfur is diluted during combustion, this concentration cannot cause an exceedance of the standard.

Because none of these fuels could cause an exceedance of the standard, no additional monitoring is required.

BAAQMD Regulation 9-1-304 (Sulfur Content of Liquid & Solid Fuels)

This section establishes sulfur limits for liquid and solid fuels. The only liquid fuels at this facility is diesel fuel, hence the rule is applicable only to those sources burning diesel fuel. The diesel engines (S56, S66, S222, S223, S224, S225,) will be fired exclusively with CARB-certified diesel fuel with a sulfur content of 0.0015 wt. percent. Hence, compliance with the 0.5 wt% sulfur standard of Regulation 9-1-304 is expected.

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S9, S10, S11, Engines; S38, S39, Boilers; S67, S68, S69, S70, Cogen Engines, S72, S73, Boilers; A404, A405, A406, A407, Digester Gas Flares	BAAQMD Regulation 6-1-301 And SIP 6-301	Ringelmann 1.0	None
S56, S66, S222, S223, S224, S225, Standby Diesel Engines	BAAQMD Regulation 6-1-303 And SIP 6-303	Ringelmann 2.0	None, operated infrequently
S9, S10, S11, Engines; S56, S66 Standby Diesel Engines; S222, S223, S224, S225, Standby Diesel Engines A404, A405, A406, A407, Digester Gas Flares	BAAQMD Regulation 6-1-310 And SIP 6-310	0.15 gr/dscf	None
S67, S68, S69, S70, Cogen Engines,	BAAQMD Regulation 6-1-310	0.15 gr/dscf	Source test every 8760 hours of operation or every three years, whichever is sooner
S67, S68, S69, S70, Cogen Engines,	BAAQMD Regulation 6-1-310.2	Grain loading limit depending on exhaust rate, 0.0776 gr/dscf between 7063 and 10594 dscf/min	Source test every five years
S38, S39, Boilers	BAAQMD Regulation 6-1-310.3	0.15 gr/dscf at 6% O2	None

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S72, S73, Boilers;	BAAQMD Regulation 6-1-310.3	0.15 gr/dscf at 6% O2	Source test every 8760 hours of operation or every three years, whichever is sooner
S67, S68, S69, S70, Cogen Engines,	BAAQMD Condition # 26639, Part 13	PM10/PM2.5: 0.07 g/bhp-hr including filterable and condensable PM	Source test every 8760 hours of operation or every three years, whichever is sooner
S67, S68, S69, S70, Cogen Engines,	BAAQMD Condition # 26639, Part 13	PM10/PM2.5: 13.07 tons/year including filterable and condensable PM for all four engines	Source test every 8760 hours of operation or every three years, whichever is sooner and calculations
S67, S68, S69, S70, Cogen Engines,	BAAQMD Condition # 26639, Part 14	PM2.5: 10 tons/year including filterable and condensable PM for all four engines	Source test every 8760 hours of operation or every three years, whichever is sooner and calculations
S72, S73, Boilers	BAAQMD Condition # 27140, Part 5	9.9 lb/day each	Source test every 8760 hours of operation or every three years, whichever is sooner and calculations
S52, Sandblast Operations	BAAQMD Regulation 12-4-301	Ringelmann 1.0	None

PM Discussion:

BAAQMD Regulation 6 "Particulate Matter and Visible Emissions"

Visible Emissions

BAAQMD Regulation 6-1-301 limits 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 normally not associated with combustion of gaseous fuels. This includes emissions from all sources burning natural gas and digester gas at IC engines, boilers, and flares. Since there are no visible emissions expected from gaseous fuels, periodic monitoring to ensure compliance with Regulation 6-1-301 is not required.

BAAQMD Regulation 6-1-303 limits visible emissions to no darker than 2.0 on the Ringelmann Chart (except for periods or aggregate periods less than 3 minutes in any hour) from emergency engines. These engines must run on diesel fuel containing no more than 15 ppm sulfur, by weight. Therefore, the diesel engines are not expected to exceed the standard.

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 @ 6% O_2. These are the "grain loading" standards.

Stationary IC Engines (S9, S10, S11, S12, S13, S14, S67, S68, S69, S70), Boilers (S38, S39, S72, S73), and Flares (A404, A405, A406, A407):
There are no sources that burn gaseous fuel (natural gas and/or digester gas) exclusively that would be expected to have emissions near this limitation.

The only sources that could potentially exceed these limits are the standby diesel generators. S56, S66, S222, S223, S224, and S225. These engines would be operated as emergency backup generators in the event of an emergency. AP-42 gives a factor of 0.31 lb/MM Btu for diesel engines. The flue gas factor for diesel combustion is 9190 dscf/MM Btu at 0% oxygen. At typical oxygen levels of 15% in the flue gas, the factor becomes 32,358 dscf/MM Btu. Converting the AP-42 factor into a grain loading and then an exhaust concentration gives the following [(0.31 lb/MM Btu)(7000 grain/lb)]/32,358 dscf flue gas = 0.067 gr/dscf. The calculated grain loading is less than ½ of the standard. Periodic monitoring is not necessary for these sources since their operation is intermittent and since it is expected the engines will easily meet the 0.15 gr/scf standard of 6-1-310.

General Operations

In addition to the limitation of Section 6-1-310, according to 6-1-311 a person shall not discharge into the atmosphere from any general operation particulate matter from any emission point, at a rate in excess of that specified in Table 1 for the process weight rate indicated.

The process weight limitation does not apply to the combustion of fuels.

BAAQMD Regulation 12 "Miscellaneous Standards of Performance – Sandblasting"

Visible Emissions

BAAQMD Regulation 12-4-301 limits 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). Pursuant to California Health & Safety Code 41905, the standards shall be statewide, and no rule or regulation of any district that is applicable to sandblasting operations shall be stricter or less strict than the standards adopted by the state board pursuant to the recommendation of the committee. The facility is required to and

maintains that they follow Title 17 of the California Code of Regulations for abrasive blasting. Therefore, there are no monitoring requirements for S52.

POC [NMOC] Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S5, S7, S9, S10, S11, S67, S68, S9, S70, Engines S72, S73, Boilers	8-2-301	15 lb/day and greater than 300 ppm total carbon	Source test every 8760 hours of operation or every three years, whichever is sooner
S100, Municipal Wastewater Treatment Plant; S110, Preliminary Treatment; S120, Primary Treatment; S140, Flow Equalization; S150, Secondary Treatment; S160, Secondary Clarifiers; S170, Tertiary Treatment; S180, Disinfection; S190, Reclamation; S200, Sludge Handling; S210, Digesters	8-2-301	15 lb/day and greater than 300 ppm total carbon	None
S9, S10, S11, Engines	Condition 17899, Part 4b	225 ppmv @ 15% O2, dry, when burning digester gas	Source test every 8760 hours of operation or every three years, whichever is sooner
S15, S71, Paint Spray Booths	BAAQMD 8-19-301.1	Baked coating: 2.3 lb/gal	Recordkeeping
S15, S71, Paint Spray Booths	BAAQMD 8-19-301.1	Air-dried coating: 2.8 lb/gal	Recordkeeping
S15, S71, Paint Spray Booths	BAAQMD Condition # 17737, Part 1	50 gal coating during any consecutive twelve-month period at each source.	Recordkeeping
S15, S71, Paint Spray Booths	BAAQMD Condition # 17737, Part 1	50 gal primer during any consecutive twelve-month period at each source.	Recordkeeping

POC [NMOC] Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S15, S71, Paint Spray Booths	BAAQMD Condition # 17737, Part 2	50 gal MEK, 50 gal Mineral Spirits during any consecutive twelve-month period at each source	Recordkeeping
S26, Gasoline Dispensing Island	BAAQMD Condition # 17738, Part 1	50,000 gallons during any consecutive twelve-month period	Recordkeeping
S67, S68, S69, S70, Cogen Engines,	BAAQMD Condition # 26639, Part 15a	0.12 g/bhp-hr or 30.6 ppmv @ 15% O_2, dry	Source test every 8760 hours of operation or every three years, whichever is sooner
S72, S73, Boilers	BAAQMD Condition # 27140, Part 4.b.i	15 ppmv, dry at 3% O_2 when firing natural gas only	Source test every 8760 hours of operation or every three years, whichever is sooner
	BAAQMD Condition # 27140, Part 4.b.ii	30 ppmv, dry at 3% O_2 when firing digester gas only	Source test every 8760 hours of operation or every three years, whichever is sooner
	BAAQMD Condition # 27140, Part 4.b.iii	Weighted average of natural gas and digester gas limit in condition 17140, parts 4.b.i and 4.b.ii when firing both fuels	Source test every 8760 hours of operation or every three years, whichever is sooner

POC Discussion:

Potential POC emission sources include the combustion sources as a result of incomplete combustion of any organics that may be in the natural gas, landfill gas, diesel fuel and digester gas (trace amounts) and the precursor organics that may result from the wastewater processes.

Combustion POC Sources (S9, S10, S11, S12, S13, S14): Periodic source tests are imposed for these combustion sources. Test results indicate that the emissions from each source are far below 15 lbs/day and 300 ppm. Therefore, monitoring of POC emissions are not required for these sources. Below is a past test result for each source:

Sources	Outlet Emissions		Test Date	Report No.
	lb/day	ppm		
S9		<85	3/22/17	OS-6750
S10		<75	914/17	OS-7216
S11		159	6/21/18	OS-7123
S67		22	12/7/20	OS-8124
S68		15	12/11/20	OS-8125
S69		19	11/19/20	OS-8126
S70		22	11/20/20	OS-8127
S72		<2.1	6/9/21	OS-8111
S73		<2.1	6/8/21	OS-8113

Wastewater POC Sources (S100, S110, S120, S140, S150, S160, S170, S180, S190, S200, and S210): 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 145 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:

PTE = (145 E6 gpd)(243 lb/yr-1E6 gpd) = 35,235 lb/yr (97 lb/day throughout wastewater sources, all locations combined)

The emissions of POCs occur at various locations, at numerous liquid sources throughput 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.

Changes to permit:

Paint Spraying

Table VII-C and Condition 1826 for S15 and S16, Paint Spraying, were modified. S16 was deleted. A new source S71, Paint Spray Booth with Natural Gas Heater and Paint Arresters was added. The throughputs were not increased. A clarification was added to show that the condition states that each source has separate, not combined, throughputs.

S9 through S11, Engines1

These engines no longer burn landfill gas. Therefore, the requirements of Regulation 8, Rule 34, Solid Waste Disposal Sites, have been removed.

The source test monitoring frequency has been corrected from annual to every 8760 hours of operation as stated in Condition 17899. Therefore, a requirement for records of hours of operation was added in part 10f.

The requirements of Regulation 9, Rule 2, Hydrogen Sulfide, have been added.

Sources S12, S13, and S14 have been removed from Table VII-B because they have been decommissioned.

S38, S39, Natural Gas Boilers
The requirements of Regulation 8, Rule 2, Miscellaneous Operations, have been removed because they do not apply to sources that only use natural gas.

The boilers shared a combined NOx and SO2 limit with S36 and S37, Engines. These engines have been demolished. The limit will be lowered using the basis in the original 1986 application 28990 of 44.6 lb NOx/day and 14.0 lb SO2/day.

S67 through S70, Engines
A requirement for records of hours of operation was added in part 22f of Condition 26639 was added because source tests are required after every 8,760 hours of operation, not annually.

S210, Digesters
The citations for 6-1-301 and 6-1-310 have been added to Table VII-K for the flares. The flare numbers have been added to the title of the table.

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.

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. Therefore, this permit has no streamlining.

X. Glossary

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

D. Alternate Operating Scenarios

No alternate operating scenario has been requested for this facility.
0

E. Compliance Status

The San Jose/Santa Clara Water Pollution Control Plant certifies compliance on an annual basis by September 1st of each year.

The plant also submitted a Compliance Certification on September 15, 2021, with the application for the renewal.

The District has determined that the facility is out of compliance with two requirements and has added a custom schedule of compliance to Section V of the permit. The three items are:

S67-S70, Cogeneration Engines
The testing for PM10/PM2.5, ammonia and formaldehyde at new cogeneration engines, S67 through S70, has not been approved.
Title V permit
Regulation 2, Rule 6, Sections 307 and 404, and 40 CFR 70.7(b) state that a facility should not operate after expiration of the Title V permit if the renewal application has not been submitted in a timely manner. The Title V renewal application was due by September 5, 2021. It was submitted on September 15, 2021. This occurred because the deadline was incorrect in Section I.B.1 of the permit that was issued on March 6, 2017. Nonetheless, the facility is technically out of compliance with the requirement.

F. Differences between the Application and the Proposed Permit

Following are the differences in the equipment list between the time that the current Title V permit was renewed on March 3, 2017 and the permit proposal date:

None.

Devices removed from service or archived since the permit was renewed on March 6, 2017:

- S5, S7, S12, S13, S14, S36, S37, S54, S55, S57, Engines
- S16, Paint Spraying Building
- S218, S219, Portable Engines
- A401, Flare
- A402, Flare
- A403, Flare
- A403, Flare

Devices added since the permit was renewed on March 6, 2017:

- S67, S68, S69, S70, 4834-hp Digester Gas/Natural Gas Cogeneration Engines
- S71, Enclosed Paint Booth with Natural Gas Heater
- S72, S73, Digester Gas/Natural Gas Boilers
- S222, S223, S224, S225, 4376-hp Emergency Diesel Generators
- A3, Chlorine Injection System
- A5, Odor Control System 1, Biotrickling Filter
- A6, Odor Control System 2, Carbon Absorption
- A7, Paint Arrestors
- A9, Gas Treatment System, Iron Sponge
- A10, Selective Catalytic Reduction
- A11, Oxidation Catalyst
- A12, Selective Catalytic Reduction
- A13, Oxidation Catalyst
- A14, Selective Catalytic Reduction
- A15, Oxidation Catalyst
- A16, Selective Catalytic Reduction
- A17, Oxidation Catalyst
- A18, Gas Treatment System, Activated Carbon
- A406, Flare
- A407, Flare
- A500, Iron Salts Injection
- A501, Polymer Injection

APPENDIX A

GLOSSARY

ACT
Federal Clean Air Act

APCO
Air Pollution Control Officer

ARB
Air Resources Board

BAAQMD
Bay Area Air Quality Management District

BACT
Best Available Control Technology

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

CAA
The federal Clean Air Act

CAAQS
California Ambient Air Quality Standards

CAM
Compliance Assurance Monitoring per 40 CFR Part 64

CAPCOA
California Air Pollution Control Officers Association

CEM
Continuous Emission Monitor

CEQA
California Environmental Quality Act

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

CO
Carbon Monoxide

Cumulative Increase

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

District
The Bay Area Air Quality Management District

EPA
The federal Environmental Protection Agency.

Excluded
Not subject to any District regulations.

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

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

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

IC
Internal Combustion

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

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

MOP
The District's Manual of Procedures.

NAAQS
National Ambient Air Quality Standards

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

NMHC
Non-methane Hydrocarbons (Same as NMOC and POC)

NMOC
Non-methane Organic Compounds (Same as NMHC and POC)

NOx
Oxides of nitrogen.

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

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

Offset Requirement
A New Source Review requirement to provide federally enforceable emission offsets for the emissions from a new or modified source. Applies to emissions of POC, 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 (Same as NMHC and NMOC)

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.

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

RICE
Reciprocating internal combustion engine

SIP

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

SO2
Sulfur dioxide

THC
Total Hydrocarbons (NMHC + Methane)

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

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

TPH
Total Petroleum Hydrocarbons

TSP
Total Suspended Particulate

VOC
Volatile Organic Compounds

Units of Measure:

bhp	=	brake-horsepower
btu	=	British Thermal Unit
cu. ft.	=	cubic foot
cfm	=	cubic feet per minute
dscf	=	dry standard cubic foot
dscfm	=	dry standard cubic foot per minute
g	=	gram
gal	=	gallon
gpm	=	gallons per minute
gr	=	grain
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inch
max	=	maximum
m^2	=	square meter
min	=	minute
mm	=	million
MMbtu	=	million btu

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

APPENDIX B

ENGINEERING EVALUATION APPICATION 27020

ENGINEERING EVALUATION

San Jose/Santa Clara Water Pollution Control
700 Los Esteros Road, San Jose, CA
Application: 27020
Plant: 778

1. BACKGROUND

San Jose/Santa Clara Water Pollution Control has applied to obtain an Authority to Construct for the following equipment:

S222 Emergency Standby Diesel Generator;
Caterpillar; Model: C175; Model Year: 2015;
4376 BHP; Family Name: FCPXL84.7NSF
29.26 MMbtu/hr, abated by integral SCR and Diesel Oxidizing Catalyst

S223 Emergency Standby Diesel Generator;
Caterpillar; Model: C175; Model Year: 2015;
4376 BHP; Family Name: FCPXL84.7NSF
29.26 MMbtu/hr, abated by integral SCR and Diesel Oxidizing Catalyst

S224 Emergency Standby Diesel Generator;
Caterpillar; Model: C175; Model Year: 2015;
4376 BHP; Family Name: FCPXL84.7NSF
29.26 MMbtu/hr, abated by integral SCR and Diesel Oxidizing Catalyst

S225 Emergency Standby Diesel Generator;
Caterpillar; Model: C175; Model Year: 2015;
4376 BHP; Family Name: FCPXL84.7NSF
29.26 MMbtu/hr, abated by integral SCR and Diesel Oxidizing Catalyst

The engines meet the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 4 Off-road standard. The engine will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

The facility included RYPOS diesel particulate filters (DPF) in the application. However, these engines are packaged with SCR and a diesel oxidation catalyst. The California Air Resources Board verifies the DPF technology. The verification for this DPF is invalid if the engine has pre-existing abatement devices. In this case, the engine meets all limits without the DPFs, so the DPFs will not be included in the permit.

2. EMISSIONS

S222, S223, S224, and S225 have been certified by EPA to be cleaner burning engines. Except for SO_2, the emission factors for the engine are from the EPA certification test results. The SO_2 emissions were calculated based on the maximum allowable sulfur content (0.0015 wt% S) of the diesel fuel with assumption that all of the sulfur present will be converted to SO_2 during the combustion process.

Basis:
4376 hp output rating
50 hr/yr operation for testing and maintenance
208.8 gallons/hr max fuel use rate
NMHC, NO_x, CO, and PM10 emission factors provided by the EPA certification test results.

SO_2 emissions are quantified based on the full conversion of 0.0015 wt% (~ 15 ppm) sulfur in the ULS diesel fuel. The SO_2 emission factor was derived from EPA AP-42, Table 3.4-1.

Emissions:
Annual emissions are calculated based on 50 hours per year of operation for testing and maintenance. The emissions at 500 hours per year are calculated to determine the potential to emit in accordance with EPA's memorandum of September 6, 1995 "Calculating Potential to Emit (PTE) for Emergency Generators."

Emissions for Single Engine

Pollutant	Emissions, g/bhp-hr	Emissions, lb/hr	Emissions, lb/day	Emissions, lb/50 hrs	Emissions, lb/500 hrs
NOX	0.39	3.76	90.30	188.12	1881.22
POC	0				
CO	0.011	0.11	2.55	5.31	53.06
PM10	0.019	0.18	4.40	9.16	91.65
SO2*	1.27E-05	0.00	0.00	0.01	0.06

**From Table 3.4-1 of AP-42: 0.001515 lb SO_2/MMBTU with 15 ppm ULSD*

Emissions for Four Engines

	EF, g/bhp-hr	Emissions, lb/hr	Emissions, lb/day	Emissions, lb/50 hrs	Emissions, lb/500 hrs	Emissions, tpy (based on 50 hours)
NOX	0.39	15.05	361.19	752.49	7524.9	0.376
POC	0					
CO	0.011	0.42	10.19	21.22	212.2	0.011
PM10	0.019	0.73	17.60	36.66	366.6	0.018
SO2*	1.27E-05	0.00	0.01	0.02	0.2	0.000

**From Table 3.4-1 of AP-42: 0.001515 lb SO_2/MMBTU with 15 ppm ULSD*

3. PLANT CUMULATIVE INCREASE AND OFFSETS

Following is a summary of the cumulative increase in criteria pollutant emissions that will result from the operation of the engines.

Pollutant	Annual Emissions (TPY)
NO_x	0.376
POC	0
CO	0.011
PM10	0.018
SO2	0

Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NO_x per Regulation 2-2-302. It the facility emits or is permitted to emit more than 35 tpy of POC or NO_x, the offsets must be provided by the facility. The facility emits more than 35 tpy of both POC and NOx and so must provide POC and NOx offsets at a ratio of 1:1.15. In this case, no POC offsets have been calculated, so the facility must provide 0.433 tpy NOx offsets for 0.376 tpy NOx emissions. The offsets will be provided by Certificate 1352.

The facility is not subject to PM10 or SO2 offsets because the facility does not emit or have the potential to emit more than 100 tpy of PM10 or SO2.

CO emissions are not subject to offsets.

All of the NOx and POC increases after 1991 have been offset to date.

4. TOXIC RISK SCREENING ANALYSIS

This application requires a Toxics Risk Screen because the diesel particulate emissions are above the toxic trigger level.

Toxic Pollutant Emitted	Emission Rate (lb/yr)	Risk Screening Trigger (lb/yr)
PM_{10} (Diesel Particulate)	0.34	36.66

The engines will meet Best Available Control Technology for toxics (TBACT) since the diesel particulate emissions will be 0.019 g/bhp-hr. Per BAAQMD Regulation 2-5-301, engines that meet the TBACT requirement must also pass the cancer toxic risk screening level of less than ten in a million. An engine that does not meet the TBACT requirement must pass the toxic risk screening level of less than one in a million.

Per BAAQMD Regulation 2-5-302, the project must also meet cancer toxic risk screening level of less than ten in a million.

BAAQMD Regulations 2-5-301 and 2-5-302 also have limits on the acute hazard index and the chronic hazard index, but there are no acute and chronic hazard index triggers for diesel particulate.

Estimates of residential risk assume exposure to annual average toxic air contaminant concentrations occur 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimates for offsite workers assume exposure occurs 8 hours per day, 245 days per year, for 40 years. Risk estimates for students assume a higher breathing rate, and exposure is assumed to occur 10 hours per day, 36 weeks per year, for 9 years.

Based on 50 hours per year of operation, the emergency generators passed the Health Risk Screening Analysis (HRSA) conducted on May 5, 2015 by the District's Toxics Evaluation Section. The sources pose no significant toxic risk, since the increased cancer risk to the maximally exposed receptor (worker) is 0.06. The increased cancer risk to the nearest resident near the project is 0.05 in a million. In accordance with the District's Regulation 2, Rule 5, this risk level is considered acceptable.

5. BACT

In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO_x, CO, SO_2 or PM_{10}. Each engine is subject to BACT for NOx because the maximum NOx emissions will be 90.4 lb/day.

The BACT2 emission limit for engines in the District's BACT/TBACT workbook for engines greater than 750 hp is 4.8 g/bhp-hr. Emergency engines are not subject to BACT1. Because the NOx emission rate is 0.39 g/bhp-hr, the engines meet BACT2.

6. STATEMENT OF COMPLIANCE

CARB STATIONARY DIESEL ENGINE ATCM

The State Office of Administrative Law approved the Airborne Toxic Control Measure (ATCM) on November 8, 2004. State law requires the local Air Districts to implement and enforce the requirements of the ATCM.

Section 93115.5 contains fuel requirements for diesel. The facility will comply because the diesel sold in California complies with the requirements.

Section 93115.6(b)(2)(B) of the ATCM restricts use of engines during school hours if an engine is located within 500 feet of school grounds. The standard condition includes the prohibition.

Section 93115.6(b)(3) of the ATCM allows new engines to be operated for testing and maintenance for 50 hr/yr if the particulate emissions are between 0.01 and 0.15 g/bhp-hr. Section 93115.4(a)(50) defines a "new" engine as an engine that is installed after January 1, 2005. Therefore, this engine is defined as a "new" engine for the purposes of the ATCM.

BAAQMD Regulations

The engines will be operated as emergency standby engines and therefore are not subject to the emission rate limits in Regulation 9, Rule 8 ("NO_x and CO from Stationary Internal Combustion Engines"). The engines are exempt from the requirements of Sections 9-8-301 through 305, 501 and 503 per Section 9-8-110.5 (Emergency Standby Engines). The engines are subject to and expected to comply with 9-8-330 (Emergency Standby Engines, Hours of Operation) since non-emergency hours of operation will be limited in the permit conditions to 50 hours per year. The engines are also subject to and expected to comply with monitoring and record keeping requirements of Section 9-8-530 and the SO_2 limitations of Regulations 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Regulation 9-8-530 requirements are incorporated into the proposed permit conditions.

Compliance with Regulation 9, Rule 1 is assured since diesel fuel with a 0.0015% by weight sulfur is mandated for use in California.

Like all combustion sources, the engines are subject to Regulation 6, Rule 1 ("Particulate Matter"). Section 6-1-303.1 limits opacity from emergency internal combustion engines to Ringelmann 2. This engine is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Section 6-1-303.1.

Title V, Major Facility Review

Plant 778 is a major facility because it emits more than 100 tpy of NOx, POC, and CO. Therefore, it is subject to Major Facility Review and has a Title V permit.

The addition of these four emergency engines will result in a minor permit revision to the Title V permit. A minor permit revision is any revision that is not an administrative amendment or a

significant permit revision. A significant permit revision is defined in BAAQMD Regulation as follows:

> **2-6-226SIGNIFICANT PERMIT REVISION: ANY REVISION TO A FEDERALLY ENFORCEABLE CONDITION CONTAINED IN A MAJOR FACILITY REVIEW PERMIT THAT CAN BE DEFINED AS FOLLOWS:**
>
> 226.1 The incorporation of a change considered a major modification under 40 CFR Parts 51 (NSR) or 52 (PSD);
>
> 226.2 The incorporation of a change considered a modification under 40 CFR Parts 60 (NSPS), 61 (NESHAPS), or Section 112 of the Clean Air Act (HAP);
>
> 226.3 Any significant change or relaxation of any applicable monitoring, reporting or recordkeeping condition;
>
> 226.4 The establishment of or change to a permit term or condition allowing a facility to avoid an applicable requirement, including:
>
> 4.1 a federally enforceable emission limit assumed in order to avoid classification as a modification under any provision of Title I of the federal Clean Air Act, or
>
> 4.2 an alternative hazardous air pollutant emission limit pursuant to Section 112(i)(5) of the Clean Air Act;
>
> 226.5 The establishment of or change to a case-by-case determination of any emission limit or other standard;
>
> 226.6 The establishment of or change to a facility-specific determination for ambient impacts, visibility analysis, or increment analysis on portable sources; or
>
> 226.7 The incorporation of any requirement promulgated by the U. S. EPA under the authority of the Clean Air Act provided that three or more years remain on the permit term.

An increase in the potential to emit of 40 tpy of NOx or POC would be considered to be a major modification. The potential to emit of emergency engines is calculated based on usage of 500 hours/yr in accordance with EPA's memorandum of September 6, 1995 "Calculating Potential to Emit (PTE) for Emergency Generators."

Following is a table showing the potential to emit:

	Emissions, lb/500 hrs	Emissions, ton/500 hrs
NOX	7524.9	3.762
POC		
CO	212.2	0.106
PM10	366.6	0.183
SO2	0.2	0.000

The emissions are below the trigger for a major modification.

The revision is not considered to be a modification under 40 CFR 60, 40 CFR 61, or Section 112 of the Clean Air Act.

There will be no significant change or relaxation of any applicable monitoring, reporting or recordkeeping condition.

The revision will not establish or change a permit term or condition allowing the facility to avoid an applicable requirement.

The revision will not establish or change a case-by-case determination of any emission limit or other standard. The BACT determination conforms to the District's BACT/TBACT workbook and is therefore not a case-by-case determination.

The revision will not establish or change a facility-specific determination for ambient impacts, visibility analysis, or increment analysis on portable sources.

The revision is not incorporating any requirement promulgated by the U. S. EPA under the authority of the Clean Air Act.

Therefore, the revision is a minor permit revision. It will be incorporated into the Title V permit after the Authority to Construct is approved. In accordance with BAAQMD Regulation 2-6-406, the facility may proceed with construction and operation as soon as the Authority to Construct is approved.

CEQA

This application is considered to be ministerial under the District's Regulation 2-1-311 because it was analyzed in accordance with Permit Handbook Chapter 2.3.3. Therefore, it is not subject to CEQA review.

PUBLIC NOTICE

This facility is not within 1,000 feet of a school and therefore is not subject to the public notification requirements of Regulation 2-1-412.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

The engine is subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because it was manufactured after April 1, 2006 and is not a fire pump engine, as required by Section 60.4200(a)(2)(i).

Each engine has a total displacement of 84.67 liters and has 16 cylinders, so each cylinder has a volume of less than 30 liters. Section 60.4205(b) requires these engines to comply with the emission standards in Section 60.4202, which refers to 40 CFR 89.112 and 40 CFR 89.113 for all pollutants. For engines greater than 750 hp, these standards are:

NMHC+NOx: 6.4 g/kW-hr

CO: 3.5 g/kW-hr

PM: 0.20 g/kW-hr

20% opacity during acceleration mode

15% opacity during lugging mode

50% opacity during peaks in acceleration or lugging mode

According to the EPA Certified Emissions Data for non-road compression ignition engines, the engine will comply with the standards.

Sections 60.4206 and 60.4211(a) require that the owner/operator operate and maintain the engine according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine. The owner/operator is expected to comply with this requirement.

Section 60.4207(a) requires that the owner/operator must use fuel that complies with 40 CFR 80.510(a). This means that the fuel must have a sulfur content of 500 parts per million (ppm) maximum, cetane index of 40 or a maximum aromatic content of 35 volume percent. The owner/operator is expected to comply with this requirement because CARB diesel is required to be used in California.

Section 60.4207(b) requires that the owner/operator must use fuel that complies with 40 CFR 80.510(b). This means that the fuel must have a sulfur content of 15 parts per million (ppm) maximum, and the same cetane index or aromatic content as above. The owner/operator is expected to comply with this requirement because CARB diesel is required to be used in California.

Section 60.4209(a) requires a non-resettable hour meter. This requirement is already in the standard permit conditions.

Section 60.4209(b) requires a back pressure monitor if the engine has a diesel particulate filter and has to comply with Section 60.4204. Since the engines are emergency engines, they are not subject to Section 60.4204 and the standard does not require back pressure monitors.

The engine will comply with the requirements of Section 60.4211(c) because it has been certified in accordance with 40 CFR 89.

The engine will comply with the requirement in Section 60.4211(e) to run for less than 100 hours per year for maintenance checks and readiness testing, and the prohibition of running for any reason other than emergency operation, maintenance, and testing because they are limited by permit condition to 50 hours per year for reliability testing and otherwise may only operate for emergencies.

The owner/operator is not required to perform tests in accordance with Section 60.4212 or 60.4213. Section 60.4214 states that owner/operators do not have to submit an initial notification to EPA for emergency engines.

Although the engines have diesel particulate filters, they are not subject to the recordkeeping requirements of Section 60.4214(c), because the standard does not require back pressure monitors if the engines do not have to comply with Section 60.4204.

The owner/operator is required to comply with certain sections of 40 CFR 60, Subpart A, General Provisions. The owner/operator is expected to comply with this requirement.

NESHAPS

The engines are subject to 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. Section 63.6590 states that the engine complies by complying with the NSPS Subpart IIII, discussed above.

PSD

PSD is not triggered.

PERMIT CONDITIONS

Condition #22850: ----------

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing.
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)]

2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited.
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)]

3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is
installed, operated and properly maintained.
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection(e)(4)(G)(1)]

4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
    a. Hours of operation for reliability-related activities (maintenance and testing).
    b. Hours of operation for emission testing to show compliance with emission limits.
    c. Hours of operation (emergency).
    d. For each emergency, the nature of the emergency condition.
    e. Fuel usage for each engine(s).

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection e)(4)(I), (or, Regulation 2-6-501)]

5. At School and Near-School Operation:
If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply: The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:
a. Whenever there is a school sponsored activity (if the engine is located on school grounds)

b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session. "School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property.

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(1)] or (e)(2)(B)(2)]

RECOMMENDATION

Issue an Authority to Construct for the following sources and abatement devices:

S222 Emergency Standby Diesel Generator;
Caterpillar; Model: C175; Model Year: 2015;
4376 BHP; Family Name: FCPXL84.7NSF
29.26 MMbtu/hr abated by integral SCR and Diesel Oxidizing Catalyst

S223 Emergency Standby Diesel Generator;
Caterpillar; Model: C175; Model Year: 2015;
4376 BHP; Family Name: FCPXL84.7NSF
29.26 MMbtu/hr, abated by integral SCR and Diesel Oxidizing Catalyst

S224 Emergency Standby Diesel Generator;
Caterpillar; Model: C175; Model Year: 2015;
4376 BHP; Family Name: FCPXL84.7NSF
29.26 MMbtu/hr, abated by integral SCR and Diesel Oxidizing Catalyst

S225 Emergency Standby Diesel Generator;
Caterpillar; Model: C175; Model Year: 2015;
4376 BHP; Family Name: FCPXL84.7NSF
29.26 MMbtu/hr, abated by integral SCR and Diesel Oxidizing Catalyst

_____

Brenda Cabral
Supervising Air Quality Engineer

APPENDIX C

ENGINEERING EVALUATION APPLICATION 27353

ENGINEERING EVALUATION

San Jose/Santa Clara Water Pollution Control
700 Los Esteros Road, San Jose, CA
Application: 27353
Plant: 778

1. BACKGROUND

San Jose/Santa Clara Water Pollution Control has applied to obtain an Authority to Construct for the following equipment:

A500, Iron Salts Injection abating S110, Preliminary Treatment and S210, Anaerobic Digesters
A501, Polymer Injection abating S120, Primary Treatment

Iron Salts

The main purpose of the iron salts (FeCl3 or ferric chloride) injection is to achieve the H2S limit of 350 ppmv at S210, Anaerobic Digesters. The iron salts will reduce the concentration of H2S, however, at all points after they are introduced. This abatement device replaces an previously unpermitted similar device.

The facility has been advised that the proposed system may have to be improved to comply with lower limits in the future. The facility has informed the District that it will submit a large cogeneration project that burns digester gas in the near future. It is likely that the digester gas H2S limit will be lowered when the facility builds a new cogeneration in facility to comply with BACT.

The ferric chloride solution (with water) will be injected at the Emergency Basin Overflow Structure (EBOS). This structure is part of S110, Preliminary Treatment. It will be mixed with the raw sewage entering the plant. The concentration is 10 mg FeCl3/l. The proposed usage is up to 2,600 gal/day.

Polymer Injection

The purpose of the polymer injection is to improve the removal of solids in S120, Primary Treatment. The solids are sent to S S210, Anaerobic Digesters. The facility has stated that the total amount of solids will not change. However, the polymer injection will allow the solids to be removed from the water at an earlier point in the process.

2. EMISSIONS

There will be no increase in emissions. The facility has stated both that there will be an increase and that there will not be an increase in H2S at the digesters. The facility has submitted the H2S concentrations at the digesters for three years.

The facility has also submitted an application for modifications at the digesters, #27366. The District will impose conditions in this application to ensure that there is no increase in H2S, and therefore SO2.

3. PLANT CUMULATIVE INCREASE AND OFFSETS

There will be no increase in cumulative increase. No offsets will be required.

4. TOXIC RISK SCREENING ANALYSIS

S110, Preliminary Treatment, S120, Primary Treatment, and S210, Anaerobic Digesters will not have an increase in emissions and are not considered to be modified. Therefore, the application is not subject to BAAQMD Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants, and a Health Risk Screening Analysis is not required.

5. BACT

S110, Preliminary Treatment, S120, Primary Treatment, and S210, Anaerobic Digesters will not have an increase in emissions and are not considered to be modified. Therefore, the application is not subject to the BACT in BAAQMD Regulation 2-2-301.

6. STATEMENT OF COMPLIANCE

BAAQMD Regulation 9, Rule 2, Hydrogen Sulfide

THE FACILITY HAS STATED THAT AN ANALYSIS HAS BEEN PERFORMED THAT SHOWS THAT THE H2S CONCENTRATION AT THE POINT OF INJECTION WILL NOT CAUSE EXCEEDANCES OF THE STANDARDS IN BAAQMD REGULATION 9-2-301 (GROUND LEVEL CONCENTRATIONS IN EXCESS OF 0.06 PPM AVERAGED OVER THREE CONSECUTIVE MINUTES OR 0.03 PPM AVERAGED OVER ANY 60 CONSECUTIVE MINUTES).

The demonstration will be fully analyzed in 2016.

Title V, Major Facility Review

Plant 778 is a major facility because it emits more than 100 tpy of NOx, POC, and CO. Therefore, it is subject to Major Facility Review and has a Title V permit.

The addition of A500, Iron Salts Injection, and A501, Polymer Injection, will result in a minor permit revision to the Title V permit. A minor permit revision is any revision that is not an administrative amendment or a significant permit revision. A significant permit revision is defined in BAAQMD Regulation as follows:

> **2-6-226SIGNIFICANT PERMIT REVISION: ANY REVISION TO A FEDERALLY ENFORCEABLE CONDITION CONTAINED IN A MAJOR FACILITY REVIEW PERMIT THAT CAN BE DEFINED AS FOLLOWS:**
>
> 226.1 The incorporation of a change considered a major modification under 40 CFR Parts 51 (NSR) or 52 (PSD);
>
> 226.2 The incorporation of a change considered a modification under 40 CFR Parts 60 (NSPS), 61 (NESHAPS), or Section 112 of the Clean Air Act (HAP);

> 226.3 Any significant change or relaxation of any applicable monitoring, reporting or recordkeeping condition;
> 226.4 The establishment of or change to a permit term or condition allowing a facility to avoid an applicable requirement, including:
> 4.1 a federally enforceable emission limit assumed in order to avoid classification as a modification under any provision of Title I of the federal Clean Air Act, or
> 4.2 an alternative hazardous air pollutant emission limit pursuant to Section 112(i)(5) of the Clean Air Act;
> 226.5 The establishment of or change to a case-by-case determination of any emission limit or other standard;
> 226.6 The establishment of or change to a facility-specific determination for ambient impacts, visibility analysis, or increment analysis on portable sources; or
> 226.7 The incorporation of any requirement promulgated by the U. S. EPA under the authority of the Clean Air Act provided that three or more years remain on the permit term.

There will be no increase in emissions, therefore the change is an alteration, not a modification. Therefore, the project is not subject to Sections 2-6-226.1 or 2-6-226.2.

The revision is not considered to be a modification under 40 CFR 60, 40 CFR 61, or Section 112 of the Clean Air Act.

There will be no significant change or relaxation of any applicable monitoring, reporting or recordkeeping condition.

The revision will not establish or change a permit term or condition allowing the facility to avoid an applicable requirement.

The revision will not establish or change a case-by-case determination of any emission limit or other standard.

The revision will not establish or change a facility-specific determination for ambient impacts, visibility analysis, or increment analysis on portable sources.

The revision is not incorporating any requirement promulgated by the U. S. EPA under the authority of the Clean Air Act.

Therefore, the revision is a minor permit revision. It will be incorporated into the Title V permit after the Authority to Construct is approved. In accordance with BAAQMD Regulation 2-6-406, the facility may proceed with construction and operation as soon as the Authority to Construct is approved.

CEQA

This project is exempt from CEQA pursuant to BAAQMD Regulation 2-1-312.2 because it is an application to install abatement equipment.

PUBLIC NOTICE

This facility is not within 1,000 feet of a school and therefore is not subject to the public notification requirements of Regulation 2-1-412.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

The alteration is not subject to NSPS.

NESHAPS

The alteration is not subject to NESHAPS.

PSD

PSD is not triggered.

PERMIT CONDITIONS

None.

RECOMMENDATION

Issue an Authority to Construct for the following abatement devices:

A500, Iron Salts Injection abating S110, Preliminary Treatment and S210, Anaerobic Digesters
A501, Polymer Injection abating S120, Primary Treatment

_____

Brenda Cabral
Supervising Air Quality Engineer

APPENDIX D

ENGINEERING EVALUATION APPLICATION 27366

ENGINEERING EVALUATION

San Jose/Santa Clara Water Pollution Control
700 Los Esteros Road, San Jose, CA
Application: 27366
Plant: 778

1. BACKGROUND

San Jose/Santa Clara Water Pollution Control has applied to obtain an Authority to Construct for the following new abatement devices:

A5, Odor Control System 1 including biotrickling filter, 5,450 cfm, abating S200, Sludge Handling
A6, Odor Control System 2, 10,000 cfm; 2-bed carbon unit, 14,700 lb carbon total, abating S110, Preliminary Treatment
A406, Enclosed Ground Flare abating S210, Anaerobic Digesters, 25.2 MMbtu/hr, 700 cfm digester gas
A407, Candlestick Flare abating S210, Anaerobic Digesters, 273.6 MMbtu/hr, 7600 cfm digester gas

an Authority to Construct for a modification to the following equipment:

S210, Anaerobic Digesters (16; three 1.47 MMgal and thirteen 2.42 MMgal)

and an alteration of the following equipment:

S110, Preliminary Treatment
S200, Sludge Handling

The following existing flares will be decommissioned:

A401, Candlestick Flare abating S210, Anaerobic Digesters, 0.239 MMbtu/hr
A402, Candlestick Flare abating S210, Anaerobic Digesters, 0.239 MMbtu/hr
A403, Candlestick Flare abating S210, Anaerobic Digesters, 0.239 MMbtu/hr

The following existing candlestick flares will be kept as back up:

A404, Enclosed Flare abating S210, Anaerobic Digesters, 25.2 MMbtu/hr
A405, Candlestick Flare abating S210, Anaerobic Digesters, 225 MMbtu/hr

S110, Preliminary Treatment

A new screening building will be added to the plant. The emissions will be routed to A5, Odor Control System 1. The system will consist of one fan and two carbon beds containing a total of 14,700 lb carbon. Sample points will be installed before the carbon and on each carbon bed stack. Both systems will be in use at once. When the carbon needs to be changed, the emissions will be fugitive. Following are specifications to be provided to the vendor:

Carbon volume: 471 cf
Carbon H2S capacity: 0.025 g/cubic centimeter

Based on these specification, the facility expects that the carbon bed will absorb about 735 lb of H2S. The facility expects negligible organic emissions at these sources and has accepted a limit of 10 ppm at the outlet.

S200, Sludge Handling

The facility proposes to control odor from six dissolved air flotation units (DAFT) and two thickened sludge storage tanks by covering the equipment and abating it with a 2-bed carbon unit.

S210, Anaerobic Digesters

The facility intends to make the following changes at S210, which currently consists of sixteen vessels:

- Decommission vessels 1-4
- Modify vessels 5-8 by adding fixed covers and converting the vessels from lower temperature mesophilic operation (~95 F) to higher temperature thermophilic operation (~130 F)

Three existing flares will be demolished. Two existing flares will be kept as backup flares. Two new flares will be built:

A406, Enclosed Ground Flare abating S210, Anaerobic Digesters, 25.2 MMbtu/hr
A407, Candlestick Flare abating S210, Anaerobic Digesters, 273.6 MMbtu/hr

A406, Enclosed Ground Flare, will meet the RACT limits for secondary pollutants of 0.06 lb NOx/MMbtu and 0.20 lb CO/MMbtu. A407, Candlestick Flare, will be used only rarely for safety reasons and will not be subject to the RACT limits. In any case, source testing for a candlestick flare is not feasible, so the secondary emission rates will not be determined.

2. EMISSIONS

S110, Preliminary Treatment and S200, Sludge Handling

There will be no increase in emissions. Enclosing the screening building and covering the DAFTs and thickened sludge storage and routing the emissions to a carbon unit and biotrickling filter will reduce the emissions of H2S. The remaining emissions have been modeled to ensure that they will not cause a violation of BAAQMD Regulation 9, Rule 2, Hydrogen Sulfide.

The facility expects to negligible organic emissions at these sources and has accepted a limit of 10 ppm at the outlet.

S210, Anaerobic Digesters

A. Digester Gas Combustion

The facility anticipates that the production of digester gas will increase from 5-10%. 10% will be used as a worst-case (or best-case) scenario. The facility submitted the gas production for three years-March 1, 2013 to February 29, 2016. The average gas production for that period was 674,530 mscf/yr. The facility's records show that the average H2S concentration of the digester gas has been 227 ppm. The submittals can be found in the application folder.

The additional digester gas will displace natural gas at the facility's engines: S5, S7, S9-S15, S36, S37, and S54. S38 and S39, Boilers, have permits to burn digester gas, but have not. Emissions from burning digester gas are comparable to the emissions from burning natural gas, except that natural gas contains much more POC than digester gas and digester gas contains much more sulfur than natural gas. To avoid triggering the requirements for a modification of the combustion sources, the facility must decrease the H2S concentration by the same percentage that the digester gas increases. Following is a calculation of the H2S burned in the digester gas and the SO2 emitted:

3-yr average DG production	674530	kscf/yr
P	1	atm
V	674,530	kscf/yr
n	1749548	lb-moles/yr
R	0.7302	
T, F	68	Fahrenheit
T, R	528	Rankine
Concentration, H2S	227	ppmv
MW, H2S	34.08	
n, H2S	397.1	lb-moles/yr
Mass, H2S	13535	lb/yr
MW, SO2	64.066	
Mass, SO2	25444	lb/yr
	12.722	tpy

A permit condition will limit the SO2 emissions from digester gas combustion to 12.722 tons per any consecutive 12-month period and digester gas production to 674,530 mscf per any consecutive 12-month period. The facility can accomplish the SO2 limit by lowering the H2S concentration or lowering production. The facility will be able to determine the annual SO2 emissions from digester gas combustion because they have flow meters on every digester and measure the H2S content of the digester gas every day.

Additionally, to avoid triggering the requirements for a modification of the combustion sources, emissions per highest day must not increase. The facility currently has a limit of 350 ppm. The data for the past 3 years shows that the facility has exceeded that limit on 12 occasions in the past 3 years. The basis for the new limit will not include these occasions. Similarly, daily SO2 emissions will not increase due to a 10% increase in digester gas production if the maximum daily H2S concentration decreases by 10%. The new limit will be 315 ppm.

B. PV Valves

A discussion of possible H2S emissions from the PV valves on the digesters is included in Section 6, Statement of Compliance, under the discussion of compliance with Regulation 9, Rule 2 and a discussion of possible organic emissions is included in Section 6, under the discussion of compliance with Regulation 8, Rule 2.

C. Flares

No increase in emissions from digester gas combustion is expected from the additional flares because they are replacing existing flares. The new enclosed flare, A406, will be used preferentially before the old flares or the new candlestick flare. The new flare will meet the updated RACT limits of 0.06 lb NOx/MMbtu and 0.20 lb CO/MMbtu, so emissions of NOx and CO should decrease.

There will be an increase in emissions from the pilots for the two new flares. The applicant has estimated an increase in emissions as shown below. Each pilot will consume about 0.745 MMbtu/hr. The NOx and CO factors are based on some manufacturer's data. The NOx factor for A406, Enclosed Flare, will be reduced from 0.25 to 0.06 lb/MMbtu, since the applicant has stated that A406 will meet the RACT limits.

The applicant expects 100% conversion of H2S to SO2 at the flares. The permit condition for A406 will reflect this expectation. A407 is a candlestick flare and the assumption cannot be tested.

The applicant expects 98% control of CH4 at the flares. The permit condition for A406 will reflect this expectation. A407 is a candlestick flare and the assumption cannot be tested.

A406, Flare Pilot Emissions

Pollutant	EF lb/MMbtu	lb/day	tpy
NOx	0.06	1.07	0.196
NMHC	0.005	0.09	0.016
CO	0.2	3.58	0.653
PM10	0.00745	0.13	0.024

A407, Flare Pilot Emissions

Pollutant	EF lb/MMbtu	lb/day	tpy
NOx	0.068	1.22	0.222
NMHC	0.005	0.09	0.016
CO	0.31	5.54	1.012
PM10	0.00745	0.13	0.024

Total Pilot Emissions

NOx	2.29	0.418
NMHC	0.18	0.033
CO	9.12	1.664
PM10	0.27	0.049

The emissions have been based on the assumption that the pilots are natural gas, although the applicant is proposing to use digester gas. The factor for NMHC that the applicant provided is not representative, since it was based on AP-42 chapter 13.5-2, which is based on refinery flares. The NMHC factor above is from the natural gas emission factor in AP42 Table 1.4-2 for natural gas combustion in boilers.

3. PLANT CUMULATIVE INCREASE AND OFFSETS

The increase in cumulative increase will come from the pilots at the flares.

Pollutant	tpy
NOx	0.418
NMHC (POC)	0.033
CO	1.664
PM10	0.049

The facility will have to provide offsets for NOx and POC at a ratio of 1 to 1.15 for a total of 0.480 tons of NOx offsets and 0.059 tons of POC offsets. The offsets will come from Certificate 1524.

4. TOXIC RISK SCREENING ANALYSIS

S110, Preliminary Treatment, and S200, Sludge Handling, will not have an increase in emissions and are not considered to be modified. Therefore, the sources are not subject to BAAQMD Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants, and a Health Risk Screening Analysis is not required.

S210, Digesters, will not have an increase in emissions and so will not be subject to BAAQMD Regulation 2, Rule 5, at this time. The emissions from PV valves are already forseeable. There may be a decrease because the number of vessels will decrease from 16 to 12. The PV valves have been evaluated for H2S emissions for compliance and BAAQMD Regulation 9, Rule 2.

5. BACT

S110, Preliminary Treatment, and S200, Sludge Handling, will not have an increase in emissions and are not considered to be modified. Therefore, the sources are not subject to BACT in BAAQMD Regulation 2-2-301.

S210, Anaerobic Digesters, will have an increase in production and is considered to be modified. However, at the combustion sources, there will be no increase in emissions because emissions of SO2 will remain the same, and emissions of POC will decrease. Therefore, there is no increase at the combustion sources that is subject to BACT.

6. STATEMENT OF COMPLIANCE

BAAQMD Regulation 8, Rule 2, Miscellaneous Operations

The digesters are subject to the standard in Regulation 8-2-301, that prohibits emissions from a miscellaneous source that have an organic concentration of more than 300 ppm as total carbon if the total emissions are more than 15 lb/day. Based on data from the Source Test Division, one sample of the digester gas contained 200 ppm NMOC. If the organic concentration is below 300 ppm as total carbon, the source cannot be out of compliance. Releases through the PV valve should be rare. If the PV valve does vent for an hour, the organic emissions would be about 0.85 lb/hr. The calculation is available in Appendix A.

BAAQMD Regulation 9, Rule 2, Hydrogen Sulfide

BAAQMD Regulation 9, Rule 2 places the following limits on concentrations of H2S resulting from emissions at facilities:

> **9-2-301LIMITATIONS ON HYDROGEN SULFIDE: A PERSON SHALL NOT EMIT DURING ANY 24 HOUR PERIOD, HYDROGEN SULFIDE IN SUCH QUANTITIES AS TO RESULT IN GROUND LEVEL CONCENTRATIONS IN EXCESS OF 0.06 PPM AVERAGED OVER THREE CONSECUTIVE MINUTES OR 0.03 PPM AVERAGED OVER ANY 60 CONSECUTIVE MINUTES.**

The District prepared an air dispersion modeling analysis on the outlet of the odor control system at S200, Sludge Handling, and at the PV valves of S210, Anaerobic Digesters. The District assumed that only one PV valve would open in any incident.

The maximum concentration resulting from estimated hourly emissions of 0.0047 lb H2S/hr at S200 was 0.0002 ppm, which is acceptable.

The maximum concentration resulting from estimated hourly emissions of 4.5 lb H2S/hr at S210 was 0.11 ppm, which would not be acceptable. The results from the analysis are considered to be "scalable," which means that a reduction in H2S emissions is directly proportional to the concentration. The model calculates the worst-case concentration, which is dependent on worst-case meteorological conditions.

The hourly emission rate at the new H2S limit of 315 ppm would actually be about 3.79 lb H2S/hr. (The calculation is available in Appendix A.)

To ensure that the limit of 0.03 ppm averaged over any 60 consecutive minutes is not exceeded, the facility can limit H2S releases through the PV valve to 1.22 lb/hr. If the digester gas concentration is at the new annual average rate, 206 ppm or so, the PV valves could release for approximately 29 minutes without exceeding the limit.

Releases through the PV valve should be rare. The facility is committed to managing the digesters so that the digester gas flows to the engines and when there is not sufficient engine capacity, to flares. Each digester is equipped with a pressure sensor, so the facility has the means to monitor if there has been a release. If the pressure in a digester reaches 10.5 inches of water, the PV valve is presumed to be open. The flow at that pressure is 2533 cfm at 130 F. When the pressure is released, the PV valve re-seats.

A permit condition will be added that allows releases up to 1.22 lb H2S/hr. In the rare event of a release, the facility can readily determine the mass emissions by using the time of the release, the concentration, and a rate of 2533 cfm. If the facility calculates that more than 1.22 lb H2S has been released in an hour, the facility will have the opportunity to obtain the actual meteorological conditions and complete a similar analysis under actual conditions to determine whether the concentration exceeded the limit at the time of the release.

If the analysis shows that the concentration was under the limit, the release will not be considered to be a violation of BAAQMD Regulation 9, Rule 2.

If the analysis shows that the concentration was over the limit or the facility decides not to complete the analysis, the release will be considered to be a violation of BAAQMD Regulation 9, Rule 2 and the facility will have to report the violation.

Title V, Major Facility Review

Revisions to the Title V permit to reflect these changes will be made in a future action.

CEQA

An Initial Study/Mitigated Negative Declaration for the project was adopted on May 24, 2016 by the City of San Jose. The resolution number was #77758.

PUBLIC NOTICE

This facility is not within 1,000 feet of a school and therefore is not subject to the public notification requirements of Regulation 2-1-412.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

The sources are not subject to NSPS.

NESHAPS

The sources are not subject to NESHAPS.

PSD

PSD is not triggered.

PERMIT CONDITIONS

S-4 and S-8 have been deleted from part 1 of Condition 17741 because they have been removed.

Condition 17741

For S –210, Anaerobic Digesters

1. The owner/operator shall ensure that emissions from S-210 ~~shall be~~ are abated at all times by combustion at any of the following sources except as specified in part 2: ~~S-4,~~ S-5, S-6, S-7, ~~S-8,~~ S-9, S-10, S-11, S-12, S-13, S-14, S-36, S-37, and S-54 ~~except as specified in part 2~~. (Basis: Regulation 1-301)

2a. This part shall apply until construction of A406 and A407, Flares, is complete: Emissions from S-210 shall be abated by any of the following: A-401, A-402, A-403, A-404, and A-405 only when equipment failure or other emergencies require the flaring of digester gas. (Basis: Cumulative Increase)

2b. This part shall apply after construction of A406 and A407, Flares, is complete: The owner/operator shall ensure that emissions from S-210 ~~shall be~~ are abated by any of the following only when equipment failure or other emergencies require the flaring of digester gas: ~~A-401, A-402, A-403,~~ A-404, ~~and~~ A-405, A-406, and A-407 ~~only when equipment failure or other emergencies require the flaring of digester gas~~. The owner/operator shall use the following flares only when the engines or A-406 are not available or are not sufficient: A-404, A-405, and A-407. (Basis: Cumulative Increase)

3a. This part shall apply until startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366: Digester gas total sulfur content shall not exceed 350 ppm. (Basis: 9-1-302)

3b. After startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366, the owner/operator shall ensure that digester gas total sulfur content ~~shall not~~ does not exceed ~~350~~315 ppm. (Basis: ~~9-1-302~~Cumulative Increase)

4. After startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366, the owner/operator shall ensure that SO2 emissions from digester gas combustion do not exceed 12.722 tons in any consecutive 12-month period. The owner/operator shall ensure that the production of digester gas does not exceed 742,000 thousand standard cubic feet (mscf or kscf) in any consecutive 12-month period. The owner/operator shall use daily records of H2S content and digester gas production to calculate SO2 emissions. For the purposes of this part, the owner/operator shall assume that all H2S in the digester gas is combusted. (Basis: Cumulative Increase)

~~4~~5. To demonstrate compliance with the~~is~~ ~~standard~~limits in part 3 and part 4, the owner/operator ~~permit holder~~ shall monitor and record the following:

a. Sulfur content of the digester gas at least once every calendar ~~week~~day.

b. Daily digester gas flow from each digester ~~If the permit holder can demonstrate 3 months of digester sulfur results lower than 200 ppm the monitoring frequency for sulfur analysis may be reduced to at least once every calendar month.~~ (Basis: Cumulative Increase~~Regulation 9-1-302~~)

~~5~~6. The owner/operator ~~permit holder~~ shall record the dates, hours of use, and purpose of flaring in a District approved logbook, whenever the flares are used. (Basis: Regulation 2-6-409.2)

7. The owner/operator shall record the dates, the times, and the H2S concentration in a District approved logbook whenever digester gas is vented from any PV valve at S210, Digesters. (Basis: 2-1-403)

~~6~~8. A release of digester gas ~~The failure to abate digester gas emissions from the following causes or activities~~ shall not be considered a violation of Parts 1 or 2 of this permit condition under the following conditions.

a. H2S emissions from the digester gas release are less than 1.22 lb per hour, or.~~Digester gas leaks from the floating roof sludge seals and digester gas piping systems, provided the sludge seals and piping systems are maintained in good operating condition.~~

b. ~~Preventative maintenance on pressure relief valves to ensure proper operation.~~The owner/operator prepares an air dispersion modeling analysis within 30 days of the incident that shows that the limits in BAAQMD Regulation 9, Rule 2, were not exceeded.

~~c. Manual draining of condensate from digester gas piping systems to ensure proper digester operation.~~

~~d. Removing a digester or digester gas system component from service.~~

~~e. Pressure relief of the digester gas system.~~

The owner/operator shall ensure that, if detected and known, the occurrence, duration, and cause of emissions of digester gas from any cause~~s~~ or activity~~ies~~ ~~not listed above in this part shall be~~ are recorded. Notwithstanding this part ~~8~~6, the owner/operator ~~permit holder~~ shall not cause or allow any digester gas emissions otherwise allowed by this Part to create a violation of District regulations. (Basis: 2-1-403)

9. The owner/operator shall ensure that the heat input to A-406, Enclosed Flare, does not exceed 700 scfm of digester gas. (Basis: Cumulative Increase)

10. The owner/operator shall ensure that the heat input to A-407, Candlestick Flare, does not exceed 7,600 scfm of digester gas. (Basis: Cumulative Increase)

11. The owner/operator shall install flow meters and recorders to monitor the digester gas flow to A-406 and A-407. (Basis: Cumulative Increase)

12. The owner/operator shall install a temperature monitor and recorders to monitor the temperature at A-406. (Basis: Cumulative Increase)

13. The initial combustion zone temperature of A-406, Flare the Landfill Gas Flares shall be maintained at the 1400 degrees F during all times that digester gas is being combusted. During the initial source test, the owner/operator shall determine the temperature at which the flare operates while meeting all limits. After this temperature is determined, it will become the new temperature limit.

14. The owner/operator shall ensure that the emissions of nitrogen oxides (NOx) from A-406 do not exceed 0.06 pounds per million BTU (calculated as NO2). (basis: RACT)

15. The owner/operator shall ensure that the emissions of carbon monoxide (CO) from A-406 do not exceed 0.2 pounds per million BTU. (basis: RACT)

16. The owner/operator shall ensure that hydrogen sulfide (H2S) is not detectable at the outlet of A-406. (basis: 2-1-301)

17. The owner/operator shall ensure that the emissions of methane (CH4) from A-4 do not exceed 0.9 pounds per million BTU. (basis: 2-1-301)

18. In order to demonstrate compliance with parts 14, 15, 16, and 17 of these conditions, the owner/operator shall conduct an initial District approved source test on A-406, Enclosed Flare within 60 days of startup. The source test shall determine the following:
    a. digester gas flow rate (dry basis);
    b. concentrations (dry basis) of carbon dioxide (CO2), nitrogen (N2), oxygen (O2), methane (CH4) and hydrogen sulfide (H2S) and total non-methane organic compounds (NMOC) in the digester gas;
    c. stack gas flow rate (dry basis);
    d. concentrations (dry basis) of NOx, CO, H2S, CH4, NMOC, SO_2, and O_2 in the stack gas;
    e. the H2S and methane destruction efficiencies achieved by each flare; and
    f. the average combustion temperature during the test period.

    In addition, source tests shall be repeated every 8,760 hours of operation or every five years, whichever comes first. The periodic source test is not required if the flare has not been operated since the last District-approved source test. The Source Test Section of the District shall be contacted to obtain approval of the source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. The source test report shall be submitted to the Compliance and Enforcement Division and to the Source Test Section within 60 days of the test date.
    (basis: Regulations 2-1-301 and 9-1-302)

19. In order to demonstrate compliance with the above conditions, the owner/operator shall maintain the following records in a District approved logbook.
    a. Record the operating times and the digester gas flow rate to A-406 and A-407 on a daily basis when operating. Summarize these records on a monthly basis.
    b. Maintain continuous records of the combustion zone temperature for A-406, Enclosed Flare during all hours of operation.
    c. Maintain records of all test dates and test results performed to demonstrate compliance with part 18 above and any applicable rule or regulation.

    All records shall be maintained on site or shall be made readily available to District staff upon request for a period of at least 5 years from the date of entry. These record keeping requirements do not replace the record keeping requirements contained in any applicable rules or regulations.
    (basis: Cumulative Increase, 2-1-301, 2-6-501, 9-1-302, and 9-2-301)

Condition 26312

For S –110, Preliminary Treatment

1. After issuance of the permit to operate pursuant to Application 27366, the owner/operator shall ensure that the screening building at S110, Preliminary Treatment, is enclosed and is abated at all times by A6, Carbon System, except for periods not to exceed 24 hours during which the carbon is replaced. (Basis: 2-1-403)

2. The owner/operator shall ensure that the carbon is replaced in either of the two carbon beds within 24 hours when routine monitoring shows that the concentration of H2S exceeds 0.05 ppm or the concentration of POC exceeds 10 ppm. The owner/operator shall maintain a supply of carbon on site to ensure that replacement of carbon occurs in an expeditious manner. (Basis: 2-1-403)

3. The owner/operator shall monitor the concentration of H2S with a portable H2S monitor at the outlet of each carbon vessel on a weekly basis. (Basis: 2-1-403)

4. The owner/operator shall monitor POC concentrations on a weekly basis with a photo-ionization detector (PID), flame-ionization detector (FID), or other method approved in writing by the District's Source Test Manager at the following locations:
   a. At the inlet to the carbon vessels.
   b. At the outlet of the carbon vessels.
   c. When using an FID to monitor breakthrough, readings may be taken with and without a carbon filter tip fitted on the FID probe. Concentrations measured with the carbon filter tip in place shall be considered methane for the purpose of these permit conditions. [basis: 2-1-403]

Condition 26313

For S –200, Sludge Handling

1. After issuance of the permit to operate pursuant to Application 27366, the owner/operator shall ensure that the dissolved air flotation units and the thickened sludge storage tanks at S200, Sludge Handling, are covered and are abated at all times by A-5, Biotrickling Filter. (Basis: 2-1-403)

2. The owner/operator shall ensure that the concentration of H2S at the outlet of A-5 does not exceed 0.05 ppm. (Basis: 2-1-403)

3. The owner/operator shall monitor the concentration of H2S with a portable H2S monitor at the outlet of each carbon vessel on a weekly basis. (Basis: 2-1-403)

4. The owner/operator shall control the H2S concentrations with portable carbon units during maintenance or media replacement at A-5. [basis: 2-1-403]

RECOMMENDATION

Issue an Authority to Construct for the following equipment:

A5, Odor Control System 1 including biotrickling filter, 5,450 cfm, abating S110, Preliminary Treatment
A6, Odor Control System 2, 10,000 cfm; 2-bed carbon unit, 14,700 lb carbon total, abating S200, Sludge Handling
A406, Enclosed Ground Flare abating S210, Anaerobic Digesters, 25.2 MMbtu/hr, 700 cfm digester gas
A407, Candlestick Flare abating S210, Anaerobic Digesters, 273.6 MMbtu/hr, ,7600 cfm digester gas

an Authority to Construct for a modification to the following equipment:

S210, Anaerobic Digesters (12) 2.42 million gal ea

and an Authority to Construct for alteration of the following equipment:
S110, Preliminary Treatment
S200, Sludge Handling

Delete the permits for the following abatement equipment after permit to operate issued for A406 and A407:
A401, Candlestick Flare abating S210, Anaerobic Digesters, 0.239 MMbtu/hr
A402, Candlestick Flare abating S210, Anaerobic Digesters, 0.239 MMbtu/hr
A403, Candlestick Flare abating S210, Anaerobic Digesters, 0.239 MMbtu/hr

_____ _____

Brenda Cabral Date
Supervising Air Quality Engineer

Appendix A
Calculations

Calculation of H2S emissions assuming PV valve at S210 vents for one hour at 315 ppm H2S

P	1	atm
V	2,533	cfm
n	5.88	lb-moles/min
R	0.7302	
T, F	130	Fahrenheit
T, R	590	Rankine
Concentration, H2S	315	ppmv
MW, H2S	34.08	
Mass, H2S	0.063	lbs/min
	3.79	lb/hr

Calculation of organic emissions assuming PV valve at S210 vents for one hour at 200 ppm total carbon

P	1	atm
V	2,533	cfm
n	5.88	lb-moles/min
R	0.7302	
T, F	130	Fahrenheit
T, R	590	Rankine
Concentration, total carbon	200	ppmv
MW, Total Carbon	12	
Mass, Total Carbon	0.01	lbs/min
	0.85	lb/hr

Calculation of CH4 emissions at A406

A406

V, DG	700	cfm
% CH4	60%	
CH4	25200	cfh
Emissions CH4 @ 98% control, cfm	504	cfh
btu content, DG	650	btu/scf
Total heat input	27.3	MMbtu/hr
P	1	atm
V	504	cfh
n	1.31	lb-moles/hr
R	0.7302	
T, F	68	Fahrenheit
T, R	528	Rankine
MW, CH4	16	
Mass, CH4	20.9	lbs/hr
Total heat input	27.3	MMbtu/hr
CH4 emissions per MMbtu	0.77	lb CH4/MMbtu

Calculation of CH4 emissions at A407

A407

V, DG	7600	cfm
% CH4	60%	
CFM, CH4	273600	cfh
Emissions CH4 @ 98% control, cfm	5472	cfh
btu content, DG	650	btu/scf
Total heat input	296.4	MMbtu/hr
P	1	atm
V	5,472	cfh
n	14.19	lb-moles/hr
R	0.7302	
T, F	68	Fahrenheit
T, R	528	Rankine
MW, CH4	16	
CH4 emissions	227.09	lb/hr
Total heat input	296.4	MMbtu/hr
CH4 emissions per MMbtu	0.766	lb CH4/MMbtu

APPENDIX E

ENGINEERING EVALUATION APPLICATION 28954

San Jose-Santa Clara Regional Wastewater Facility
700 Los Esteros Road
Application: #28954
Plant: #778

BACKGROUND

San Jose-Santa Clara Regional Wastewater Facility (RWF) has applied for a change of conditions for Permit Condition #17741, which would affect the following source:

S-210 Anaerobic Digesters

And the associated abatement devices:

A-404 Enclosed Flare, 25.2 MMBtu/hr
A-405 Candlestick Flare, 225MMBtu/hr
A-406 Enclosed Ground Flare, 25.2 MMBtu/hr
A-407 Candlestick Flare, 273.6 MMBtu/hr

The facility has requested various changes to Permit Condition #17741. The sections below describe the changes requested by the RWF followed by the response of the Air District. Part 1 of the permit condition will also be updated to include Sources 67 through 70, permitted in Application #28651, S-72 and S-73, permitted in Application #29724, and to remove sources which have been decommissioned.

The facility has also requested an administrative change to include source descriptions to Permit Condition #17900.

DISCUSSION

RWF Request 1

Condition No. 17741 Part 2

This provision is intended to allow combustion of digester gas from the flares during emergencies and during maintenance and construction activities. The provision also restates fuel type and heat input limits for engines that appear in other conditions. The only purpose of the condition is to limit use of the digester gas flares. The redundant limits on engine operations are not necessary and should be eliminated.

The RWF has submitted Application No. 28651 for the replacement of three cogeneration engines with four new engines. This application includes a request to modify Condition No. 17741 part 2 to make the requirements more clear. We reiterate the request to modify the condition as follows to eliminate unnecessary provisions.

~~*2a. This part shall apply until construction of A406 and A407, Flares, is complete: Emissions from S-210 shall be abated by any of the following: A-401, A-402, A-403, A-404, and A-405 only when equipment failure or other emergencies require the flaring of digester gas. (Basis: Cumulative Increase)*~~

~~*2b. This part shall apply after construction of A406 and A407, Flares, is complete: The owner/operator shall ensure that emissions from S-210 are abated by any of the following only when equipment failure or other emergencies require the flaring of digester gas: A-404, A-405, A-406, and A-407. The owner/operator shall use the following flares only when the engines or A-406 are not available or are not sufficient: A-404, A-405, and A-407. (Basis: Cumulative Increase)*~~

2. *The owner/operator may only combust digester gas from S-210 in the flares A-401, A-402, A-403, A-404, A-405, A-406, or A-407 under the following circumstances:*
    a. *During equipment failure or other emergencies which require the flaring of digester gas.*
    b. *During maintenance and/or construction activities provided that the total quantity of digester gas abated by the flares during non-emergency operation does not exceed 74,200 Mscf in any consecutive 12-month period.*

Air District Response

The partial intention of this permit condition was to ensure that A-406 is used as a priority during an emergency flaring event. A-406 is subject to the most stringent RACT limits and is an enclosed flare, therefore, compliance can be determined via source test. This is unlike A-407 which is a candlestick flare, and thus cannot be source tested. The ability to determine compliance requires that A-406 be used before operation of A-407 or the existing flares.

The Air District proposes to partially accept the proposed language. This proposed language below reduces the complexity of the Part while maintaining the key components which include: ensuring that digester gas is only combusted in the flares during equipment failure or other emergencies; during maintenance and testing; and requiring that A-406 is used as the primary flare when functional. The facility has not used A-401, A-402, and A-403 and is in the process of decommissioning these abatement devices. They will be removed from Part 2 and archived. Part 2 of Permit Condition # 17741 will read:

2. *The owner/operator may only combust digester gas from S-210 in the flares A-404, A-405, A-406, or A-407 under the following circumstances:*
    a. *During equipment failure or other emergencies which require the flaring of digester gas.*
    b. *During construction, maintenance, testing, and/or emergencies which require the flaring of digester gas, provided that the total quantity of digester gas abated by*

the flares during non-emergency operation does not exceed 74,200 Mscf in any consecutive 12-month period.

c. A-406 shall be used as the primary flare when it is functional and has sufficient capacity to combust the entirety of the digester gas in need of flaring. This Part is contingent upon successful completion of the startup source test of A-406.

RWF Request 2

Condition No. 17741 Part 3

Prior to the permit modification pursuant to Application No. 27366, the sulfur content in digester gas was limited to 350 ppm on the basis of BAAQMD Regulation 9-1-302. This limit has been retained in Condition No. 17741 Part 3a until startup of the thermophilic digester operation. Although the limit is more restrictive than necessary to comply with the 300 ppm SO_2 emission limit in 9-1-302, the limit has been in place for the digester gas and compliance has been demonstrated on an ongoing basis. We are therefore willing to accept the 350 ppm sulfur content limit for digester gas after start-up of the thermophilic digesters.

Condition No. 17741 Part 3b. decreases the sulfur limit in the digester gas to 315 ppm with the justification of avoiding a cumulative emissions increase. Condition No. 17741 Part 4 includes the limits required to prevent a cumulative emission increase. The decrease in the digester gas sulfur content limit is therefore not necessary. The RWF proposes to restore the condition to limit H2S in the digester gas to 350 ppm as described in the previous paragraph. The proposed limit is consistent with the condition in place prior to Application No. 27366.

~~*3a. This part shall apply until startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366: Digester gas total sulfur content shall not exceed 350 ppm. (Basis: 9-1-302)*~~

~~*3b. After startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for application 27366, the owner/operator shall ensure that digester gas total sulfur content does not exceed 315 ppm (Basis: cumulative Increase)*~~

3 The owner/operator shall ensure that the digester gas total sulfur content does not exceed 350 ppm. (Basis: 9-1-302)

Air District Response

The sulfur content of the digester gas was reduced to 315 ppm in part (b) of this permit condition to avoid triggering a modification of each digester gas fired combustion source at the facility. Due to the switch to a thermophilic operation, the facility anticipated up to a 10% increase in digester gas production. The additional digester gas would displace the natural gas used at the engines. Digester gas burns similarly to natural gas, however, it contains more sulfur. To avoid triggering the requirements for a modification of the combustion

sources, the facility was required to decrease the H_2S concentration by the same percentage that the digester gas increased. A 10% decrease in sulfur content results in a 315 ppm concentration of sulfur in the digester gas.

The original 350 ppm sulfur limit in digester gas was due to the requirements of BACT. Therefore, the emission limit was less than the requirements of 9-1-302.

Part 3 of Permit Condition # 17741 will remain the same.

RWF Request 3

Condition No. 17741 Part 4

Condition 17741 Part 4 is intended to limit SO_2 emissions on the basis of preventing a cumulative emission increase from combustion equipment. The explicit limit is 12.722 tons of SO_2 emissions per year. Part 4 also includes a digester gas production limit of 742,000 kscf per year. The reason for the digester gas production limit is not clear. The digester gas limit paired with the sulfur content limit from Part 3b (315 ppm) would equate to SO_2 emissions of 19.4 tons per year. The presence of the 12.722 ton emission limit makes the digester gas production limit meaningless. Assuming that the intent of the condition is to actually limit emissions to 12.722 tons of SO_2 per year, only the explicit emission limit is required. The revised condition below includes only the relevant limit.

4. *After startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366, the owner/operator shall ensure that SO_2 emissions from digester gas combustion do not exceed 12.722 tons in any consecutive 12-month period. ~~The owner/operator shall ensure that the production of digester gas does not exceed 742,000 thousand standard cubic feet (mscf or kscf) in any consecutive 12-month period.~~ The owner/operator shall use daily records of H_2S content and digester gas production to calculate SO_2 emissions. For the purposes of this part, the owner/operator shall assume that all H_2S in the digester gas is combusted. (Basis: Cumulative Increase)*

Air District Response

As mentioned in the response to modification of Part 3, to avoid a modification to the digesters, an SO_2 limit was placed on digester gas combustion. This was done to ensure no increase in SO_2 emissions would result from the 10% increase in digester gas production. The facility provided data which showed annual digester gas production was 674,530 mscf. After the 10% increase, digester gas production will be 742,000 mscf in any consecutive 12-month period. The intention of this permit condition was to allow the facility flexibility in their method of operation. However, the intention was not clearly stated.

By limiting the sulfur content in Part 3, limiting the digester gas production, and enforcing a 12.722 ton/year SO_2 limit, the facility does not have the operational flexibility as intended. Therefore, this Part will retain the 12.722 tons/year SO_2 limit and the sulfur content limit in Part 3. With daily records of H_2S content in the digester gas and the digester gas production

rate, compliance with the 12.722 tons/year can be determined. True operational flexibility as intended can be achieved with the following permit condition language:

4. *After startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366, the owner/operator shall ensure that SO_2 emissions from digester gas combustion do not exceed 12.722 tons in any consecutive 12-month period. The owner/operator shall use daily records of H_2S content and digester gas production to calculate SO_2 emissions. For the purposes of this part, the owner/operator shall assume that all H_2S in the digester gas is combusted. (Basis: Cumulative Increase)*

Additionally, each combustion source has a heat input limit which define the facility emissions limits from that source. Digester gas usage at the sources will be limited by the heat input limits. Also, the digester gas pretreatment system, A-9, Gas Treatment System – Iron Sponge, and A-18, Gas Treatment System – Activated Carbon, set to come online at the end of year 2020, will greatly reduce H_2S from the digester gas prior to combustion. The gas pretreatment system is currently on Authority to Construct under Application #28651. The RWF accepted a 50 ppm sulfur limit in the gas existing A-18, prior to combustion, in Permit Condition #26639. Through these limits and new treatment system, the facility will be able to confidently meet the SO_2 emission limit and the digester gas production limit is redundant.

Under Application #27366, the SO_2 limit was placed on the combustion sources located at the facility at the time. This Part now specifies that the limit applies to all combustion of digester gas.

RWF Request 4

Condition No. 17741 Part 5

Condition 17741 Part 5 imposes monitoring conditions to demonstrate compliance with Parts 3 and 4. However, the requirement to monitor and record the digester gas flow from each digester goes beyond the level of detail needed to ensure compliance with the SO_2 emission limit. The requirement to monitor and record digester gas production (part b) should also be revised to refer to the total digester gas combustion. The quantity of digester gas consumed/produced is monitored at the flares and at the inlet to the blend gas stations prior to mixing with natural gas to fuel the engines. The following condition notes the proposed change.

5. *To demonstrate compliance with the limits in part 3 and part 4, the owner/operator shall monitor and record the following: a. Sulfur content of the digester gas at least once every calendar day. b.* ***Total*** *daily digester gas* ***combustion*** ~~*flow from each digester*~~ *(Basis: Cumulative Increase)*

Air District Response

Part 4 of this permit condition requires that the RWF use daily records of H_2S content and digester gas production to calculated SO_2 emissions. It is agreed that the permit condition

should be changed, however, it will be changed to explicitly reflect this requirement. Therefore, Part 5 will read:

5. *To demonstrate compliance with the limits in part 3 and part 4, the owner/operator shall monitor and record the following:*

    a. *Sulfur content of the digester gas at least once every calendar day. The sulfur content of the digester gas shall be used to calculate SO_2 emissions from all combustion sources firing untreated digester gas.*

    b. *Sulfur content for digester gas combusted in S-67, S-68, S-69, and S-70 will be determined from the outlet of the Gas Treatment System, A-18, as specified in Condition 26639, Part 20.*

    c. *Total daily digester gas production. (Basis: Cumulative Increase)*

Since the digester gas will be treated by the Gas Treatment System prior to combustion in S-67, S-68, S-69, and S-70, the sulfur readings will be taken at the treatment system outlet for these sources. Language has been included to Part 5 to reflect where sulfur readings will occur.

The intention of Part 5 is to collect the necessary data to ensure compliance with Parts 3 and 4. The flow from each digester is not required for this intention. Overall digester gas production will suffice. Part 7 will be modified to ensure digester health and to ensure the facility is aware of digester venting with the requirement of pressure sensors.

The RWF has flowmeters for each digester, but during low flow velocity in the pipes, they are not very accurate. A more accurate and reliable flow value comes from the flowmeters on the inlet to the blend stations.

<u>RWF Request 5</u>

Condition No. 17741 Part 7

Condition 17741 Part 7 requires monitoring and records of all releases from pressure relief valves (PRV) on the anaerobic digesters. A strict interpretation of this condition would require a mechanism to monitor each PRV and record even momentary releases. This level of instrumentation is not practical or necessary and has not been implemented.

When interpreted in conjunction with Part 8, which limits H_2S releases to 1.22 pounds per hour, the intent of part 7 appears to be to ensure that any release with the potential to emit 1.22 pounds or more of H_2S is captured and recorded. A release of digester gas that would exceed 1.22 pounds per hour would require a significant system upset that results in all, or nearly all, of the digester gas flow to be vented directly to the atmosphere. At the current digester gas production rate and H_2S concentration, all digester gas would need to be vented for approximately 45 minutes before H_2S emissions would exceed 1.22 pounds. Any such event would be captured in the RWF operations logs. Documenting operational upsets

that could affect digester gas venting is the compliance approach that has been used at the RWF since the revised permit was issued. The following revision to Part 7 codifies the current monitoring approach.

7. *The owner/operator shall record the dates, the times, and the H_2S concentration in a District approved logbook whenever* ***a process upset causes*** *digester gas* ~~*is*~~ ***to be*** *vented from any* ~~*PV*~~ ***pressure relief*** *valve at S210, Digesters* ***for more than 15 minutes out of any hour****. (Basis: 2-1-403)*

Air District Response

Since the submittal of this application, the facility has agreed to install pressure sensors which will monitor the internal pressure of each digester to determine when the pressure exceeds the pressure relief valve trigger set point. The facility will be able to identify all occurrences of venting and the duration. Along with the pressure sensors, the facility is installing acoustic transmitters to listen for when the PRV seat moves. The installation of the pressure sensors will commence with the completion of the digester project, which is estimated for completion in May 2021. Part 7 will read:

7. *Within 90 days of the startup of thermophilic operations of any digester vessel pursuant to the Authority to Construct for Application 27366, the owner/operator shall record the dates, the times, and the H_2S concentration in a District approved logbook whenever digester gas is vented from any pressure relief valve at S210, Digesters. (Basis: 2-1-403)*

RWF Request 6

Condition No. 17741 Part 8

Condition 17741 Part 8 should be revised to eliminate the reference to Part 2, correct a typographical error, and eliminate a redundancy with the record keeping requirement of with Part 7. The following revision to Part 8 shows the proposed corrections.

8. *A release of digester gas shall not be considered a violation of Part*~~*s*~~ *1* ~~*or 2*~~ *of this permit condition under the following conditions.*
   ~~*c.*~~***a.*** *H_2S emissions from the digester gas release are less than 1.22 lb. per hour, or.*
   b. *The owner/operator prepares an air dispersion modeling analysis within 30 days of the incident that shows that the limits in BAAQMD Regulation 9, Rule 2, were not exceeded.*

~~*The owner/operator shall ensure that, if detected and known, the occurrence, duration, and cause of emissions of digester gas from any cause or activity are recorded.*~~ *Notwithstanding this part 8, the owner/operator shall not cause or allow any digester gas emissions otherwise allowed by this Part to create a violation of District regulations (Basis: 2-1-403)*

Air District Response

Part 2 is referenced in Part 8 since it states that digester gas production should be combusted in the flares and the engines and not released. The record keeping requirement for all occurrences cannot be removed as it relates to Part 7. The typographical error will be corrected.

As mentioned above, the facility has agreed to install pressure sensors. Therefore, the facility has withdrawn their request for a change to the recordkeeping requirement in this Part. Part 8 will read:

8. *A release of digester gas at a pressure relief valve on a digester shall not be considered a violation of Parts 1 or 2 of this permit condition under the following conditions.*
   a. *H_2S emissions from the digester gas release are less than 1.22 lb. per hour, or.*
   b. *The owner/operator prepares an air dispersion modeling analysis within 30 days of the incident that shows that the limits in BAAQMD Regulation 9, Rule 2, were not exceeded.*

The owner/operator shall ensure that, if detected and known, the occurrence, duration, and cause of emissions of digester gas from any cause or activity are recorded. Notwithstanding this part 8, the owner/operator shall not cause or allow any digester gas emissions otherwise allowed by this Part to create a violation of District regulations (Basis: 2-1-403)

RWF Request 7

Condition No. 17741 Part 9 and Part 10

Condition 17741 Parts 9 and 10 should be revised to correct an error. Part 9 limits "heat input" to "700 scfm". This is a conflict of terms considering that scfm is a measure of gas flow and heat input is determined by a combination of flow and digester gas heat content. A digester gas flow of 700 scfm would equate to a heat input of approximately 26 MMBtu/hr or 625 MMBtu/day. The condition should be revised as follows with a daily heat input limit to show consistency in the parameters and to be consistent with the daily heat input limits on the other combustion devices.

9. *The owner/operator shall ensure that the heat input to A-406, Enclosed Flare, does not exceed ~~700 scfm of digester gas~~* ***heat input of 625 MMBtu/day.*** *(Basis: Cumulative Increase)*

Part 10 of the condition should be similarly modified with the flow limit replaced with a daily heat input limit.

10. *The owner/operator shall ensure that the heat input to A-40, Candlestick Flare, does not exceed ~~7,600 scfm of digester gas~~* ***heat input of 6,785 MMBtu/day.*** *(Basis: Cumulative Increase)*

Air District Response

The RWF monitors digester gas heat content continually with a gas chromatograph installed on the digester gas line and the flares are equipped with flowmeters, therefore, the facility has the ability to determine the heat input to each flare at all times. Digester gas does not have a constant heat value, but instead ranges from 600 to 620 Btu/scf. Using the heat value and the flowrate to the flares allows for better control of the emissions. The changes to limit the heat input in Parts 9 and 10 are acceptable. However, the daily heat input limits will be based on the hourly heat input provided to the Air District at the time of application for consistency. A-406 has an hourly heat input of 25.2 MMBtu/hr which equates to a daily limit of 605 MMBtu/day. A-407 has an hourly heat input of 273.6 MMBtu/hr which equates to 6,567 MMBtu/day. Parts 9 and 10 will read:

9. *The owner/operator shall ensure that the heat input to A-406, Enclosed Flare, does not exceed 605 MMBtu/day. (Basis: Cumulative Increase)*

10. *The owner/operator shall ensure that the heat input to A-40, Candlestick Flare, does not exceed 6,567 MMBtu/day. (Basis: Cumulative Increase)*

RWF Request 8

Condition No. 17741 Part 13

Condition 17741 Part 13 sets the combustion zone temperature limit for the new enclosed flare. The permit condition appears to be loosely based on the standard BAAQMD condition for combustion zone temperature in landfill gas flare. However, instead of specifying a minimum combustion zone temperature, the condition states that the flare must be operated at a specific temperature. As the permit condition is currently written, any deviation from the required temperature would be unacceptable. Even under stable operating conditions, flare combustion zone temperatures vary in a range of around a set point. Changes in the fuel input rate and ambient conditions such as wind gusts increase the variability in the combustions zone temperature. Typically, the operating temperature is set 50 or more degrees above the minimum allowable temperature to account for the variability in the combustion zone temperature. We propose to replace Part 13 with the standard BAAQMD condition, as taken from Title V Permit #A2740, for flare combustion zone temperature as presented below.

13. *The combustion zone temperature of the A-406 flare shall be maintained at a minimum of 1400 degrees F, averaged over any three-hour period. If a source test demonstrates compliance with all applicable requirements at a different temperature, the APCO may revise the minimum combustion zone temperature limit in accordance with the procedures identified in Regulations 2-6-414 or 2-6-415 and the following criteria. The minimum combustion zone temperature for a flare shall be equal to the average combustion zone temperature measured during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature shall not be less than 1400 degrees F.*

Air District Response

The Air District proposes to change the language so that it is functionally acceptable. The language will read:

13. The combustion zone temperature of A-406 shall be maintained at a minimum of 1,400 degrees F, except upon start-up where a 15-minute warm-up period is allowed and a residence time of at least 0.6 seconds is maintained. If a source test demonstrates compliance with all applicable requirements at a different temperature, the APCO may revise the minimum combustion zone temperature limit in accordance with the procedures identified in Regulations 2-6-414 or 2-6-415 and the following criteria. The minimum combustion zone temperature for a flare shall be equal to the average combustion zone temperature measured during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature shall not be less than 1400 degrees F.

RWF Request 9

Condition No. 17741 Part 16

Condition 17741 Part 16 states that H_2S must not be detectable at the outlet of A-406. This condition is not necessary and does not have a clear basis. The concentration of H_2S in the flare outlet would generally be expected to be undetectable using current test methods. The emissions calculations for SO_2 are based on the assumption that 100 percent of H_2S is converted to SO_2. Both of these assumptions are appropriate for combustion at the temperature specified for the enclosed flare. The requirement to verify that H_2S is reduced to less than detection limits is not appropriate. Although conversion of H_2S to SO_2 is nearly complete in the combustion process, 100 percent destruction of H_2S cannot be guaranteed. A trace quantity of H_2S could be present in the outlet of the flare and could potentially be detected by an adequately sophisticated test method. That trace quantity of H_2S would not cause an exceedance of any air quality standard or regulation. This condition is not necessary and should therefore be eliminated.

Air District Response

In the original application, the facility maintained that H_2S in the exhaust would be non-detect. At a 98% destruction efficiency, H_2S emission will increase and exceed the acute and chronic trigger levels listed in Table 2-5-1 of Regulation 2, Rule 5, as demonstrated in the calculations further in this document. Please see the tables in the Toxic Risk Screening Analysis section below for more details.

RWF Request 10

Condition No. 17741 Part 20

Condition 17741 Part 20 includes the record keeping provisions required to demonstrate compliance with Part 2. The requirements should be revised as follows to match proposed modifications to Part 2.

20. In order to demonstrate compliance with the maintenance/construction activity provisions of Part 2, the owner/operator shall maintain the following records in a District approved logbook:

a. Record the operating times of each flare ~~and engine~~ listed within Part 2, operated during maintenance/construction activities;

b. Record the combined daily thermal throughput ~~rate~~ of all listed flares ~~and engines~~ within Part 2 during maintenance/construction activities; and

*c. Record the total amount of digester gas from S-210, Anaerobic Digesters, which is abated by the listed flares ~~with~~ **in** Part 2 during maintenance/construction activities, on a monthly basis.*

All records shall be maintained on site or shall be readily available to District staff upon request for a period of at least 5 years from the date of entry. These record keeping requirements do not replace the record keeping requirement contained in any applicable rule~~s~~ or regulation~~s~~. (Basis: Cumulative Increase and Regulation 2-6-501)

Air District Response

The proposed changes to Part 20 are fair and acceptable. Part 2 refers only to the flares. The engines at the facility have their own monitoring requirements in their respective permit conditions. The language in Part 20 will read:

20. In order to demonstrate compliance with the maintenance/construction activity provisions of Part 2, the owner/operator shall maintain the following records in a District approved logbook:

a. Record the operating times of each flare listed within Part 2, operated during maintenance/construction activities;

b. Record the combined daily thermal throughput of all listed flares within Part 2 during maintenance/construction activities; and

c. Record the total amount of digester gas from S-210, Anaerobic Digesters, which is abated by the listed flares in Part 2 during maintenance/construction activities, on a monthly basis.

All records shall be maintained on site or shall be readily available to District staff upon request for a period of at least 5 years from the date of entry. These record keeping requirements do not replace the record keeping requirement contained in any applicable rule~~s~~ or regulation~~s~~. (Basis: Cumulative Increase and Regulation 2-6-501)

RWF Request 11

Boilers S-226, S-227, and S-228

These sources were registered in January 2011 pursuant to BAAQMD Regulation 9-7-410 and subsequently to the Permit to Operate. The regulation has since been modified with the addition of Section 110.7 which exempts process heaters used to heat thermal fluid for radiant comfort heating. All three of these boilers are used exclusively for comfort heating and are now exempt from the Regulation. These sources should therefore be removed from the permit to operate.

Air District Response

Sources S-226, S-227, and S-228 will be changed to exempt. The boilers have a capacity of less than 10 MMBtu/hr and are fired exclusively on natural gas. Per Regulation 2-1-114.1.2, the boilers are exempt.

RWF Request 12

Condition No. 17900

Condition No. 17900 applies to cogeneration engines EG-2 (S-36) and EG-3 (S-37) and two natural gas fired boilers (S-38 and S-39). The condition description includes the reference to the two boilers and the descriptions of the two generators. The condition should be modified to include the appropriate references to all four sources.

Air District Response

For clarity, Permit Condition #17900 will include a description of all sources referenced in the condition. The opening portion of the condition will read:

Permit Condition #17900

This Condition applies to the following sources:

S-36 Engine Generator 2, Cogen Unit, Plt EG-2
S-37 Engine Generator 3, Cogen Unit, Plt EG-3
S-38 Boiler, Low NOx
S-39 Boiler, Low NOx

Condition No. 17741 Part 8

Language will be added to Part 8 to clarify the intent of the Part which is to reference digester gas released solely from the pressure relief valves of the digesters. The H_2S analysis was conducted on the pressure relief valves and not from another location of the facility. Therefore, a release of digester gas from any other location does not apply to Part 8.

Condition No. 17741 Part 17

Upon review of Permit Condition 17741, a typo was discovered in Part 17. The Part should reference A-406 and not A-4. The original permit application (Application #27366) explains that the applicant expects 98% control of CH_4 at A-406, which is to be reflected in the permit conditions. This error will be corrected in this evaluation and the database.

EMISSION CALCULATIONS

As previously stated in the response to change Part 16 of Permit Condition #17794, the decrease in the flare destruction efficiency of H_2S will lead to an increase in emissions from A-406 and A-407. The table below shows the hourly and yearly emissions from each abatement device.

H_2S Emissions from A-406 and A-407					
A-406		Units	**A-407**		Units
Inlet Flow	700	scfm	Inlet Flow	7600	scfm
H_2S Concentration	315	ppm	H_2S Concentration	315	ppm
Molar Volume	385.3	scf/mol	Molar Volume	385.3	scf/mol
Molecular Volume	34.08	lb/lbmol	Molecular Volume	34.08	lb/lbmol
Destruction Efficiency	98%		Destruction Efficiency	98%	
Outlet H_2S	0.023	lb/hr	Outlet H_2S	0.254	lb/hr
Outlet H_2S	205.019	lb/yr	Outlet H_2S	2225.923	lb/yr
Total H_2S emissions	0.278	lb/hr	**H_2S Trigger Levels**	0.093	lb/hr
	2430.942	lb/yr		390	lb/hr

TOXIC RISK SCREENING ANALYSIS

Per Regulation 2-5-110, a project shall not be subject to this rule if, for each TAC, the total project emissions are below the acute and chronic trigger levels listed in Table 2-5-1 of this regulation. A project includes all new or modified sources of TACs within a 3-year period. The following tables provides a review of the project TAC emissions.

Toxic Air Contaminant Acute Summary						
Pollutant (CAS #)	**CAS #**	**App #28651 (lb/hr)**	**App #28811 (lb/hr)**	**App #29724 (lb/hr)**	**App #28954 (lb/hr)**	**Project Total (lb/hr)**
1,1,2,2-Tetrachloroethane	79-34-5	1.2E-03	--	--	--	1.2E-03
1,1,2-Trichloroethane	79-00-5	9.9E-04	--	--	--	9.9E-04
1,1-Dichloroethane	75-34-3	2.9E-03	--	--	--	2.9E-03
1,2-Dichloroethane	107-06-2	7.3E-04	--	--	--	7.3E-04
1,3-Butadiene	106-99-0	8.3E-03	--	--	--	8.3E-03
Acetaldehyde	75-07-0	2.6E-01	--	--	--	2.6E-01
Acrolein	107-02-8	6.4E-01	--	--	--	6.4E-01
Ammonia	7664-41-7	1.8E+00	--	--	--	1.8E+00
Arsenic	7440-38-2	--	--	9.9E-06	--	9.9E-06
Benzene	71-43-2	1.4E-02	2.2E-06	1.0E-04	--	1.4E-02
Beryllium	7440-41-7	--	--	5.9E-07	--	5.9E-07
Cadmium	7440-43-9	--	--	5.4E-05	--	5.4E-05
Carbon Tetrachloride	56-23-5	1.1E-03	--	--	--	1.1E-03
Chlorobenzene	108-90-7	3.8E-03	--	--	--	3.8E-03
Chloroethane	75-00-3	2.3E-04	--	--	--	2.3E-04
Chloroform	67-66-3	8.8E-04	--	--	--	8.8E-04
Copper	7440-50-8	--	--	4.2E-05	--	4.2E-05
Ethylbenzene	100-41-4	1.2E-03	--	--	--	1.2E-03
Ethylene Dibromide	106-93-4	1.4E-03	--	--	--	1.4E-03
Formaldehyde	50-00-0	1.6E+00	7.9E-05	3.7E-03	--	1.6E+00
Hydrogen Sulfide	7783-06-4	--	--	4.4E-03	2.78E-01	2.82E-01
Lead Compounds	7439-92-1	--	--	2.5E-05	--	2.5E-05
Manganese	7439-96-5	--	--	1.9E-05	--	1.9E-05
Mercury	7439-97-6	--	--	1.3E-05	--	1.3E-05
Methanol	67-56-1	3.1E-01	--	--	--	3.1E-01
Methylene Chloride	75-09-2	2.5E-03	--	--	--	2.5E-03
Methyl Ethyl Ketone (MEK)	78-93-3	--	2.6E+00	--	--	2.6E+00
n-Hexane	110-54-3	1.4E-01	--	8.9E-02	--	2.3E-01
Naphthalene	91-20-3	2.3E-03	--	3.0E-05	--	2.3E-03
Nickel	7440-02-0	--	--	1.0E-04	--	1.0E-04
Phenol	108-95-2	7.4E-04	--	--	--	7.4E-04
Polycyclic Aromatic Hydrocarbon	N/A	8.3E-04	--	5.1E-05	--	8.8E-04
Selenium	7782-49-2	--	--	1.2E-06	--	1.2E-06
Silica (Crystalline, Respirable)	7631-86-9	--	3.8E-06	--	--	3.8E-06
Styrene	100-42-5	2.9E-03	--	--	--	2.9E-03
Toluene	108-88-3	5.1E-02	3.6E-06	1.7E-04	--	5.1E-02
Vinyl Chloride	75-01-4	4.6E-04	--	--	--	4.6E-04
Xylene	1330-20-7	2.3E-02	--	--	--	2.3E-02

Toxic Air Contaminant Chronic Summary						
Pollutant (CAS #)	**CAS #**	**App #28651 (lb/yr)**	**App #28811 (lb/yr)**	**App #29724 (lb/yr)**	**App #28954 (lb/yr)**	**Project Total (lb/yr)**
1,1,2,2-Tetrachloroethane	79-34-5	1.1E+01	--	--	--	1.1E+01
1,1,2-Trichloroethane	79-00-5	8.6E+00	--	--	--	8.6E+00
1,1-Dichloroethane	75-34-3	2.6E+01	--	--	--	2.6E+01
1,2-Dichloroethane	107-06-2	6.4E+00	--	--	--	6.4E+00
1,3-Butadiene	106-99-0	7.2E+01	--	--	--	7.2E+01
Acetaldehyde	75-07-0	2.3E+03	--	--	--	2.3E+03
Acrolein	107-02-8	5.6E+03	--	--	--	5.6E+03
Ammonia	7664-41-7	1.6E+04	--	--	--	1.6E+04
Arsenic	7440-38-2	--	--	8.6E-02	--	8.6E-02
Benzene	71-43-2	1.2E+02	1.9E-02	9.1E-01	--	1.2E+02
Beryllium	7440-41-7	--	--	5.2E-03	--	5.2E-03
Cadmium	7440-43-9	--	--	4.8E-01	--	4.8E-01
Carbon Tetrachloride	56-23-5	1.0E+01	--	--	--	1.0E+01
Chlorobenzene	108-90-7	3.3E+01	--	--	--	3.3E+01
Chloroethane	75-00-3	2.0E+00	--	--	--	2.0E+00
Chloroform	67-66-3	7.7E+00	--	--	--	7.7E+00
Copper	7440-50-8	--	--	3.7E-01	--	3.7E-01
Ethylbenzene	100-41-4	1.1E+01	--	--	--	1.1E+01
Ethylene Dibromide	106-93-4	1.2E+01	--	--	--	1.2E+01
Formaldehyde	50-00-0	1.4E+04	6.9E-01	3.2E+01	--	1.4E+04
Hydrogen Sulfide	7783-06-4	--	--	3.8E+01	2.43E+03	2.4E+03
Lead Compounds	7439-92-1	--	--	2.2E-01	--	2.2E-01
Manganese	7439-96-5	--	--	1.6E-01	--	1.6E-01
Mercury	7439-97-6	--	--	1.1E-01	--	1.1E-01
Methanol	67-56-1	2.7E+03	--	--	--	2.7E+03
Methylene Chloride	75-09-2	2.2E+01	--	--	--	2.2E+01
Methyl Ethyl Ketone (MEK)	78-93-3	--	6.7E+02	--	--	6.7E+02
n-Hexane	110-54-3	1.2E+03	--	7.8E+02	--	2.0E+03
Naphthalene	91-20-3	2.0E+01	--	2.6E-01	--	2.0E+01
Nickel	7440-02-0	--	--	9.1E-01	--	9.1E-01
Phenol	108-95-2	6.5E+00	--	--	--	6.5E+00
Polycyclic Aromatic Hydrocarbon	N/A	7.3E+00	--	4.5E-01	--	7.7E+00
Selenium	7782-49-2	--	--	1.0E-02	--	1.0E-02
Silica (Crystalline, Respirable)	7631-86-9	--	1.0E-03	--	--	1.0E-03
Styrene	100-42-5	2.6E+01	--	--	--	2.6E+01
Toluene	108-88-3	4.4E+02	3.1E-02	1.5E+00	--	4.4E+02
Vinyl Chloride	75-01-4	4.0E+00	--	--	--	4.0E+00
Xylene	1330-20-7	2.0E+02	--	--	--	2.0E+02

A Health Risk Analysis (HRA), conducted on June 11, 2020, estimated the potential health risk resulting from increased project TAC emissions from a reduction of required destruction efficiency for H_2S at A-406 and A-407. The intent of the HRA was to evaluate the impacts of increased H_2S emissions on chronic and acute hazard indices.

The results from the HRA indicate that the maxim project risks are as follows: Chronic Hazard Index (HI), 0.097; Acute HI, 0.41. In accordance with Regulation 2-5-302 these are acceptable project risks. Since the modified sources only increase H_2S, only project risk values impacted by H_2S are considered. The cancer risk value previously evaluated for these sources (7.4 in a million) remains the same. In accordance with Regulation 2, Rule 2 Sections 301 and 302 the project risks are acceptable. TBACT is not considered for this modification since the project only impacts H_2S, which is not a carcinogen. Only chronic HI and acute HI were evaluated. Since the chronic HI is less than 0.2, TBACT is not required.

BEST AVAILABLE CONTROL TECHNOLOGY

Per Regulation 2-2-301, Best Available Control Technology (BACT) is required for new or modified sources of BACT pollutants that emit or exceed a maximum daily emission rate of 10 lb/day. BACT is not applicable for this project.

OFFSETS AND CUMULATIVE INCREASE

Per Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits, or is permitted to emit, more than 10 tons per year of POC or NO_X. Furthermore, pursuant to Regulation 2-2-303 offsets must be provided for any new or modified source at a major facility with a cumulative increase that exceeds 1.0 ton per year of PM_{10}, $PM_{2.5}$, or SO_2. For purposes of Regulation 2-2-303, a major facility is defined as a facility that is permitted to emit 100 tons/yr or more of PM_{10}, $PM_{2.5}$, or SO_2. There is no increase in these emissions for this project. Therefore, offsets are not required.

There is no increase in criteria pollutants from this project. Therefore, the cumulative increase remains unchanged.

STATEMENT OF COMPLIANCE

Regulation 2, Rule 1: California Environmental Quality Act (CEQA) Requirements

The City of San Jose Planning, Building and Code Enforcement Division (lead agency) prepared an Environmental Impact Report (File No. PP15-055), certified on August 28, 2015, for the Digester and Thickener Facilities Upgrade Project. The report resulted in a Mitigated Negative Declaration.

This facility is not within 1,000 feet of a school and therefore is not subject to the public notification requirements of Regulation 2-1-412.

Regulation 9, Rule 2: Inorganic Gaseous Pollutants: Hydrogen Sulfide

This rule states: A person shall not emit during any 24-hour period, hydrogen sulfide in such quantities as to result in ground level concentrations in excess of 0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes.

The District conducted an H_2S analysis on June 11, 2020 to determine the project's compliance with this rule. The modeling analysis demonstrates the potential H_2S emissions from the change in destruction efficiency from A-406 and A-407. As part of the project, an H_2S analysis for the following sources was also conducted: Boiler S-72, Boiler S-73, Sludge Handling S-200 (A5/A6), and Digester S-210 (PV1). Modeled concentrations for each source (micrograms per cubic meter (ug/m^3)) were determined for the highest 1-hour period in a 5-year meteorological data set. Concentrations were then converted to ppm by volume (ppmv at 20 degrees C) by the following multiplier: (0.02404 / Molecular Weight H_2S)* as follows:

ppmv H_2S = ug/m3 H_2S x (0.02404 / 34 g/mole)

The modeling analysis demonstrates that H_2S emissions from both A-406 and A-407 would comply with the 9-2-301 hourly limit of 0.03 ppmv. A summary of maximum H_2S concentrations from each requested source is given in the table below.

Source	NAD 83 UTM Coordinates (meters)		1-hour Max (ug/m3)	1-hour Max (ppmv)
	Easting (x)	Northing (y)		
A-406	593,051	4,143,955	0.05399	0.000038
A-407	592,851	4,143,505	1.06876	0.000756
S-72	593,651	4,143,555	0.07187	0.000051
S-73	593,651	4,143,555	0.07137	0.000050
A5/A6	593,701	4,143,505	0.15314	0.000108
PV1	593,001	4,143,955	101.15335	0.071521

The PV valves on the Digester, S-210, could exceed the hourly limit in Regulation 9-2-301. However, it would have to discharge 4.5 pounds of H_2S under the worst-case meteorological conditions to reach the value in the above table. It should also be understood that all of the concentrations given in the table occur at different times and except for S-72 and S-73 at different locations. Therefore, the cumulative impacts between multiple sources cannot be determined by this approach. Given that the worst-case meteorological conditions would produce the concentrations above, which still demonstrate compliance, it is presumed that this project is in compliance with Regulation 9, Rule 2.

Regulation 2, Rule 6: Major Facility Review

RWF is a major facility for POC, NO_X, and CO and is subject to the requirements of Regulation 2-6. Revisions to the Title V permit to reflect these changes will be made in a future action.

New Source Performance Standards (NSPS)
The digesters, S210, within this project are not subject to NSPS.

National Emission Standards for Hazardous Air Pollutants (NESHAPs)
The digesters, S210, within this project are not subject to NESHAPs.

PERMIT CONDITIONS

Permit Condition #17741

2. The owner/operator shall ensure that emissions from S-210 are abated at all times by combustion at any of the following sources except as specified in part 2: S-9, S-10, S-11, S-12, S-13, S-14, S-36, S-37, S-54, S-67, S-68, S-69, S-70, S-72 and S-73. (Basis: Regulation 1-301)

2. The owner/operator may only combust digester gas from S-210 in the flares A-404, A-405, A-406, or A-407 under the following circumstances:
   a. During equipment failure or other emergencies which require the flaring of digester gas.
   b. During maintenance, testing, and/or emergencies which require the flaring of digester gas.
   c. A-406 shall be used as the primary flare when it is functional and has sufficient capacity to combust the entirety of the digester gas in need of flaring. This Part is contingent upon successful completion of the startup source test of A-406.

3a. This Part shall apply until startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366: Digester gas total sulfur content shall not exceed 350 ppm. (Basis: 9-1-302)

3b. After startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366, the owner/operator shall ensure that digester gas total sulfur content does not exceed 315 ppm. (Basis: Cumulative Increase)

4. After startup of thermophilic operation of any digester vessel pursuant to the Authority to Construct for Application 27366, the owner/operator shall ensure that SO2 emissions from digester gas combustion do not exceed 12.722 tons in any consecutive 12-month period. The owner/operator shall use daily records of H_2S content and digester gas production to calculate SO_2 emissions. For the purposes of this part, the owner/operator shall assume that all H_2S in the digester gas is combusted. (Basis: Cumulative Increase)

5. To demonstrate compliance with the limits in Part 3 and Part 4, the owner/operator shall monitor and record the following:
   a. Sulfur content of the digester gas at least once every calendar day. The sulfur content of the digester gas shall be used to calculate SO_2 emissions from all

combustion sources firing untreated digester gas.

b. Sulfur content for digester gas combusted in S-67, S-68, S-69, S-70, S-72, and S-73 will be determined from the outlet of the Gas Treatment System, A-18, as specified in Condition 26639, Part 20.
c. Total daily digester gas production. (Basis: Cumulative Increase)

6. The owner/operator shall record the dates, hours of use, and purpose of flaring in a District approved logbook, whenever the flares are used. (Basis: Regulation 2-6-409.2)

7. Within 90 days of the startup of thermophilic operations of any digester vessel pursuant to the Authority to Construct for Application 27366, the owner/operator shall record the dates, the times, and the H_2S concentration in a District approved logbook whenever digester gas is vented from any pressure relief valve at S210, Digesters. (Basis: 2-1-403)

8. A release of digester gas at a pressure relief valve on a digester shall not be considered a violation of Parts 1 or 2 of this permit condition under the following conditions:
   a. H_2S emissions from the digester gas release are less than 1.22 lb per hour, or
   b. The owner/operator prepares an air dispersion modeling analysis within 30 days of the incident that shows that the limits in BAAQMD Regulation 9, Rule 2, were not exceeded.

   The owner/operator shall ensure that, if detected and known, the occurrence, duration, and cause of emissions of digester gas from any cause or activity are recorded. Notwithstanding this part 8, the owner/operator shall not cause or allow any digester gas emissions otherwise allowed by this Part to create a violation of District regulations. (Basis: 2-1-403)

9. The owner/operator shall ensure that the heat input to A-406, Enclosed Flare, does not exceed 605 MMBtu/day. (Basis: Cumulative Increase)

10. The owner/operator shall ensure that the heat input to A-407, Candlestick Flare, does not exceed 6,567 MMBtu/day. (Basis: Cumulative Increase)

11. The owner/operator shall install flow meters and recorders to monitor the digester gas flow to A-406 and A-407. (Basis: Cumulative Increase)

12. The owner/operator shall install a temperature monitor and recorders to monitor the temperature at A-406. (Basis: Cumulative Increase)

13. The combustion zone temperature of A-406 shall be maintained at a minimum of 1,400 degrees F, except upon start-up where a 15-minute warm-up period is allowed and a residence time of at least 0.6 seconds is maintained. If a source test demonstrates compliance with all applicable requirements at a different temperature, the APCO may revise the minimum combustion zone temperature limit in accordance with the procedures identified in Regulations 2-6-414 or 2-6-415 and the following criteria. The minimum combustion zone temperature for a flare shall be equal to the average combustion zone temperature measured during the most recent complying source test

minus 50 degrees F, provided that the minimum combustion zone temperature shall not be less than 1400 degrees F.

14. The owner/operator shall ensure that the emissions of nitrogen oxides (NO_x) from A-406 do not exceed 0.06 pounds per million BTU (calculated as NO_2). (Basis: RACT)

15. The owner/operator shall ensure that the emissions of carbon monoxide (CO) from A-406 do not exceed 0.2 pounds per million BTU. (Basis: RACT)

16. The owner/operator shall ensure that hydrogen sulfide (H_2S) emissions are less than 0.278 lb/hr at the outlet of A-406. (Basis: 2-1-301)

17. The owner/operator shall ensure that the emissions of methane (CH_4) from A-406 do not exceed 0.9 pounds per million BTU. (Basis: 2-1-301)

18. In order to demonstrate compliance with parts 14, 15, 16, and 17 of these conditions, the owner/operator shall conduct an initial District approved source test on A-406, Enclosed Flare within 60 days of startup. The source test shall determine the following:
    a. digester gas flow rate (dry basis);
    b. concentrations (dry basis) of carbon dioxide (CO_2), nitrogen (N_2), oxygen (O_2), methane (CH_4) and hydrogen sulfide (H_2S) and total non-methane organic compounds (NMOC) in the digester gas;
    c. stack gas flow rate (dry basis);
    d. concentrations (dry basis) of NO_x, CO, H_2S, CH_4, NMOC, SO_2, and O_2 in the stack gas;
    e. the H_2S and methane destruction efficiencies achieved by each flare; and
    f. the average combustion temperature during the test period.

    In addition, source tests shall be repeated every 8,760 hours of operation or every five years, whichever comes first. The periodic source test is not required if the flare has not been operated since the last District-approved source test. The Source Test Section of the District shall be contacted to obtain approval of the source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. The source test report shall be submitted to the Compliance and Enforcement Division and to the Source Test Section within 60 days of the test date. (Basis: Regulations 2-1-301 and 9-1-302)

19. In order to demonstrate compliance with the above conditions, the owner/operator shall maintain the following records in a District approved logbook.
    a. Record the operating times and the digester gas flow rate to A-406 and A-407 on a daily basis when operating. Summarize these records on a monthly basis.
    b. Maintain continuous records of the combustion zone temperature for A-406, Enclosed Flare during all hours of operation.
    c. Maintain records of all test dates and test results performed to demonstrate compliance with part 18 above and any applicable rule or regulation.

    All records shall be maintained on site or shall be made readily available to District staff upon request for a period of at least 5 years from the date of entry. These record keeping

requirements do not replace the record keeping requirements contained in any applicable rules or regulations. (Basis: Cumulative Increase, 2-1-301, 2-6-501, 9-1-302, and 9-2-301)

20. In order to demonstrate compliance with the maintenance/construction activity provisions of Part 2, the owner/operator shall maintain the following records in a District approved logbook:
    a. Record the operating times of each flare listed within Part 2, operated during maintenance/construction activities;
    b. Record the combined daily thermal throughput of all listed flares within Part 2 during maintenance/construction activities; and
    c. Record the total amount of digester gas from S-210, Anaerobic Digesters, which is abated by the listed flares in Part 2 during maintenance/construction activities, on a monthly basis.

All records shall be maintained on site or shall be readily available to District staff upon request for a period of at least 5 years from the date of entry. These record keeping requirements do not replace the record keeping requirement contained in any applicable rule~~s~~ or regulation~~s~~. (Basis: Cumulative Increase and Regulation 2-6-501)

Permit Condition #17900

S-36, Engine Generator 2, Cogen Unit, Plt EG-2
S-37, Engine Generator 3, Cogen Unit, Plt EG-3
S-38 Boiler, Low NOx
S-39 Boiler, Low NOx

Permit Condition #26639 is shown below because it was referenced in the discussion above.

Permit Condition #26639

Equipment included in this permit condition:

S-67 Cogeneration System #1
S-68 Cogeneration System #2
S-69 Cogeneration System #3
S-70 Cogeneration System #4

A-9 Gas Treatment System - Iron Sponge
A-10 Selective Catalytic Reduction
A-11 Oxidation Catalyst
A-12 Selective Catalytic Reduction
A-13 Oxidation Catalyst
A-14 Selective Catalytic Reduction
A-15 Oxidation Catalyst
A-16 Selective Catalytic Reduction
A-17 Oxidation Catalyst
A-18 Gas Treatment System – Activated Carbon

1. The owner/operator shall fire S-67, S-68, S-69, and S-70 exclusively on digester gas from S-210, Anaerobic Digesters, and/or pipeline quality natural gas. (basis: Cumulative Increase)
2. The owner/operator of S-67, S-68, S-69, and S-70, shall not allow the combined heat input to exceed 1,084,974 million BTU (HHV) during any consecutive 12-month period. (basis: Cumulative Increase)
3. The owner/operator shall provide offsets by shutting down or curtailing S-36, S-37, S-38, and S-54 within 90-days of the need for offsets. (basis: Offsets)
4. The owner/operator shall ensure that all digester gas combusted in S-67, S-68, S-69, and S-70 is treated by A-9 and A-18 prior to combustion. The owner/operator shall not allow the concentration of total sulfur in the gas exiting A-18 to exceed 50 ppm. (basis: Cumulative Increase)
5. The owner/operator shall properly maintain and operate A-9 and A-18 in accordance to the manufacturer's specifications during all periods of operation of S-67, S-68, S-69, and S-70. The owner/operator shall not regenerate A-18 media on site. (basis: Cumulative Increase)
6. The owner/operator shall abate NOx emissions from S-67, S-68, S-69, and S-70 by A-10, A-12, A-14, and A-16, respectively, at all times of operation except during startup and shutdown of S-67, S-68, S-69, and S-70. The owner/operator shall ensure that each SCR catalyst bed is equipped with a temperature monitor and continuous recorder that accurately measures and records the temperature of exhaust gas from the catalyst during all periods of operation. Except during periods of startup or shutdown, the owner/operator shall maintain the exhaust gas temperature within a range of 575 degrees Fahrenheit and 960 degrees Fahrenheit while the engine is in operation. (basis: Cumulative Increase)
7. The owner/operator shall properly maintain and operate A-10, A-12, A-14, and A-16 in accordance to manufacturer's specifications during all periods of operation of S-67, S-68, S-69, and S-70. (basis: BACT)
8. The owner/operator shall abate CO and organic compound emissions from S-67, S-68, S-69, and S-70 by A-11, A-13, A-15, A-17, respectively, at all times of operation except during startup and shutdown of S-67, S-68, S-69, and S-70. (basis: BACT, Regulation 2-5-302)
9. The owner/operator shall properly maintain and operate A-11, A-13, A-15, and A-17 in accordance to manufacturer's specifications during all periods of operation of S-67, S-68, S-69, and S-70. (basis: BACT)
10. The owner/operator shall not allow NOx emissions from each of S-67, S-68, S-69, and S-70 to exceed an emission rate of 0.124 grams of NOx (calculated as NO2) per brake-horsepower-hour, or the equivalent outlet concentration of 11 ppmv of NOx, corrected to

15% oxygen, dry basis, averaged over the test period. The owner/operator shall not allow total NOx emissions from all four engines to exceed 23.15 tons per year. The concentration and grams per brake-horsepower-hour limits do not apply during periods of startup or shutdown. The startup period shall not exceed 2 hours and the shutdown period shall not exceed 1 hour. (basis: Cumulative Increase, BACT)

11. The owner/operator shall not allow CO emissions from each of S-67, S-68, S-69, and S-70 to exceed an emission rate of 0.89 grams of CO per brake-horsepower-hour, or the equivalent outlet concentration of 130 ppmv of CO, corrected to 15% oxygen, dry basis, averaged over the source test period. The owner/operator shall not allow total CO emissions from all four engines to exceed 166.17 tons per year. The concentration and grams per brake-horsepower-hour limits do not apply during periods of startup and shutdown. The startup period shall not exceed 2 hours and the shutdown period may not exceed 1 hour. (Basis: Cumulative Increase, BACT)

12. In order to demonstrate compliance with the limits in Parts 10 and 11, the owner/operator shall use a portable analyzer to take NOx and CO emission readings to verify compliance with Parts 10 and 11 at least once on each engine every 720 hours of engine operation. All emission readings shall be taken with the engine operating at conditions representative of normal operations. NOx emission readings shall be averaged over a consecutive 15-minute period. (Basis: BACT, Cumulative Increase, and Regulation 2-1-403 and 9-8-503)

13. The owner/operator shall not allow PM10 or PM2.5 emissions from each of S-67, S-68, S-69, and S-70 to exceed 0.07 grams of PM10 or PM2.5 per brake-horsepower-hour. The owner/operator shall not allow total PM10 or PM2.5 emissions from all four engines to exceed 13.07 tons per year. This includes condensable and filterable PM. (Basis: Cumulative Increase, BACT)

14. The owner/operator shall not allow a net increase of PM2.5 emissions to exceed 10 tons per year from this project. The project includes the shutdown of S-5, S-7, S-36, S-37, S-38, and S-54; construction of S-67, S-68, S-69, S-70, A-9, A-10, A-11, A-12, A-13, A-14, A-15, A-16, A-17, A-18, and four cooling towers; and may include the following future items: shutdown of S-39 and construction of a new boiler. (Basis: Regulation 2-2-308)

15. The owner/operator shall not allow POC measured as NMOC emissions from each of S-67, S-68, S-69, and S-70 to exceed 0.12 grams of POC per brake-horsepower-hour, or the equivalent outlet concentration of 30.6 ppmv of POC (as methane), corrected to 15% oxygen, dry basis, averaged over the source test period. The owner/operator shall not allow

formaldehyde emissions from each of S-67, S-68, S-69, and S-70 to exceed 0.41 pounds per hour. (Basis: Cumulative Increase, BACT)

16. The owner/operator shall not allow the ammonia (NH3) concentration in the exhaust from each of S-67, S-68, S-69, and S-70 to exceed 10 ppmv, corrected to 15% oxygen, dry basis. (Basis: Regulation 2-5-302)

17. Sampling ports shall be installed in the exhaust stack for S-67, S-68, S-69, and S-70 after control in a straight section of piping with at least six (6) diameters clear downstream of any bends, inlets, constriction, flow altering device or change of area or geometry and two (2) diameters upstream of the stack exit or other flow disturbance. The sample ports shall be at least 6" in diameter. The number of sampling ports and platform specifications must be in accordance with BAAQMD document, "Guidelines for Construction of Particulate Sampling and Testing Facilities" The owner/operator must obtain approval from the District's Source Test Section prior to construction. (Basis: MOP Volume IV, Guidelines of Construction of Particulate Sampling and Testing Facilities)

18. In order to demonstrate compliance with Parts 10, 11, and 13 through 16 above and Regulations 9-1-302, 9-8-302.1, 9-8-302.3, the owner/operator shall ensure that a District approved source test is conducted in each engine after startup and once every 8,760 hours of operation or three years, whichever comes first. Each source test shall be conducted at the exhaust stack after control while the engine is operating under normal operating conditions while fired on digester gas or a digester gas and natural gas blend and shall not include startup or shutdown periods. Each source test shall determine all items identified below. The Source Test Section of the District shall be contacted to obtain approval of source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. Source test reports for compliance testing shall be submitted to the Source Test Section within 60 days of the test date. (Basis: BACT, Cumulative Increase, and Regulations 2-5-302, 9-1-302, 9-8-302.1, and 9-1-302.3)

    a. Actual gross electrical output (kW-hrs) from the tested engine(s) during the test period and the calculated power output (bhp) from each engine determined using the following equation: bhp = 1.34 * kW;

    b. Total flow rate (standard cubic feet per minute, dry basis, or sdcfm) of all gaseous fuel to the tested engine(s);

    c. Concentrations (percent by volume or ppmv, dry basis) of carbon dioxide (CO2), nitrogen (N2), oxygen (O2), methane (CH4), total non-methane organic

compounds (NMOC), and total sulfur compounds (TS) in the gaseous fuel burned in the tested engine(s);

d. Higher heating value (BTU/scf) for the biogas;

e. Heat input rate (BTU/hour) to the tested engine(s) averaged over the test period;

f. Exhaust gas flow rate (sdcfm) from the tested engine(s) based on EPA Method 2 or Method 19;

g. Concentrations (ppmv or percent by volume, dry basis) of NOx, CO, CH4, NMOC, SO2, NH3, formaldehyde, and O2 in the exhaust gas from the tested engine(s);

h. Corrected concentrations (ppmv, corrected to 15% O2, dry basis) of CO, NOx, SO2, CH4, and NH3 in the exhaust gas from the tested engine(s);

i. Corrected concentration (ppmv, dry basis) of NMOC in the fuel to the tested engine(s);

j. NMOC destruction efficiency (weight percent) achieved by the tested engine(s);

k. Emission rates (grams/bhp-hour) of NOx, CO, and PM10 from each engine;

l. Emissions (pounds/hour) of PM10 from each engine and the PM10 grain loading rate (grains/dscf) from the tested engine(s). This includes filterable and condensable particulate.

m. Emission rate (pounds/hour) of formaldehyde from the tested engine(s);

n. Average temperature of the SCR catalyst exhaust gas temperature for the tested engine(s) during the test period.

o. During the source test, the owner/operator shall also measure concentrations of NOx, CO, and O2 (ppmv) in the exhaust from the tested engine(s) using the portable analyzer procedures described in Part 12. The portable analyzer measurements of corrected NOx and CO concentrations shall be compared to the values measured pursuant to Part 18h.

19. The owner/operator shall measure and record the flowrate of the biogas and natural gas supplied to the engines on a continuous basis (at least one measurement every 15-minutes) using a District approved method. The flow meters and recorder shall be installed and

properly calibrated prior to any engine operation; this equipment shall be maintained in good working condition. (Basis: Cumulative Increase)

20. To demonstrate compliance with the limit in Part 4, the owner/operator shall monitor and record the sulfur content of the treated digester gas at least once each month. (Basis: Cumulative Increase)

21. The owner/operator shall monitor and record the heat content of the digester gas at least once each month. (Basis: Cumulative Increase)

22. The owner/operator shall maintain the following plans and records on-site for a minimum of 5 years from the date of entry. The plans and records shall be made available to District staff upon request.

    a. Records of heat input to each engine for each calendar month and for each rolling 12-month period. Heat input shall be calculated using District approved procedures based on measured biogas flow rate data and measured biogas methane concentration data. The calculated heat input rates shall be recorded in a data acquisition system or electronic spreadsheet.

    b. Records of all monitoring or source testing conducted to demonstrate compliance with this permit condition and District rules.

    c. An engine maintenance plan.

    d. Records of all maintenance conducted on each engine.

    e. Records of start-ups, shut downs, and malfunctions for each engine. For any malfunction, the records shall include the cause of the malfunction, the actions taken to correct the malfunction, the date and time that the malfunction was corrected, and the actions taken to prevent such malfunctions in the future.

RECOMMENDATION

Issue a Change of Condition Letter for the following sources within Permit Condition #17741:

S-210 Anaerobic Digesters

And the associated abatement devices:

A-404 Enclosed Flare, 25.2 MMBtu/hr
A-405 Candlestick Flare, 225MMBtu/hr
A-406 Enclosed Ground Flare, 25.2 MMBtu/hr
A-407 Candlestick Flare, 273.6 MMBtu/hr

Issue a Change of Conditions Letter for the following sources within Permit Condition #17900:

S-36, Engine Generator 2, Cogen Unit, Plt EG-2
S-37, Engine Generator 3, Cogen Unit, Plt EG-3
S-38 Boiler, Low NOx
S-39 Boiler, Low NOx

Issue a Letter of Exemption for the following sources:

S-226 Boiler
S-227 Boiler
S-228 Boiler

Archive the following abatement devices:

A-401 Flare
A-402 Flare
A-403 Flare

Simrun Dhoot 7/14/20
Simrun Dhoot Date
Senior Air Quality Engineer

APPENDIX F

ENGINEERING EVALUATION APPLICATION 28651

Engineering Evaluation

for

BAAQMD PERMIT APPLICATION # 28651

Proposed Project:
Four Digester Gas/Natural Gas Fired Lean Burn IC Cogeneration Engines Controlled by Oxidation Catalysts and Selective Catalytic Reduction Systems Including: Four Cooling Towers

BAAQMD PLANT # 778

Applicant: San Jose/Santa Clara Regional Water Facility
Location: San Jose, CA

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

April 2018

Prepared By:
Simrun Dhoot
Air Quality Engineer II

TABLE OF CONTENTS

BACKGROUND

San Jose/Santa Clara Regional Water Facility (RWF) has applied for an Authority to Construct and/or Permit to Operate for the addition of four new internal combustion cogeneration engines.

S-67 Cogeneration System #1, Caterpillar CG260-16, 4,834 bhp, 31 MM Btu/hr, 4-stroke, lean-burn; fired on treated digester gas and/or natural gas; abated by A-9, A-18, A-10, and A-11
S-68 Cogeneration System #2, Caterpillar CG260-16, 4,834 bhp, 31 MM Btu/hr, 4-stroke, lean-burn; fired on treated digester gas and/or natural gas; abated by A-9, A-18, A-12, and A-13
S-69 Cogeneration System #3, Caterpillar CG260-16, 4,834 bhp, 31 MM Btu/hr, 4-stroke, lean-burn; fired on treated digester gas and/or natural gas; abated by A-9, A-18, A-14, A-15
S-70 Cogeneration System #4, Caterpillar CG260-16, 4,834 bhp, 31 MM Btu/hr, 4-stroke, lean-burn; fired on treated digester gas and/or natural gas; abated by A-9, A-18, A-16, A-17

abated by
A-9 Gas Treatment System - Iron Sponge, abating S-67, S-68, S-69, and S-70
A-18 Gas Treatment System - Activated Carbon, abating S-67, S-68, S-69, and S-70

A-10 Selective Catalytic Reduction, abating S-67
A-11 Oxidation Catalyst, abating S-67

A-12 Selective Catalytic Reduction, abating S-68
A-13 Oxidation Catalyst, abating S-68

A-14 Selective Catalytic Reduction, abating S-69
A-15 Oxidation Catalyst, abating S-69

A-16 Selective Catalytic Reduction, abating S-70
A-17 Oxidation Catalyst, abating S-70

The RWF has also applied for an exemption for the following proposed equipment:

S-71 Cooling Towers (4)

The sources will be located at 700 Los Esteros Road, San Jose, CA 95134.

The four new spark-ignited, four-stroke, lean-burn reciprocating internal combustion cogeneration engines will be fired on a combination of digester gas and natural gas. An ancillary cooling tower system will be installed to serve the new cogeneration engines. Each engine will be equipped with an oxidation catalyst to control carbon monoxide (CO), volatile organic compounds (VOC), and formaldehyde emissions. Each engine will also be equipped with a selective catalytic reduction (SCR) system to control emissions of nitrogen oxides (NOx). A gas treatment system will reduce hydrogen sulfide (H_2S), sulfur dioxide (SO_2) and particular matter (PM) emissions.

Six existing sources (S-5, S-7, S-36, S-37, S-38, and S-54) will be replaced by the four new internal combustion cogeneration engines. Sources S-5 and S-7 were decommissioned in February of 2017. Four other sources (S-36, S-37, S-38, and S-54) are scheduled to be decommissioned at the end of the startup period (prior to planned, normal operation of the new engines). The facility requested a start-up period of 180-days, which was approved by the Air District in an email dated February 2, 2018. Table 1 summarizes the shutdown or anticipated shutdown dates for each engine.
Table 1. Existing Sources to be Shutdown

Existing Source Number	Existing Permit Description	Anticipated Date of Shutdown
S-5	Stationary IC Cogen Engine, E2 (digester gas, landfill gas, natural gas, diesel)	2/28/2017
S-7	Stationary IC Cogen Engine, E5 (digester gas, landfill gas, natural gas, diesel)	2/28/2017
S-36	Engine Generator 2 – Cogen Unit, Plt EG-2 (digester gas, landfill gas, natural gas)	After startup period
S-37	Engine Generator 3 – Cogen Unit, Plt EG-3 (digester gas, landfill gas, natural gas)	After startup period
S-38	Boiler, Low NOx (natural gas)	After startup period
S-54	Engine Generator 1, Cogen, 12 Cylinder Turbo LSVB, Plt EG-1 (digester gas, landfill gas, natural gas, diesel)	After startup period

In order to treat wastewater, the RWF uses over 10 megawatts of electricity per day. Currently, over two-thirds of the energy used at the RWF comes from burning digester gas and natural gas. The RWF's cogeneration system produces electricity and heat that is recovered and used for heating the digesters and for building heating and cooling. The amount of digester gas produced by the RWF will amount to roughly 41% of the total gas used to operate the cogeneration engines.

The current system includes three engine-generator sets (S-36, S-37, and S-54) in the Blower Generation building. Two engine-generator sets (S-5 and S-7) in the Pump and Engine building were part of the system prior to decommissioning. The RWF's existing engines are near the end of their design lives, operate inefficiently, and need constant maintenance.

Selective Catalytic Reduction and Oxidation Catalysts

The exhaust treatment for each engine includes a relief disk, primary silencer, oxidation catalyst (to provide CO, organic compound, and toxic air contaminant [TAC] control), SCR units (to provide NOx control), heat recovery silencers, and 48-foot exhaust stacks on a 3-foot grade. The equipment will be provided by AeriNOX.

The oxidation catalyst is mounted in the engine building upstream from the SCR assembly.

The SCR process catalyzes the chemical reduction of NOx into nitrogen and water vapor using urea. Urea is injected into the exhaust gas ductwork downstream of the oxidation catalyst. Two 7,000-gallon urea storage tanks will be used. The SCR system consists of a urea injection system, static mixing section, and catalyst housing.

The manufacturer has guaranteed that the emissions following the control devices will meet the BACT limits for IC Engines – Biogas Fired as listed in Document #96.2.4, Revision 1 of the BACT Handbook. In addition, the engines will meet a lower limit for NOx.

Table 2. Abatement Device Manufacturer Emissions Factors

Pollutant	Emissions After Control Device	
	Emission Factor/Percent Reduction	Basis for Emission Factor

CO	0.89 g/bhp-hr 130 ppmv @ 15% O_2	BACT, Level 1
NO_x	0.124 g/bhp-hr 11 ppmv @ 15% O_2	BACT, Level 2 Note: 11 ppmv @ 15% O_2 is less than the current value in the BACT/TBACT workbook
POC	0.12 g/bhp-hr 30.6 ppmv @ 15 O_2	BACT, Level 1
PM_{10}	0.07 g/bhp-hr	BACT, Level 1
$PM_{2.5}$	0.07 g/bhp-hr	BACT, Level 1
SO_2[(a)]	8.31 lb/MMscf digester gas	BACT, Level 1
Formaldehyde	0.41 lb/hr/engine	Manufacturer
Other HAPS/TACs	≥ 75%	Manufacturer

(a) SO_2 emission factor based on 50 ppm S in digester gas. Molecular weight, SO2, lb/lb-mole = 64.05. Therefore, sulfur content (digester gas) in lb/MMscf = (50/385.3)*64.05 = 8.31

Gas Treatment System

H_2S and siloxanes will be removed from the digester gas before combustion in the cogeneration engines to prevent damage to the engines and the emissions treatment catalysts and to reduce sulfur dioxide emissions from the engines. The equipment will be supplied by Unison Solutions.

H_2S will be removed by iron sponge media. Reaction of iron oxide and H_2S produces iron sulfide and water as follows:
$Fe_2O_3 + 3H_2S \rightarrow Fe_2S_3 + 3H_2O$
$FeO + H_2S \rightarrow FeS + H_2O$

The H_2S removal vessels will be arranged in two parallel trains, each with two vessels in series, for a total of four vessels. The system is designed so that any one vessel can be shut down for media removal while the remainder of the system stays in operations. The gas treatment system will reduce sulfur concentrations to less than 100 ppm. The RWF has proposed a limit of 50 ppm to limit emissions of SO_2 to less than 10 lb/day/engine.

The facility will regenerate the iron sponge media on site when the media is spent. During the regeneration process, water will be added to the vessel containing the media bed. Water will be pumped into the bottom of the vessel until the spent iron sponge is loosened and forced to the top. The digester gas in the vessel will be displaced by the water addition and will be pushed upstream into a digester gas line, rather than vented to the atmosphere. When the vessel is filled with water, the system will be regenerated with air. The oxygen is used in the conversion reaction of ferric sulfide to ferric oxide and elemental sulfur, which produces heat. The regeneration process will be complete when no more heat is given off. The water will be drained from the vessel and sent to the process drains. The regeneration process will produce ferric oxide and elemental sulfur, which are solid at the temperatures in the vessel and will not be emitted to the atmosphere. No compounds from the regeneration of the iron sponge media are expected to enter the airstream and be emitted.

Activated carbon siloxane removal media requires dehumidified gas for proper operation. Chilled water heat exchangers will cool the gas from the H_2S removal system prior to routing the gas to moisture removal vessels prior to siloxane removal.

Final particulate filters will be arranged as two units downstream of the siloxane removal vessels.

The activated carbon will not be desorbed on-site. Therefore, the reduction of SO_2 and H_2S will be real.

Cooling Towers

Four cooling towers will be constructed an operated to remove heat from the cogeneration engines for engine cooling. Each cooling tower is designed to operate continuously and will have a recirculating flow rate of 400 gallons per minute for a total of 1,600 gallons per minute. The cooling towers will recirculate tertiary treated filtered and disinfected water. They will not emit any regulated pollutant greater than five tons per year. Therefore, they are exempt from permitting per Regulation 2, Rule 1, Section 128.4.

EMISSIONS CALCULATIONS

Criteria Air Pollutants

The potential to emit for criteria pollutants is based on the emission factors guaranteed by the manufacturer (see Table 2). Emission factors for the operations of the cogeneration engines running on 100% digester gas or blended digester gas, considered the primary mode of operation, do not vary with the digester gas and natural gas blend mix. While operating under 100% natural gas, emissions from the cogeneration engines will be equal or less than emissions from the primary mode of operation. Table 3 and Table 4 summarize the engine parameters used to calculated potential to emit emissions shown in Table 5.

Table 3. Caterpillar Engine Data

Fuel	Fuel Consumption, Btu/min	Fuel gas HHV, Btu/scf	Fuel gas rate, scf/hr	Electrical Power, kW	Horsepower, hp
100% Digester Gas (a)	516,064	627	49,384	3,510	4,834

(a) Digester gas/natural gas blends are assumed to be equal to the 100% digester gas

Table 4. Cogeneration Engine Operation Information

Parameter	Value
Total quantity of engines	4
Total quantity of engines in use at one time	4
Engine rating, MMBtu/hr	31.0
Operating hours per year	8,760
Engine rating, MMBtu/yr (HHV)	271,243
Combined engine rating, MMBtu/yr (HHV)	1,084,974

Table 5. Annual Emissions for Criteria Pollutants for Each Source

Criteria Pollutant	Hours/Yr	Horsepower, bhp	Emission Factor, g/bhp-hr	Emissions, g/yr	Emissions, lb/yr[(a)]	Emissions, TPY
NO_X	8,760	4,834	0.124	5,250,884	11,581	5.791
CO	8,760	4,834	0.89	37,687,798	83,123	41.561
POC	8,760	4,834	0.12	5,081,501	11,208	5.604
PM_{10}	8,760	4,834	0.07	2,964,209	6,538	3.269
$PM_{2.5}$	8,760	4,834	0.07	2,964,209	6,538	3.269

(a) 453.4 gram per lb

Table 6. Daily Emissions for Criteria Pollutants for Each Source

Criteria Pollutant	Hours/day	Horsepower, bhp	Emission Factor, g/bhp-hr	Emissions, g/day	Emissions, lb/day
NO_X	24	4,834	0.124	14,386	31.7
CO	24	4,834	0.89	103,254	227.7
POC	24	4,834	0.12	13,921	30.7
PM_{10}	24	4,834	0.07	8,121	17.9
$PM_{2.5}$	24	4,834	0.07	8,121	17.9

Table 7. Annual and Daily Emissions for SO_2 for Each Source

Criteria Pollutant	Emission Factor, lb/MMscf	Fuel Gas Rate, scf/hr	Emissions, lb/hr	Hours/day	Emissions, lb/day	Hours/yr	Emissions, lb/yr	TPY
SO_2	8.31	49,384	0.41	24	9.85	8,760	3,592	1.798

Cooling Towers

Emissions from the cooling towers include PM_{10} and $PM_{2.5}$. The cooling towers will not emit any regulated pollutant greater than five tons per year. Therefore, the cooling towers are exempt from permitting per Regulation 2-1-128.4. The cooling towers will not trigger BACT, since emissions are expected to be less than 10 pounds per day. $PM_{2.5}$ emissions are assumed to equal PM_{10} emissions. Capacity and drift loss are from the manufacturer specifications. As shown below, the expected PM_{10} and $PM_{2.5}$ emissions are 3.51 pounds per day and 0.64 TPY, for all four.

Parameters:

Quantity of cooling towers:	4
Capacity of cooling tower (each), gallons/min:	400
Total capacity of cooling towers, gallons/min:	1,600
Operating time (annual), hours:	8,760
Drift loss, %	0.005
Max total dissolved solids, ppm by wt:	3,650
Density of water, lb/gal:	8.34

PM emissions (lb/hr) = 1,600 gallons/min x 60 min/hour x 0.005/100 x 3,650/1,000,000 x 8.34 lb/gal
= 0.15 lb/hr

PM emissions (lb/day) = 0.15 lb/hr x 24 hr/day
= 3.51 lb/day

PM emissions (lb/yr) = 3.51 lb/day x 365 day/year
= 1,280 lb/year

PM emissions (tpy) = 1,280 lb/yr x 1 ton/year
= 0.64 tpy

Greenhouse Gas Emissions

Digester gas contains approximately 64% methane (CH_4) and 34% carbon dioxide (CO_2) which are both greenhouse gases (GHGs). During the combustion of digester gas, methane is converted to CO_2. The CO_2 that is present in digester gas and the CO_2 produced during combustion of digester gas are both derived from the decomposition of organic waste materials (primarily vegetable matter). This CO_2 is considered to be biogenic CO_2.

Small traces of nitrous oxide (N_2O) are also found in digester gas (roughly 0.001%). During the combustion of digester gas, nitrous oxide is converted to NO_2.

The maximum potential GHG emissions would occur if the new cogeneration engines operated at full capacity for an entire year. The worst-case emissions are based on the engines consuming all available digester gas with the remainder of the fuel demand supplied by natural gas. The facility used actual 2016 digester gas production information to calculate worst case GHG emissions. GHG emissions from the engines were calculated using standard EPA emission factors for natural gas and biomass gases.

Table 8. Cogeneration Engine Information

Parameter	**Value**	**Units**
Total number of engines	4	count
Number of engines in use at one time	4	count
Engine rating	31	MMBtu/hr
Operating hours per year	8,760	hours
Engine rating (100% digester gas)	271,560	MMBtu/yr (HHV)
Combined engine rating (100% digester gas)	1,086,240	MMBtu/yr (HHV)
HHV Digester Gas	605	Btu/scf
HHV Natural Gas	1,013	Btu/scf
Digester Gas Supply	1,026	scfm (2016 average)
Digester Gas Supply	326,256	MMBtu/yr (HHV)
Digester Gas Supply	539,265,600	scf/yr
Natural Gas Demand	759,984	MMBtu/yr (HHV)
Natural Gas Demand	750,231,305	scf/yr

Table 9. CO_2 Emissions

Emitting Activity Name	GHG	Fuel Use (scf)	HHV (MMBtu/scf)	Emission Factor (kg /MMBtu)[(a)]	Emissions (tons)	GWP	CO2e Emissions (tons)
Natural Gas	CO_2	750,231,305	0.001034	53.06	41,130	1	41,161
Natural Gas	CH_4	750,231,305	0.001034	0.001	0.776	34	26
Natural Gas	N_2O	750,231,305	0.001034	0.0001	0.078	298	23
Digester Gas	CO_2	539,265,600	0.000605	52.07	16,988	1	16,988
Digester Gas	CH_4	539,265,600	0.000605	0.0032	1.044	34	35
Digester Gas	N_2O	539,265,600	0.000605	0.00063	0.206	298	61
Total							58,295

(a) https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

The emissions of methane and nitrous oxide are converted to a carbon dioxide equivalent emission rate using the global warming potentials of 34 for methane and 298 for nitrous oxide.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants (TACs)

The emission factors used to estimate HAP and TAC emissions from the four cogeneration engines are based on emission factors from the Environmental Protection Agency's (EPA's) AP-42, Chapter 3.2, Table 3.2-2 for Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines. Controlled emissions of formaldehyde are equivalent to the controlled formaldehyde emission factor from the Zero Waste Energy Development Company facility (Plant 21277) permit.

Emissions of formaldehyde are expected to be greater than the applicable acute trigger level. Emissions of 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,2-dichloroethane, 1,3-butadiene, acetaldehyde, ammonia, benzene, benzo(b)fluoranthene, benzo(e)pyrene, benzo(g,h,i)perylene, carbon tetrachloride, ethylene dibromide, formaldehyde, naphthalene, PAH, and vinyl chloride are expected to be greater than their respective chronic trigger levels. TACs emissions are presented in Table 10 and Table 11.
The total TAC emissions are 21.66 tons per year, which coincides with the potential to emit calculation for POC of 22.41 tons per year.

Table 10. All (4) Cogeneration Engines Acute TAC Emissions

Toxic Air Contaminant	HAP (Yes/No)	TAC (Yes/No)	Emission Limit, ppm	Controlled Emission Factor, lb/hr/engine	AP-42 Emission Factor, lb/MMBtu	PAH Potency Equivalency Factor	Control Efficiency, %	Hourly Emissions and Acute Trigger Level			
								Uncontrolled Emissions, lb/hr	Controlled Emissions, lb/hr	Acute Trigger Level	Acute Trigger Level Exceeded? (Yes/No)
1,1,2,2-Tetrachloroethane	Y	Y	-	-	4.00E-05	-	75%	4.95E-03	1.24E-03	-	-
1,1,2-Trichloroethane	Y	Y	-	-	3.18E-05	-	75%	3.94E-03	9.85E-04	-	-
1,1-Dichloroethane	N	Y	-	-	2.36E-05	-	-	2.92E-03	2.92E-03	-	-
1,2-Dichloroethane	N	Y	-	-	2.36E-05	-	75%	2.92E-03	7.31E-04	-	-
1,3-Butadiene	Y	Y	-	-	2.67E-04	-	75%	3.31E-02	8.27E-03	-	-
1,3-Dichloropropene	Y	Y	-	-	2.64E-05	-	-	3.27E-03	3.27E-03	-	-
2-Methylnaphthalene	Y	Y	-	-	3.32E-05	-	-	4.11E-03	4.11E-03	-	-
2,2,4-Trimethylpentane	Y	Y	-	-	2.50E-04	-	-	3.10E-02	3.10E-02	-	-
Acenaphthene	Y	Y	-	-	1.25E-06	-	-	1.55E-04	1.55E-04	-	-
Acenaphthylene	Y	Y	-	-	5.53E-06	-	-	6.85E-04	6.85E-04	-	-
Acetaldehyde	Y	Y	-	-	8.36E-03	-	75%	1.04E+00	2.59E-01	1.00E+00	No
Ammonia	N	Y	10	-	-	-	-	1.77E+00	1.77E+00	7.10E+00	No
Acrolein	Y	Y	-	-	5.14E-03	-	-	6.37E-01	6.37E-01	5.50E-03	**Yes**
Benzene	Y	Y	-	-	4.40E-04	-	75%	5.45E-02	1.36E-02	6.00E-02	No
Benzo(b)fluoranthene	Y	Y	-	-	1.66E-07	0.10	75%	2.06E-06	5.14E-07	-	-
Benzo(e)pyrene	Y	Y	-	-	4.15E-07	-	75%	5.14E-05	1.29E-05	-	-
Benzo(g,h,i)perylene	Y	Y	-	-	4.14E-07	-	75%	5.13E-05	1.28E-05	-	-
Biphenyl	Y	Y	-	-	2.12E-04	-	-	2.63E-02	2.63E-02	-	-
Carbon tetrachloride	Y	Y	-	-	3.67E-05	-	75%	4.55E-03	1.14E-03	4.20E+00	No
Chlorobenzene	Y	Y	-	-	3.04E-05	-	-	3.77E-03	3.77E-03	-	-

Toxic Air Contaminant	HAP (Yes/No)	TAC (Yes/No)	Emission Limit, ppm	Controlled Emission Factor, lb/hr/engine	AP-42 Emission Factor, lb/MMBtu	PAH Potency Equivalency Factor	Control Efficiency, %	Hourly Emissions and Acute Trigger Level			
								Uncontrolled Emissions, lb/hr	Controlled Emissions, lb/hr	Acute Trigger Level	Acute Trigger Level Exceeded? (Yes/No)
Chloroethane	N	Y	-	-	1.87E-06	-	-	2.32E-04	2.32E-04	-	-
Chloroform	Y	Y	-	-	2.85E-05	-	75%	3.53E-03	8.82E-04	3.30E-01	No
Chrysene	Y	Y	-	-	6.93E-07	0.01	75%	8.58E-07	2.15E-07	-	-
Ethylbenzene	Y	Y	-	-	3.97E-05	-	75%	4.92E-03	1.23E-03	-	-
Ethylene Dibromide	Y	Y	-	-	4.43E-05	-	75%	5.49E-03	1.37E-03	-	-
Fluoranthene	Y	Y	-	-	1.11E-06	-	-	1.37E-04	1.37E-04	-	-
Fluorene	Y	Y	-	-	5.67E-06	-	-	7.02E-04	7.02E-04	-	-
Formaldehyde	Y	Y	-	4.10E-01	5.28E-02	-	-	6.54E+00	1.64E+00	1.20E-01	**Yes**
Methanol	Y	Y	-	-	2.50E-03	-	-	3.10E-01	3.10E-01	6.20E+01	No
Methylene Chloride	Y	Y	-	-	2.00E-05	-	-	2.48E-03	2.48E-03	3.10E+01	No
n-Hexane	Y	Y	-	-	1.11E-03	-	-	1.37E-01	1.37E-01	-	-
Naphthalene	Y	Y	-	-	7.44E-05	-	75%	9.21E-03	2.30E-03	-	-
PAH	Y	Y	-	-	2.69E-05	-	75%	3.33E-03	8.33E-04	-	-
Phenanthrene	Y	Y	-	-	1.04E-05	-	-	1.29E-03	1.29E-03	-	-
Phenol	Y	Y	-	-	2.40E-05	-	75%	2.97E-03	7.43E-04	1.30E+01	No
Pyrene	Y	Y	-	-	1.36E-06	-	-	1.68E-04	1.68E-04	-	-
Styrene	Y	Y	-	-	2.36E-05	-	-	2.92E-03	2.92E-03	4.60E+01	No
Tetrachloroethane	Y	Y	-	-	2.48E-06	-	-	3.07E-04	3.07E-04	-	-
Toluene	Y	Y	-	-	4.08E-04	-	-	5.05E-02	5.05E-02	8.20E+01	No
Vinyl Chloride	Y	Y	-	-	1.49E-05	-	75%	1.85E-03	4.61E-04	4.00E+02	No
Xylene	Y	Y	-	-	1.84E-04	-	-	2.28E-02	2.28E-02	4.90E+01	No
							Total HAPs, lb/hr:	**8.94**	**3.17**	**--**	**--**

Toxic Air Contaminant	HAP (Yes/No)	TAC (Yes/No)	Emission Limit, ppm	Controlled Emission Factor, lb/hr/engine	AP-42 Emission Factor, lb/MMBtu	PAH Potency Equivalency Factor	Control Efficiency, %	Hourly Emissions and Acute Trigger Level			
								Uncontrolled Emissions, lb/hr	Controlled Emissions, lb/hr	Acute Trigger Level	Acute Trigger Level Exceeded? (Yes/No)
							Total TACs, lb/hr:	**10.72**	**4.94**	**--**	**--**

Note: Emission factors from AP-42, Chapter 3.2, Table 3.2-2. Formaldehyde emissions based on AP-42 emissions factor controlled to 75% by use of the oxidation catalyst (0.41 lb/hr/engine), equivalent to the formaldehyde emission factor for the Zero Waste Energy Development Company facility.

Table 11. All (4) Cogeneration Engines Chronic TAC Emissions

Toxic Air Contaminant	HAP (Yes/No)	TAC (Yes/No)	Hourly Emissions (100% Digester Gas)		Annual Emissions and Chronic Trigger Level			
			Uncontrolled, lb/hr	Controlled, lb/hr	Uncontrolled, lb/year	Controlled, lb/year	Chronic Trigger Level, lb/year	Chronic Trigger Level Exceeded? (Yes/No)
1,1,2,2-Tetrachloroethane	Y	Y	4.95E-03	1.24E-03	43.40	10.85	1.4	**Yes**
1,1,2-Trichloroethane	Y	Y	3.94E-03	9.85E-04	34.50	8.63	5	**Yes**
1,1-Dichloroethane	N	Y	2.92E-03	2.92E-03	25.61	25.61	50	No
1,2-Dichloroethane	N	Y	2.92E-03	7.31E-04	25.61	6.40	4	**Yes**
1,3-Butadiene	Y	Y	3.31E-02	8.27E-03	289.69	72.42	0.48	**Yes**
1,3-Dichloropropene	Y	Y	3.27E-03	3.27E-03	28.64	28.64	-	-
2-Methylnaphthalene	Y	Y	4.11E-03	4.11E-03	36.02	36.02	-	-
2,2,4-Trimethylpentane	Y	Y	3.10E-02	3.10E-02	271.24	271.24	-	-
Acenaphthene	Y	Y	1.55E-04	1.55E-04	1.36	1.36	-	-
Acenaphthylene	Y	Y	6.85E-04	6.85E-04	6.00	6.00	-	-
Acetaldehyde	Y	Y	1.04E+00	2.59E-01	9,070	2,268	29	**Yes**
Ammonia	N	Y	1.77E+00	1.77E+00	15,548	15,548	7,700	**Yes**
Acrolein	Y	Y	6.37E-01	6.37E-01	5,577	5,577	14	**Yes**
Benzene	Y	Y	5.45E-02	1.36E-02	477.39	119.35	2.9	**Yes**
Benzo(b)fluoranthene	Y	Y	2.06E-06	5.14E-07	0.02	0.005	0.0033	**Yes**
Benzo(e)pyrene	Y	Y	5.14E-05	1.29E-05	0.45	0.11	0.0033	**Yes**
Benzo(g,h,i)perylene	Y	Y	5.13E-05	1.28E-05	0.45	0.11	0.0033	**Yes**
Biphenyl	Y	Y	2.63E-02	2.63E-02	230.01	230.01	-	-
Carbon tetrachloride	Y	Y	4.55E-03	1.14E-03	39.82	9.95	1.9	**Yes**

Toxic Air Contaminant	HAP (Yes/No)	TAC (Yes/No)	Hourly Emissions (100% Digester Gas)		Annual Emissions and Chronic Trigger Level			
			Uncontrolled, lb/hr	Controlled, lb/hr	Uncontrolled, lb/year	Controlled, lb/year	Chronic Trigger Level, lb/year	Chronic Trigger Level Exceeded? (Yes/No)
Chlorobenzene	Y	Y	3.77E-03	3.77E-03	32.98	32.98	39000	No
Chloroethane	N	Y	2.32E-04	2.32E-04	2.03	2.03	1200000	No
Chloroform	Y	Y	3.53E-03	8.82E-04	30.92	7.73	15	No
Chrysene	Y	Y	8.58E-07	2.15E-07	0.01	0.00	0.0033	No
Ethylbenzene	Y	Y	4.92E-03	1.23E-03	43.07	10.77	33	No
Ethylene Dibromide	Y	Y	5.49E-03	1.37E-03	48.06	12.02	1.1	**Yes**
Fluoranthene	Y	Y	1.37E-04	1.37E-04	1.20	1.20	-	-
Fluorene	Y	Y	7.02E-04	7.02E-04	6.15	6.15	-	-
Formaldehyde	Y	Y	6.54E+00	1.64E+00	57,287	14,366	14	**Yes**
Methanol	Y	Y	3.10E-01	3.10E-01	2,712.43	2,712.43	150000	No
Methylene Chloride	Y	Y	2.48E-03	2.48E-03	21.70	21.70	82	No
n-Hexane	Y	Y	1.37E-01	1.37E-01	1,204.32	1,204.32	270000	No
Naphthalene	Y	Y	9.21E-03	2.30E-03	80.72	20.18	2.4	**Yes**
PAH	Y	Y	3.33E-03	8.33E-04	29.19	7.30	0.0033	**Yes**
Phenanthrene	Y	Y	1.29E-03	1.29E-03	11.28	11.28	-	-
Phenol	Y	Y	2.97E-03	7.43E-04	26.04	6.51	7700	No
Pyrene	Y	Y	1.68E-04	1.68E-04	1.48	1.48	-	-
Styrene	Y	Y	2.92E-03	2.92E-03	25.61	25.61	35000	No
Tetrachloroethane	Y	Y	3.07E-04	3.07E-04	2.69	2.69	-	-
Toluene	Y	Y	5.05E-02	5.05E-02	442.67	442.67	12000	No
Vinyl Chloride	Y	Y	1.85E-03	4.61E-04	16.17	4.04	1.1	**Yes**

Toxic Air Contaminant	HAP (Yes/No)	TAC (Yes/No)	Hourly Emissions (100% Digester Gas)		Annual Emissions and Chronic Trigger Level			
			Uncontrolled, lb/hr	Controlled, lb/hr	Uncontrolled, lb/year	Controlled, lb/year	Chronic Trigger Level, lb/year	Chronic Trigger Level Exceeded? (Yes/No)
Xylene	Y	Y	2.28E-02	2.28E-02	199.64	199.64	27000.00	No
Total HAPs, lb/year					**78,329.07**	**27,736.16**	--	--
Total HAPs, ton/year					**39.16**	**13.87**	--	--
Total TACs, lb/year					**93,929.93**	**43,317.82**	--	--
Total TACs, ton/year					**46.96**	**21.66**	--	--

A health risk assessment (HRA) was completed for this application on August 25, 2017. The analysis was conducted based on a stack height of 48.25 ft and a stack diameter of 2.44 ft. The analysis estimated the incremental health risk resulting from TAC emissions from the operation of (4) digester gas/natural gas fired cogeneration engines as proposed. In addition, (4) existing standby generator diesel engines (S-222 through 225) recently permitted under Application #27020 were included in the "Project" as required by Regulations 2-5-216 and 2-5-302.
Results from the HRA indicate that the maximum cancer risk for the project is 6.9 in a million, the chronic hazard index is 0.017, and the acute hazard index is 0.44. In accordance with Regulations 2-5-301 and 302 these are acceptable project risks. However, since the cancer risk is greater than 1.0 in a million, TBACT is required. The oxidation catalyst abatement equipment used for the project meets TBACT.
The facility proposed to change the stack parameters to a release height of 51.25 ft and a diameter of 3.0 ft. The HRA was revised using the new parameters on November 17, 2017. The results of the revised HRA indicate that the maximum cancer risk for the project is 6.7 in a million, the chronic hazard index is 0.07, and the acute hazard index is 0.41. These risk values are acceptable in accordance with Regulations 2-5-301 and 302 and represent minor changes to the previously reported values. They do not change the overall findings of the evaluation.

PLANT CUMULATIVE INCREASE

Contemporaneous On-site Emission Reductions

S-36, S-37, S-38, and S-54 will be decommissioned at the end of a 90-day start-up period and prior to the planned normal operations of the new cogeneration engines. S-5 and S-7 have already been decommissioned. The shutdown of S-5 and S-7 are considered contemporaneous because the shutdown occurred within a five-year period immediately prior to the date of a complete application for an authority to construct permit for the new sources. Actual emissions from the removal of these sources are the basis for the emission reductions. The actual emissions are based on source test results and annual reported throughput for each source to be shut down.
The most recent annual emission totals for the years 2014, 2015, and 2016 were used to estimate the baseline actual emissions from the sources. Actual emissions were calculated based on results from the following source tests, (found in Appendix C):

- Source 5: June 27th, 2014 test conducted by Air Science Technologies, Inc.
- Source 7: August 12th, 2013 test conducted by Air Science Technologies, Inc.
- Source 36: April 30th, 2015 test conducted by BAAQMD (Report No. 15124)
- Source 37: March 7th, 2015 and April 19th, 2016 tests conducted by BAAQMD
- Source 38: January 12th, 2016 test conducted by Air Science Technologies, Inc.
- Source 54: May 31st, 2017 and September 11th, 2015 tests conducted by BAAQMD

Per an email by Elaine Ko, Supervising Air Quality Engineer in the Source Test Division at BAAQMD, dated December 6, 2017, the source tests conducted at the facility by BAAQMD provided incorrect condensable PM results. Therefore, when calculating actual emissions, emission factors from AP-42 Table 3.2-1 and 3.2-2 for condensable PM were used for engines S-5, S-7, S-36, S-37, and S-54.

For S-5 and S-7, PM was not tested for in any source test. Therefore, emissions factors from AP-42 Table 3.2-1 for filterable PM_{10} and $PM_{2.5}$ were also used.
Since there was no Air District approved source test for PM from S-36, the average of PM emission factors from a total of four source tests conducted on S-37 and S-54 was used. The engines are similar in operation and, thus, the emissions resulting from the operation of all three engines will be similar. An emission factor of 0.013 lb PM/MMBtu was used.
The heat content for S-37 in the April 19th, 2016 source test was not correct. It was corrected to 740 Btu/scf based on the heat content and flow rates of digester gas and natural gas into S-37.
The contemporaneous reduction for the shutdown of sources associated with this project is presented in Table 12. The detailed calculations are in Appendix A.

Table 12. Baseline Actual Emissions from Sources to be Shutdown

Source #	Emissions Rate, ton/yr					
	CO	NOx	NMHC	SO2	PM10	PM2.5
S-5	11.674	1.034	2.256	0.416	0.569	0.569
S-7	10.699	1.882	2.358	0.594	0.890	0.890
S-36	27.372	4.883	4.370	1.162	0.665	0.665
S-37	42.402	11.778	3.056	1.914	1.001	1.001
S-38	0.003	0.083	--	0.003	--	--
S-54	29.845	8.776	3.922	1.263	0.635	0.635
Total:	**121.995**	**28.437**	**15.962**	**5.353**	**3.760**	**3.760**

Offsets

Emission offset requirements for POC and NOx are set out in Regulation 2, Rule 2, Section 302. Offsets for POC and NOx are required for new or modified sources at a facility that emits or will be permitted to emit 10 tons per year or more of that pollutant. The offsets requirements for PM_{10}, $PM_{2.5}$, and SOx are specified in Regulation 2, Rule 2, Section 303. Offsets for PM_{10}, $PM_{2.5}$, or SOx are required from facilities that exceed emissions of 100 tons per year. Table 13 presents the cumulative increase from the proposed new equipment. The cumulative increase does not include the exempt cooling towers.

Table 13. Cumulative Increase and Offsets Summary

Pollutant	Existing Facility Emissions, tpy	Application Emissions Increase, tpy	On-Site Emissions Reduction Credit, tpy	Cumulative Increase, tpy	Total Facility Emissions, tpy	Offsets Required?
CO	143.99	166.17	-121.995	44.175	188.165	No
NOx	104.03	23.15	-28.437	-5.287	98.743	No
POC	103.42	22.41	-15.962	6.448	109.868	Yes
PM_{10}	4.715	13.07	-3.760	9.31	14.025	No
$PM_{2.5}$	4.715	13.07	-3.760	9.31	14.025	No
SO_2	7.921	7.19	-5.353	1.837	9.758	No

This project will result in an emissions increase of POC. Therefore, the RWF is required to provide offsets at a ratio of 1.15 to 1.0. The required amount of emission reduction credits

(ERCs) for this application are 7.415 tpy of POC. RWF will provide offsets from Banking Certificates 1463 (2.566 tons), 1545 (0.188 tons), 1598 (0.274 tons), 1617 (2.259 tons), and 1645 (2.135 tons).

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

In accordance with Regulation 2-2-301, best available control technology (BACT) is required for any source that emits more than 10 pounds per highest day of criteria pollutant.

The dual digester gas and natural gas fired lean burn engines, S-67, S-68, S-69, and S-70, will emit more than 10 pounds per day of NOx, CO, POC, PM10, and PM2.5. Therefore, the proposed engines must comply with BACT requirements for each of these pollutants. The control equipment, emission limits, and compliance assurance monitoring procedures required by the current BACT handbook are summarized below. A detailed BACT analysis with proposed BACT limits is presented in Appendix B.

Table 14. District Proposed BACT Requirements for Each Engine

Pollutant	Emission Control Technology	Emission Limit or Concentration Limit	Monitoring Procedure
CO	Oxidation Catalyst [(a)] (Proposed by Applicant, including a Digester Gas Treatment System Upstream of Engines)	Outlet Emissions: ≤ 0.89 g CO/bhp-hr [(b)], averaged over applicable test period	Monthly Testing by Either Approved Source Test Procedures or by Portable Analyzer [(c)] Source Testing every 8,760 hours or 3-years[(d)]
NO_x	Selective Catalytic Reduction (SCR) System [(a)] (Proposed by Applicant, including a Digester Gas Treatment System Upstream of Engines)	Outlet Emissions: ≤ 0.124 g NO_x/bhp-hr [(b)], averaged over applicable test period	Monthly Testing by Either Approved Source Test Procedures or by Portable Analyzer [(c)] Source Testing every 8,760 hours or 3-years[(d)]
POC	Oxidation Catalyst [(a)] (Proposed by Applicant, including a Digester Gas Treatment System Upstream of Engines)	Outlet Emissions: ≤ 0.12 g POC/bhp-hr [(b)], (POC expressed as CH_4) averaged over applicable test period	Source Testing every 8,760 hours or 3-years[(d)]
PM_{10} & $PM_{2.5}$	Digester Gas Treatment System (Iron Sponge and Activated Carbon) (Proposed by Applicant)	Outlet Emissions: ≤ 0.07 g/bhp-hr,	Source Testing every 8,760 hours or 3-years[(d)]

(a) Use of oxidation or SCR catalysts requires a digester gas treatment system be employed to remove siloxane and other contaminants from the digester gas fuel prior to combustion in the engine. The applicant proposed to use a digester gas treatment system for this project and proposed to use both an oxidation catalyst and an SCR system for each engine.

(b) This limit includes use of a BAAQMD approved calculation procedure to convert a measured outlet concentration into units of g/bhp-hr.

(c) Portable analyzer method requires that outlet concentration is measured for at least 15 minutes, see also BAAQMD Regulation 9-8-503. When portable analyzers are used to determine compliance with NO_x and CO BACT limits, the applicant will be allowed to meet a daily average limit calculated based on at least 3 portable analyzer readings conducted at evenly spaced intervals.

(d) Compliance demonstration tests must be conducted in accordance with Source Test (ST) methods provided in the BAAQMD Manual of Procedures or in accordance with equivalent EPA approved test methods. The District is allowing a 3-hour average for the POC limit. Outlet NMOC is assumed to 100% POC.
(e) Final NOx limit is lower than the limit listed in the BACT Workbook. See Appendix B for more detail.

STATEMENT OF COMPLIANCE

Regulation 2, Rule 1 – (CEQA)

This application is not considered to be ministerial under the District's Regulation 2-1-311 and, therefore, is subject to a CEQA review. An Initial Study which resulted in a Mitigated Negative Declaration was prepared for the San Jose-Santa Clara Regional Wastewater Facility (RWF) Cogeneration Project by the City of San Jose (Project No. PP14-005). An Addendum to the San Jose-Santa Clara RWF Cogeneration Project was prepared by the City of San Jose (Project No. PP16-009). The Negative Declaration was certified on May 12, 2016.

Regulation 2, Rule 1: School Public Notice Requirements

The public notification requirements of Regulation 2-1-412 apply to modifications which result in any increase in toxic air contaminant or hazardous air contaminant emissions at facilities within 1,000 feet of the boundary of a K-12 school. The facility is located more than 1,000 feet from the nearest K-12 school and therefore is not subject to the public notification requirements of Regulation 2-1-412.

Regulation 2, Rule 2: Best Available Control Technology (BACT) Requirements

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NOx, CO, SO_2 or PM_{10}.

This project triggered BACT for NOx, CO, POC, PM10, and PM2.5. A complete BACT determination was prepared and can be found in Appendix B. The proposed engines comply with all BACT requirements.

Emission reduction credits were required in accordance with Regulation 2-2-211. Emission reduction credits for this project are real, permanent, quantifiable, and enforceable.

Regulation 2, Rule 2: Prevention of Significant Deterioration (PSD) Requirements:

The PSD requirements in District Regulation 2, Rule 2, Sections 304 and 305 apply to major modifications at a major facility. Wastewater treatment plants are not one of the 28 PSD source categories that are subject to the 100 tons/yr threshold. Therefore, the PSD thresholds for this facility are 250 tons/yr for criteria pollutants. The maximum potential emissions from this site are 221 tons/yr of CO. The PTE for all other criteria pollutants is less than 100 tons/yr for each pollutant. Since the CO PTE does not exceed 250 tons/yr, this site is not currently subject to PSD. As a result, Regulation 2-2-304 and 2-2-305 do not apply.

Regulation 2, Rule 2: NAAQS Protection Requirement

In accordance with Regulation 2-2-227.2, the threshold for determining whether an increase in $PM_{2.5}$ emissions is "significant" is 10 tpy. The proposed project to install four cogeneration engines

and four cooling towers does not result in a "significant" increase in $PM_{2.5}$ emissions. Total $PM_{2.5}$ emissions from the four cogeneration engines plus $PM_{2.5}$ emissions from the four cooling towers is 13.71 tpy. The on-site emissions reduction from the decommissioning of S-5, S-7, S-36, S-37, S-38, and S-54 is 3.76 tpy. The total $PM_{2.5}$ emissions from this project are 9.95 tpy which is below the 10 tpy threshold for the project to be considered "significant."

Regulation 2, Rule 5: Health Risk Assessment Requirements

All TAC emissions from new sources are subject to risk assessment review if emissions of any individual TAC from the project exceed the acute or chronic emission thresholds specified in Table 2-5-1 of Regulation 2, Rule 5. For this project, a HRA was required. Results from the HRA indicated that the maximum cancer risk for the project is 6.7 in a million, the chronic hazard index is 0.07, and the acute hazard index is 0.41. In accordance with Regulations 2-5-301 and 302 these are acceptable project risks. Since the cancer risk is greater than 1.0 in a million, TBACT was required. The oxidation catalyst abatement equipment used for the project meets TBACT.

Regulation 2, Rule 6: Major Facility Review

This rule requires that major and designated facilities apply for a Title V federal operating permit. This facility was determined to be subject to Title V because it has the potential to emit more than 100 tons/yr of carbon monoxide.

The District issued the Title V permit renewal for this facility on March 6, 2017. The Title V operating permit for this site and includes all District revisions approved to date and will expire on March 5, 2022.

The permitting of the sources in this application requires a significant revision of the Title V permit because a BACT determination was made. This will be done in a separate permitting action. According to Regulation 2-6-404.3, the facility must submit an application for a significant permit revision prior to commencing an operation associated with a significant permit revision.

The operation of the new cogeneration engines will produce 13.87 tons per year of HAPs. The largest potential to emit from a single HAP is 1.356 tons per year of methanol. Under the facility's Title V Renewal Application No. 24035, the Air District determined that the facility's total potential to emit for HAPs was 7.25 tons per year and that the emissions of methanol were 0.47 tons per year. With the addition of the new cogeneration engines, the facility will have a potential to emit of less than 25 tons per year for all HAPs and less than 10 tons per year of any single HAP. According to Regulation 2-6-212, a facility is considered a major facility for HAPs only if it has the potential to emit 10 tons per year or more of a single HAP or 25 tons per year or more of a combination of HAPs. Therefore, RWF is not a major facility for HAPs.

Regulation 6, Rule 1: Particulate Matter – General Requirements

Properly operating engines which run on gaseous fuel will have no visible particulate emissions. therefore, the proposed engines are expected to comply with the Regulation 6-1-301 Ringelmann 1.0 limitation.

Each stack is also subject to the Regulation 6-1-310 particulate weight limitation of 0.15 grains/dscf. Compliance with this limit will be determined by initial source testing at each engine and subsequent periodic testing of the engines.

Regulation 9, Rule 1: Sulfur Dioxide

In accordance to Regulation 9-1-301, a person shall not emit from sources, other than ships, SO_2 in quantities which result in ground level concentrations in excess of 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours. In accordance with Regulation 9-1-302, a person shall not emit from any source, a gas stream containing SO_2 in excess of 300 ppm (dry). Permit conditions will require annual source testing and quarterly analyses of the fuel sulfur content to ensure compliance with these limits.

Regulation 9, Rule 2: Inorganic Gaseous Pollutants: Hydrogen Sulfide

This rule limits ground level concentrations of hydrogen sulfide to 0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes. H_2S emissions are expected to be negligible from the new equipment, therefore, ambient concentrations of H_2S are expected to be negligible.

Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary IC Engines

This rule limits the emissions of NOx and CO from stationary internal combustion engines with an output rated by the manufacturer at more than 50 brake horsepower.

Digester gas and blended digester gas/natural gas qualifies as a waste-derived fuel per Regulation 9-8-302. In accordance with Regulation 9-8-302, a person shall not operate a spark-ignited stationary internal combustion engine fired on waste derived fuels or any combination of waste and fossil-derived gaseous fuels and liquid fuels unless the following emission limits are met:

- For lean-burn engines, NOx emissions shall not exceed 70 ppmv as corrected to 15% O_2, dry basis.
- CO emissions shall not exceed 2,000 ppmv as corrected to 15% O_2, dry basis.

Anticipated emissions of NOx and CO from each stationary spark ignited internal combustion engine would be 11 ppmv and 130 ppmv @ 15% O_2, dry basis, respectively. Therefore, the proposed engines will comply with the requirements of Regulation 9, Rule 8. The initial source test and quarterly monitoring required by the permit conditions will satisfy the requirements of Regulation 9-8-501 and 9-8-503, respectively.

New Source Performance Standards (NSPS)

The 40 CFR, Part 60, Subpart JJJJ NSPS for spark-ignition (SI) internal combustion engines (ICE) applies to both engine manufacturers and engine owners. This discussion covers the requirements for owners and operators. Section 60.4230(a)(4)(i) indicates that Subpart JJJJ applies to owners/operators of engines that commence construction after June 12, 2006, where the engine power rating is greater than 500 hp and the engine is manufactured after July 1, 2007. The proposed cogeneration engines meet these criteria. In accordance with 40 CFR Part 60.4233(e), SI ICE meeting the above criteria must comply with the emission limits in Table 1 of Subpart JJJJ. For landfill/digester gas fired engines $\geq$ 500 bhp, the Subpart JJJJ, Table 1 standards below are effective as of 7/1/2010:

Table 15. Proposed Engine Limits Compared to Applicable NSPS Limits

Pollutant	Proposed Engine Limits	NSPS Limits: 40 CFR Part 60, Subpart JJJJ, Table 1	
	g/bhp-hr	g/bhp-hr	ppmv at 15% O2
NOx	0.124	2.0	150
CO	0.89	5.0	610
VOC	0.12	1.0	80

As shown above, the proposed emission limits for the cogeneration engines (S-67, S-68, S-69, and S-70) are well below the applicable NSPS limits.

For the proposed engines, the owner/operator is subject to Section 60.4243(b) and must demonstrate compliance with the Subpart JJJJ, Table 1 limits by complying with 60.4243(b)(2) and using the test procedures in 60.4244. Pursuant to 60.4243(b)(2)(ii), the operator must keep a maintenance plan and records of maintenance conducted. These requirements were added as Condition # 26639, Part 22(d-e). The operator must also conduct initial and subsequent performance tests (every 8,760 hours of operation or every 3 years, whichever comes first). The testing requirements in Condition #26639, Part 17 will satisfy this requirement.

In accordance with 40 CFR 60.4245(a), the operator must maintain records of: all notifications, all maintenance conducted on the engines, and all performances tests. Initial notification is required pursuant to 40 CFR 60.4245(c) and 60.7(a)(1). The record keeping and notification requirements in Condition #26639, Part 22 will satisfy these provisions.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

The biogas engines are not subject to the emission or operating limitations in 40 CFR 63, Subpart ZZZZ, NESHAPs for Stationary Reciprocating Internal Combustion Engines, because they are subject to Subpart JJJ (See 40 CFR 63.6590(c)(1)). The biogas engines comply with Subpart ZZZZ by meeting Subpart JJJJ requirements.

PERMIT CONDITIONS

Permit Condition #26639

Equipment included in this permit condition:

S-67 Cogeneration System #1
S-68 Cogeneration System #2
S-69 Cogeneration System #3
S-70 Cogeneration System #4

A-9 Gas Treatment System - Iron Sponge
A-10 Selective Catalytic Reduction
A-11 Oxidation Catalyst
A-12 Selective Catalytic Reduction
A-13 Oxidation Catalyst
A-14 Selective Catalytic Reduction
A-15 Oxidation Catalyst
A-16 Selective Catalytic Reduction
A-17 Oxidation Catalyst
A-18 Gas Treatment System – Activated Carbon

23. The owner/operator shall fire S-67, S-68, S-69, and S-70 exclusively on digester gas from S-210, Anaerobic Digesters, and/or pipeline quality natural gas. (basis: Cumulative Increase)

24. The owner/operator of S-67, S-68, S-69, and S-70, shall not allow the combined heat input to exceed 1,084,974 million BTU (HHV) during any consecutive 12-month period. (basis: Cumulative Increase)

25. The owner/operator shall provide offsets by shutting down or curtailing S-36, S-37, S-38, and S-54 within 90-days of the need for offsets. (basis: Offsets)

26. The owner/operator shall ensure that all digester gas combusted in S-67, S-68, S-69, and S-70 is treated by A-9 and A-18 prior to combustion. The owner/operator shall not allow the concentration of total sulfur in the gas exiting A-18 to exceed 50 ppm. (basis: Cumulative Increase)

27. The owner/operator shall properly maintain and operate A-9 and A-18 in accordance to the manufacturer's specifications during all periods of operation of S-67, S-68, S-69, and S-70. The owner/operator shall not regenerate A-18 media on site. (basis: Cumulative Increase)

28. The owner/operator shall abate NOx emissions from S-67, S-68, S-69, and S-70 by A-10, A-12, A-14, and A-16, respectively, at all times of operation except during startup and shutdown of S-67, S-68, S-69, and S-70. The owner/operator shall ensure that each SCR catalyst bed is equipped with a temperature monitor and continuous recorder that accurately measures and records the temperature of exhaust gas from the catalyst during all periods of operation. Except during periods of startup or shutdown, the owner/operator shall maintain the exhaust gas temperature within a range of 575 degrees Fahrenheit and 960 degrees Fahrenheit while the engine is in operation. (basis: Cumulative Increase)

29. The owner/operator shall properly maintain and operate A-10, A-12, A-14, and A-16 in accordance to manufacturer's specifications during all periods of operation of S-67, S-68, S-69, and S-70. (basis: BACT)

30. The owner/operator shall abate CO and organic compound emissions from S-67, S-68, S-69, and S-70 by A-11, A-13, A-15, A-17, respectively, at all times of operation except during startup and shutdown of S-67, S-68, S-69, and S-70. (basis: BACT, Regulation 2-5-302)

31. The owner/operator shall properly maintain and operate A-11, A-13, A-15, and A-17 in accordance to manufacturer's specifications during all periods of operation of S-67, S-68, S-69, and S-70. (basis: BACT)

32. The owner/operator shall not allow NOx emissions from each of S-67, S-68, S-69, and S-70 to exceed an emission rate of 0.124 grams of NOx (calculated as NO2) per brake-horsepower-hour, or the equivalent outlet concentration of 11 ppmv of NOx, corrected to 15% oxygen, dry basis, averaged over the test period. The owner/operator shall not allow total NOx emissions from all four engines to exceed 23.15 tons per year. The concentration and grams per brake-horsepower-hour limits do not apply during periods of startup or shutdown. The startup period shall not exceed 2 hours and the shutdown period shall not exceed 1 hour. (basis: Cumulative Increase, BACT)

33. The owner/operator shall not allow CO emissions from each of S-67, S-68, S-69, and S-70 to exceed an emission rate of 0.89 grams of CO per brake-horsepower-hour, or the equivalent outlet concentration of 130 ppmv of CO, corrected to 15% oxygen, dry basis, averaged over the source test period. The owner/operator shall not allow total CO emissions from all four engines to exceed 166.17 tons per year. The concentration and grams per brake-horsepower-hour limits do not apply during periods of startup and shutdown. The startup period shall not exceed 2 hours and the shutdown period may not exceed 1 hour. (Basis: Cumulative Increase, BACT)

34. In order to demonstrate compliance with the limits in Parts 10 and 11, the owner/operator shall use a portable analyzer to take NOx and CO emission readings to verify compliance with Parts 10 and 11 at least once on each engine every 720 hours of engine operation. All emission readings shall be taken with the engine operating at conditions representative of normal operations. NOx emission readings shall be averaged over a consecutive 15-minute period. (Basis: BACT, Cumulative Increase, and Regulation 2-1-403 and 9-8-503)

35. The owner/operator shall not allow PM10 or PM2.5 emissions from each of S-67, S-68, S-69, and S-70 to exceed 0.07 grams of PM10 or PM2.5 per brake-horsepower-hour. The owner/operator shall not allow total PM10 or PM2.5 emissions from all four engines to exceed 13.07 tons per year. This includes condensable and filterable PM. (Basis: Cumulative Increase, BACT)

36. The owner/operator shall not allow a net increase of PM2.5 emissions to exceed 10 tons per year from this project. The project includes the shutdown of S-5, S-7, S-36, S-37, S-38, and S-54; construction of S-67, S-68, S-69, S-70, A-9, A-10, A-11, A-12, A-13, A-14, A-15, A-16, A-17, A-18, and four cooling towers; and may include the following future items: shutdown of S-39 and construction of a new boiler. (Basis: Regulation 2-2-308)

37. The owner/operator shall not allow POC measured as NMOC emissions from each of S-67, S-68, S-69, and S-70 to exceed 0.12 grams of POC per brake-horsepower-hour, or the equivalent outlet concentration of 30.6 ppmv of POC (as methane), corrected to 15% oxygen, dry basis, averaged over the source test period. The owner/operator shall not allow formaldehyde emissions from each of S-67, S-68, S-69, and S-70 to exceed 0.41 pounds per hour. (Basis: Cumulative Increase, BACT)

38. The owner/operator shall not allow the ammonia (NH3) concentration in the exhaust from each of S-67, S-68, S-69, and S-70 to exceed 10 ppmv, corrected to 15% oxygen, dry basis. (Basis: Regulation 2-5-302)

39. Sampling ports shall be installed in the exhaust stack for S-67, S-68, S-69, and S-70 after control in a straight section of piping with at least six (6) diameters clear downstream of any bends, inlets, constriction, flow altering device or change of area or geometry and two (2) diameters upstream of the stack exit or other flow disturbance. The sample ports shall be at least 6" in diameter. The number of sampling ports and platform specifications must be in accordance with BAAQMD document, "Guidelines for Construction of Particulate Sampling and Testing Facilities" The owner/operator must obtain approval from the District's Source Test Section prior to construction. (Basis: MOP Volume IV, Guidelines of Construction of Particulate Sampling and Testing Facilities)

40. In order to demonstrate compliance with Parts 10, 11, and 13 through 16 above and Regulations 9-1-302, 9-8-302.1, 9-8-302.3, the owner/operator shall ensure that a District approved source test is conducted in each engine after startup and once every 8,760 hours of operation or three years, whichever comes first. Each source test shall be conducted at the exhaust stack after control while the engine is operating under normal operating conditions while fired on digester gas or a digester gas and natural gas blend and shall not include startup or shutdown periods. Each source test shall determine all items identified below. The Source Test Section of the District shall be contacted to obtain approval of source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. Source test reports for compliance testing shall be submitted to the Source Test Section within

days of the test date. (Basis: BACT, Cumulative Increase, and Regulations 2-5-302, 9-1-302, 9-8-302.1, and 9-1-302.3)

a. Actual gross electrical output (kW-hrs) from the tested engine(s) during the test period and the calculated power output (bhp) from each engine determined using the following equation: bhp = 1.34 * kW;

b. Total flow rate (standard cubic feet per minute, dry basis, or sdcfm) of all gaseous fuel to the tested engine(s);

c. Concentrations (percent by volume or ppmv, dry basis) of carbon dioxide (CO2), nitrogen (N2), oxygen (O2), methane (CH4), total non-methane organic compounds (NMOC), and total sulfur compounds (TS) in the gaseous fuel burned in the tested engine(s);

d. Higher heating value (BTU/scf) for the biogas;

e. Heat input rate (BTU/hour) to the tested engine(s) averaged over the test period;

f. Exhaust gas flow rate (sdcfm) from the tested engine(s) based on EPA Method 2 or Method 19;

g. Concentrations (ppmv or percent by volume, dry basis) of NOx, CO, CH4, NMOC, SO2, NH3, formaldehyde, and O2 in the exhaust gas from the tested engine(s);

h. Corrected concentrations (ppmv, corrected to 15% O2, dry basis) of CO, NOx, SO2, CH4, and NH3 in the exhaust gas from the tested engine(s);

i. Corrected concentration (ppmv, dry basis) of NMOC in the fuel to the tested engine(s);

j. NMOC destruction efficiency (weight percent) achieved by the tested engine(s);

k. Emission rates (grams/bhp-hour) of NOx, CO, and PM10 from each engine;

l. Emissions (pounds/hour) of PM10 from each engine and the PM10 grain loading rate (grains/dscf) from the tested engine(s). This includes filterable and condensable particulate.

m. Emission rate (pounds/hour) of formaldehyde from the tested engine(s);

n. Average temperature of the SCR catalyst exhaust gas temperature for the tested engine(s) during the test period.

o. During the source test, the owner/operator shall also measure concentrations of NOx, CO, and O2 (ppmv) in the exhaust from the tested engine(s) using the portable analyzer procedures described in Part 12. The portable analyzer measurements of corrected NOx and CO concentrations shall be compared to the values measured pursuant to Part 18h.

41. The owner/operator shall measure and record the flowrate of the biogas and natural gas supplied to the engines on a continuous basis (at least one measurement every 15-minutes) using a District approved method. The flow meters and recorder shall be installed and properly calibrated prior to

any engine operation; this equipment shall be maintained in good working condition. (Basis: Cumulative Increase)

42. To demonstrate compliance with the limit in Part 4, the owner/operator shall monitor and record the sulfur content of the treated digester gas at least once each month. (Basis: Cumulative Increase)

43. The owner/operator shall monitor and record the heat content of the digester gas at least once each month. (Basis: Cumulative Increase)

44. The owner/operator shall maintain the following plans and records on-site for a minimum of 5 years from the date of entry. The plans and records shall be made available to District staff upon request.

    a. Records of heat input to each engine for each calendar month and for each rolling 12-month period. Heat input shall be calculated using District approved procedures based on measured biogas flow rate data and measured biogas methane concentration data. The calculated heat input rates shall be recorded in a data acquisition system or electronic spreadsheet.

    b. Records of all monitoring or source testing conducted to demonstrate compliance with this permit condition and District rules.

    c. An engine maintenance plan.

    d. Records of all maintenance conducted on each engine.

    e. Records of start-ups, shut-downs, and malfunctions for each engine. For any malfunction, the records shall include the cause of the malfunction, the actions taken to correct the malfunction, the date and time that the malfunction was corrected, and the actions taken to prevent such malfunctions in the future.

Permit Condition #17741----------

Permit Condition No. 17741 will be revised to incorporate the new sources evaluated under this application and to remove sources S-5, S-7, S-36, S-37, and S-54. The revision to this permit condition will occur in Application No. 28954, which the facility submitted to the Air District in October of 2017. The changes will be made prior to the operation of S-67, S-68, S-69, or S-70 occurs.

RECOMMENDATION

The District completed the review of the material contained in the permit application for this proposed project and determination that the proposed project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. I recommend that the District issue an Authority to Construct for the following equipment:

S-67 Cogeneration System #1, Caterpillar CG260-16, 4,834 bhp, 31 MM Btu/hr, 4-stroke, lean-burn; fired on treated digester gas and/or natural gas; abated by A-9, A-18, A-10, and A-11
S-68 Cogeneration System #2, Caterpillar CG260-16, 4,834 bhp, 31 MM Btu/hr, 4-stroke, lean-burn; fired on treated digester gas and/or natural gas; abated by A-9, A-18, A-12, and A-13
S-69 Cogeneration System #3, Caterpillar CG260-16, 4,834 bhp, 31 MM Btu/hr, 4-stroke, lean-burn; fired on treated digester gas and/or natural gas; abated by A-9, A-18, A-14, A-15
S-70 Cogeneration System #4, Caterpillar CG260-16, 4,834 bhp, 31 MM Btu/hr, 4-stroke, lean-burn; fired on treated digester gas and/or natural gas; abated by A-9, A-18, A-16, A-17

abated by
A-9 Gas Treatment System - Iron Sponge, abating S-67, S-68, S-69, and S-70
A-18 Gas Treatment System - Activated Carbon, abating S-67, S-68, S-69, and S-70

A-10 Selective Catalytic Reduction, abating S-67
A-11 Oxidation Catalyst, abating S-67

A-12 Selective Catalytic Reduction, abating S-68
A-13 Oxidation Catalyst, abating S-68

A-14 Selective Catalytic Reduction, abating S-69
A-15 Oxidation Catalyst, abating S-69

A-16 Selective Catalytic Reduction, abating S-70
A-17 Oxidation Catalyst, abating S-70

I recommend that the District issue an Exemption for the following equipment:

S-71 Cooling Towers (4)

By: _____ Date: _____

Simrun Dhoot
Air Quality Engineer II

APPENDIX A

Actual Source Emissions

Fuel Information

Parameter	Value
Natural gas higher heating value, Btu/scf	1025
Digester gas higher heating value, Btu/scf	627
Natural gas F-factor, dscf/MMBtu	8710
Digester gas F-factor, dscf/MMBtu	9810

Fuel SO2 Emission Factors

Parameter	Value
Molecular weight, SO2, lb/lb-,ole	64.05
Average sulfur content (digester gas), ppm	222
Average sulfur content (digester gas), lb/MMscf	36.90
AP-42 emission factor (natural gas), lb/MMBtu	0.000588
AP-42 emission factor (natural gas), lb/MMscf	0.60

Historical Hours of Operation

Source	Description	Annual Hours of Operation			
		2014	2015	2016	Average
S-5	Stationary IC Cogen Engine (DG, LG, NG, Diesel)	528	1,745	6,596	2,956
S-7	Stationary IC Cogen Engine (DG, LG, NG, Diesel)	180	3,012	5,719	2,970
S-36	Engine Generator, Cogen Unit (DG, LG, NG, Diesel)	3,899	5,664	1,804	3,789
S-37	Engine Generator, Cogen Unit (DG, LG, NG, Diesel)	6,643	7,079	4,344	6,022
S-38	Boiler, Low NOx (DG, NG)	1,096	1,860	2,348	1,768
S-54	Engine Generator, Cogen (DG, LG, NG, Diesel)	6,643	2,760	3,324	4,242

Historical Fuel Usage

S#	Description	Fuel Usage, kscf/yr									Heat Input		
		2014		2015		2016		Average			Average (MMBtu/yr)		
		Digester Gas	Natural Gas	Digester Gas	Natural Gas	Digester Gas	Natural Gas	Digester Gas	Natural Gas	Total	Digester Gas	Natural Gas	Total
S-5	IC Cogen Engine	2,499	2,323	8,940	8,039	55,793	17,397	22,410.67	9,253.00	31,663.67	14,051.49	9,484.33	23,535.81
S-7	IC Cogen Engine	5,803	3,302	27,541	19,511	62,479	26,400	31,941.00	16,404.33	48,345.33	20,027.01	16,814.44	36,841.45
S-36	Cogen Unit	64,013	66,585	93,713	90,356	28,103	28,626	61,943.00	61,855.67	123,798.67	38,838.26	63,402.06	102,240.32
S-37	Cogen Unit	117,829	105,760	117,830	108,569	71,038	63,225	102,232.33	92,518.00	194,750.33	64,099.67	94,830.95	158,930.62
S-38	Boiler	0	6,739	0	11,837	0	16,097	0.00	11,557.67	11,557.67	0.00	11,846.61	11,846.61
S-54	Cogen Unit	99,446	90,477	43,681	31,774	59,667	34,908	67,598.00	52,386.33	119,984.33	42,383.95	53,695.99	96,079.94

SO2 Emissions

Source #	Average Annual Digester Gas, MMscf	Average Annual Natural Gas, MMscf	SO2 Emission Rate, ton/yr
S-5	22.41	9.25	0.416
S-7	31.94	16.4	0.594
S-36	61.94	61.86	1.162
S-37	102.23	92.52	1.914
S38	0	11.56	0.003
S-54	67.6	52.39	1.263
		Total	5.352

Baseline Emissions for Sources S-5 and S-7

S#	Fuel Usage				Source Test Results			Emissions Rate, lb/kscf			Emissions Rate, lb/kscf		
	Average Total Digester Gas Rate, kscf/yr	Average Total Natural Gas Rate, kscf/yr	Blend Average Higher Heating Value, Btu/scf	Blend Average F-Factor, scf/BTU	CO @ 15% O2, ppmvd	NOx @ 15% O2, ppmvd	NMHC @ 15% O2, ppmvd	CO	NOx	NMHC	CO	NOx	NMHC
S-5	22,410.67	9,253.00	743.31	9,489	406	21.9	137	0.737	0.065	0.142	11.674	1.034	2.256
S-7	31,941.00	16,404.33	762.05	9,437	239	25.6	92	0.443	0.078	0.098	10.699	1.882	2.358

$$Emissions\ Rate, \frac{lb}{kscf} = [Concentration, ppm\ @15\%\ O2\ ] \times [Molecular\ weight\ of\ pollutant] \times \left[\frac{1\ mole}{385.3\ dscf}\right] \times \left[\frac{20.9}{20.9-15}\right] \times [F\ factor, dscf/MMBtu] \times \left[\frac{Fuel\ HHV, Btu/scf}{10^6}\right] \div 10^3$$

Baseline Particulate Matter Emissions for Sources S-5 and S-7

Source #	Average Heat Input, MMBtu/yr	Emission Factor, lb/MMBtu	Emissions Rate, ton/yr
S-5	23,536	0.04831	0.569
S-7	36,841	0.04831	0.890

Baseline Particulate Matter Emissions for Source S-38

Source #	Total usage, kscf/hr	Source Test Data, ppm		Source Test Data, lb/kscf		Emissions Rate, ton/yr	
		CO	NOx	CO	NOx	CO	NOx
38	11,557.69	2.0	6.28	0.0005	0.014	0.003	0.083

$$Emissions\ Rate, \frac{lb}{kscf} = [Concentration, ppm\ @15\%\ O2\ ] \times [Molecular\ weight\ of\ pollutant] \times \left[\frac{1\ mole}{385.3\ dscf}\right] \times \left[\frac{20.9}{20.9-15}\right] \times [F\ factor, dscf/MMBtu] \times \left[\frac{Fuel\ HHV, Btu/scf}{10^6}\right] \div 10^3$$

Baseline Emissions for Sources S-36, S-37, and S-54

Source #	Average Heat Input MMBtu/yr	Emission Factor, lb/MMBtu				Emissions Rate, ton/yr			
		CO	NOx	NMHC	PM	CO	NOx	NMHC	PM
S-36	102,240	0.54	0.096	0.085	0.013	27.372	4.883	4.37	0.665
S-37	158,931	0.534	0.148	0.038	0.013	42.402	11.778	3.056	1.001
S-54	96,080	0.621	0.183	0.082	0.013	29.845	8.776	3.922	0.635

Summary of Offsets from the Shutdown of Emission Sources

Source #	Emissions Rate, ton/yr					
	CO	NOx	NMHC	SO2	PM10	PM2.5
S-5	11.674	1.034	2.256	0.416	0.569	0.569
S-7	10.699	1.882	2.358	0.594	0.890	0.890
S-36	27.372	4.883	4.370	1.162	0.665	0.665
S-37	42.402	11.778	3.056	1.914	1.001	1.001
S-38	0.003	0.083	--	0.003	--	--
S-54	29.845	8.776	3.922	1.263	0.635	0.635
Total:	121.995	28.437	15.962	5.353	3.760	3.760

APPENDIX B

BACT Analysis

Background

BACT is defined in BAAQMD Regulation 2-2-206 as follows:

> **2-2-206BEST AVAILABLE CONTROL TECHNOLOGY (BACT): FOR ANY NEW OR MODIFIED SOURCE, EXCEPT CARGO CARRIERS, THE MORE STRINGENT OF:**
>
> 206.1 The most effective emission control device or technique which has been successfully utilized for the type of equipment comprising such a source; or
>
> 206.2 The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source; or
>
> 206.3 Any emission control device or technique determined to be technologically feasible and cost-effective by the APCO; or
>
> 206.4 The most effective emission control limitation for the type of equipment comprising such a source which the EPA states, prior to or during the public comment period, is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitations are not achievable. Under no circumstances shall the emission control required be less stringent than the emission control required by any applicable provision of federal, state or District laws, rules or regulations.
>
> **THE APCO SHALL PUBLISH AND PERIODICALLY UPDATE A BACT/TBACT WORKBOOK SPECIFYING THE REQUIREMENTS FOR COMMONLY PERMITTED SOURCES. BACT WILL BE DETERMINED FOR A SOURCE BY USING THE WORKBOOK AS A GUIDANCE DOCUMENT OR, ON A CASE-BY-CASE BASIS, USING THE MOST STRINGENT DEFINITION OF THIS SECTION 2-2-206.**

The District's BACT/TBACT Workbook is available on the District's website at: http://hank.baaqmd.gov/pmt/bactworkbook/default.htm.
As discussed in the District's BACT/TBACT Workbook Policy and Implementation Procedure, the District categorizes BACT in two ways:

- BACT(2) Achieved in Practice, and
- BACT(1) Technological Feasible and Cost Effective.

BACT(2) Assessment:
The BACT(2) or "achieved in practice" category is based on the definitions in BAAQMD Regulations 2-2-206.1, 2-2-206.2, and 2-2-206.4. BACT(2) is the most effective emission control *device* already in use or the most stringent emission *limit* achieved in the field for the source type and capacity under review. Controls or limits are considered BACT(2) if the control device performance or emission limit has been verified by source testing or other appropriate documentation approved by BAAQMD or another California air district. BACT(2) cannot be any less stringent than the emission controls or limits required by any applicable federal, state, or District rule.
BACT(1) Assessment:
The BACT(1) or "technologically feasible and cost effective" category is based on all of the definitions in BAAQMD Regulation 2-2-206 including Section 206.3. BACT(1) is a more stringent level of control than BACT(2) and is technology forcing. For this category, the control equipment must be commercially available and cost-effective.

For this source category determination, the District identified an emission limit as a BACT(2) limit if the limit has been verified by source test data and supported by other documentation. As noted above, several biogas-fired engine projects equipped with add-on catalytic emission control systems have been operating for a year or longer. Source test data, or in some cases, CEM data demonstrate that these in-operation projects have been meeting the District's proposed BACT(2) emission limits. (1, 4, 5, 12) In addition, South Coast Air Quality Management District and San Joaquin Valley Air Pollution Control District have adopted rules that will require existing biogas fired IC engines to meet emission levels that are similar to the levels achieved by natural gas fired engines. (11, 14) The District's proposed BACT(2), emission limits for biogas fired engines are based on either the permitted emission levels for these in-operation projects, as verified by source test data, or on the regulatory limits specified in SIP-approved rules of this District or other air districts.

Applicable Emissions Control Technologies

Selective catalytic reduction (SCR) systems and oxidation catalysts have been widely used for many years to control nitrogen oxide (NO_x), carbon monoxide (CO), and precursor organic compounds (POC) emissions from a variety of natural gas fired combustion operations. However, the use of these catalytic abatement systems on digester gas and landfill gas fired internal combustion engines was not feasible in the past, because these gases contain siloxanes and other contaminants that can damage or impair the performance of catalytic abatement systems.

During the last decade, gas pre-treatment systems were developed that can successfully remove these problematic siloxane contaminants from landfill and digester gas. As a result, the District and other air pollution control agencies determined that SCR systems and oxidation catalysts are technologically feasible for engines fired on digester gas or landfill gas that has been treated to remove the siloxanes.

Pollutant-Specific BACT Limits

Permitted emission limits for various biogas energy projects involving biogas fired IC engines were collected and compared to the District's BACT limits (Document #96.2.4 for IC Engine – Biogas Fired), as well as the four proposed cogeneration engines described in this application. The information was gathered from the federal RACT/BACT/LAER Clearinghouse and regulatory or source test information provided by other regional regulatory agencies. A complete BACT analysis was conducted for each of the following criteria pollutants: POC, NO_x, CO, SO_2, PM_{10}, and $PM_{2.5}$.

POC:

Comparison of POC Emission Limits for Biogas Fired IC Engine Projects

Emission Limit Units	grams/bhp-hour	ppmv @ 15% O_2
BAAQMD BACT Guideline		
BACT (1)	0.12	
BACT (2)	0.16	
Relevant Projects and Rules		
SCAQMD Rule 1110.2	0.15	30
SJVAPCD Cambrian Energy Woodville	0.12	
MAS ASB Cogen Facility (Atlanta, GA)	0.12	25
BAAQMD Ameresco HMB (source test)	0.03	5.7

In September 2012, the South Coast Air Quality Management District (SCAQMD) amended SCAQMD Rule 1110.2 Emissions from Gaseous and Liquid-Fueled Engines. SCAQMD added new limits for digester gas (biogas) fired engines that will apply to all existing engines. The new limits include a VOC exhaust concentration limit of 30 ppmvd, measured as carbon and corrected to 15% oxygen dry basis. SCAQMD's definition of VOC is the same as the BAAQMD's definition of POC. Using standard BAAQMD biogas assumptions, SCAQMD's outlet concentration limit converted to g/bhp-hr is 0.16 g/bhp-hr. The Air District's BACT(1) and the proposed engines in this application meet this limit.

San Joaquin Valley Air Pollution Control District (SJVAPCD) permitted biogas-fired engines located at Cambrian Energy Woodville Facility with a VOC emission limit of 0.12 g/bhp-hr. The MAS ASB Cogen facility in Atlanta, GA, source tested engines equipped with oxidation catalysts and firing 100% landfill gas found an average NMOC emission rate of 0.12 g/bhp-hr for the three engines at this site in June 2012.

Ameresco HMB source test data on engines controlled by oxidation catalysts provided emission limits much lower than 0.12 grams/bhp-hr of POC (~ equivalent to 28 ppmv of POC as CH_4 at 15% O_2). However, the District did not use this data to establish BACT(1) limits because of the fact that some recent source tests at Ameresco HMB were inconclusive at demonstrating compliance with the low POC emission levels observed by earlier tests due to high NMOC detection limits. The latter tests results ranged from 22 ppmv to 37 ppmv of POC at 15% O_2.

The Air District proposes to leave BACT(1) and BACT(2) for POC unchanged.

San Jose/Santa Clara RWF provided uncontrolled and controlled POC emissions as part of the application for the four new cogeneration systems. Although the proposed oxidation catalyst is expected to reduce POC emissions, the effect cannot be easily quantified. The expected inlet concentrations of POC are low and therefore, the percentage decrease in POC emission is expected to be modest. The emission factors provided by Caterpillar indicates that uncontrolled POC emissions would equate to approximately 0.16 g/bhp-hr compared to abated emissions of 0.12

g/bhp-hr. These emission factors correspond to an annual reduction of 7.5 tons when the equipment is operated continuously at full capacity.

NOx:

Comparison of NOx Emission Limits for Biogas Fired IC Engine Projects

Emission Limit Units	grams/bhp-hour	ppmv @ 15% O_2
BAAQMD BACT Guideline		
BACT (1)	n/s	
BACT (2)	0.15	
Proposed BACT Limits		
BACT (1)	n/s	
BACT (2)	0.124	11
Relevant Projects and Rules		
SCAQMD Rule 1110.2		11
Orange County Sanitation		11
BAAQMD Ameresco HMB (source test)	0.15	

SCAQMD Rule 1110.2 Emissions from Gaseous and Liquid-Fueled Engines includes new limits for landfill and digester (biogas) fired engines that will apply to all existing engines. The new limits include a NO_x exhaust concentration limit of 11 ppmvd, measured as NO_2 and corrected to 15% oxygen, dry basis.

Orange County Sanitation District operates a 3,471 bhp spark ignition internal combustion engine which operates on a combination of digester and natural gas. The engine is abated by an SCR and catalytic oxidizer and has been in operation since 2010. A source test conducted in 2014 of the engine show that the engine has the ability to meet a NOx limit of 11 ppmv @ 15% O_2, dry basis.

The Ameresco HMB energy plant is located in Half Moon Bay (HMB), CA at the Los Trancos Canyon Landfill on Ox Mountain. This landfill gas energy plant includes one 2677 bhp lean-burn engine that is fired on treated landfill gas and equipped with a selective catalytic reduction (SCR) system to control NO_x emissions and an oxidation catalyst to control CO emissions (Engine 1) and five other 2677 bhp engines that are only equipped with oxidation catalysts (Engines 2-6). The Ameresco HMB Engine 1 has been operating with SCR controls since mid-2009. (1) Four annual source tests demonstrate that this engine met a NO_x emission level of 0.15 g/bhp-hr, averaged over the source testing period.

San Jose/Santa Clara RWF has agreed to meet the 11 ppm limit for NOx for the four 4,834 bhp cogeneration engines proposed in this application. As a result of this project and information provided above, the Air District proposes a limit of 0.124 g/bhp-hr as BACT(2) for NOx.

CO:

Comparison of CO Emission Limits for Biogas Fired IC Engine Projects

Emission Limit Units:	grams / bhp-hour	ppmv as CO @ 15% O_2
BAAQMD BACT Guideline		
Proposed BAAQMD BACT(1)	0.89	120
Proposed BAAQMD BACT(2)	1.80	191
Relevant Projects and Rules		
BAAQMD Zero Waste Energy (App 24388)	0.89	124
BAAQMD Ameresco HMB (source tests, max)	0.96	
BAAQMD Potrero Hills (App 23333)	1.20	127
SJVAPCD Fiscalini Farms and Dairy	1.75	
BAAQMD Ameresco HMB (App 12649)	1.80	191
MAS ASB Cogen , LLC CHP Facility (max limits)	2.00	270
SJVAPCD Cambrian Energy Woodville	2.14	
SCAQMD Rule 1110.2	2.36	250
Santa Barbara APCD Santa Maria Landfill	2.50	308

Oxidation catalyst may be used to control CO emissions from biogas fired engines, if the biogas has low contaminant levels or has been treated to remove the siloxanes and sulfur compounds. Several biogas fired engine projects have successfully met low CO emission levels using oxidation catalysts.

The SCAQMD Rule 1110.2 limits CO emissions from landfill and digester gas fired engines 250 ppmv at 15% O_2, which is equivalent to 2.36 g/bhp-hr based on BAAQMD landfill gas data. Therefore, the BACT(2) CO emission level should not be any less stringent than this emission level.

However, the Ameresco HMB project demonstrates that landfill gas fired engines equipped with oxidation catalysts can meet the lower CO emission limit of 1.8 g/bhp-hr on a consistent basis. This landfill gas energy plant includes six 2677 bhp lean-burn engines fired on treated landfill gas. Each engine is equipped with an oxidation catalyst. The engines have been operating since mid-2009. (1) Four annual source tests have been completed at this facility, which included tests on each engine each year. For these annual tests, CO emissions ranged from 0.13 g/bhp-hr to 0.96 g/bhp-hr. Due to the variability in test results, the Air District will not require 0.13 g/bhp-hr as BACT(2).

For the BAAQMD Zero Waste Energy project, the District issued a CO emission limit of 0.89 g/bhp-hr for the three 1108 bhp lean-burn engines based on the engine manufacturer's CO emissions data and the expected CO control efficiency of 64.4% provided by the oxidation catalyst manufacturer. Since this emission limit has not yet been demonstrated, this limit is identified as a BACT(1) limit.

The Air District proposes to leave BACT(1) and BACT(2) for CO unchanged.

San Jose/Santa Clara RWF has proposed a limit of 0.89 g/bhp-hr or 130 ppm @ 15% O_2. This will comply with BACT.

$PM_{10}/PM_{2.5}$ Limits:

Comparison of PM10/PM2.5 Emission Limits for Biogas Fired IC Engine Projects

Emission Limit Units:	grams / bhp-hour	grains/sdcf
BAAQMD BACT Guideline		
BAAQMD BACT(1)	0.07	0.014
BAAQMD BACT(2)	0.10	0.023
Relevant Projects and Rules		
BAAQMD Potrero Hills (App 23333)	0.07	0.014
BAAQMD Zero Waste Energy (App 24388)	0.10	0.024
BAAQMD Ameresco HMB (App 12649)	0.10	0.023
AP-42 (Chapter 2.4, Table 2.4-5, 11/98)	0.18	0.035

Biogas has low particulate levels, and combustion of biogas results in particulate emissions that are similar to natural gas combustion operations. For both natural gas and biogas combustion in IC engines, particulate emissions are minimized by treating the fuel gas using standard filtration and condensation steps.

The particulate emission calculations for several biogas fired engine projects permitted in the District have been based on engine manufacturer guarantees of 0.1 g/bhp-hr of PM_{10} and $PM_{2.5}$. In addition, the federal RACT/BACT/LAER Clearinghouse cites this 0.1 g/bhp-hr PM_{10} level (or an equivalent pound/hour emission rate) as BACT limits for the following projects: NH-0014 (two 1600 kW landfill gas fired engines at University of New Hampshire) and OH-0348 (ten 2233 bhp landfill gas fired engines at Loraine County LFG Power Station).

The Potrero Hills Energy Producers, LLC accepted a PM_{10} limit of 0.07 g/bhp-hr for each of their treated landfill gas fired engines. Potrero Hills Energy Producers, LLC has demonstrated through source test data demonstrates that this limit is feasible. Source test data for Ameresco HMB for total particulate emissions has also demonstrated that this limit is being achieved in practice.

San Jose/Santa Clara RWF has proposed a gas treatment system which would include activated carbon to remove siloxanes from the digester gas. This would result in reduced $PM_{10/2.5}$ emissions, as well. The facility has proposed to meet a 0.07 g/bhp-hr limit for $PM_{10/2.5.}$

The Air District proposes a limit of 0.07 g/bhp-hr as BACT(2) for $PM_{10/2.5}$. Emissions reduction and cost information will be gathered from multiple vendors to determine if BACT(1) needs revision.

APPENDIX C

Source Tests

APPENDIX G

ENGINEERING EVALUATION APPLICATION 28811

Engineering Evaluation
San Jose - Santa Clara Regional Wastewater Facility
Application No. 28811
Plant No. 778

BACKGROUND

San Jose - Santa Clara Regional Wastewater Facility (RWF) has applied for an Authority to Construct and/or Permit to Operate for the following source:

S-71 Enclosed Paint Booth with Natural Gas Heater, abated by A-5 Paint Arrestors, 18,000 cfm

And, consequently, for a change in permit conditions for the following:

S-15 Paint Spray Booth

The equipment will be located at 700 Los Esteros Road, San Jose, CA 95134.

RWF as applied for a replacement for an existing paint booth (S-16). The new paint booth will serve the same function as the existing equipment. A change in throughput or total usage is not anticipated.

The existing paint booth (S-16) is used for painting miscellaneous equipment such as metal pipes and pipe fittings. It has reached the end of its useful life and will be replaced. The new paint booth will serve the same function as the existing equipment. Exhaust fans will induce an estimated airflow of up to 18,000 cfm through the booth. Overspray entrained in the outlet air stream will be captured by the fiberglass paint arrestors (A-5). A-5 has a capture efficiency of 98%. The new paint booth will include an integrated natural gas heater to supply hot air to the internal chamber to facilitate drying and curing the paint.

The replacement paint booth will not result in increased usage of paint, primer, or clean-up solvent. The new paint booth includes a natural gas fired heater to speed up drying. The dryer will have a heat input capacity of 1.075 MMBtu/hr and will be fueled exclusively by natural gas.

The existing paint booth (S-16) and a smaller paint booth (S-15) are subject to Condition No. 17737. This condition contains usage limits of 50 gallons each for paint, primer, MEK, and mineral spirits of 50 gallons per year each at each of the paint booths. S-71 will be subject to the same limits.

The natural gas heater used to speed up drying will be included as part of the surface coating process, per policy, Permitting of Surface Coating Curing Ovens. The natural gas heater does not exceed the exemption thresholds of Regulation 2-1-114.1.2 since it is a heater with a rated heat input of less than 10 MMBtu/hr and fired exclusively on natural gas. Emissions from the heater will be accounted for on the surface coating S-form. Combustion emissions from the heater will be included as part of the combined source's emissions.

S-71 will be subject to condition no. 17737.

EMISSIONS CALCULATIONS

Yearly VOC emissions are calculated based on the VOC content of each coating material and the proposed throughputs provided in gallons per year. Daily VOC emissions are calculated using the proposed operating schedule of 8 hours/day, 5 days/week, and 52 weeks/yr.

Table 1. VOC emissions from S-71

Material	Density lb/gal	VOC Content Fraction	Quantity Used gal/yr	VOC Emissions lb/yr	VOC emissions lb/day
Paint (Imron)	9.81	0.23	100	225.63	0.9
Primer (Corlar)	14	0.15	100	210	0.8
MEK (cleanup solvent)	6.7	1	100	670	2.6
Mineral Spirits (cleanup solvent)	6.58	1	100	658	2.5
Total				1763.63	6.8

Emissions from natural gas combustion from the operation of the heater can be found in Table 2. The emission factors of PM, VOC, and SO2 were taken from AP-42 Table 1.4-2. The emission factors for NOx and CO were taken from AP-42, Table 1.4-1 for Residential Furnaces. The heat input value is 1.075 MMBtu/hr or 0.001061 MMscf/hr.

Table 2. Natural Gas Combustion

Pollutant	Emissions Factor lb/MMscf	Potential Emissions lb/hr	Potential Emissions lb/day	Potential Emissions tons/yr
PM_{10}	7.6	0.008	0.065	0.008
$PM_{2.5}$	7.6	0.008	0.065	0.008
NOx	94	0.100	0.798	0.104
VOC	5.5	0.006	0.047	0.006
SO2	0.6	0.001	0.005	0.001
CO	40	0.042	0.340	0.044

PLANT CUMULATIVE EMISSIONS

S-71 is located at an existing facility. Therefore, there are existing emissions at this plant. The existing emissions were calculated in Application 28651. Table 3 summarizes the cumulative increase in emissions that will result from the operation of S-71.

Table 3. Cumulative increase in tons/year

Pollutant	Existing Facility Emissions, tpy	Existing Emissions from S-16 to be Removed	New Emissions from S-72	Net Increase
PM_{10}	4.715		0.008	0.008
$PM_{2.5}$	4.715		0.008	0.008
NOx	104.03		0.104	0.104
VOC	130.42	0.882	0.888*	0.006
SO2	7.921		0.001	0.001
CO	143.99		0.044	0.044

*sum of VOC emissions from spray booth and natural gas heater emissions

TOXIC RISK SCREENING ANALYSIS

Toxic air contaminant (TAC) emissions are determined based on the requested maximum throughput levels and the highest weight percent of the TAC components in the provided Material Safety Data Sheet (MSDS). A worst-case scenario was considered and it was assumed that all is emitted. A modest transfer efficiency of 50% was used with a control efficiency of 98% by A-5, Paint Arrestors. The estimated TAC emissions associated with the operation are below with their associated risk screening triggers as set forth in Regulations 2-5:

Table 4. Annual and hourly TAC emissions from S-1

Corlar (primer)	Hourly Emissions (lb/hr)	Acute Trigger Level (lb/hr)	Yearly Emissions (lb/yr)	Chronic Trigger Level (lb/yr)
Quartz-Crystalline Silica	3.84E-06	none	0.001	120.0
Solvent				
Methyl Ethyl Ketone (MEK)	2.6	29.0	670	none

Since no trigger levels are exceeded, a health risk screening analysis is not required.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NOx, CO, SO_2 or PM_{10}.

Based on the emission displayed above, BACT is not triggered for any pollutant since the maximum daily emission of each pollutant does not exceed 10 lbs/day.

OFFSETS

Per Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that has the potential to emit more than 10 tons/yr of POC or NOx. Per Regulation 2-2-303, offsets must be provided for any new or modified source at a facility that has the potential to emit more than 100 tons/yr of $PM_{2.5}$, PM_{10}, or SO_2.

Actual emissions show that the facility emits 104.03 tons/year of NOx and 103.42 tons/year of POC. Since this is more than 35 tons/year, the facility will have to provide offsets at a ratio of 1.15:1. The facility emits fewer than 100 tons/year of $PM_{2.5}$, PM_{10}, and SO_2 and will not need to provide offsets for these pollutants.

The facility will provide 0.120 tons/year of NOx offsets and 0.007 tons/year in POC offsets from Banking Certificate #1545.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

S-71 is not defined as affected by any Subpart of 40 CFR Part 60.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

NESHAPS 40 CFR Part 63 Subpart MMMM (National Emission Standards for Hazardous Air Pollutants: Surface Preparation and Coating of Miscellaneous Metal Parts and Products) does not apply to this operation because the operation uses fewer than 50 gallons of coating per year.

NESHAPS 40 CFR Part 63 Subpart HHHHHH (National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources) does not apply to this operation because

methylene chloride (MeCL), chromium (Cr), lead (Pb), manganese (Mn), nickel (Ni), or cadmium (Cd) are not used. Also, S-71 is not used to apply coatings for autobody refinishing operations.

STATEMENT OF COMPLIANCE

The owner and operator of S-71 is subject to the Air District's Regulation 8-19 (Surface Preparation and Coating of Miscellaneous Metal Parts and Products). S-71 is subject to and expected to comply with the VOC limits of 8-19-302 since the coatings have a VOC content of less than 2.3 lb/gal. S-71 complies with Regulation 8-19-308 since the manufacturer provided a MSDS with VOC contents expressed in lb/gal. S-71 is expected to comply with the VOC content limits of 8-19-312 since all coatings will have a VOC content of less than 3.0 lb/gal. S-71 complies with 8-18-313 by using a high volume, low pressure spray. Regulation 8-19-320 does not apply since S-71 will be abated by equipment with a capture efficiency of 98%. S-71 is expected to comply with the surface preparation standards of Regulation 8-19-321.

The project is considered to be ministerial under the District's CEQA Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 5.1) Sine the RWF is on the Air District's High Public Interest Facility List, a Notice of Exemption has been filed with the Santa Clara County Clerk's Office.

The facility is located more than 1,000 feet from the nearest K-12 school and therefore is not subject to the public notification requirements of Regulation 2-1-412.

PSD does not apply.

PERMIT CONDITIONS

COND# 17737 ----------

For S-15, Paint Spray Booth
S-71~~16~~, Enclosed Paint Booth with Natural Gas Heater abated by A-5 Paint Arrestors~~Paint Staging Building~~

1) The total amount of paint and primer coatings used at S-15 and S-71~~16~~ shall not exceed the following limits during any consecutive twelve month period. (Basis: Cumulative Increase)

S-15: 50 gal paint, 50 gal primer
S-71~~16~~: 50 gal paint, 50 gal primer

2) The net amount of clean-up solvent used at S-15 and S-71~~16~~ shall not exceed the following limits during any consecutive twelve-month period. (Basis: Cumulative Increase)

S-15: 50 gal MEK, 50 gal Mineral Spirits
S-71~~16~~: 50 gal MEK, 50 gal Mineral Spirits

3) The owner/operator of S-71 shall ensure that all emissions from S-71 shall be abated at all times of operation by A-5, Paint Arrestors. A-5 shall be rated at 98% control. (Basis: Cumulative Increase)

4) No methylene chloride (MeCL), chromium (Cr), lead (Pb), manganese (Mn), nickel (Ni), or cadmium (Cd) will be used in S-15 or S-71. (Basis: 40 CFR 63 Subpart HHHHHH)

5~~3~~) To demonstrate compliance with the above conditions, the operator shall maintain the following records in a District-approved log (Basis: Regulation 2-6-409.2):

a. Total daily coating usage at S-15 and S-71~~16~~.
b. Net daily clean-up solvent usage at S-15 and S-71~~16~~.
c. Cumulative monthly totals of the above daily usage rates, in gallons per month.

These records shall be kept on-site and made available for District inspection for a period of five years from the date on which a record is made.

End of Conditions

RECOMMENDATION

Issue Authority to Construct to RWF for the following source:

S-71 Enclosed Paint Booth with Natural Gas Heater, abated by A-5 Paint Arrestors, 18,000 cfm

And a change in permit conditions for the following source:

S-15 Paint Spray Booth

By: _____ Date: _____

Simrun Dhoot
Air Quality Engineer II

APPENDIX H

ENGINEERING EVALUATION APPLICATION 29724

Engineering Evaluation
San Jose-Santa Clara Regional Wastewater Facility
700 Los Esteros Road, San Jose, California 95134
Plant No. 778 (Site No. A0778)
Application No. 29724
Project Description: Two (2) New Dual Fueled Digester Gas/Natural Gas Boilers

BACKGROUND

San Jose-Santa Clara Regional Wastewater Facility (RWF) has applied to obtain an Authority to Construct (A/C) and Permit to Operate (P/O) for the following equipment:

S-72 Dual Fueled Digester Gas/Natural Gas Boiler, #1
Cleaver-Brooks Model CBLE 700-350-125HW Firetube Boiler
Maximum Digester Gas Input Heat Capacity: 15.045 MMBtu/Hr
Maximum Natural Gas Input Heat Capacity: 14.996 MMBtu/Hr
Digester Gas Fuel Abated by Iron Sponge Gas Treatment System, A-9; and, Activated Carbon Gas Treatment System, A-18

S-73 Dual Fueled Digester Gas/Natural Gas Boiler, #2
Cleaver-Brooks Model CBLE 700-350-125HW Firetube Boiler
Maximum Digester Gas Input Heat Capacity: 15.045 MMBtu/Hr
Maximum Natural Gas Input Heat Capacity: 14.996 MMBtu/Hr
Digester Gas Fuel Abated by Iron Sponge Gas Treatment System, A-9; and, Activated Carbon Gas Treatment System, A-18

The dual fueled digester gas/natural gas boilers (S-72 and S-73) will operate at 700 Los Esteros Road in San Jose, California. S-72 and S-73 will be used to provide supplemental heat to the facility's anaerobic digesters in the event that the permitted cogeneration engines (S-67 through S-70) cannot provide enough heat due to maintenance, breakdowns, or other unforeseen circumstance. S-72 and S-73 will primarily be fired on treated digester gas; with natural gas as a backup. The treated digester gas will derive from the facility's gas treatment system (A-9 and A-18). A-9 and A-18 are expected to reduce hydrogen sulfide (H_2S), particulate matter 10 microns in size (PM_{10}), and particulate matter 2.5 microns in size ($PM_{2.5}$).

Furthermore, RWF has previously accepted a 10 ton/yr $PM_{2.5}$ project limit within Part 14 of New Source Review (NSR) Permit Condition #26639 to avoid the National Ambient Air Quality Standard (NAAQS) Protection Requirement provisions of Regulation 2-2-308. RWF would like to retain the limit within Part 14 of NSR Permit Condition #26639 and has accepted to include S-72 and S-73 into Part 14 of the condition.

RWF's operation is not one of the 28 categories listed in Section 169(1) of the federal Clean Air Act. Furthermore, RWF will emit below 250 ton/yr of any regulated NSR pollutant as defined in Title 40 of the Code of Federal Regulations (CFR) Section 52.21(b)(50). Pursuant to Regulation 2-2-224, RWF is not defined as a Prevention of Significant Deterioration (PSD) Project. Therefore, the requirements of Regulations 2-2-304 through 2-2-307 do not apply to this application.

The criteria pollutants associated with S-72 and S-73 are nitrogen oxides (NO_X), precursor organic compounds (POC), PM_{10}, $PM_{2.5}$, sulfur dioxide (SO_2), and carbon monoxide (CO).

EMISSION CALCULATIONS

The applicant has provided the following information for S-72 and S-73, which was either supplied by the manufacturer or obtained from the facility using expert knowledge of the operation. The facility has accepted a 50 ppmv hydrogen sulfide (H_2S) fuel content limitation for the digester gas. It is assumed that S-72 and S-73 will achieve a 98% destruction efficiency of H_2S. Potential to emit (PTE) emission rate calculations are based on the provided information. Annual emission rates are based on the maximum capacity of the equipment, assuming an operating schedule of 8,760 hours per year.

Table 1. Boiler Specifications for S-72 and S-73

Boiler Manufacturer	Cleaver-Brooks
Boiler Model	CBLE 700-350-125HW
Boiler Type	Hot Water Firetube
Natural Gas Combustion Rated Capacity [1] (MMBtu/hr)	14.996
Digester Gas Combustion Rated Capacity [1] (MMBtu/hr)	15.045
Digester Gas F_d Factor [1] (dscf/MMBtu)	9,800
Digester Gas Heat Content [1] (Btu/scf)	610

[1] Information obtained from the specifications provided by the manufacturer.

Table 2. Criteria Pollutant Emission Factors for Boilers S-72 and S-73

Fuel Type	Pollutant	Emission Factor (ppmv@3% O_2)	Emission Factor (lb/MMscf)	Basis
Natural Gas	NO_X	9	--	Manufacturer [1]
	POC	--	5.5	AP-42 [2,3]
	PM_{10}	--	7.6	AP-42 [2]
	$PM_{2.5}$	--	7.6	AP-42 [2]
	SO_2	--	0.6	AP-42 [2]
	CO	50	--	Manufacturer [1]
Digester Gas	NO_X	20	--	Manufacturer [1]
	POC	30	--	Applicant [4]
	PM_{10}	--	16.7	Limit [5]
	$PM_{2.5}$	--	16.7	Limit [5]
	SO_2	--	8.14	H_2S Limit [6]
	CO	50	--	Manufacturer [1]

[1] Information obtained from the specifications provided by the manufacturer.

[2] Emission factors obtained from Table 1.4-2 of AP-42 Chapter 1.4 for Natural Gas Combustion.

[3] The emission factor obtained from AP-42 Chapter 1.4 for Natural Gas Combustion is for volatile organic compounds (VOC). It is assumed that VOC is equivalent to POC.

[4] The applicant has requested for POC volumetric concentration limit of 30 ppmv @ 3% O_2 while consuming digester gas.

[5] The applicant has requested for a daily emission limit less than 10 lb/day (reviewed at 9.9 lb/day) in order to avoid BACT. The emission factor is presumed to be in compliance with the requested limit.

[6] The SO_2 emission factor is based on a 50 ppmv hydrogen sulfide fuel content of the digester gas. In addition, it is assumed that S-72 and S-73 will achieve a 98% destruction efficiency of H_2S.

The following tables provide a summary of the criteria pollutant PTE emission rates of S-72 and S-73.

Table 3. Criteria Pollutant Potential to Emit Emissions for Each Boiler

Pollutant	Hourly Emission Rate[1] (lb/hr)	Daily Emission Rate[1] (lb/day)	Annual Emission Rate[1] (lb/yr)	Annual Emission Rate[1] (ton/yr)
NO_X[2]	0.41	9.86	3,598.12	1.799
POC[2]	0.21	5.16	1,882.12	0.941
PM_{10}[2]	0.41	9.90	3,613.50	1.807
$PM_{2.5}$[2]	0.41	9.90	3,613.50	1.807
SO_2[2]	0.20	4.82	1,759.98	0.880
CO[2]	0.63	**15.00**	5,476.76	2.738

[1] The emission rates are for each boiler reviewed in this application.

[2] The emission rate is based on digester gas combustion, which is the higher value of the two fuels consumed.

Except for H_2S, toxic air contaminant (TAC) emission factors were obtained from Table 1.4 of the Environmental Protection Agency (EPA) AP-42 Chapter 1.4 *"Natural Gas Combustion"* (AP-42). The following tables provide the TAC emission rates from S-72 and S-73. For further information, please reference Appendix A – *"Emissions Review for New Source Review Application No. 29724"* (Appendix A).

Table 4. New Boiler Toxic Air Contaminant Hourly Emission Rate

Pollutant	CAS#	S-72 Hourly Emission Rate (lb/hr)	S-73 Hourly Emission Rate (lb/hr)
Benzene	71-43-2	5.2E-05	5.2E-05
Formaldehyde	50-00-0	1.8E-03	1.8E-03
Hexane	110-54-3	4.4E-02	4.4E-02
Naphthalene	91-20-3	1.5E-05	1.5E-05
Toluene	108-88-3	8.4E-05	8.4E-05
Polycyclic Aromatic Hydrocarbons	N/A	2.6E-05	2.6E-05
Arsenic	7440-38-2	4.9E-06	4.9E-06
Beryllium	7440-41-7	3.0E-07	3.0E-07
Cadmium	7440-43-9	2.7E-05	2.7E-05
Copper	7440-50-8	2.1E-05	2.1E-05
Hydrogen Sulfide	7783-06-4	2.2E-03	2.2E-03
Lead Compounds	7439-92-1	1.2E-05	1.2E-05
Manganese	7439-96-5	9.4E-06	9.4E-06
Mercury	7439-97-6	6.4E-06	6.4E-06
Nickel	7440-02-0	5.2E-05	5.2E-05
Selenium	7782-49-2	5.9E-07	5.9E-07

Table 5. New Boiler Toxic Air Contaminant Annual Emission Rate

Pollutant	CAS#	S-72 Annual Emission Rate (lb/yr)	S-73 Annual Emission Rate (lb/yr)
Benzene	71-43-2	4.5E-01	4.5E-01
Formaldehyde	50-00-0	1.6E+01	1.6E+01
Hexane	110-54-3	3.9E+02	3.9E+02
Naphthalene	91-20-3	1.3E-01	1.3E-01
Toluene	108-88-3	7.3E-01	7.3E-01
Polycyclic Aromatic Hydrocarbons	N/A	2.2E-01	2.2E-01
Arsenic	7440-38-2	4.3E-02	4.3E-02
Beryllium	7440-41-7	2.6E-03	2.6E-03
Cadmium	7440-43-9	2.4E-01	2.4E-01
Copper	7440-50-8	1.8E-01	1.8E-01
Hydrogen Sulfide	7783-06-4	1.9E+01	1.9E+01
Lead Compounds	7439-92-1	1.1E-01	1.1E-01
Manganese	7439-96-5	8.2E-02	8.2E-02
Mercury	7439-97-6	5.6E-02	5.6E-02
Nickel	7440-02-0	4.5E-01	4.5E-01
Selenium	7782-49-2	5.2E-03	5.2E-03

For the purposes of Regulation 2-5, a project includes TAC emissions from all new or modified sources permitted within a 3-year period. NSR Applications #28651 and #28811 were submitted May 15, 2017 and August 1, 2017, respectively. NSR Application #28651 was submitted for the installation of four (4) cogeneration engines. NSR Application #28811 was submitted for a new coating operation and for an alteration to an existing coating operation. The project TAC emissions will include TAC emission increases from the cogeneration engines and the new coating operation. The following tables provide a summary of the project TAC emissions.

Table 6. Toxic Air Contaminant Acute Summary

Pollutant (CAS #)	CAS #	Application #28651	Application #28811	Application #29724	Project Total

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
1,1,2,2-Tetrachloroethane	79-34-5	1.2E-03	--	--	1.2E-03
1,1,2-Trichloroethane	79-00-5	9.9E-04	--	--	9.9E-04
1,1-Dichloroethane	75-34-3	2.9E-03	--	--	2.9E-03
1,2-Dichloroethane	107-06-2	7.3E-04	--	--	7.3E-04
1,3-Butadiene	106-99-0	8.3E-03	--	--	8.3E-03
Acetaldehyde	75-07-0	2.6E-01	--	--	2.6E-01
Acrolein	107-02-8	6.4E-01	--	--	6.4E-01
Ammonia	7664-41-7	1.8E+00	--	--	1.8E+00
Arsenic	7440-38-2	--	--	9.9E-06	9.9E-06
Benzene	71-43-2	1.4E-02	2.2E-06	1.0E-04	1.4E-02
Beryllium	7440-41-7	--	--	5.9E-07	5.9E-07
Cadmium	7440-43-9	--	--	5.4E-05	5.4E-05
Carbon Tetrachloride	56-23-5	1.1E-03	--	--	1.1E-03
Chlorobenzene	108-90-7	3.8E-03	--	--	3.8E-03
Chloroethane	75-00-3	2.3E-04	--	--	2.3E-04
Chloroform	67-66-3	8.8E-04	--	--	8.8E-04
Copper	7440-50-8	--	--	4.2E-05	4.2E-05
Ethylbenzene	100-41-4	1.2E-03	--	--	1.2E-03
Ethylene Dibromide	106-93-4	1.4E-03	--	--	1.4E-03
Formaldehyde	50-00-0	1.6E+00	7.9E-05	3.7E-03	1.6E+00
Hydrogen Sulfide	7783-06-4	--	--	4.4E-03	4.4E-03
Lead Compounds	7439-92-1	--	--	2.5E-05	2.5E-05
Manganese	7439-96-5	--	--	1.9E-05	1.9E-05
Mercury	7439-97-6	--	--	1.3E-05	1.3E-05
Methanol	67-56-1	3.1E-01	--	--	3.1E-01
Methylene Chloride	75-09-2	2.5E-03	--	--	2.5E-03
Methyl Ethyl Ketone (MEK)	78-93-3	--	2.6E+00	--	2.6E+00
n-Hexane	110-54-3	1.4E-01	--	8.9E-02	2.3E-01
Naphthalene	91-20-3	2.3E-03	--	3.0E-05	2.3E-03
Nickel	7440-02-0	--	--	1.0E-04	1.0E-04
Phenol	108-95-2	7.4E-04	--	--	7.4E-04
Polycyclic Aromatic Hydrocarbon	N/A	8.3E-04	--	5.1E-05	8.8E-04
Selenium	7782-49-2	--	--	1.2E-06	1.2E-06
Silica (Crystalline, Respirable)	7631-86-9	--	3.8E-06	--	3.8E-06
Styrene	100-42-5	2.9E-03	--	--	2.9E-03
Toluene	108-88-3	5.1E-02	3.6E-06	1.7E-04	5.1E-02
Vinyl Chloride	75-01-4	4.6E-04	--	--	4.6E-04
Xylene	1330-20-7	2.3E-02	--	--	2.3E-02

Table 7. Toxic Air Contaminant Chronic Summary

Pollutant (CAS #)	CAS #	Application #28651 (lb/yr)	Application #28811 (lb/yr)	Application #29724 (lb/yr)	Project Total (lb/yr)
1,1,2,2-Tetrachloroethane	79-34-5	1.1E+01	--	--	1.1E+01
1,1,2-Trichloroethane	79-00-5	8.6E+00	--	--	8.6E+00
1,1-Dichloroethane	75-34-3	2.6E+01	--	--	2.6E+01
1,2-Dichloroethane	107-06-2	6.4E+00	--	--	6.4E+00

1,3-Butadiene	106-99-0	7.2E+01	--	--	7.2E+01
Acetaldehyde	75-07-0	2.3E+03	--	--	2.3E+03
Acrolein	107-02-8	5.6E+03	--	--	5.6E+03
Ammonia	7664-41-7	1.6E+04	--	--	1.6E+04
Arsenic	7440-38-2	--	--	8.6E-02	8.6E-02
Benzene	71-43-2	1.2E+02	1.9E-02	9.1E-01	1.2E+02
Beryllium	7440-41-7	--	--	5.2E-03	5.2E-03
Cadmium	7440-43-9	--	--	4.8E-01	4.8E-01
Carbon Tetrachloride	56-23-5	1.0E+01	--	--	1.0E+01
Chlorobenzene	108-90-7	3.3E+01	--	--	3.3E+01
Chloroethane	75-00-3	2.0E+00	--	--	2.0E+00
Chloroform	67-66-3	7.7E+00	--	--	7.7E+00
Copper	7440-50-8	--	--	3.7E-01	3.7E-01
Ethylbenzene	100-41-4	1.1E+01	--	--	1.1E+01
Ethylene Dibromide	106-93-4	1.2E+01	--	--	1.2E+01
Formaldehyde	50-00-0	1.4E+04	6.9E-01	3.2E+01	1.4E+04
Hydrogen Sulfide	7783-06-4	--	--	3.8E+01	3.8E+01
Lead Compounds	7439-92-1	--	--	2.2E-01	2.2E-01
Manganese	7439-96-5	--	--	1.6E-01	1.6E-01
Mercury	7439-97-6	--	--	1.1E-01	1.1E-01
Methanol	67-56-1	2.7E+03	--	--	2.7E+03
Methylene Chloride	75-09-2	2.2E+01	--	--	2.2E+01
Methyl Ethyl Ketone (MEK)	78-93-3	--	6.7E+02	--	6.7E+02
n-Hexane	110-54-3	1.2E+03	--	7.8E+02	2.0E+03
Naphthalene	91-20-3	2.0E+01	--	2.6E-01	2.0E+01
Nickel	7440-02-0	--	--	9.1E-01	9.1E-01
Phenol	108-95-2	6.5E+00	--	--	6.5E+00
Polycyclic Aromatic Hydrocarbon	N/A	7.3E+00	--	4.5E-01	7.7E+00
Selenium	7782-49-2	--	--	1.0E-02	1.0E-02
Silica (Crystalline, Respirable)	7631-86-9	--	1.0E-03	--	1.0E-03
Styrene	100-42-5	2.6E+01	--	--	2.6E+01
Toluene	108-88-3	4.4E+02	3.1E-02	1.5E+00	4.4E+02
Vinyl Chloride	75-01-4	4.0E+00	--	--	4.0E+00
Xylene	1330-20-7	2.0E+02	--	--	2.0E+02

TOXIC RISK SCREENING ANALYSIS

Pursuant to Regulation 2-5-110, a project shall not be subject to this rule if, for each TAC, the total project emissions are below the acute and chronic trigger levels listed in Table 2-5-1 of this regulation. A project includes all new or modified sources of TACs within a 3-year period. The following table provides a review of the project TAC emission rates.

Table 8. Project Toxic Air Contaminant Pollutant Emissions Summary

Pollutant	Hourly Emission Rate (lb/hr)	Acute Threshold (lb/hr)	Exceeds Acute Threshold? (Yes/No)	Annual Emission Rate (lb/yr)	Chronic Threshold (lb/yr)	Exceeds Chronic Threshold? (Yes/No)
1,1,2,2-Tetrachloroethane	1.2E-03	--	--	1.1E+01	1.4E+00	**Yes**
1,1,2-Trichloroethane	9.9E-04	--	--	8.6E+00	5.0E+00	**Yes**
1,1-Dichloroethane	2.9E-03	--	--	2.6E+01	5.0E+01	No
1,2-Dichloroethane	7.3E-04	--	--	6.4E+00	4.0E+00	**Yes**
1,3-Butadiene	8.3E-03	1.5E+00	No	7.2E+01	4.8E-01	**Yes**
Acetaldehyde	2.6E-01	1.0E+00	No	2.3E+03	2.9E+01	**Yes**
Acrolein	6.4E-01	5.5E-03	**Yes**	5.6E+03	1.4E+01	**Yes**
Ammonia	1.8E+00	7.1E+00	No	1.6E+04	7.7E+03	**Yes**

Arsenic	9.9E-06	4.4E-04	No	8.6E-02	1.6E-03	**Yes**
Benzene	1.4E-02	6.0E-02	No	1.2E+02	2.9E+00	**Yes**
Beryllium	5.9E-07	--	--	5.2E-03	3.4E-02	No
Cadmium	5.4E-05	--	--	4.8E-01	1.9E-02	**Yes**
Carbon Tetrachloride	1.1E-03	4.2E+00	No	1.0E+01	1.9E+00	**Yes**
Chlorobenzene	3.8E-03	--	--	3.3E+01	3.9E+04	No
Chloroethane	2.3E-04	--	--	2.0E+00	1.2E+06	No
Chloroform	8.8E-04	3.3E-01	No	7.7E+00	1.5E+01	No
Copper	4.2E-05	2.2E-01	No	3.7E-01	--	--
Ethylbenzene	1.2E-03	--	--	1.1E+01	3.3E+01	No
Ethylene Dibromide	1.4E-03	--	--	1.2E+01	1.1E+00	**Yes**
Formaldehyde	1.6E+00	1.2E-01	**Yes**	1.4E+04	1.4E+01	**Yes**
Hydrogen Sulfide	4.4E-03	9.3E-02	No	3.8E+01	3.9E+02	No
Lead Compounds	2.5E-05	--	--	2.2E-01	2.9E-01	No
Manganese	1.9E-05	--	--	1.6E-01	3.5E+00	No
Mercury	1.3E-05	1.3E-03	No	1.1E-01	2.1E-01	No
Methanol	3.1E-01	6.2E+01	No	2.7E+03	1.5E+05	No
Methylene Chloride	2.5E-03	3.1E+01	No	2.2E+01	8.2E+01	No
Methyl Ethyl Ketone (MEK)	2.6E+00	2.9E+01	No	6.7E+02	--	--
n-Hexane	2.3E-01	--	--	2.0E+03	2.7E+05	No
Naphthalene	2.3E-03	--	--	2.0E+01	2.4E+00	**Yes**
Nickel	1.0E-04	3.1E-05	**Yes**	9.1E-01	3.1E-01	**Yes**
Phenol	7.4E-04	1.3E+01	No	6.5E+00	7.7E+03	No
Polycyclic Aromatic Hydrocarbon	8.8E-04	--	--	7.7E+00	3.3E-03	**Yes**
Selenium	1.2E-06	--	--	1.0E-02	8.0E+00	No
Silica (Crystalline, Respirable)	3.8E-06	--	--	1.0E-03	1.2E+02	No
Styrene	2.9E-03	4.6E+01	No	2.6E+01	3.5E+04	No
Toluene	5.1E-02	8.2E+01	No	4.4E+02	1.2E+04	No
Vinyl Chloride	4.6E-04	4.0E+02	No	4.0E+00	1.1E+00	**Yes**
Xylene	2.3E-02	4.9E+01	No	2.0E+02	2.7E+04	No

The project exceeds listed Table 2-5-1 acute and chronic trigger levels and is subject to the requirements of this regulation.

Pursuant to a Health Risk Assessment completed on June 14, 2019 and revised on February 19, 2020, the project cancer risk is 7.4 in a million, the project chronic hazard index is 0.098 and the project acute hazard index is 0.42. The project does not exceed a cancer risk of 10 in a million, a chronic hazard index of 1.0, and an acute hazard index of 1.0. Therefore, the project meets the requirements of Regulations 2-5-302 and 2-5-303. Furthermore, with an overall project chronic hazard index at 0.097 and a source cancer risk of 0.12 in a million, S-72 and S-73 do not exceed a chronic hazard index of 0.20 nor a cancer risk of 1.0 in a million. Therefore, S-72 and S-73 are not subject to Best Available Control Technology for Toxics (TBACT).

BEST AVAILABLE CONTROL TECHNOLOGY

Pursuant to Regulation 2-2-301, Best Available Control Technology (BACT) is required for new or modified sources of BACT pollutants that emit or exceed a maximum daily emission rate of 10 lb/day. S-72 and S-73 emit 15.00 lb/day of CO each. Therefore, S-72 and S-73 are subject to the BACT requirements for CO.

In accordance with the District's BACT Workbook, Document #17.1.1 (dated August 4, 2010), BACT for natural gas boilers with a maximum input heat rating in between 5 MMBtu/hr to 33.5

MMBtu/hr, which is technologically feasible and cost effective (BACT1), is 50 ppmv CO at 3% O_2 dry. Furthermore, the District's BACT Workbook, Document #17.5.1 (dated April 21, 1993), establishes BACT for landfill or digester gas boilers, which is achieved in practice (BACT2), as 100 ppmv CO at 3% O_2 dry.

RWF is proposing to install boilers that meet a CO volumetric concentration of 50 ppmv at 3% O_2 dry. Therefore, S-72 and S-73 meet the BACT requirement of Regulation 2-2-301.

OFFSETS

Pursuant to Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits, or is permitted to emit, more than 10 tons per year of POC or NO_X. Furthermore, pursuant to Regulation 2-2-303 offsets must be provided for any new or modified source at a major facility with a cumulative increase that exceeds 1.0 ton per year of PM_{10}, $PM_{2.5}$, or SO_2. For purposes of Regulation 2-2-303, a major facility is defined as a facility that is permitted to emit 100 tons/yr or more of PM_{10}, $PM_{2.5}$, or SO_2. The following table provides a summary of the facility's potential to emit (PTE); which was obtained from NSR Applications #28651 and #28811.

Table 9. Facility Potential to Emit

Pollutant	Existing Potential to Emit[1] (ton/yr)	NSR App #28811 Emission Increase (ton/yr)	NSR App #29724 Emission Increase (ton/yr)	New Potential to Emit (ton/yr)
POC	109.868	0.006[2]	1.882	111.756
NO_X	104.030	0.104	3.598	107.732
PM_{10}	14.025	0.008	3.614	17.647
$PM_{2.5}$	14.025	0.008	3.614	17.647
SO_2	9.758	0.001	1.760	11.519
CO	188.165	0.044	5.476	193.685

[1] Existing PTE was obtained from NSR Application #28651.

[2] The emission increase of an enclosed spray booth with natural gas heater (S-71) was calculated to be 0.888 ton/yr of POC. However, the existing spray booth that will be removed (S-16) has a PTE of 0.882 ton/yr of POC. Therefore, the actual PTE for the application will be the difference in emissions between S-71 and S-16.

The following table provides a review of the facility's cumulative increase.

Table 10. Facility Cumulative Increase

Pollutant	Existing Cumulative Increase (ton/yr)	NSR App #29724 Cumulative Increase (ton/yr)	New Cumulative Increase (ton/yr)
POC	35.488	1.882	37.370
NO_X	43.594	0.000[1]	43.594
PM_{10}	4.723	3.614	8.337
$PM_{2.5}$	0.002	3.614	3.616

SO_2	1.833	1.760	3.593
CO	77.906	5.476	83.382

[1] Contemporaneous Onsite Emission Reduction Credits in the amount of 5.287 ton/yr of NO_X existed from NSR Application #28651.

The facility has a PTE greater than 35 tons per year of POC and NO_X. Pursuant to Regulation 2-2-302.2, the facility is required to provide offsets at 1.15:1 ratio. Furthermore, the facility is not major for PM_{10}, $PM_{2.5}$, or SO_2. Therefore, the facility is not subject to the offset requirements of Regulation 2-2-303. The following table provides a summary of the amount of offsets owed for this application.

Table 11. Offsets Required for New Source Review Application #29724

Pollutant	Application Emission Increase (ton/yr)	Onsite Emission Reduction Credit (ton/yr)	Emission Increase Subject to Offsets (ton/yr)	Offset Ratio	Offsets Required (ton/yr)	Remaining Onsite Emission Reduction Credit (ton/yr)
POC	1.882	0.000	1.882	1.15:1	2.164	0.000
NO_X	3.598[1]	5.287[1]	0.000	1.15:1	0.000	1.689
PM_{10}	3.614	0.000	3.614	N/A	N/A	0.000
$PM_{2.5}$	3.614	0.000	3.614	N/A	N/A	0.000
SO_2	1.760	0.000	1.760	N/A	N/A	0.000
CO	5.476	0.000	5.476	N/A	N/A	0.000

[1] Contemporaneous Onsite Emission Reduction Credits in the amount of 5.287 ton/yr of NO_X existed from NSR Application #28651. This application is considered to be part of the cogeneration project identified in NSR Application#28651. This application was also part of the CEQA review. The sources that contribute to the contemporaneous onsite emission reduction credits include stationary internal combustion cogeneration engines (S-5, S-7, S-36, S-37, and S-54) and boiler (S-38).

POC credits in the amount of 2.164 ton/yr will derive from Banking Certificate #1762.

NEW SOURCE PERFORMANCE STANDARDS

The following New Source Performance Standards (NSPS) may apply to S-72 and S-73.

40 CFR Part 60 Subpart D

Pursuant to §60.40, an affected facility is each fossil fueled fired steam generating unit of more than 250 MMBtu/hr. S-72 and S-73 are steam generating units. However, the input heat ratings of S-72 or S-73 are not greater than 250 MMBtu/hr. Therefore, S-72 and S-73 are not subject to the requirements of this subpart.

40 CFR Part 60 Subpart Da

Pursuant to §60.40Da, an affected facility is each electric utility steam generating unit that is capable of more than 250 MMBtu/hr, which was constructed after September 18, 1978. Since S-72 and S-73 do not provide steam for the generation of electricity of a utility power distribution system for sale, S-72 and S-73 are not considered electric utility steam generating

units. Furthermore, the input heat rating of both S-72 and S-73 are less than 250 MMBtu/hr. Therefore, S-72 and S-73 are not subject to the requirements of this subpart.

40 CFR Part 60 Subpart Db
Pursuant to §60.40b(a), an affected facility is each steam generating unit that commences construction after June 19, 1984 and has a heat input capacity of 100 MMBtu/hr. S-72 and S-73 are less than 100 MMBtu/hr. Therefore, S-72 and S-73 are not subject to the requirements of this subpart.

40 CFR Part 60 Subpart Dc
Pursuant to §60.40c(a), an affected facility is each steam generating unit that commences construction after June 9, 1989 and has a heat input capacity in between 10 MMBtu/hr to 100 MMBtu/hr. S-72 and S-73 are steam generating units, constructed after June 9, 1989, with a heat input capacity of 15.045. Therefore, S-72 and S-73 are subject to this subpart.

However, this subpart contains SO_2 emission standards for coal, mixture of coal and other fuels, oil, or mixture of oil and other fuels. This subpart does not contain a SO_2 emission standard for digester gas/natural gas combustion.

In addition, this subpart contains particulate matter (PM) emission standards for coal, mixture of coal and other fuels, oil, mixture of oil and other fuels, wood, or mixture of wood and other fuels. This subpart does not contain a PM emission standard for digester gas/natural gas combustion.

This subpart does not have applicable standards for digester gas/natural gas combustion. Therefore, S-72 and S-73 meet the requirements of this subpart.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS
The following National Emission Standards for Hazardous Air Pollutants (NESHAP) may apply to the facility.

40 CFR Part 63 Subpart DDDDD
Pursuant to §63.7485, industrial, commercial, and institutional boilers or process heaters, which are located at a major source of hazardous air pollutants (HAP), are subject to the requirements of this regulation. The facility is not major for HAPs. Therefore, S-72 and S-73 are not subject to this subpart.

40 CFR Part 63 Subpart JJJJJJ
Pursuant to §63.11193, industrial, commercial, and institutional boilers, which are located at an area source of HAPs, are subject to the requirements of this regulation. The facility is an area source of HAPs. Therefore, S-72 and S-73 are subject to this subpart.

However, S-72 and S-73 are gas-fired boilers. Pursuant to §63.11195(e), gas-fired boilers are not subject to the requirements of this subpart. Therefore, S-72 and S-73 are not subject to this subpart.

STATEMENT OF COMPLIANCE
Regulation 2, Rule 2

Pursuant to Regulation 2-2-308, a new or modified source, as defined under federal regulation, which will result in a significant net increase in emissions of any pollutant for which a National Ambient Air Quality Standard (NAAQS) has been established, is required to demonstrate that such an increase will not cause or contribute to an exceedance of any NAAQS in accordance with the procedures for a Prevention of Significant (PSD) Air Quality Impact Analyses.

The proposed facility would have exceeded the significant threshold for $PM_{2.5}$. However, the facility has accepted a permit limitation to stay below the significant threshold for $PM_{2.5}$. Therefore, the facility is not subject to the requirements of Regulation 2-2-308.

The following table provides a summary of the emission increase of the project.

Table 12. Project Significant Increase Review

Pollutant	Previous Project Emission Increase (ton/yr)	NSR Application #29724 Emission Increase (ton/yr)	Adjusted Project Emission Increase (ton/yr)	Significance Threshold[1] (ton/yr)	Exceeds Significant Threshold? (Yes/No)
POC	6.448	1.882	8.330	40	No
NO_X	0.000[2]	0.000[2]	0.000[2]	40	No
PM_{10}	9.310[3]	3.614[3]	12.924[3]	15	No
$PM_{2.5}$	10.000[4]	N/A[4]	10.000[4]	10	No
SO_2	1.837	1.796	3.633	40	No
CO	44.175	5.476	49.651	100	No

[1] As defined in Regulation 2-2-227.

[2] Contemporaneous Onsite Emission Reduction Credits in the amount of 5.287 ton/yr of NO_X existed from NSR Application #28651.

[3] The net emission increase from the cogeneration project was estimated in NSR Application #28651.

[4] Facility is subject to NSR Permit Condition #26639, which limits the total $PM_{2.5}$ emissions from the project to less than 10 ton/yr.

Regulation 2, Rule 6

RWF is a major facility for POC, NO_X, and CO and is subject to the requirements of Regulation 2-6. In addition, RWF has accepted a $PM_{2.5}$ project limit to avoid the NAAQS Protection standard of Regulation 2-2-308. Pursuant to Regulation 2-6-226.4, the establishment of a permit condition allowing a facility to avoid an applicable requirement, which includes a federally

enforceable limit assumed in order to avoid classification as a modification under the provision of Title I of the federal Clean Air Act, is considered a significant permit revision to the Title V permit. The proposed cogeneration project, which include the boilers, is considered a Significant Permit Revision. RWF is required to submit a Significant Permit Revision for the addition of S-72 and S-73.

Regulation 6, Rule 1
Pursuant to Regulations 6-1-301 and 6-1-302, a person shall not emit from any source for a period or periods aggregating more than three minutes in any hour, a visible emission which is as dark or darker than No. 1 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree and/or an emission equal to or greater than 20% opacity as perceived by an opacity sensing device, where such a device is required by District regulations. The project is expected to meet the requirements of Regulations 6-1-301 and 6-1-302.

Regulation 9, Rule 1
S-72 and S-73 are subject to the SO_2 limitations of Regulation 9-1-301 (Limitations on Ground Level Concentrations of Sulfur Dioxide), Regulation 9-1-302 (Limitations Sulfur Dioxide Emissions) and 9-1-304 (Burning of Solid and Liquid Sulfur Dioxide Fuel).

Pursuant to Regulation 9-1-301, the ground level concentrations of SO_2 shall not exceed 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours. Pursuant to Regulation 9-1-302, a person shall not emit from any source, a gas stream containing SO_2 in excess of 300 ppm (dry). Compliance with Regulation 9-1 is expected due to a fuel total sulfur limit of 50 ppmv.

Regulation 9, Rule 2
According to Regulation 9-2-301, a person shall not emit during any 24-hour period, H_2S in such quantities as to result in ground level concertation in excess of 0.06 ppm average over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes.

S-72 and S73 are sources of H_2S emissions. However, pursuant to an HRA completed on June 14, 2019 and revised on February 19, 2020, the acute hazard index of H_2S alone is 0.0. An acute hazard index less than 1.0 correlates to compliance with this regulation. Therefore, S-72 and S-73 are expected to be in compliance with this regulation.

Regulation 9, Rule 7
Pursuant to Regulation 9-7-307, S-72 and S-73 are required to meet the following emission limitations.

Table 13. Regulation 9-7 Volumetric Concentration Emission Limits (@ 3% O_2 dry)

Source #	Fuel	NO_X Volumetric Concentration (ppmv)	Equipment NO_X Concentration (ppmv)	CO Volumetric Concentration (ppmv)	Equipment CO Concentration (ppmv)

72	Natural Gas	15	9	400	50
	Digester Gas	30	20	400	50
73	Natural Gas	15	9	400	50
	Digester Gas	30	20	400	50

Pursuant to Regulation 9-7-206, "Digester Gas-Fired Device" is defined as a boiler, steam generator or process heater that fires or co-fires digester gas at least 90% of its operating time, on a calendar basis. However, In the event S-72 and S-73 are not digester gas-fired devices, S-72 and S-73 will be subject to the heat-input weighted average limit of Regulation 9-7-307.9.

S-72 and S-73 will meet the NO_X and CO volumetric concentration limits of Regulation 9-7-307.

In addition, pursuant to Regulation 9-7-312, no person shall operate a boiler or steam generator with a stack temperature that exceeds the following.

Table 14. Regulation 9-7 Stack Gas Temperature Limits Review

Heater Design	Maximum Temperature (°F), Highest Limit
Fire-Tube	100°F over saturated steam temperature (steam boiler); 100°F over hot water temperature (water boiler); or, 250°F greater than combustion air temperature.
Water-Tube	150°F over saturated steam temperature (steam boiler); 150°F over hot water temperature (water boiler); or, 250°F greater than combustion air temperature.

However, the aforementioned gas temperature requirements do not apply to devices certified by the Air-Conditioning, Heating and Refrigeration Institute (AHRI) as having a thermal efficiency of 80% or more. The manufacturer of S-72 and S-73 expects a thermal efficiency of 82%. Therefore, the requirements of Regulation 9-7-312 do not apply.

Moreover, pursuant to Regulation 9-7-403, an initial demonstration of compliance is required. The initial demonstration specifies that source tests be performed to determine compliance with the limitations of Regulation 9-7-307, unless the devices have an input heat rating less than 10 MMBtu/hr; at which point a portable analyzer may be used. S-72 and S-73 both have an input heat rating greater than 10 MMBtu/hr. Therefore, source testing is required. Furthermore, S-72 and S-73 will be subject to annual source testing pursuant to Regulation 9-7-506.

In accordance with Regulation 9-7-501, boilers firing multiple fuels must be equipped with a non-resettable totalizing fuel meter for each fuel line.

Lastly, Regulation 9-7-503 requires the following records to be kept for at least 24 months from the date of entry, which are to be made available to District staff upon request.

- Documentation verifying the hours of equipment testing using non-gaseous fuel, and of total operating hours using non-gaseous fuel during each calendar month;
- Results of any testing required by Regulation 9-7-506; and,
- Total operating hours and operating hours firing or co-firing digester gas.

However, since the facility is a Title V facility, records must be kept for a minimum of five (5) years.

California Environmental Quality Act

The City of San Jose prepared an Initial Study (IS) and filed a Mitigated Negative Declaration (MND), Addendum, and Notices of Determination (NOD) for the RWF's new cogeneration engine installation and boiler/chiller replacement project (SCH#2014042039, File No. PP14-005, and File No. PP16-009). The City of San Jose is identified as the lead agency.
The IS included proposals to install four (4) cogeneration engines, with a capacity of up to 12.5 Megawatts (MW) when operating 3 of the 4 cogeneration engines. The addendum included the replacement of existing boilers with two (2) new boilers. The new boilers will have a total maximum design input heat rating of up to 34 MMBtu/hr. The boilers will be capable of running on either a digester gas/natural gas blend, or natural gas alone. The boilers will provide standby heat for the RWF's hot water loop in the event that heat is not available from the cogeneration engines. The City of San Jose concluded that with mitigation measures, the project would result in a less than significant impact.

With the implementation of an enforceable $PM_{2.5}$ limit, the project is below the significance thresholds of the District's California Environmental Quality Act (CEQA) Guidelines.

The following table provides a summary of the net annual emissions, which will result from the project as proposed.

Table 15. California Environmental Quality Act Threshold of Significance Review

Pollutant	Cogeneration Engines Net Increase (ton/yr)	Boilers Net Increase (ton/yr)	Project Net Increase (ton/yr)	CEQA Operational Maximum Emissions (ton/yr)
ROG[1]	6.448	1.882	8.330	10
NO_X	0.000[2]	0.000[2]	0.000[2]	10
PM_{10}	9.310[3]	3.004[3]	12.314[3]	15
$PM_{2.5}$	N/A	N/A	10.000[4]	10

[1] It is assumed that reactive organic gases (ROG) is equivalent to POC.

[2] Contemporaneous Onsite Emission Reduction Credits were available from NSR Application #28651.

[3] The net emission increase from the cogeneration project was estimated in NSR Application #28651.

[4] Facility is subject to NSR Permit Condition #26639, which limits the total $PM_{2.5}$ emissions from the project to less than 10 ton/yr.

The District has received the necessary information indicating that the City of San Jose is acting as lead agency. Therefore, Section 2-1-426.2 has been complied with and the application has been deemed complete for CEQA purposes.

The District has reviewed and considered the information contained in the City of San Jose's approved IS, MND, and Addendum. The District will be filing a NOD with the Santa Clara County Clerk.

California Health & Safety Code §42301.6 and Regulation 2-1-412
Pursuant to California Health & Safety Code §42301.6(a), prior to approving an application for a permit to construct or modification of a source, which is located within 1,000 feet from the outer boundary of a school site, the District shall prepare a public notice as detailed in §42301.6. §42301.9(a) defines a "school" as any public or private school used for the purposes of the education of more than 12 children in kindergarten or any grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes.
The facility is located more than 1,000 feet away from a school. Therefore, the requirements of the California Health & Safety Code §42301.6(a) do not apply.

PERMIT CONDITIONS

The following permit condition is for S-72 and S-73.

Permit Condition #27140
GENERAL REQUIREMENTS

1. The owner/operator of the Dual Fueled Digester Gas/Natural Gas Firetube Boilers (S72 and S73) shall only operate the sources on digester gas, which is generated from the Anaerobic Digesters (S210) and abated by the Gas Treatment System – Iron Sponge (A9) and the Gas Treatment System – Activated Carbon (A18), and/or Public Utilities Commission regulated natural gas. [Basis: Cumulative Increase]

2. The owner/operator of S72 and S73 shall not allow the heat input to each source exceed 131,794 MMBtu during any consecutive 12-month period. [Basis: Cumulative Increase]

3. The owner/operator of S72 and S73 shall operate these sources only when a non-resettable totalizing fuel meter is installed in each fuel line for each source. [Basis: Regulation 9-7-501]

EMISSION LIMITATIONS

4. The owner/operator shall ensure that the following pollutant concentrations, in the combustion gases exhausting from S72 and S73, are less than the following limits:

   a. NOx:
      i. 9 ppmv @ 3% O2, on a dry basis, when firing natural gas.
      ii. 20 ppmv @ 3% O2, on a dry basis, when firing digester gas.
      iii. A weighted average of the emission limits of Parts 4(a)(i) and 4(a)(ii) of this condition, when firing a combination of digester gas supplemented with natural gas.
   b. POC:

i. 15 ppmv @ 3% O2, on a dry basis, when firing natural gas.
ii. 30 ppmv @ 3% O2, on a dry basis, when firing digester gas.
iii. A weighted average of the emission limits of Parts 4(b)(i) and 4(b)(ii) of this condition, when firing a combination of digester gas supplemented with natural gas.

c. CO:
i. 50 ppmv @ 3% O2, on a dry basis, when firing natural gas, digester gas, or a combination of natural gas and digester gas.

[Basis: Cumulative Increase, BACT, and Regulation 9-7-307]

5. The owner/operator of S72 and S73 shall not exceed a PM10 and PM2.5 emission rate of 9.9 lb/day, each. An emission factor of 16.7 lb/MMscf, at the maximum capacity of S72 and S73, is presumed to be in compliance with this part. [Basis: Cumulative Increase]

6. The owner/operator shall ensure that the digester gas fired at S72 and S73 does not exceed a total sulfur content of 50 ppmv. [Basis: Cumulative Increase]

MONITORING REQUIREMENTS

7. To demonstrate compliance with the standard in Part 6 of this condition, the owner/operator shall monitor and record the sulfur content of the digester gas at least once every month. [Basis: Cumulative Increase]

8. The owner/operator shall conduct the monitoring required by Part 7 of this condition in accordance with any of the following methodologies:

a. Draeger Tube Test Method: A Draeger Tube test or a meter using a Draeger H_2S sensor, Part No 680910, or equivalent, demonstrating an H_2S level up to 200 ppmv shall demonstrate compliance with the above limit. An H_2S measurement by Draeger Tube exceeding 200 ppmv shall not be deemed a violation but shall trigger a requirement to demonstrate compliance using either methods of Part 8(b) and (c) of this condition.
b. Portable Instrument Method: A Draeger PAC-III (or equivalent) portable meter with an H_2S sensor capable of measuring over 800 ppmv H_2S. In the event that H_2S levels exceed 800 ppmv, the owner/operator shall commence to perform a source test using the method of Part 8(c) of this condition.
c. Chromatographic Method: The owner/operator may sample and test for sulfides according to BAAQMD Lab Method 44A (Manual of Procedures, Volume III), or by ASTM Method 5504, or by any other equivalent method, approved in advance by the District.

[Basis: Cumulative Increase and Regulation 2-1-403]

SOURCE TEST REQUIREMENTS

9. Within 60 days from the startup of S72 and S73, and within a frequency of no less than once every 12 months after each subsequent source test thereafter, the owner/operator shall conduct District approved source tests to determine compliance with the limits in Part 4 (a) and (c) of this condition. The owner/operator shall submit the source test results to the District's Source Test Section no later than 60 days after the source test is completed. [Basis: Regulation 2-1-403 and Regulation 9-7-403]

10. Within 60 days from the startup of S72 and S73, and once every 8,760 hours of operation or 3 years thereafter, whichever comes first, the owner/operator shall conduct District approved source tests to determine compliance with the limits in Parts 4(b) and 5 of this condition. The owner/operator shall submit the source test results to the District's Source Test Section no later than 60 days after the source test is completed. [Basis: Regulation 2-1-403]

11. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements as specified in Volume IV of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section, in writing, of the source test protocols and projected test dates at least 7 days prior to testing. [Basis: Regulation 2-1-403]

12. Sampling ports shall be installed in the exhaust stacks of S72 and S73 in a straight section of piping with at least six (6) diameters clear downstream of any bends, inlets, constriction, flow altering device or change of area or geometry and two (2) diameters upstream of the stack exit or other flow disturbance. The sample ports shall be at least 6" in diameter. The number of sampling ports and platform specifications must be in accordance with BAAQMD document, "Guidelines for Construction of Particulate Sampling and Testing Facilities." The owner/operator must obtain approval from the District's Source Test Section prior to construction. [Basis: MOP Volume IV, Guidelines of Construction of Particulate Sampling and Testing Facilities]

RECORDKEEPING REQUIREMENTS

13. The owner/operator of S72 and S73 shall maintain the following records for a minimum of five (5) years and be made available to the District upon request:

    a. Total operating hours firing on natural gas only;
    b. Total operating hours co-firing on digester gas;
    c. Monthly records of digester gas and natural gas consumed;
    d. Total sulfur content records required by Part 7 of this condition; and,
    e. Source test results required by Parts 9 and 10 of this condition.

    [Basis: Regulation 2-1-403]

End of Conditions

In addition to the aforementioned permit condition, NSR Permit Condition #26639 will need to be amended to include S-72 and S-73 in the project emission limitation for $PM_{2.5}$.

Permit Condition #26639

This permit condition, as originally adopted within New Source Review Application #28651 on April 3, 2018, is further amended within New Source Review Application #29724.

Equipment included in this permit condition:
S-67 Cogeneration System #1
S-68 Cogeneration System #2

S-69 Cogeneration System #3
S-70 Cogeneration System #4
S-72 Dual Fueled Digester Gas/Natural Gas Boiler
S-73 Dual Fueled Digester Gas/Natural Gas Boiler

A-9 Gas Treatment System - Iron Sponge
A-10 Selective Catalytic Reduction
A-11 Oxidation Catalyst
A-12 Selective Catalytic Reduction
A-13 Oxidation Catalyst
A-14 Selective Catalytic Reduction
A-15 Oxidation Catalyst
A-16 Selective Catalytic Reduction
A-17 Oxidation Catalyst
A-18 Gas Treatment System - Activated Carbon

1. The owner/operator shall fire S67, S68, S69, and S70 exclusively on digester gas from S210, Anaerobic Digesters, and/or pipeline quality natural gas. (basis: Cumulative Increase)

2. The owner/operator of S67, S68, S69, and S70, shall not allow the combined heat input to exceed 1,084,974 million BTU (HHV) during any consecutive 12-month period. (basis: Cumulative Increase)

3. The owner/operator shall provide offsets by shutting down or curtailing S36, S37, S38, and S54 within 90-days of the need for offsets. (basis: Offsets)

4. The owner/operator shall ensure that all digester gas combusted in S67, S68, S69, and S70 is treated by A9 and A18 prior to combustion. The owner/operator shall not allow the concentration of total sulfur in the gas exiting A18 to exceed 50 ppm. (basis: Cumulative Increase)

5. The owner/operator shall properly maintain and operate A9 ~~and~~ through A18 in accordance to the ~~manufacturer's~~ manufacturers' specifications during all periods of operation of S67, S68, S69, and S70. The owner/operator shall not regenerate A9 and A18 media on site. (basis: Cumulative Increase)

6. The owner/operator shall abate NOx emissions from S67, S68, S69, and S70 by A10, A12, A14, and A16, respectively, at all times of operation except during startup and shutdown of S67, S68, S69, and S70. The owner/operator shall ensure that each SCR catalyst bed is equipped with a temperature monitor and continuous recorder that accurately measures and records the temperature of exhaust gas from the catalyst during all periods of operation. Except during periods of startup or shutdown, the owner/operator shall maintain the exhaust gas temperature within a range of 575 degrees Fahrenheit and 960 degrees Fahrenheit while the engine is in operation. (basis: Cumulative Increase)

7. The owner/operator shall properly maintain and operate A10, A12, A14, and A16 in accordance to manufacturer's specifications during all periods of operation of S67, S68, S69, and S70. (basis: BACT)

8. The owner/operator shall abate CO and organic compound emissions from S67, S68, S69, and S70 by A11, A13, A15, A17, respectively, at all times of operation except during startup and shutdown of S67, S68, S69, and S70. (basis: BACT, Regulation 2-5-302)

9. The owner/operator shall properly maintain and operate A11, A13, A15, and A17 in accordance to manufacturer's specifications during all periods of operation of S67, S68, S69, and S70. (basis: BACT)

10. The owner/operator shall not allow NOx emissions from each of S67, S68, S69, and S70 to exceed an emission rate of 0.124 grams of NOx (calculated as NO2) per brake-horsepower-hour, or the equivalent outlet concentration of 11 ppmv of NOx, corrected to 15% oxygen, dry basis, averaged over the test period. The owner/operator shall not allow total NOx emissions from all four engines to exceed 23.15 tons per year. The concentration and grams per brake-horsepower-hour limits do not apply during periods of startup or shutdown. The startup period shall not exceed 2 hours and the shutdown period shall not exceed 1 hour. (basis: Cumulative Increase, BACT)

11. The owner/operator shall not allow CO emissions from each of S67, S68, S69, and S70 to exceed an emission rate of 0.89 grams of CO per brake-horsepower-hour, or the equivalent outlet concentration of 130 ppmv of CO, corrected to 15% oxygen, dry basis, averaged over the source test period. The owner/operator shall not allow total CO emissions from all four engines to exceed 166.17 tons per year. The concentration and grams per brake-horsepower-hour limits do not apply during periods of startup and shutdown. The startup period shall not exceed 2 hours and the shutdown period may not exceed 1 hour. (Basis: Cumulative Increase, BACT)

12. In order to demonstrate compliance with the limits in Parts 10 and 11, the owner/operator shall use a portable analyzer to take NOx and CO emission readings to verify compliance with Parts 10 and 11 at least once on each engine every 720 hours of engine operation. All emission readings shall be taken with the engine operating at conditions representative of normal operations. NOx emission readings shall be averaged over a consecutive 15-minute period. (Basis: BACT, Cumulative Increase, and Regulation 2-1-403 and 9-8-503)

13. The owner/operator shall not allow PM10 or PM2.5 emissions from each of S67, S68, S69, and S70 to exceed 0.07 grams of PM10 or PM2.5 per brake-horsepower-hour. The owner/operator shall not allow total PM10 or PM2.5 emissions from all four engines to exceed 13.07 tons per year. This includes condensable and filterable PM. (Basis: Cumulative Increase, BACT)

14. The owner/operator shall not allow a net increase of PM2.5 emissions to exceed 10 tons per year from this project. The project includes the shutdown of S5, S7, S36, S37, S38, and S54; construction of S67, S68, S69, S70, S72, S73, A9, A10, A11, A12, A13, A14,

A15, A16, A17, A18, and four cooling towers; and may include the ~~following future items: such as the~~ shutdown of S-39 ~~and construction of a new boiler~~. The following provides the net decrease for each source which is proposed to be shut down.

S5: 0.569 ton PM2.5/yr
S7: 0.890 ton PM2.5/yr
S36: 0.665 ton PM2.5/yr
S37: 1.001 ton PM2.5/yr
S38: 0.000 ton PM2.5/yr
S54: 0.635 ton PM2.5/yr

(Basis: Regulation 2-2-308)

15. The owner/operator shall not allow POC measured as NMOC emissions from each of S67, S68, S69, and S70 to exceed 0.12 grams of POC per brake-horsepower-hour, or the equivalent outlet concentration of 30.6 ppmv of POC (as methane), corrected to 15% oxygen, dry basis, averaged over the source test period. The owner/operator shall not allow formaldehyde emissions from each of S-67, S-68, S-69, and S-70 to exceed 0.41 pounds per hour. (Basis: Cumulative Increase, BACT)

16. The owner/operator shall not allow the ammonia (NH3) concentration in the exhaust from each of S67, S68, S69, and S70 to exceed 10 ppmv, corrected to 15% oxygen, dry basis. (Basis: Regulation 2-5-302)

17. Sampling ports shall be installed in the exhaust stack for S67, S68, S69, and S70 after control in a straight section of piping with at least six (6) diameters clear downstream of any bends, inlets, constriction, flow altering device or change of area or geometry and two (2) diameters upstream of the stack exit or other flow disturbance. The sample ports shall be at least 6" in diameter. The number of sampling ports and platform specifications must be in accordance with BAAQMD document, "Guidelines for Construction of Particulate Sampling and Testing Facilities" The owner/operator must obtain approval from the District's Source Test Section prior to construction. (Basis: MOP Volume IV, Guidelines of Construction of Particulate Sampling and Testing Facilities)

18. In order to demonstrate compliance with Parts 10, 11, and 13 through 16 above and Regulations 9-1-302, 9-8-302.1, 9-8-302.3, the owner/operator shall ensure that a District approved source test is conducted in each engine after startup and once every 8,760 hours of operation or three years, whichever comes first. Each source test shall be conducted at the exhaust stack after control while the engine is operating under normal operating conditions while fired on digester gas or a digester gas and natural gas blend and shall not include startup or shutdown periods. Each source test shall determine all items identified below. The Source Test Section of the District shall be contacted to obtain approval of source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. Source test reports for compliance testing shall be submitted to the Source Test Section within 60 days of the test date. (Basis: BACT, Cumulative Increase, and Regulations 2-5-302, 9-1-302, 9-8-302.1, and 9-1-302.3)

a. Actual gross electrical output (kW-hrs) from the tested engine(s) during the test period and the calculated power output (bhp) from each engine determined using the following equation: bhp = 1.34 * kW;
b. Total flow rate (standard cubic feet per minute, dry basis, or sdcfm) of all gaseous fuel to the tested engine(s);
c. Concentrations (percent by volume or ppmv, dry basis) of carbon dioxide (CO2), nitrogen (N2), oxygen (O2), methane (CH4), total non-methane organic compounds (NMOC), and total sulfur compounds (TS) in the gaseous fuel burned in the tested engine(s);
d. Higher heating value (BTU/scf) for the biogas;
e. Heat input rate (BTU/hour) to the tested engine(s) averaged over the test period;
f. Exhaust gas flow rate (sdcfm) from the tested engine(s) based on EPA Method 2 or Method 19;
g. Concentrations (ppmv or percent by volume, dry basis) of NOx, CO, CH4, NMOC, SO2, NH3, formaldehyde, and O2 in the exhaust gas from the tested engine(s);
h. Corrected concentrations (ppmv, corrected to 15% O2, dry basis) of CO, NOx, SO2, CH4, and NH3 in the exhaust gas from the tested engine(s);
i. Corrected concentration (ppmv, dry basis) of NMOC in the fuel to the tested engine(s);
j. NMOC destruction efficiency (weight percent) achieved by the tested engine(s);
k. Emission rates (grams/bhp-hour) of NOx, CO, and PM10 from each engine;
l. Emissions (pounds/hour) of PM10 from each engine and the PM10 grain loading rate (grains/dscf) from the tested engine(s). This includes filterable and condensable particulate.
m. Emission rate (pounds/hour) of formaldehyde from the tested engine(s);
n. Average temperature of the SCR catalyst exhaust gas temperature for the tested engine(s) during the test period.
o. During the source test, the owner/operator shall also measure concentrations of NOx, CO, and O2 (ppmv) in the exhaust from the tested engine(s) using the portable analyzer procedures described in Part 12. The portable analyzer measurements of corrected NOx and CO concentrations shall be compared to the values measured pursuant to Part 18h.

19. The owner/operator shall measure and record the flowrate of the biogas and natural gas supplied to the engines on a continuous basis (at least one measurement every 15-minutes) using a District approved method. The flow meters and recorder shall be installed and properly calibrated prior to any engine operation; this equipment shall be maintained in good working condition. (Basis: Cumulative Increase)

20. To demonstrate compliance with the limit in Part 4, the owner/operator shall monitor and record the sulfur content of the treated digester gas at least once each month. (Basis: Cumulative Increase)

21. The owner/operator shall monitor and record the heat content of the digester gas at least once each month. (Basis: Cumulative Increase)

22. The owner/operator shall maintain the following plans and records on-site for a minimum of 5 years from the date of entry. The plans and records shall be made available to District staff upon request.

    a. Records of heat input to each engine for each calendar month and for each rolling 12-month period. Heat input shall be calculated using District approved procedures based on measured biogas flow rate data and measured biogas methane concentration data. The calculated heat input rates shall be recorded in a data acquisition system or electronic spreadsheet.
    b. Records of all monitoring or source testing conducted to demonstrate compliance with this permit condition and District rules.
    c. An engine maintenance plan.
    d. Records of all maintenance conducted on each engine.
    e. Records of start-ups, shut-downs, and malfunctions for each engine. For any malfunction, the records shall include the cause of the malfunction, the actions taken to correct the malfunction, the date and time that the malfunction was corrected, and the actions taken to prevent such malfunctions in the future.
    f. Records and calculations demonstrating compliance with the PM2.5 limitation of Part 14 of this condition.

End of Conditions

RECOMMENDATION

Issue an Authority to Construct to San Jose-Santa Clara Regional Wastewater Facility for the following equipment:

S-72 Dual Fueled Digester Gas/Natural Gas Boiler, #1
Cleaver-Brooks Model CBLE 700-350-125HW Firetube Boiler
Maximum Digester Gas Input Heat Capacity: 15.045 MMBtu/Hr
Maximum Natural Gas Input Heat Capacity: 14.996 MMBtu/Hr
Digester Gas Fuel Abated by Iron Sponge Gas Treatment System, A-9; and, Activated Carbon Gas Treatment System, A-18

S-73 Dual Fueled Digester Gas/Natural Gas Boiler, #2
Cleaver-Brooks Model CBLE 700-350-125HW Firetube Boiler
Maximum Digester Gas Input Heat Capacity: 15.045 MMBtu/Hr
Maximum Natural Gas Input Heat Capacity: 14.996 MMBtu/Hr
Digester Gas Fuel Abated by Iron Sponge Gas Treatment System, A-9; and, Activated Carbon Gas Treatment System, A-18

By: _____ Date: _____
Alfonso Borja

Senior Air Quality Engineer

APPENDIX I

ENGINEERING EVALUATION APPLICATION 30725

ENGINEERING EVALUATION
San Jose/Santa Clara Water Pollution Control
700 Los Esteros Road, San Jose, CA
Application: 30725
Plant: 778

1. BACKGROUND

San Jose/Santa Clara Water Pollution Control has applied for a permit condition change for the following devices:

S120 Primary Treatment abated by;

A6 Odor Control System 2, 10,000 CFM; 2-Bed Carbon Unit, 14,700 Lb Carbon Total Condition No. 26312

S200 Sludge Handling abated by;

A5 Odor Control System 1 including Biotrickling Filter, 5,450 CFM Condition No. 26313

S120-Primary Treatment, Abated by A6 Odor Control System 2

The Primary Treatment (S120), screens incoming sewage before it is pumped to the dissolved air flotation tanks (DAFT) permitted under Sludge Handling (S200). The emissions will be routed to Odor Control System 2 (A6). The system consists of one (1) fan and two (2) carbon beds containing a total of 14,700 lb of carbon. Sample points have been installed before the carbon, and on each carbon bed stack.

Permit Condition No. 26312 establishes operating limits for S120 and A6. This condition was initially adopted under New Source Review (NSR) Application No. 27366. The facility has requested to update Permit Condition No. 26312 by making the following updates:

- Remove all reference of the Biotower (A20) abating Headworks 3 of the Preliminary Treatment (S110). The abatement device was erroneously included. However, the operation of S110 and A20 are limited under Permit Condition No. 27178; and,
- Increase the hydrogen sulfide (H_2S) limit of Permit Condition No. 26312 from 0.05 ppm to 1.5 ppm. The 0.05 ppm threshold was initially based on manufacturer specifications under ideal operating conditions. However, the facility claims that this threshold is not a guarantee by the equipment manufacturer and that the instrument may not accurately measure readings below 1ppm.

S200, Sludge Handling, Abated by A5 Odor Control System 1

The facility currently controls odors from S200, which consists of six (6) existing DAFT plus a previous authority construct authorized ten (10) additional DAFT for a total of up to sixteen (16) DAFT and two (2) thickened sludge storage tanks. Odors are controlled by covering the equipment and routing emissions to a Biotrickling Filter (A5). Permit Condition No. 26313 was initially adopted in NSR Application No. 27366 and established operating limits for S200 and A5.

The facility has requested to increase the H_2S concentration limit of Permit Condition No. 26313, Part 2 from 0.05 ppm to 1.5 ppm. The 0.05 ppm threshold was initially based on manufacturer specifications under ideal operating conditions. However, the facility claims that this threshold is not a guarantee by the equipment manufacturer and that the instrument may not accurately measure readings below 1ppm.

Furthermore, Permit Condition No. 26313 incorrectly references a carbon vessel as a part of A5. The condition will be updated to remove references to a carbon vessel as part of A5.

2. EMISSIONS

The increase in carbon changeout threshold from 0.05 to 1.5 ppm H_2S will increase permitted H_2S emissions. The ideal gas law was used to determine H_2S emission rates at 1.5 ppm. Table 1 shows the calculated results and parameters used to determine total emission rate. H_2S emissions have been modeled to ensure that they will not cause a violation of BAAQMD Regulation 9, Rule 2, Hydrogen Sulfide.

The facility has not requested a change in POC emission limits.

Table 1: H_2S Emissions from S120/A6 and S200/A5

Parameters	S200/A-6	S120/A-5	Total
Pressure (atm)	1	1	-
Volume (cfm)	10000	5450	-
[1]Temperature (F)	70	70	-
Temperature (R)	530	530	-
R (Gas Constant)	0.7302	0.7302	-
Total Moles (lb-mol/min)	25.84	14.08	-
Total Moles (lb-mol/hr)	1550.36	844.95	-
H2S Concentration (ppm)	1.5	1.5	-
MW, H2S (lb/lb-mol)	34.01	34.01	-
Mass H2S (lb-mol/hr)	0.002	0.001	-
Hourly H_2S Emission Rate (lb/hr)	0.079	0.043	**0.123**
Annual H_2S Emission Rate (lb/yr)	693	378	**1,080**

[1] Temperature is assumed to be at near ambient levels.

3. PLANT CUMULATIVE INCREASE AND OFFSETS

Pursuant to Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits, or is permitted to emit, more than 10 tons per year of precursor organic compounds (POC) or nitrogen oxides (NO_X). Furthermore, pursuant to Regulation 2-2-303 offsets must be provided for any new or modified source at a major facility with a cumulative increase that exceeds 1.0 ton per year of particulate matter 10 microns in size (PM_{10}), particulate matter 2.5 microns in size ($PM_{2.5}$), or sulfur dioxide (SO_2).

H_2S is the only pollutant of concern. Since there is no increase in POC, NO_X, CO, PM_{10}, $PM_{2.5}$, or SO_2, Regulation 2-2-303 is not applicable, nor will this application have a cumulative emission increase.

4. BACT

H_2S is the only pollutant expected to have an emission increase with the proposed changes. Since H_2S is not considered a Best Available Control Technology (BACT) pollutant, BACT is not applicable for this application.

5. TOXIC RISK SCREENING ANALYSIS

Toxic air contaminant emission from S120 and S200 exceed Regulation 2-5 acute and chronic trigger level for H_2S, which are 0.093 lb/hr and 390 lb/year, respectively. A health risk assessment (HRA) was completed for this project using H_2S emissions in Table 1.

Since Boilers #1 and #2 (S72 and S73) also emit H_2S and were permitted within the three years from the date this application was received, they were included in the HRA to determine the project risk. The Boilers were permitted under Air District Application #29724.

Risk Assessment results can be seen in the table below. Maximum Chronic Hazardous Index (HI) was 0.0062. Maximum Acute HI is 0.10. Per Regulation 2-5-302, these are acceptable project risk values because the chronic HI does not exceed 1.0 and the acute HI does not exceed 1.0. TBACT (regulation 2-5-301) is not triggered.

Table 2: HRA Summary Results for Application #30725

Receptor	Chronic HI	Acute HI	ppm H2S
Resident	0.00054	NA	NA
Worker	0.0062	NA	NA
PMI (Max 1-hour)	NA	0.10	0.0031

6. STATEMENT OF COMPLIANCE

BAAQMD Regulation 9, Rule 2, Hydrogen Sulfide

BAAQMD Regulation 9, Rule 2 places the following limits on concentrations of H_2S resulting from emissions at facilities:

> **9-2-301** **Limitations on Hydrogen Sulfide:** A person shall not emit during any 24-hour period, hydrogen sulfide in such quantities as to result in ground level concentrations in excess of 0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes.

The District prepared an air dispersion modeling analysis on the outlet of the odor control systems abating S120 and S200.

The maximum ground level concentration resulting from the total hourly emission rate of 0.123 pounds of H_2S per hour from the project was 0.0031 ppm. This value is acceptable, since the ground level concentration at the potential to emit is less than 0.03 ppm averaged over any hour.

Title V, Major Facility Review

The proposed emission increase is considered a minor permit revision per Regulation 2-6-215. The facility will need to submit a Major Facility Review (MFR) permit. Revisions will be made to Title V permit to reflect these changes in a future action.

CEQA

The City of San Jose has already prepared an Initial Study (IS) and filed a Mitigated Negative Declaration (MND), Addendum, and Notices of Determination (NOD) , for the components of the project that include upgrades and improvements to the anaerobic digesters, dissolved air flotation thickeners (DAFTs), and digester gas system, conversion of the current mesophilic digestion process to a temperature phased anaerobic digestion (TPAD) system, an odor control system, and replacement of existing flares (File No. PP15-055). The City of San Jose is identified as the lead agency.

The initial findings of the MND demonstrate that the project will not have a significant effect on the environment in that the initial study identifies one or more potentially significant effects on the environment for which the project applicant has made or agrees to make project revisions that clearly mitigate the effects to a less than significant level.

The proposed H_2S emission increases in this application do not have an impact on control measures stated in the IS under Chapter 2: Air Quality. Furthermore, a health risk assessment was performed for the project, which included permitted sources within the previous 3-year period. The following table provides a review of the project's risk compared to the Bay Area Air Quality Management District's California Environmental Quality Act (CEQA) Thresholds of Significance for Risk and Hazards for New Sources and Receptors.

Table 3: CEQA Thresholds of Significance Project Overview

Pollutant	Project Risk and Hazard Index	CEQA Threshold of Significance Index	Significant Air Quality Impacts (Yes/No)
Acute	0.10	1.0	No
Chronic	0.0062	1.0	No

The proposed changes are below the significant thresholds of the District's CEQA Guidelines; which are an acute and chronic hazard index of 1.0. Therefore, the impacts of the proposed emission increase would not result in a significant air quality impact.

The District has received the necessary information indicating that the City of San Jose is acting as lead agency. Therefore, Section 2-1-426.2 has been complied with and the application has been deemed complete for CEQA purposes.

The District has reviewed and considered the information contained in the City of San Jose's approved IS, MND, Addendum, and NODs. The District will be filing a NOD with the Santa Clara County Clerk.

PUBLIC NOTICE

This facility is not within 1,000 feet of a school and therefore is not subject to the public notification requirements of Regulation 2-1-412.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

Pursuant to 40 CFR Subpart QQQ §60.690, the provisions apply to affected facilities located in petroleum refineries for which construction, modification, or reconstruction is commenced after May 4, 1987. Since the facility is a publicly owned treatment works (POTW) that does not operate at a refinery, the POTW is not subject to the requirements of this subpart.

NESHAPS

The sources are not subject to NESHAPS.

PSD

PSD is not triggered.

7. PERMIT CONDITIONS

For S–120, Primary Treatment

Condition 26312

This condition as initially adopted in New Source Review (NSR) Application 27366 on June 20, 2016, is further amended within NSR Application 30725.

~~1.~~5. After issuance of the permit to operate pursuant to Application 27366, the owner/operator shall ensure that the screening building at S120, Primary Treatment, is enclosed and is abated at all times by A6, Carbon System, except for periods not to exceed 24 hours during which the carbon is replaced. ~~The owner/operator shall ensure that Headworks 3 is enclosed and is abated at all times by A20, Biotower.~~ (Basis: 2-1-403)

~~2.~~6. The owner/operator shall ensure that the carbon is replaced in either of the two carbon beds within 24 hours when routine monitoring shows that the concentration of H2S exceeds ~~0.05~~ 1.5 ppm or the concentration of POC exceeds 10 ppm. The owner/operator shall maintain a supply of carbon on site to ensure that replacement of carbon occurs in an expeditious manner. (Basis: 2-1-403)

~~3.~~7. ~~The owner/operator shall ensure that the H2S emissions from the stack of A2 do not exceed 1.5 ppm. (Basis: Regulation 9-2)~~(Deleted – Incorrect Abatement Device Reference)

~~4.~~8. The owner/operator shall monitor the concentration of H2S at A6 ~~and A20~~ with a portable H2S monitor, or other approved method, at the ~~every~~ outlet of each carbon vessel on a weekly basis. (Basis: 2-1-403)

~~5.~~9. The owner/operator of A6 shall monitor POC concentrations on a weekly basis with a photo-ionization detector (PID), flame-ionization detector (FID), or other method approved in writing by the District's Source Test Manager at the following locations:

a. At the inlet to the carbon vessels.
b. At the outlet of the carbon vessels.

When using an FID to monitor breakthrough, readings may be taken with and without a carbon filter tip fitted on the FID probe. Concentrations measured with the carbon filter tip in place shall be considered methane for the purpose of these permit conditions. [basis: 2-1-403]

Condition 26313
For S–200, Sludge Handling

This condition as initially adopted in New Source Review (NSR) Application 27366 on June 20, 2016, is further amended within NSR Application 30725.

~~1.~~5. After issuance of the permit to operate pursuant to Application 27366, the owner/operator shall ensure that the dissolved air flotation units and the thickened sludge storage tanks at S200, Sludge Handling, are covered and are abated at all times by A-5, Biotrickling Filter. (Basis: 2-1-403)

~~2.~~6. The owner/operator shall ensure that the concentration of H2S at the outlet of A-5 does not exceed ~~0.05~~1.5 ppm. (Basis: 2-1-403)

~~3.~~7. The owner/operator shall monitor the concentration of H2S with a portable H2S monitor, or other approved method, at the outlet of ~~each carbon vessel~~ the A-5 Biotrickling Filter on a weekly basis. (Basis: 2-1-403)

~~4.~~8. The owner/operator shall control the H2S concentrations with portable carbon units during maintenance or media replacement at A-5. (Basis: 2-1-403)

8. RECOMMENDATION

Issue a Revised Authority to Construct with permit condition changes for the following equipment:

S120 Primary Treatment abated by;
A6 Odor Control System 2, 10,000 CFM; 2-Bed Carbon Unit, 14,700 Lb Carbon Total
Subject to Condition No. 26312

S200 Sludge Handling abated by;
A5 Odor Control System 1 including Biotrickling Filter, 5,450 CFM
Subject to Condition No. 26313

_____ _____
Alfonso Borja Date
Supervising Air Quality Engineer

30725

Appendix J

NMOC EMISSION CALCULATIONS

NMOC Compound Concentrations in Digester Gas
Average MW of NMOC: 113 lb/lb-mole (113 g/g-mole)
Concentration of NMOC: 63 µg/l = 63 E-06 g/l (taken from San Jose/Santa Clara Water Pollution Control tests, based on highest observed concentration; µg = microgram = 1,000,000th of a gram)
Highest monthly average Digester Gas Production Rate, estimated: 1,500,000 cu ft/day (62,500 cu ft/hr)

Digester Gas Typical Composition:
Methane: 62% (typical, dry basis)
CO2: 38%
(Average DG Density = 1.22 g/l at STP)
Nitrogen + Oxygen: <1%

NMOC Emissions, maximum-Uncontrolled = (1,500,000 cu ft/day)(63 E-06 g NMOC/liter)(1000 liter/cu m)(cu m/35.314cu ft)(lb/454 g) = 5.9 lb/day (2,151 lb/yr)

Conversion of 63 µg/l to ppmv, basis 1,000,000 liter digester gas: (63 E-06 g NMOC/liter DG)(1,000,000 liter DG)(g-mole NMOC/113 g NMOC)(22.4 liter NMOC/g-mole NMOC) = 12.5 liter NMOC per 1,000,000 liter DG = 13 ppmv

Concentration Conversion from Volume to Weight basis:
[63 E-6 g/l DG][L DG/1.22 g] = 52 ppm, wt

300 ppm Carbon in Digester Gas (DG):
MW, Methane: 16.1 lb/mole
Highest monthly average digester gas production rate: 1,500,000 cu ft/day

Total carbon (NMOC) emitted @ 300 ppm = [1,500,000 cu ft/day][300 cu ft NMOC as methane/1E6 cu ft DG][lb-mole/386 cu ft][16.1 lb/lb-mole] = 19 lb/day