

Bay Area Air Quality Management District

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Permit Evaluation and Statement of Basis for RENEWAL of the

MAJOR FACILITY REVIEW PERMIT

for

Sonoma County Central Landfill Facility #A2254

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Application 29009

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**Title V Statement of Basis for:
Renewal of Major Facility Review Permit for
Sonoma County Central Landfill,
Site # A2254, Application #29009**

A. Background

The Sonoma County Central Landfill (SCCL) is subject to the Major Facility 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” more than 100 tons per year of a regulated air pollutant, specifically more than 100 tons per year of nitrogen oxide and carbon monoxide. Therefore, this facility is required to have an MFR permit pursuant to Regulation 2-6-301.

This facility is also subject to the Title V operating permit requirements and Regulation 2, Rule 6, MFR permit requirements, because it is a designated facility as defined by Regulation 2-6-204. The Standards of Performance for Municipal Solid Waste Landfills (40 CFR Part 60, Subpart WWW) require the owner or operator of a landfill that is subject to Subpart WWW and that has a design capacity of greater than or equal to 2.5 million megagrams (Mg) and 2.5 million cubic meters (m³) to obtain an operating permit pursuant to Part 70. The landfill at this facility is subject to this NSPS because it has design capacities that are larger than 2.5 million Mg and larger than 2.5 million m³. Therefore, this facility is required to have an MFR permit pursuant to Regulation 2-6-304.

Major Facility Operating Permits (Title V permits) must meet specifications contained in 40 CFR Part 70 as contained in BAAQMD Regulation 2, Rule 6, Major Facility Review (MFR). The permits must contain all “applicable requirements” (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

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

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for this facility is A2254. In 2015, this facility was purchased from the Sonoma County Department of Public Works by Republic Services Sonoma County, Inc. It was assigned a new District Plant Number: 22987, but for Title V purposes, it will retain the facility ID of A2254.

The Sonoma County Central Landfill (Site #A2254) was initially issued a Major Facility Operating Permit (Title V Permit) on February 27, 2001. The Title V permit has since undergone two Significant Revisions, three Minor Revisions, and an Administrative Amendment with the most recent permit change occurring on February 25, 2019 under Application #29711. The current

application (A#29009) is for a Title V renewal. Although the existing permit expired on May 19, 2018, it continues in force until the District takes final action on the permit renewal.

Four additional permit applications have been processed since the last renewal of this permit. Application #28326 added a new flare A-4 and archived flare A-3. Application #27467 added a portable propane tipper engine, S-24. Application #28194 made revisions to Condition # 4044 for S-1, Sonoma County Central Landfill to update gas collection system changes. Application #29060 made revisions to Condition # 4044 for S-1, Sonoma County Central Landfill to allow higher operation values for some wells. The permit evaluations for Application #28326, #27467, #29194 and #29060 are included in Appendix C for reference. Following the completion of each application, the revisions will be incorporated into the Title V permit pursuant to the application number noted above and in accordance with the Title V permit revision procedures in Regulation 2, Rule 6. Minor Revision Application # 28195 was folded into this renewal Application # 29009.

Table 1. Summary of Title V Revision Applications Included with this Permit Renewal

Title V Application #	Type of Revision Requested	District NSR Application #	Project Description
28195	Minor	28326	Added a new flare A-4 and archived flare A-3, condition # 4044 and 19933 revised, added a facility wide permit condition #26507
		27467	Added a portable propane tipper Engines S-24
		28194	Revised the number of alterations for the landfill gas collection system, update gas collection system changes
		29060	Request to allow higher operation values for some wells

Pursuant to Regulation 2, Rule 6, section 416, the District has reviewed the terms and conditions of this Major Facility Review permit and determined that they are valid and correct. This review included an analysis of all applicability determinations for all sources. The review also included an assessment of the sufficiency of all monitoring for determination of compliance with applicable requirements. The statements of basis for permit revisions that have occurred through the last revision of the Major Facility Review permit are hereby incorporated by reference and are available upon request. The proposed permit shows all changes to the permit since the last revision in strikeout/underline format. These changes are discussed in this Statement of Basis.

B. Facility Description

The Sonoma County Central Landfill is an active Class III municipal solid waste (MSW) landfill that was formerly operated by the Sonoma County Department of Transportation and Public Works

and is now operated by Republic Services of Sonoma County, Inc. The facility accepts non-hazardous residential, commercial, industrial, and inert wastes. It has a total permitted area of 398.5 acres, with a permitted waste disposal footprint of 172.8 acres, and a design capacity of 32.65 million cubic yards (approximately 19.6 million tons). The facility was temporarily closed and not accepting waste from 2006-2009. The waste-in-place as of December 31, 2019 was reported to be 17.0 million tons, and the site’s estimated closure is 2031. The landfill sources include: S-1 Sonoma County Central Landfill - Waste Decomposition Proces, S- 22 Sonoma County Central Landfill - Waste and Cover Material Dumping, and S-23 Sonoma County Central Landfill - Excavating, Bulldozing, and Compacting.

Landfills generate landfill gas due to the waste decomposition process. The landfill gas contains methane and carbon dioxide, which are greenhouse gases (GHG), and small amounts of non-methane organic compounds (NMOC) and sulfur compounds. Many of the NMOCs are precursor organic compounds (POCs). Many NMOCs are also toxic air contaminants (TACs) and hazardous air pollutants (HAPs). Hydrogen sulfide (H₂S), a TAC, makes up about 95% or more of the sulfur compounds.

Air District and EPA regulations require that landfill gas from larger landfills be continuously collected and controlled to reduce emissions of NMOCs to the atmosphere. These collection and control requirements also reduce GHG, TAC, and HAP emissions. In order to meet these requirements, the Sonoma County Central Landfill (S-1) is equipped with an active landfill gas collection and control system. Landfill gas collection systems are perforated pipes that are buried in the refuse at numerous locations. For active collection systems, the perforated pipes are connected to blowers by solid pipes (referred to as laterals and headers). The blowers maintain a vacuum in the buried refuse and draw landfill gas into the perforated pipes. Under normal operating conditions the collection system operates continuously and, all of the collected landfill gas is vented to control devices. Typically, the landfill gas is vented to the (10) Internal Combustion Engines (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14). When one or more engines are shut down, some of the collected landfill gas is vented to the A-4 Landfill Gas Flare in addition to the remaining operational engines. Combustion destroys most of the methane, NMOC, TAC, and HAP that are present in the landfill gas; however, landfill gas combustion also produces secondary emissions comprised of nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter (PM), formaldehyde, and acid gases such as hydrogen chloride (HCl) and hydrogen fluoride (HF).

Sonoma County Central Landfill’s actual emissions for 2019 are summarized in Table 1.

Table 1. Sonoma County Central Landfill Emissions (tons/year) for 2019

Source Number/Description	NO _x	POC	PM10	SO ₂	CO
S-1 SCCL – Waste Decomposition Process	0.15	55.36	0.00	0.00	0.00
S-4 Lean Burn IC Engine and Genset # 1	3.13	0.18	0.46	0.46	8.53

Source Number/Description	NOx	POC	PM10	SO2	CO
S-5 Lean Burn IC Engine and Genset # 2	1.95	0.15	0.40	0.40	7.85
S-6 Lean Burn IC Engine and Genset # 3	4.68	0.23	0.59	0.59	11.47
S-7 Lean Burn IC Engine and Genset # 4	1.96	0.12	0.31	0.31	5.36
S-9 Lean Burn IC Engine and Genset # 5	2.08	0.09	0.23	0.23	5.69
S-10 Lean Burn IC Engine and Genset # 6	4.22	0.15	0.39	0.39	9.64
S-11 Lean Burn IC Engine and Genset # 7	2.31	0.18	0.48	0.48	9.38
S-12 Lean Burn IC Engine and Genset # 8	4.20	0.20	0.53	0.53	12.50
S-13 Lean Burn IC Engine and Genset # 9	0.19	0.02	0.06	0.06	0.88
S-14 Lean Burn IC Engine and Genset # 10	0.00	0.00	0.00	0.00	0.00
S-15 Landfill Gas Compression Plant – Pilot Scale	0.00	0.00	0.00	0.00	0.00
S-22 SCCL – Waste and Cover Material Dumping	0.00	0.00	22.23	0.00	0.00
S-23 SCCL – Excavating Bulldozing, and Compacting	0.00	1.24	1.24	0.00	0.00
S-24 Portable Landfill Truck Tipper Engine	0.64	0.09	0.01	0.00	1.51
A-4 Enclosed Landfill Gas Flare	3.53	0.25	0.29	4.95	9.70
Total Facility Emissions	29.05	57.03	27.22	8.39	82.52

Sonoma County Central Landfill’s HAP emissions for 2019 are 10.6 tons per year. Application #28326 added a new flare A-4 and archived flare A-3. Application #27467 added a portable propane tipper engine, S-24. These source description changes were incorporated into this Title V renewal permit by adding the new source descriptions to Table II-B and Table II-C by updating the new source descriptions to the titles of the applicable tables (Tables IV-A and VII-A). All of the above sources are subject to the permit conditions, Condition # 4044, and regulatory requirements that applied to the original S-1. Permit condition # 4044 and 19933 (for the flare) were revised; a facility wide permit condition #26507 was added. S-24 is exempt from Title V permit requirements pursuant to Regulation 2-6-114 because it is a portable rather than a stationary engine.

C. Permit Content

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

Changes to Permit, Title Page:

- The District is updating the name of the person issuing the permit to Jack P. Broadbent, Executive Officer/Air Pollution Control Officer.

I. Standard Conditions

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

Many of these conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

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

Changes to the Permit, Section I:

- The dates of adoption and approval of rules in Standard Condition 1.A have been updated.
- New permit issuance and expiration dates will be added to Standard Condition I.B.1.
- Email addresses for BAAQMD and EPA were added to Sections I.F and I.G, respectively.

II. Equipment

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S-24). Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302. Each of the permitted sources has previously been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with state law and the District’s regulations. The capacities in the permitted sources table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-403. The permitted sources are listed in Table II-A.

Significant sources are those sources that are exempt from permitting, but have a potential to emit more than 2 tons of a “regulated air pollutant,” as defined in BAAQMD Rule 2-6-222, per year or

400 pounds of a “hazardous air pollutant,” as defined in BAAQMD Rule 2-6-210, per year. There are no “significant sources” at this facility.

All abatement (control) devices that control permitted or significant sources are listed. Each abatement device whose primary function is to reduce emissions is identified by an “A” and a number (e.g., A-3). 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.

Following is a summary of the differences in the equipment list between the time that the Title V permit was last revised (May 2012) and the permit proposal date. The reasons for each of these equipment changes are explained above in Section B and summarized below

Changes to the Permit, Section II:

- The gas collection system description for S-1 is being updated in Table II-A. A number of gas collection system alterations were previously authorized by the District pursuant to NSR Application # 26628. The collection system description is being updated to reflect all gas collection system alterations that have been completed to date.
- A new abatement device, Flare A-4, was permitted under NSR application # 28326. The abatement device is being added to Table II-B.
- The District is removing Flare A-3 from Table II-B. A-3 has been decommissioned and removed from the facility.
- The District added Table II-C to identify equipment that is specifically exempt from Title V permitting requirements. A new source, portable propane tipper engine, S-24, was permitted under NSR application # 27467. Since this engine is a non-road engine, it is exempt from Title V permit requirements pursuant to BAAQMD Regulation 2-6-114. The District is adding S-24 to Table II-C list of exempt sources.

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. This facility does not have any significant sources that do not have District permits.

Changes to the Permit, Section III:

- The web site link for the Air District’s SIP requirements was updated.
- The dates of adoption or approval of the rules and their “federal enforceability” status in Table III have been updated.
- The following rules and standards have been added to Table III to conform to current practice:
 - BAAQMD Regulation 8, Rule 40 - Aeration of Contaminated Soil and Removal of Underground Storage Tanks, 116 - Exemption, Small Volume
 - BAAQMD Regulation 8, Rule 40 - Aeration of Contaminated Soil and Removal of Underground Storage Tanks, 117 - Exemption, Accidental Spills.
 - BAAQMD Regulation 11, Rule 18 Hazardous Air Pollutants - Reduction of Risk from Air Toxic Emissions at Existing Facilities.
 - BAAQMD Regulation 14, Rule 1 - Mobile Sources Emission Reduction Methods – Bay Area Commuter Benefits Program.
- The following rules and standards have been removed from Table III to conform to current practice. These requirements continue to be applicable; however, they should not be included in Title V permits, because they were adopted pursuant to a governor’s special order rather than through the usual stationary source applicable requirements mechanisms.
 - California H&SC Title 17, Sections 95100-95109, Mandatory Greenhouse Gas Emissions Reporting
 - California H&SC Title 17, Sections 95460-95467, Methane Emissions from Municipal Solid Waste Landfills

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 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.

BAAQMD Regulation 6, Rules 1 and 6

Since last renewal (AN 23816 in 2012) of the Title V permit for this site, BAAQMD Regulation 6, Rule 1 was amended. For Regulation 6, Rule 1, changes to section names and new applicable limits were reflected in Table IV. As shown in Section C.VII, each engine has a potential to emit 997 kg/year of total particulate matter, which is less than 1000 kg/year. Therefore, the engines are subject to the 0.15 gr/dscf limit in Regulation 6-1-310.1. As shown in Section C.VII, it is expected that each engine will comply with the 0.15 gr/dscf limit. The engines are not subject to testing requirements in Regulation 6-1-504 since the PTE for each engine is less than 2000 kg/year. As shown in Section C.VII, the A-4 flare has a potential to emit for total particulate matter of 4249 kg/year, which is greater than 1000 kg/year. Therefore, the new limit in Section 310.2 will apply. From Table 6-1-310.2, the exhaust flow rate for the flare is 13,025 dscf/min. Therefore, the applicable limit for the flare will be 0.0697 gr/dscf, effective July 1, 2020. Since the flare has a potential to emit greater than 2000 kg/year, the testing requirements in Regulation 6-1-504 will apply. The flare must be tested for TSP once every five years with initial test results due by July 1, 2024.

Active landfills are potential bulk material sites because they use soil for daily cover material. Soil stockpiles for this site are expected to have a footprint of greater than 100 square feet or a height greater than 5 feet. Since the stockpiles at this site handle more than 10 tons/year of soil, Section 6-1-307 applies. Section 307.1 limits visible emissions from active operations, and Section 307.2 limits the extent of spills or requires adequate wetting or wind screens.

BAAQMD Regulation 6, Rule 6 was adopted in 2018. The applicable provisions have been added to Table IV-A.

NSPS and NESHAP Applicability for Landfill Gas Fired Stationary Spark Ignition IC Engines (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13 and S-14)

In addition, two new federal rules have been promulgated/amended that apply to internal combustion engines: 40 CFR Part 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines and 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. These new rules have been reviewed and discussed here.

40 CFR Part 60, Subpart JJJJ applies to owners and operators of stationary spark ignition internal combustion engines that commenced construction, modification, or reconstruction after June 12, 2006. The engines at this site were all installed and operated prior to June 12, 2006 and have not been modified or reconstructed since that date. Therefore, this rule does not apply.

The NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR, Part 63, Subparts A and ZZZZ) apply to reciprocating IC engines (RICE) located at major and area sources of HAP. Sonoma County Central Landfill is an area source of HAP since its PTE of any single hazardous air pollutant is below major facility threshold (10 tons/year), and its PTE of any combination of hazardous air pollutants is below major facility threshold (25 tons/year).

Each of these landfill-gas fired IC Engines is considered to be an existing engine because these engines commenced construction prior to June 12, 2006. Per 40 CFR 63.6590(a)(1)(iii), the subpart ZZZZ applies to existing stationary RICE located at an area source of HAP emissions. Therefore, the engines are subject to Subpart ZZZZ.

Pursuant to Table 2d to Subpart ZZZZ of Part 63, non-emergency, non-black start stationary RICE, which combust landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, have no emission limits. The landfill-gas fired RICE engines at this site must follow the management practice standards (listed below):

- Change oil and filter every 1,440 hours of operation or annually, whichever comes first;
- Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and
- Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.

Management practices, record keeping and reporting requirements from the subpart were added to the requirements for S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13 and S-14.

Changes to the permit, Section IV:

- The web site link for the Air District's SIP requirements was updated.
- In the title of Table IV-A and throughout Table IV-A, A-3 flare was removed, and A-4 flare was added.
- In Table IV-A, BAAQMD Regulation 1-1-301, Public Nuisance was added.
- In Tables IV-A and IV-B, footnote 1 was removed. This reminder has been included in the preamble of Section IV.
- In Tables IV-A and IV-B, Regulation 6, Rule 1 citations have been updated and new applicable limits have been added: SIP 6-302, BAAQMD 6-1-302, 6-1-307, 6-1-310, and 6-1-504.
- In Table IV-A, BAAQMD Regulation 6, Rule 6, Particulate Matter – Prohibition of Trackout was added.
- In Table IV-A, Permit Condition #4044 citations were updated pursuant to NSR application 28326.
- New sitewide CO limit Permit Condition #26507 was added to Tables IV-A and IV-B.

- In Table IV-B, the District is adding a new NESHAP requirement (40 CFR, Part 63, Subparts A and ZZZZ) that apply to stationary reciprocating IC engines.
- In Table IV-B, Permit Condition #24894 citations were updated pursuant to NSR application 28326.

V. Schedule of Compliance

A schedule of compliance is required in all Title V permits pursuant to BAAQMD Regulation 2-6-409.10 which provides that a major facility review permit shall contain the following information and provisions:

“409.10 A schedule of compliance containing the following elements:

- 10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;
- 10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and
- 10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.”

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

Changes to permit:

None.

VI. Permit Conditions

Each permit condition is identified with a unique numerical identifier, up to five digits. The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 *et seq.*, an order of abatement pursuant to H&SC § 42450 *et seq.*, or as an administrative revision initiated by District staff. After issuance of the Title V permit, permit conditions will be revised using the procedures in Regulation 2, Rule 6, Major Facility Review.

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

- BACT: This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- Cumulative Increase: This term is used for a condition imposed by the APCO that limits a source’s operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.

- **Offsets:** This term is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.
- **PSD:** This term is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- **TRMP:** This term is used for a condition imposed by the APCO to ensure compliance with limits that arise from the District's Toxic Risk Management Policy. This policy was replaced by Regulation 2, Rule 5 in 2005.

During the initial Title V permit development, the District reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. When necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting requirements have been added to the permit.

Changes to the permit, Section VI:

Condition # 4044

- Replaced A-3 with A-4 in the list of applicable equipment for this condition.
- In Part 4, revised the gas collection system description and added the authorized collection system alterations approved pursuant to NSR Application # 28194.
- In Part 5, conditions authorizing alternative wellhead temperature limits were included pursuant to NSR Application #29060
- In Part 6, citations for TAC concentration limits were updated.
- In Part 7, the landfill gas sulfur content limit was updated pursuant to NSR Application #28326.
- In Parts 8 and 9, A-3 was replaced with A-4.
- In Part 10, A-3 was replaced with A-4 and citations were updated.
- In Parts 11 and 12, A-3 was replaced with A-4.
- In Part 13, replaced A-3 with A-4, added a daily heat input limit for the flare, corrected the annual limit, which applies over a rolling 12-month period.
- In Parts 14 and 15, A-3 was replaced with A-4.
- In Part 16, A-3 was replaced with A-4 and citations were updated.
- In Part 17, citations were updated and obsolete testing requirements were removed.
- In Part 18, citations were updated.
- In Part 19, A-3 was replaced with A-4.

Condition # 19933

- In Parts 1-3, A-3 was replaced with A-4.
- In Part 10, the annual heat input limit was corrected to reflect that it applies over a rolling 12-month period.

Condition # 26507

- This new condition, Parts 1-3, was added to limit site-wide CO emissions pursuant to NSR application #28326.

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

VII. Applicable Limits and Compliance Monitoring Requirements

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

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

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

The District has reviewed the current monitoring requirements and determined that the current monitoring is adequate to provide a reasonable assurance of compliance. The tables below identify federally enforceable limits that have no specific monitoring requirements or for which monitoring has been.

SO₂ Discussion:

SO₂ Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
Lean Burn IC Engines (S-4 through S-14) And Landfill Gas Flare (A-4)	BAAQMD 9-1-301	Property Line Ground Level SO ₂ Limits: ≤ 0.5 ppm for 3 minutes and ≤ 0.25 ppm for 60 minutes and ≤ 0.05 ppm for 24 hours	None

Maximum potential sulfur dioxide (SO₂) emissions are calculated below for all combustion sources followed by a discussion of the applicable limit related to sulfur dioxide emissions.

Potential to Emit Calculations for Landfill Gas Fired Combustion Equipment
(S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, S-14, and A-4)

Maximum potential annual SO₂ emissions from all engines and the flare are based on the maximum permitted operating rates and the permit condition limit of 300 ppmv of total reduced sulfur compounds in the collected landfill gas. The heat content of the landfill gas is assumed to be 497 BTU/scf and the flue gas generation rate is 4.785 scf of flue gas per scf of landfill gas.

$$(300 \text{ ft}^3 \text{ S}/1 \text{ MM ft}^3 \text{ LFG})/(4.785 \text{ MM ft}^3 \text{ flue gas}/\text{MM ft}^3 \text{ LFG}) = 63 \text{ ppmv SO}_2 \text{ at 0\% O}_2 = 63 \text{ ppm} * (20.9-10)/(20.9-0) = 33 \text{ ppmv at 10\% O}_2$$

$$(300 \text{ ft}^3 \text{ S}/1 \text{ MM ft}^3 \text{ LFG})/(387 \text{ ft}^3 \text{ S}/\text{lbmol S}) * (1 \text{ lbmol SO}_2/1 \text{ lbmol S}) * (64.06 \text{ lbs SO}_2/\text{lbmol SO}_2)/(497 \text{ MM BTU}/\text{MM ft}^3 \text{ LFG}) = 0.10 \text{ lbs SO}_2/\text{MM BTU}$$

PTE for Each Engine:

$$(92,199 \text{ MM BTU}/\text{year}) * (0.10 \text{ lbs}/\text{MM BTU}) = 4.579 \text{ tons}/\text{year of SO}_2 \text{ per engine}$$

PTE for A-4 Flare:

$$(547,680 \text{ MM BTU}/\text{year}) * (0.10 \text{ lbs}/\text{MM BTU}) = 27.197 \text{ tons}/\text{year of SO}_2$$

The maximum potential sulfur dioxide emissions from all landfill gas combustion equipment are:
(4.579 tons/year per engine)*(10 engines) + 27.197 tons/year = 72.98 tons/year of SO₂.

Regulation 9-1-301 limits ground level sulfur dioxide concentrations at the fence line. Compliance with Section 9-1-302 below is expected to ensure compliance with these ground level limits. Therefore, additional monitoring for the ground level limits is not necessary.

Regulation 9-1-302 limits the sulfur dioxide concentration in any exhaust gas to 300 ppmv of SO₂. Note that this limit is not referenced to any particular oxygen concentration, and therefore applies to the as measured conditions of the exhaust stream. As shown above, the outlet concentration is expected to be less than 33 ppmv of SO₂ in the exhaust gas from any landfill gas combustion device. The limit is nearly 10 times the expected outlet concentration. Permit conditions require annual testing of the landfill gas sulfur content. Since the margin of compliance with the outlet SO₂ concentration limit is high, more frequent monitoring is not necessary.

PM Discussion:

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
Lean Burn IC Engines (S-4 through S-14) And Landfill Gas Flare (A-4)	SIP 6-301	≤ Ringelmann 1.0 for 3 minutes in any hour	Added Visual Observation per BAAQMD 6-102
Lean Burn IC Engines (S-4 through S-14)	SIP 6-310	≤ 0.15 grains/dscf	No TSP Source Testing Required per Regulation 6-1-504, because PTE for each engine is < 2000 kg/year
Landfill Gas Flare (A-4)	SIP 6-310	< 0.15 grains/dscf	Added TSP Source Testing Requirement (once every 5 years) per Regulation 6-1-504, because PTE for A-4 is between 2000-8000 kg/year

Maximum potential PM₁₀ emissions are calculated below for the sources listed above. The monitoring requirements in Regulation 6, Rule 1, Section 504 are deemed to be adequate. Considering that PM₁₀ emissions from each engine are not substantial, no additional TSP monitoring is warranted for the engines.

Potential to Emit Calculations for Landfill Gas Fired Combustion Equipment
 (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, S-14, and A-4)

Maximum potential annual PM₁₀ emissions from the engines were determined based on the maximum permitted operating rate (1138 hp) and the PM₁₀ emission factor of 0.10 lb/bhp-hr as estimated in AN6178.

PTE for Each Engine:

$$(0.10 \text{ g/bhp-hr})(1138 \text{ hp})(8760 \text{ hrs/yr})/(453.6\text{g/lb})/(2000 \text{ lbs/ton}) = 1.099 \text{ tons/year of PM}_{10} \text{ per engine (997 kg/year)}$$

$$(0.10 \text{ g/bhp-hr})(1138 \text{ hp}) (1 \text{ lb}/453.6 \text{ g}) (1\text{hr}/60 \text{ min}) /287 \text{ scf LFG/min})/(4.785 \text{ scf flue gas/scf LFG})*(7000 \text{ grains/lb}) = 0.021 \text{ grains/dscf for each engine}$$

Maximum potential annual PM₁₀ emissions from the flare were determined based on the maximum permitted operating rate and the AP-42 PM₁₀ emission factor of 17 lbs/MM scf of

methane. The landfill gas is assumed to contain 50% methane, which results in a heat content (HHV) of 497 BTU/scf and a flue gas generation rate of 4.785 scf of flue gas per scf of landfill gas.

PTE for A-4 Flare:

$$(547,680 \text{ MM BTU/year}) / (497 \text{ MM BTU/MM scf LFG}) * (0.5 \text{ scf CH}_4/\text{scf LFG}) * \\ (17 \text{ lbs PM}_{10}/\text{MM scf CH}_4) / (2000 \text{ lbs/ton}) = 4.683 \text{ tons/year of PM}_{10} \text{ (4249 kg/year)}$$

$$(17 \text{ lbs PM}_{10}/\text{MM scf CH}_4) * (0.5 \text{ scf CH}_4/\text{scf LFG}) / (1\text{E}6 \text{ scf LFG/MM scf LFG}) / (4.785 \text{ scf flue gas/scf LFG}) * (7000 \text{ grains/lb}) = 0.012 \text{ grains/dscf}$$

The maximum potential particulate emissions from all landfill gas combustion equipment are:
(1.099 tons/year per engine)*(10 engines) + 4.683 tons/year = 15.672 tons/year of PM₁₀.

Changes to the permit, Section VII:

- In the title of Table VII-A, A-3 flare was removed, and A-4 flare was added.
- The Regulation 6-1-302 opacity requirement was added to Tables VII-A and VII-B, and the Regulation 6-102 requirement to visual observe operations to assure compliance was added to all opacity requirements.
- The Regulation 6-1-310 limits were updated and added to Tables VII-A and VII-B, and the Regulation 6-1-504 testing requirement for the A-4 Flare was added to Table VII-A.
- The Regulation 6-1-307 prohibitions on visible emissions for regulated bulk material handling operations were added to Table VII-A.
- The trackout and opacity requirements from Regulation 6-6-301 and 302 were added to Table VII-A.
- The Regulation 9-8-301 and 302 limits were updated in Table VII-B. The quarterly portable analyzer requirements from Regulation 9-8-503 were also added.
- Emission limit for total sulfur content in landfill gas was revised to 300 ppmv associated with Condition #4044 Part 7 in Tables VII-A and VII-B
- Daily throughput limit for A-4 flare and daily monitoring requirement associated with Condition #4044, Part 13 are added to Table VII-A for A-4 flare.
- The maintenance requirements from 40 CFR, Part 63, Subpart ZZZZ, Table 2d were added to Table VII-B.

VIII. Test Methods

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. They are not “applicable requirements” as defined by Regulation 2-6-202.

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

Changes to the permit, Section VIII:

- Test methods from Regulation 6 were updated.

- An obsolete test method for Regulation 9, Rule 1 was removed.

IX. Permit Shield

Changes to the permit, Section IX:

- This standard Title V permit section was missing. This section was added, but there are no permit shields for this facility.

X. Revision History

Changes to the permit, Section X:

- This section was re-numbered and the revision history was updated to include this proposed permit renewal.

XI. Glossary

Changes to the permit, Section XI:

- This section was renumbered.

D. Alternate Operating Scenarios:

No alternate operating scenario has been requested for this facility.

E. Compliance Status:

The responsible official for Sonoma County Central Landfill submitted a signed Certification Statement form dated December 11, 2020. On this form, the responsible official certified that the following four statements are true:

Based on information and belief formed after reasonable inquiry, the sources identified in the Applicable Requirements and Compliance Summary form that are in compliance will continue to comply with the applicable requirements;

Based on information and belief formed after reasonable inquiry, the sources identified in the Applicable Requirements and Compliance Summary form will comply with future-effective applicable requirements, on a timely basis;

Based on information and belief formed after reasonable inquiry, information on application forms, all accompanying reports, and other required certifications is true, accurate, and complete;

All fees required by Regulation 3, including Schedule P have been paid.

F. Differences Between the Application and the Proposed Permit:

The application for renewal of this Title V permit was received by the District on November 19, 2017. The changes between the application and the proposed permit include the following:

- The District issued Permit to Operate for the new portable tipper engine S-24 on July 15, 2019.

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

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 that allows the District to impose requirements.

CAA

The federal Clean Air Act

CAAQS

California Ambient Air Quality Standards

CAPCOA

California Air Pollution Control Officers Association

CARB

California Air Resources Board (same as ARB)

CEQA

California Environmental Quality Act

CEM

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

CFR

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

CH₄ or CH₄

Methane

CO

Carbon Monoxide

CO₂

Carbon Dioxide

Cumulative Increase

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

District

The Bay Area Air Quality Management District

EG

Emission Guidelines

E6, E9, E12

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

EPA

The federal Environmental Protection Agency.

Excluded

Not subject to any District regulations.

Federally Enforceable, FE

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

FP

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

FR
Federal Register

Grains
1/7000 of a pound

H₂S or H₂S
Hydrogen Sulfide

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.

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

H&SC
Health and Safety Code

LFG
Landfill gas

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

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

MAX or Max
Maximum

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

MIN or Min
Minimum

MOP

The District's Manual of Procedures.

MSW

Municipal solid waste

MW

Molecular weight

N2 or N₂

Nitrogen

NA

Not Applicable

NAAQS

National Ambient Air Quality Standards

NESHAPS

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

NMHC

Non-methane Hydrocarbons

NMOC

Non-methane Organic Compounds (same as NMHC)

NO₂

Nitrogen Dioxide

NO_x

Oxides of nitrogen.

NSPS

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

NSR

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

O2

Oxygen

Offset Requirement

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

Phase II Acid Rain Facility

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

POC

Precursor Organic Compounds

PM

Particulate Matter

PM10

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

PSD

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

RMP

Risk Management Plan

S

Sulfur

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

SSM

Startup, Shutdown, or Malfunction

SSM Plan

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

TAC

Toxic Air Contaminant

TBACT

Best Available Control Technology for Toxics

THC

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

Title V

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

TOC

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

TPH

Total Petroleum Hydrocarbons

TRMP

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

TRS

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

TSP

Total Suspended Particulate

TVP

True Vapor Pressure

VOC

Volatile Organic Compounds

Symbols:

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

Units of Measure:

atm	=	atmospheres
bhp	=	brake-horsepower
btu or BTU	=	British Thermal Unit
°C	=	degrees Centigrade
cfm	=	cubic feet per minute
dscf	=	dry standard cubic feet
°F	=	degrees Fahrenheit
ft ³	=	cubic feet
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
gr	=	grains
hp	=	horsepower
hr	=	hour
in	=	inches
kW	=	kilowatt
lb	=	pound
max	=	maximum
m ²	=	square meter
m ³	=	cubic meter
min	=	minute

mm	=	millimeter
MM	=	million
MMBtu	=	million Btu
MW	=	megawatts
MMcf	=	million cubic feet
Mg	=	mega grams
ppb	=	parts per billion
ppbv	=	parts per billion, by volume
ppm	=	parts per million
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scf	=	standard cubic feet
scfm	=	standard cubic feet per minute
sdcf	=	standard dry cubic feet
sdcfm	=	standard dry cubic feet per minute
yd ³	=	cubic yards
yr	=	year

APPENDIX B

**NSR Permit Evaluations
Application #27467**

Engineering Evaluation Report Application # 27467

Republic Services of Sonoma County, Inc, Plant #22987
500 Mecham Road, Petaluma, CA 94952

BACKGROUND

Republic Services of Sonoma County, Inc is proposing to install a portable propane-fired IC engine powering a truck tipper at the landfill active face. The IC engine is located at 500 Mecham Road, Petaluma, CA.

S-24 Portable Landfill Truck Tipper Powered By a Propane-Fired IC Engine; KEM Equipment, Model 8.0L, 195 bhp, 17.1 gallons/hr propane)

The purpose of the tipper is to speed the cycle times for incoming waste trailers. Typical unloading takes five to ten minutes of truck engine power take off use at high rpms to drive trailer hydraulics to push out a load of trash. The proposed portable equipment accomplishes unloading in less than five minutes with no truck engine idling.

EMISSIONS

This propane-fired IC engine (S-24) has a rating of 195 bhp. The propane has a sulfur content of 0.54 grains/100 ft³ (per applicant). The emission rates for this engine (while burning propane) and equivalent outlet emission concentrations for S-24 are presented in Table 1. Maximum daily and maximum annual emissions from S-24 are presented in Table 2.

Table 1. Emission Rates from S-24

	g/bhp-hr	g/hr	lbs/hr	ppmv @ 15% O2	grains/dscf @ 0% O2
HC (POC)	0.67	130.87	0.29	52.3	
NOx	0.97	189.03	0.42	72.3	
CO	2.01	392.61	0.87	246.8	
PM10	0.0856	16.70	0.04		0.0189
SO2	4.97E-06	0.00	0.00		

$$SO_2 = 0.10(S) = 0.10(0.54 \text{ gr}/100 \text{ ft}^3) = 0.054 \text{ lb}/1000 \text{ gal (17.1 gal/hr, 1.556 MMBtu/hr)}$$

Table 2. Maximum Daily and Maximum Annual Emissions from S-24 (while burning propane)

	g/bhp-hr	hours/day	Emissions pounds/day	hours/year	Emissions tons/year
HC (POC)	0.67	11	3.2	2000	0.2885
NOx	0.97	11	4.6	2000	0.4168
CO	2.01	11	9.5	2000	0.8656
PM10	0.0856	11	0.4	2000	0.0368
SO2	4.97E-06	11	0.0	2000	0.0000

TOXICS

Operation of the propane-fired IC engine, S-24, will result in emissions of toxic air contaminants (TACs). Based on the proposed operating rate, S-24 will emit TACs which exceeds the acute and chronic trigger level of Table 2-5-1. Therefore, this project requires a health risk screening analysis.

The emission factors for methane (Natural Gas) internal combustion are from tables 3.2-3 “Uncontrolled Emission Factors For 4-Stroke Rich-Burn Engines” in the July 2000 AP 42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combustion Sources, Section 2: Natural Gas-Fired Reciprocating Engines.

The HAP emission estimates are based on uncontrolled emission factors and an assumed abatement efficiency of 0% removal of organic HAP compounds since a catalyst has not been proposed.

Table 3
TAC Emissions Estimates

Compound	Unabated Emissions (lb/hr)	Acute Trigger Level (lb/hr)	HRSA Triggered? (Y/N)	Unabated Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	HRSA Triggered? (Y/N)
1,1,2,2-Tetrachloroethane	N/A	None	NO	7.92E-02	1.90E+00	NO
1,1,2-Trichloroethane	N/A	None	NO	4.79E-02	6.60E+00	NO
1,1-Dichloroethane	N/A	None	NO	3.54E-02	6.60E+01	NO
1,3-Butadiene	N/A	None	NO	2.07E+00	6.30E-01	YES
Acetaldehyde	4.37E-03	1.00E+00	NO	8.73E+00	3.80E+01	NO
Acrolein	4.12E-03	5.50E-03	NO	8.23E+00	1.40E+01	NO
Benzene	2.47E-03	2.90E+00	NO	4.94E+00	3.80E+00	YES
Carbon Tetrachloride	2.77E-05	4.20E+00	NO	5.54E-02	2.50E+00	NO
Chlorobenzene	N/A	None	NO	4.04E-02	3.90E+04	NO
Chloroform	2.14E-05	3.30E-01	NO	4.29E-02	2.00E+01	NO
Ethyl Benzene	N/A	None	NO	7.76E-02	4.30E+01	NO
Ethylene dibromide	N/A	None	NO	6.67E-02	1.50E+00	NO
Formaldehyde	3.21E-02	1.20E-01	NO	6.42E+01	1.80E+01	YES
Methanol	4.79E-03	6.20E+01	NO	9.58E+00	1.50E+05	NO
Methylene chloride	6.45E-05	3.10E+01	NO	1.29E-01	1.10E+02	NO
Naphthalene	N/A	None	NO	3.04E-01	3.20E+00	NO
PAH	N/A	None	NO	6.39E-04	6.90E-03	NO
Styrene	1.86E-05	4.60E+01	NO	3.72E-02	3.50E+04	NO
Toluene	8.73E-04	8.20E+01	NO	1.75E+00	1.20E+04	NO
Vinyl Chloride	1.12E-05	4.00E+02	NO	2.25E-02	1.40E+00	NO
Xylene	3.05E-04	4.90E+01	NO	6.10E-01	2.70E+04	NO

STATEMENT OF COMPLIANCE

Regulation 1: General Provisions and Definitions

All sources are subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. The proposed propane-fired IC engine has low emissions and is not expected to be a source of public nuisance.

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

District Regulation 2, Rule 1, Section 310 specifies that all proposed new and modified sources subject to District permit requirements must be reviewed in accordance with the California Environmental Quality Act (CEQA) requirements, except for ministerial projects or projects exempt from CEQA under Section 2-1-312. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.2, Combustion Equipment – Internal Combustion Engines, Stationary Natural Gas Engines. Therefore, this application is considered to be ministerial and is exempt from CEQA review.

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 applicant has reported that there are no K-12 schools within a 1,000-foot radius of this facility. The District's database found that there are no K-12 schools within half a mile of the facility. Therefore, the public notice requirements in Regulation 2-1-412 do not apply.

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

Regulation 2, Rule 2, Section 301 states that BACT requirements are triggered if maximum potential emissions from a new or modified source will be 10 pounds/day or more of NO_x, CO, POC, NPOC, PM₁₀, or SO₂. As shown in Table 2, the emissions will not exceed 10 pounds/day for any pollutant. Therefore, BACT is not required.

Regulation 2, Rule 2: Offsets

The cumulative emission increases for this site and this application are summarized below.

**Table 4
Cumulative Emission Increase Inventory**

Pollutant	Current Balance tons/year	Application Increases tons/year	New Balance tons/year	Offset Ratio	Offsets Required tons/year	ERC Certificate #
POC	43.510	0.2885	43.7985	1.15	0.3318	1367
NOx	55.112	0.4168	55.5288	1.15	0.4793	1458
CO	111.010	0.8656	111.8756	NA	NA	NA
PM10	6.853	0.0368	6.8898	NA	NA	NA
SO2	33.155	0.0000	33.1550	NA	NA	NA

NOx and POC Offset Requirement

The offset requirements for precursor organic compounds (POC) and nitrogen oxides (NOx) are found in Regulation 2, Rule 2, Section 302. Under Section 2-2-302, POC and NOx emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 10 tons per year or more on a pollutant specific basis. If the facility emits or will be permitted to emit less than 35 tons of POC or NOx per year, the emission offsets may be provided by the District’s Small Facility Banking Account. If the facility will be permitted to emit more than 35 tons/year of POC or NOx, the site is responsible for providing the required offsets at a ratio of 1.15 to 1.0.

Since NOx and POC emissions from this site are greater than 35 tons/year, offsets are required for the proposed application.

Pursuant to Regulation 2-2-302, a facility with a cumulative increase of greater than 35 tons per year of NOx or POC must reimburse the District Small Facility Bank for any unreimbursed offsets previously provided by the District, at a 1.0 to 1.0 ratio.

California Health and Safety Code (H&SC) Section 42301.2 states the following:

“A district shall not require emission offsets for any emission increase at a source that results from the installation, operation, or other implementation of any emission control device or technique used to comply with a district, state, or federal emission control requirement, including, but not limited to, requirements for the use of reasonably available control technology or best available retrofit control technology, unless there is a modification that results in an increase in capacity of the unit being controlled.” (AB 2525 Chapter 771, September 23, 1996)

The District has formulated the following policy for landfill gas-fired flares.

“In accordance with California Health and Safety Code (H&SC) Section 42301.2 and District Regulation 1-240, no offsets will be required for landfill gas flares, provided that there is no increase of capacity at the associated landfill. If the flare is being permitted to handle an increase in capacity at the landfill, then offsets are required only for the emissions associated with the landfill capacity increase. Offsets will not be required for

a flare that replaces one of equal or lesser capacity. If the replacement control device has a higher permitted capacity than the existing unit, emissions offsets for secondary pollutants are required only for the increased capacity. New landfills require offsets in accordance with Regulations 2-2-302 and 2-2-303 for all permitted emissions". (Ref. District Responses to Issues Raised by the Landfill Gas to Energy Industry Coalition, agreement reached 11/29/06)

Although this guidance was developed specifically for landfill gas-fired flares, the applicability of the determination will be expanded to all landfill gas to energy equipment. Sources S-4 through S-7, S-9 through S-12, S-13, and S-14 are all landfill gas-fired engines and qualify as landfill gas to energy equipment. Therefore, offsets are not required for applications #6178, #6914, #19313 and Small Facility Bank offset reimbursement is not required for this application.

However, offsets are required for the increase in emissions in this application. The applicant has identified banking certificates #1367 for the POC emission increase and #1458 for the NOx emission increase. ERC Certificate #1458 is owned by National Offsets Inc. and has signed an agreement to transfer 0.5000 tons/year to the applicant. These certificates will be surrendered and credits withdrawn prior to issuance of the Permit to Operate. Any remaining ERC amounts will be re-issued back to the applicant.

**Table 5
Emission Reduction Credit Certificates**

ERC Certificate #	Pollutant	Current Balance tons/year	Proposed Withdrawal Amount tons/year	New Balance tons/year	ERC Amounts to be Re-Issued to Applicant tons/year
1367	POC	25.000	0.3318	24.6682	24.6682
1458	NOx	35.869	0.5000	35.3690	0.0207

SO₂ and PM₁₀ Offset Requirement

Offsets are not required for SO₂ and PM₁₀ increase because this facility is not a major facility for SO₂ or PM₁₀.

Regulation 2, Rule 5: Health Risk Assessment Requirements:

The District's regulation concerning toxic air contaminant emissions is codified in Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants. All toxic air contaminants (TAC) emissions from new and modified 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.

Operation of the propane fired engine, S-24, will result in emissions of toxic air contaminants. Based on the proposed operating rate of 2,000 hours/year, the emissions of 1,3 butadiene, benzene, and formaldehyde exceed the chronic trigger level. Therefore, this project requires a health risk screening analysis.

The risk screen was conducted using the AERMOD air dispersion model with Santa Rosa meteorological data set for 2013. Health risks were calculated using the District's standard assumptions for resident, worker, and infant, children, and adolescent receptors and current OEHHA health effects values. Detailed explanations of the modeling procedures and health risk calculation assumptions are provided in the attached HRSA report for this application. The health risks for this source and for the total project are summarized in Table 6.

Table 6
Summary of Source and Project Health Risks

Receptor	Cancer Risk	Chronic Hazard Index	Acute Hazard Index
Resident	0.01 in a million	0.0002	N/A
Worker	0.009 in a million	0.0004	N/A
Any	N/A	N/A	0.02

Since the maximum cancer risk for S-24 will not exceed 1 in a million cancer risk, Regulation 2-5-301 does not require that S-24 be equipped with TBACT. Since the project risk limit does not exceed 10 in a million cancer risk or 1.0 chronic hazard index this engine will satisfy the Regulation 2-5-302 project risk limits.

Major Facility Review, Regulation 2, Rule 6

This facility is subject to MFR Permit requirements pursuant to Regulation 2-6-301, because it has the potential to emit more than 100 tons per year of any regulated air pollutant. It is also subject to MFR Permit requirements pursuant to Regulation 2-6-304, because it is a designated facility that is subject to the requirements of 40 CFR, Part 60, Subpart WWW. As a designated facility, this facility was required to obtain a Title V Federal Operating Permit.

This facility was originally plant #2254 which has been archived and has been issued a new plant #22987. The facility has been issued a Title V permit. The Title V federal permitting requirements of 40 CFR Part 70 have been codified and are enforced through District Regulation 2, Rule 6. This regulation applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and other designated facilities. Therefore, this facility is subject to Regulation 2, Rule 6.

Regulation 6, Rule 1: Particulate Matter – General Requirements

Like all combustion sources, this propane-fired IC engine is subject to Regulation 6, Rule 1. Since the engine displacement is less than 1500 cubic inches, Section 6-1-303 applies instead of 6-1-301. Section 6-1-303 limits visible emissions to not exceed Ringelmann 2.0 for periods aggregating more than 3 minutes in any hour or equivalent opacity. Section 6-1-305 prohibits public nuisance caused by fallout of visible particulate emissions. Properly operating propane-fired IC engines are not expected to produce visible emissions or fallout in violation of these sections.

Section 6-1-310 limits particulate emissions to 0.15 grains/dscf of exhaust gas volume. The particulate emission rate from this IC engine is 0.0856 grams per bhp-hour, which

result in an outlet grain loading of 0.0189 grains per dscf at 0% O₂. This emission rate is less than the limit in Section 6-1-310, so compliance with this section is ensured.

Regulation 8, Rule 1: Organic Compounds – General Provisions

All internal combustion engines are exempt from Regulation 8 per Section 8-1-110.2, therefore none of the rules in Regulation 8 apply to this engine.

Regulation 9, Rule 1: Inorganic Gaseous Pollutants – Sulfur Dioxide

This propane-fired IC engine is subject to Regulation 9, Rule 1. The engine burns propane fuel and is subject to Section 9-1-304, which prohibits burning of fuel containing more than 0.5% sulfur by weight. The facility is expected to comply with this requirement since the propane has a maximum sulfur content of 0.54 gr-S/100 scf (6.7 ppmw).

Regulation 9-1-302 limits the SO₂ concentration in any exhaust stack to 300 ppmv at the as found oxygen concentration. This engine is expected to emit less than 300 ppmv of SO₂ due to combustion of propane.

Regulation 9, Rule 8: Inorganic Gaseous Pollutants – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

Regulation 9, Rule 8 applies to stationary internal combustion engines with a rated output greater than 50 bhp. The engine has a rated capacity of 195 bhp and is subject to this rule.

The definition of Stationary Internal Combustion Engine in Reg 9-8-204 is as follows: Any spark or compression ignited internal combustion engine that is operated, or intended to be operated, at a specific site for more than one year or is attached to a foundation at that site.

By Exemption 9-8-112, the requirements of this rule do not apply to an internal combustion engine registered as portable. However, the PERP regulations indicate that associated engines determined to qualify as part of a stationary source permitted by a District are not eligible for PERP registration. Engines that remain at a single stationary source for more than 12 months (even if the engine moves around within the site) have been generally considered by many districts to be part of that stationary source and are therefore not eligible for PERP registration.

The Tipper engine is a non-road engine that may remain onsite for more than 12 months and is portable – it is not attached to a foundation. This engine meets the Federal requirements of 40 CFR Part 89 Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines. Federal regulations prohibit Districts from adopting more stringent emission standards for nonroad engines. Since S-24 is a portable nonroad engine, District staff now expects that the Regulation 9, Rule 8, emission standards should not apply to portable engines, even if the portable engine remains at a single facility for more than 12 months.

By Title 40 §1074.10 Scope of preemption. (a) States and localities are preempted from adopting or enforcing standards or other requirements relating to the control of

emissions from new engines smaller than 175 horsepower that are primarily used in farm or construction equipment or vehicles, as defined in this part. For equipment that is used in applications in addition to farming or construction activities, if the equipment is primarily used as farm and/or construction equipment or vehicles (as defined in this part), it is considered farm or construction equipment or vehicles. (b) For nonroad engines or vehicles other than those described in paragraph (a) of this section and § 1074.12, States and localities are preempted from enforcing any standards or other requirements relating to control of emissions from nonroad engines or vehicles except as provided in subpart B of this part. (Subpart B—Procedures for Authorization, § 1074.101 Procedures for California nonroad authorization requests.)

It appears that the monitoring and recordkeeping requirements in 9-8-501 – 503 will not apply to S-24 if the District is preempted from imposing the Regulation 9-8-301 or 302 emission standards on the on-site portable engine. Regulation 9-8-503 states, “Any person who must comply with Section 9-8-301, 302, ... shall use a portable analyzer ... to verify compliance ...” Thus, it appears that 9-8-503 will not apply to S-24, if the District finds Sections 301 and 302 do not apply. Likewise, Sections 9-8-501 and 9-8-502 appear to be applicable to engines only if an engine is subject to a 9-8-300 emission limit.

Therefore, the propane-fired IC engine will comply with the requirements of this rule.

Federal Requirements

The engine in this application is not considered to be a “stationary” engine by federal definitions, because it meets the requirements of nonroad engine, as defined in 40 CFR 1068.30:

Nonroad engine means:

- (1) Except as discussed in paragraph (2) of this definition, a nonroad engine is an internal combustion engine that meets any of the following criteria:
 - (i) It is (or will be) used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers).
 - (ii) It is (or will be) used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers).
 - (iii) By itself or in or on a piece of equipment, it is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.
- (2) An internal combustion engine is not a nonroad engine if it meets any of the following criteria:
 - (i) The engine is used to propel a motor vehicle, an aircraft, or equipment used solely for competition.

- (ii) The engine is regulated under 40 CFR part 60, (or otherwise regulated by a federal New Source Performance Standard promulgated under Section 111 of the Clean air Act (42 U.S.C. 7411)).
- (iii) The engine otherwise included in paragraph (1)(iii) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two years) and that operates at that single location approximately three months (or more) each year. See §1068.31 for provisions that apply if the engine is removed from the location.

Although this engine resides at this facility for more than 12 months, it does not reside at a single on-site location (as defined above) for more than 12 consecutive months. Therefore, this engine meets the federal definition of nonroad.

NSPS

Since the portable engine in this application is a nonroad engine and is not a stationary engine, the NSPS requirements for stationary spark-ignited engines (40 CFR, Part 60, Subpart JJJJ) and the NESHAP requirements for stationary reciprocating internal combustion engines (40 CFR, Part 63, Subpart ZZZZ) do not apply to this engine.

The engine is subject to 40 CFR Part 1048 Control Of Emissions From New, Large Nonroad Spark-Ignition Engines. Section 1048.620(a) states large engines fueled by natural gas or liquefied petroleum gas are exempt from the provisions of this subpart provided all of the following are met:

- (1) The engine must operate solely on natural gas or liquefied petroleum gas.
- (2) The engine must have maximum engine power at or above 250 kW.
- (3) The engine must be in an engine family that has a valid certificate of conformity showing that it meets emission standards for engines of that power rating under 40 CFR part 89 or 1039.

The engine family for S-24 has been certified to comply with these emission standards under EPA Family Name FKEMB08.0CS1. Therefore, the provisions of the subpart do not apply.

Permit Conditions

The proposed engine will be subject to the following conditions in Condition # 26171, which is listed below.

Condition # 26171

1. The owner/operator of the portable propane-fueled waste tipper engine (S-24) has been issued a permit for a portable source (also known as a nonroad engine by federal definitions) that is subject to Regulation 2-1-220. Based on this portable source and nonroad engine determination, this engine is not subject to the federal NSPS requirements for stationary spark ignited engines (40 CFR Part 60, Subpart JJJJ), or the federal NESHAP requirements for stationary reciprocating internal combustion engines (40 CFR, Part 63, Subpart ZZZZ). To retain this portable source and nonroad engine determination, the owner/operator shall not operate this engine in any one on-site location for more than 12 consecutive months. Any backup or standby engine that replaces this engine at the same on-site location and is intended to perform the same function will be counted toward this time limitation. The owner/operator shall not move equipment and then return it to the same location in an attempt to circumvent the portable equipment time requirement. (Basis: Regulations 2-1-220.1-3, 2-1-220.10, and 40 CFR 1068.30)
2. The owner/operator shall fire the engine exclusively on propane. (Basis: Cumulative Increase)
3. The owner/operator shall ensure that S-24 does not operate more than 11 hours during any one day and that S-24 does not operate more than 2,000 hours during any consecutive rolling 12-month period unless the owner/operator can demonstrate to the APCO's satisfaction that the heat input to the engine has not exceeded 17.2 million BTU (HHV) during any one day and that the heat input to the engine has not exceeded 3,129 million BTU (HHV) during any consecutive rolling 12-month period. (Basis: Cumulative Increase and BACT avoidance)
4. To demonstrate compliance with Parts 1-3, the owner/operator shall maintain the following records in a District approved log and shall make these records available to District staff upon request. All records shall be retained for at least five years from the date of entry. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District or state regulations. (Basis: Cumulative Increase, Offsets, Regulation 2-1-220 and 40 CFR 1068.30)
 - a. The owner/operator shall maintain annual records of engine operating locations, waste placement locations, operating procedures, or other documentation that demonstrates to the APCO's satisfaction that the waste tipper engines have satisfied the portability criteria in Part 1.
 - b. The owner/operator shall record the engine's hours of operation per day.
 - c. The owner/operator shall record the engine's total operating time for each consecutive rolling 12-month period.

Recommendation

I recommend issuance of an Authority to Construct permit for the following equipment subject to Condition #26171:

S-24 Portable Landfill Truck Tipper Powered By a Propane-Fired IC Engine; KEM Equipment, Model 8.0L, 195 bhp, 17.1 gallons/hr propane

Stanley Tom, P.E.
Air Quality Engineer

Date

APPENDIX C

**NSR Permit Evaluations
Application #28194**

**Engineering Evaluation
for
Landfill Gas Collection System Alterations
at S-1 Sonoma County Center Landfill**

Republic Service Inc.; PLANT # 22987
APPLICATION # 28194

BACKGROUND

Republic Services of Sonoma County, Inc. (Republic) operates the Sonoma Center Landfill at 500 Mecham Road, Petaluma, CA 94952 (Site # 22987). This facility includes an active landfill: S-1 Sonoma County Central Landfill.

As described in the District's May 20, 2013 Major Facility Review Permit for Facility Number A2254, Condition # 4044, Part 4, the landfill gas collection system for the S-1 Sonoma County Central Landfill consists of 135 vertical wells, 34 horizontal collectors. As described in Application # 26628 issued on December 19, 2014, the authorized collection system alterations were:

- install up to 50 new LFG extraction (horizontal and vertical) wells,
- decommission up to 50 existing LFG extraction wells.

Since the approval of Application Number 26628, 36 LFG collection wells were installed, and 28 LFG collection wells were decommissioned. The remaining gas collection system alterations pursuant to Application #26628:

- install 14 gas extraction wells,
- decommission 22 gas extraction wells.

Republic requests the well actions remaining in Application Number 26628 be closed and that the allowable well counts be revised as follow in this application 28194:

- install up to 100 new gas collection wells,
- permanently decommission up to 100 gas collection wells, and
- replacement of vertical wells unlimited, provide the requirements of 8-34-117 and 118 are met.

These proposed changes in this application 28194 will not result in an increase of total collection wells and therefore, no increase of LFG from the extraction wells.

COLLECTION SYSTEM DESCRIPTION

As of September 6, 2016, the landfill gas collection system for the S-1 Sonoma County Central Landfill consisted of the following collection system components: 167 active vertical wells (VW, including 3 dual extraction wells), 30 horizontal LFG trench collectors (HC). Condition # 4044, Part 4 reflects this current list of collection system components. Specific component identification numbers are listed in Table 1a, 1b and Table 2.

Table 1a. Landfill I well counts

GEM ID	Well ID	Collector Type	GEM ID	Well ID	Collector Type
SCV001-1	V-001.1	VW	SCV078-1	V-078.1	VW
SCV002-1	V-002.1	VW	SCV079-1	V-079.1	VW
SCV003-0	V-003	VW	SCV080-0	V-080	VW
SCV04-2A	V-04.2A	VW	SCV081-1	V-081.1	VW
SCV005-0	V-005	VW	SCV082-1	V-082.1	VW
SCV006-1	V-006.1	VW	SCV083-A	V-083A	VW
SCV007-1	V-007.1	VW	SCV084-A	84A	VW
SCV008-1	V-008.1	VW	SCV85-1A	85.1A	VW
SCV010-1	V-010.1	VW	SCV85-5A	V-085.5A	VW
SCV12-1A	V-12.1A	VW	SCV086A	V-086A	VW
SCV014-1	V-014.1	VW	SCV087-0	V-087	VW
SCV015-0	V-015	VW	SCV087-5	V-087.5	VW
SCV016-1	V-016.1	VW	SCV088-A	V-088A	VW
SCV017-0	V-017	VW	SCV088-5	V-088.5	VW
SCV018-0	V-018	VW	SCV089-A	V-089A	VW
SCV019-0	V-019	VW	SCV089-5	V-089.5	VW
SCV020-0	V-020	VW	SCV090-0	V-090	VW
SCV021-A	V-021A	VW	SCV091-0	V-091	VW
SCV022-0	V-022	VW	SCV092-A	V-092A	VW
SCV023-0	V-023	VW	SCV093-0	V-093	VW
SCV024-A	V-024A	VW	SCV094-0	V-094	VW
SCV025-0	V-025	VW	SCV095-0	V-095	VW
SCV044-A	V-044A	VW	SCV095-5	V-095.5	VW
SCV045-A	V-045A	VW	SCV096-0	V-096	VW
SCV049-5A	V-049.5A	VW	SCV096-5	V-096.5	VW
SCV050-A	V-050A	VW	SCV097-0	V-097	VW
SCV051-A	V-051A	VW	SCV097-5	V-097.5	VW
SCV051-5A	V-051.5A	VW	SCV098-0	V-098	VW
SCV052-A	V-052A	VW	SCV099-0	V-099	VW
SCV052-5A	V-052.5A	VW	SCV100-0	V-100	VW
SCV057-0	V-057	VW	SCV100-3	V-100.3	VW
SCV064-0	V-064	VW	SCV100-5	V-100.5	VW
SCV064-5	V-064.5	VW	SCV100-7	V-100.7	VW
SCV065-0	V-065	VW	SCV101-0	V-101	VW
SCV066-A	V-066A	VW	SCV104-0	V-104	VW
SCV066-5	V-066.5	VW	SCV105A	105A	VW
SCV067-A	V-067A	VW	SCV106A	106A	VW
SCV067-5	V-067.5	VW	SCV107-0	V-107	VW
SCV068-1	V-068.1	VW	SCV108A	108A	VW
SCV068-5	V-068.5	VW	SCV109-0	V-109	VW
SCV069-0	V-069	VW	SCV110A	110A	VW
SCV074-A	V-074A	VW	SCV111-0	V-111	VW

SCV075-A	V-075A	VW	SCV112-0	V-112	VW
SCV076-1	V-076.1	VW	SCV113-0	V-113	VW
SCV077-1	V-077.1	VW	SCV114-0	V-114	VW

Table 1b. Landfill I continued

GEM ID	Well ID	Collector Type	GEM ID	Well ID	Collector Type
SCV115-0	V-115	VW	SCV139-0	V-139	VW
SCV116-0	V-116	VW	SCV140-0	V-140	VW
SCV117-0	V-117	VW	SCV141-0	V-141	VW
SCV118-0	V-118	VW	SCV142-0	V-142	VW
SCV119-0	V-119	VW	SCV143-0	V-143	VW
SCV120-0	V-120	VW	SCV144-0	V-144	VW
SCV122-0	V-122	VW	SCV145-0	V-145	VW
SCV123-0	V-123	VW	SCV146-0	V-146	VW
SCV124-0	V-124	VW	SCV147-0	V-147	VW
SCV125A0	125A	VW	SCV148-0	V-148	VW
SCV126A0	126A1	VW	SCV149-A	V-149A	VW
SCV127A0	127A	VW	SC000H03	H-03	HC
SCV128-A	V-128A	VW	SC000H04	H-04	HC
SCV129A0	V-129	VW	SC000H24	H-24	HC
SCV131-0	V-131	VW	SC000H25	H-25	HC
SCV132-0	V-132	VW	SC000H51	H-51	HC
SCV133-0	V-133	VW	SC000H52	H-52	HC
SCV134-0	V-134	VW	SC000H53	H-53	HC
SCV135-0	V-135	VW	SC000H54	H-54	HC
SCV136-0	V-136	VW	SCLEW-05	L-05	VW
SCV137-0	V-137	VW	SCLEW-06	L-06	VW
SCV138-0	V-138	VW	SCLEW-07	L-07	VW

Table 2. Landfill II well counts

GEM ID	Well ID	Collector Type	GEM ID	Well ID	Collector Type	GEM ID	Well ID	Collector Type
SCEC0006	EC-06	HC	SCEC0039	EC-39	HC	SCV223-0	V-223	VW
SCEC0008	EC-08	HC	SCEC0040	EC-40	RW	SCV224-0	V-224	VW
SCEC0009	EC-09	HC	SCV201-0	V-201	VW	SCV225-0	V-225	VW
SCEC0010	EC-10	HC	SCV202-0	V-202	VW	SCV226-0	V-226	VW
SCEC0015	EC-15	HC	SCV204-0	V-204	VW	SCV227-0	V-227	VW
SCEC0016	EC-16	HC	SCV205-0	V-205	VW	SCV228-0	V-228	VW
SCEC0017	EC-17	HC	SCV206-0	V-206	VW	SCV229-0	V-229	VW
SCEC0018	EC-18	HC	SCEC0207	EC-207	RW	SCV230-0	V-230	VW
SCEC0019	EC-19	HC	SCEC0208	EC-208	RW	SCV231-0	V-231	VW
SCEC0020	EC-20	HC	SCEC0209	EC-209	RW	SCV232-0	V-232	VW
SCEC0022	EC-22	HC	SCV212-0	EC-212	RW	SCV233-0	V-233	VW
SCEC0024	EC-24	HC	SCV213-0	V-213	VW	SCV234-0	V-234	VW
SCEC0030	EC-30	HC	SCV214-0	V-214	VW	SCV235-0	V-235	VW
SCEC0031	EC-31	HC	SCV215-0	V-215	VW	SCV236-0	V-236	VW
SCEC0032	EC-32	HC	SCV216-0	V-216	VW	SCV237-0	V-237	VW
SCEC0033	EC-33	HC	SCV217-0	V-217	VW	SCV238-0	V-238	VW
SCEC0034	EC-34	HC	SCV218-0	V-218	VW	SCV239-0	V-239	VW

SCEC0035	EC-35	HC	SCV219-0	V-219	VW	SCV240-0	V-240	VW
SCEC0036	EC-36	HC	SCV220-0	V-220	VW	SCV241-0	V-241	VW
SCEC0037	EC-37	HC	SCV221-0	V-221	VW	SCV242-0	V-242	VW
SCEC0038	EC-38	HC	SCV222-0	V-222	VW	SCV243-0	V-243	VW

EMISSIONS

Landfill gases are produced when bacteria break down organic waste. Landfill gas includes methane (~45% to 60%), carbon dioxide (~40%) and small amounts of nitrogen, oxygen, ammonia, sulfides, hydrogen and various other gases. To prevent landfill surface leaks in excess of the District's Regulation 8-34-303 leak limit (500 ppmv, expressed as methane above background), landfill gas collection system well alterations are intended to ensure that the landfill gas collection system will continue to adequately control the landfill gas from a site, and to maintain or improve the overall capture efficiency of the gas collection system. The potential emission impacts of the proposed collection system alterations for this site are discussed in more detail below.

Impacts of Collection System Alterations on Landfill Emissions:

Using the reported landfill gas collection rates for each control device (measured during 10/2015 source tests, S-13 and S-14 measured during 11/2009), the annual average landfill gas collection rate was 3801 scfm at an average of 41.5% methane (3152 scfm at 50% methane). The landfill currently has 197 gas collection components, and the average gas collection rate per component is 16 scfm.

Impacts of Collection System Alterations on Control Device Capacity:

The maximum expected landfill gas generation rate in 2015 was determined to be 118.1 scfm using the LandGEM model. Currently, Republic vents their collected landfill gas to a variety of on-site landfill gas control devices: ten IC turbines (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13 and S-14), one enclosed flares (A-3). The energy recovery devices can handle up to 2870 scfm of landfill gas while the flare can handle an additional 1500 scfm of landfill gas. The total capacity of the current landfill gas control system is 4370 scfm of gas. Thus, the existing landfill gas control equipment has sufficient capacity to handle all of the gas that could potentially be collected from the landfill.

STATEMENT OF COMPLIANCE

Regulation 2, Rule 1 (CEQA and Public Notice Requirements):

This application is for a change of permit conditions at the S-1 Landfill with Gas Collection System that involves some physical alterations of the gas collection system, but that will not involve any modifications to the source (S-1). The gas collection system is part of the landfill gas abatement systems for the landfill. The proposed alterations do not result in any emission increases. Therefore, this application is categorically exempt from CEQA review pursuant to Regulation 2-1-312.2. In addition, the Engineering Evaluation for this application uses fixed standards and objective measurements and does not involve any element of discretion. Consequently, no further CEQA review is required.

The project is over 1000 feet from the nearest school and is therefore not subject to the public notification requirements of Regulation 2-1-412.

Regulation 2, Rule 2:

Since this application does not result in any emission increases, this project is not subject to New Source Review (NSR). No new BACT, Offset or PSD requirements will apply.

New Source Review for Toxic Air Contaminants:

This application does not result in any increases of Toxic Air Contaminants (TACs). Therefore, NSR for TACs is not triggered, and no new T-BACT requirements will apply.

Regulation 2, Rule 6:

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act (40 CFR, Part 70) and BAAQMD Regulation 2, Rule 6, Major Facility Review (MFR), because it is a major facility for NO_x and CO emissions and also because it is a designated facility (since it is subject to the control requirements of the Emission Guidelines for MSW Landfills). Therefore, this facility is required to have an MFR permit pursuant to Regulations 2-6-301 and 2-6-304.

The MFR Permit for this facility was last revised on May 20, 2013. Since this application will result in permit condition modifications, a minor revision of the Title V permit will be required.

Regulation 8, Rule 34:

Sonoma County Central Landfill (S-1) is subject to Regulation 8, Rule 34. S-1 is expected to comply with Regulation 8-34-301 by:

- (a) continuously operating the gas collection system and continuously operating gas control systems (including S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, S-14 and A-3),
- (b) having no leaks (exceeding 1000 ppmv) from the gas collection system, and
- (c) processing all collected gases in control devices achieving at least 98% NMOC destruction efficiency (or emitting less than 20 ppmv of NMOC from the IC engines and gas turbines).

The S-1 Sonoma County Central Landfill is also subject to Regulation 8-34-303, which limits leaks on the surface of the landfill to less than 500 ppmv as methane. This site has generally been complying with the surface leak requirements. However, surface leaks above the standard are occasionally discovered by the facility and are typically eliminated within a few days of discovery. The proposed collection system alterations will keep pace with the expected increases in gas production rate at this site and are expected to prevent excessive surface leaks at this landfill.

For deep interior wells, well spacing should be less than 300 feet with each well achieving a radius of influence of about 150 feet. For perimeter wells, well spacing should be less than 200 feet apart. Based on maps of the gas collection system, the current vertical wells are 150-300 feet apart and appear to be of sufficient density.

The proposed collection system alterations are necessary to maintain compliance with the collection system installation dates specified in Regulation 8-34-304. This site is complying with all applicable monitoring requirements (8-34-505-510).

Federal Requirements:

The landfill at this facility is subject to the 40 CFR Part 60, Subpart WWW NSPS for Municipal Solid Waste (MSW) Landfills. Compliance with the District’s Regulation 8, Rule 34 operating requirements is expected to ensure compliance with all applicable federal NSPS operating provisions.

NESHAPs for MSW Landfills: Any landfills that are subject to the landfill gas collection and control requirements of either the NSPS for MSW Landfills or the EG for MSW Landfills are also subject to the NESHAPs for MSW Landfills (40 CFR, Part 63, Subpart AAAA). This NESHAP requires that subject facilities prepare and implement startup, shutdown, malfunction plans and additional reporting requirements. All applicable requirements are contained in the existing MFR permit, and this facility is expected to comply with these requirements.

PERMIT CONDITION REVISIONS

The District is proposing to revise Condition # 4044, Part 4, as shown below in strike through and underline formatting. The proposed revisions to Part 4 identify the collection system alterations that are being authorized pursuant to this Authority to Construct. No other condition changes are proposed.

Condition # 4044

For S-1 Sonoma County Central Landfill, S-22 Waste and Cover Material, S-23 Mobile Surface Equipment, A-3 Landfill Gas Flare, and A-8 Water Sprays

- 4. The Sonoma County Central Landfill includes the landfill gas collection system components listed below. Well and collector locations, depths, and lengths are as described in detail in the current Landfill Collection and Control System Design Plan.

- a. Total Number of Vertical Wells: ~~135~~167
Total Number of Horizontal Collectors: ~~34~~30

- b. The Permit Holder has been authorized to make the landfill gas collection system alterations described below pursuant to Permit Application # 26628 and #28194. All collection system alterations shall comply with subparts 4b(i-vii) below.

- i. The authorized collection system alterations are:
 - Install up to 100 new gas collection wells
 - Permanently decommission up to 100 gas collection wells
 - Modify wellhead monitoring locations, as needed, provided that each landfill gas collection system component identified in Part 4a and each new collection system component installed per Part 4b is adequately represented by a wellhead monitoring location. The Permit Holder shall maintain documentation on site that identifies all landfill gas

collection system components that are represented by each wellhead monitoring location.

- ii. The Permit Holder shall apply for and receive a Change of Conditions before altering the landfill gas collection components described subpart 4a, other than those authorized by Part 4b. Installing, altering, or permanently decommissioning a vertical well, horizontal collector, or other gas collection component is subject to this requirement, unless this change constitutes a replacement as defined in subpart 4b(iii) below.
- iii. Replacement of landfill gas collection system components with identical or functionally equivalent components will not be deemed an alteration and will not be subject to subpart 4b(ii) under the following circumstances. If a well or collector will be shut down and replaced by a new well or collector in essentially the same location as the old component and this decommission/installation will be accomplished in accordance with Regulations 8-34-117 and 8-34-118, then this activity shall be considered a component replacement that is not subject to the Authority to Construct requirement. For each individual well or collector replacement, this subpart authorizes a maximum vacuum disconnection time of five consecutive days for compliance with Regulation 8-34-117.5. The disconnected component and the new component shall not be counted toward the subpart 4b(i) limits; the numbers of replacement wells and replacement collectors are not limited. Alterations, repairs, or replacements of non-perforated piping sections (such as risers, laterals, or header pipes), piping connectors, or valves are not subject to an Authority to Construct requirement.
- iv. At least three days prior to initiating operation of a well or collector installed pursuant to subpart 4b, the Permit Holder shall submit a start-up notice to the District that contains the component ID number for each new well or collector and the anticipated initial start-up date for each new component.
- v. For each well or collector that is permanently decommissioned after January 3, 2017, the Permit Holder shall submit a decommissioning notice to the District within no later than three working days after the component was disconnected from vacuum system. This decommissioning notice shall contain the component ID for each well or collector that was decommissioned, the date and time that each component was disconnected from the vacuum system, and the reason the component was decommissioned.
- vi. Within six months of installing a new component or permanently decommissioning an existing component, the Permit Holder shall prepare an updated map of the landfill gas collection system that identifies the ID numbers and locations of all operable wells and collectors. On this map or in

accompanying documentation, the Permit Holder shall summarize all component changes that were made since the last map was prepared. The previous collection system map, the updated collection system map, and the component change summary shall be provided to District staff upon request.

vii. If the Permit Holder has a net reduction (number of decommissioned components minus the number of installed components) of more than five components within a 120-day period, the Permit Holder shall submit a more comprehensive decommissioning notice to the District. In addition to the information required by subpart 4b(v), this comprehensive decommissioning notice shall include the maps and documentation required by subpart 4b(vi), shall identify all component changes that have occurred but that are not included on the most recently updated map, shall identify any components that are temporarily disconnected from vacuum pursuant to subpart 1c, shall provide estimated vacuum reconnection dates for these components, shall include a list of all well installations that are expected to occur within the next 120 days, and shall discuss the reasons why this reduction in gas collection components is not expected to result in surface emission leaks. Upon request, the Permit Holder shall provide wellhead monitoring data, surface leak monitoring data, records of repair attempts made to date, and other information to support the need for a net collection component reduction of more than five wells. The District may require additional surface monitoring to verify that this net component reduction is not causing landfill surface leaks. The District will notify the Permit Holder in writing of any additional surface monitoring that is required pursuant to this subpart.

RECOMMENDATION

Issue a Change of Conditions for Condition # 4044 that will authorize the landfill gas collection system alterations described below.

S-1 Sonoma County Center Landfill

- Install up to 100 new gas collection wells
- Permanently decommission up to 100 gas collection wells

By:

Davis Zhu
Air Quality Engineer

Date

APPENDIX D

**NSR Permit Evaluation
Application #28326**

ENGINEERING EVALUATION

Application # 28326

Sonoma County Central Landfill; Site # 22987
Plant Address: 500 Meham Road, Petaluma, CA 94952

BACKGROUND

Republic Service, Inc (Republic) operates the Sonoma County Central Landfill (Sonoma) in Petaluma, CA. This site includes an active landfill (S-1, S-22, S-23), a LFG to energy electrical generation facility consisting of 10 internal combustion (IC) engines, and one enclosed landfill gas flare (A-3). Each IC engine is rated as a 1,138 horsepower (HP), 10.5 MMBtu/hr engine, with approximately ~350 scfm capacity. Republic has applied for an Authority to Construct the following:

A-4 Enclosed Landfill Gas Flare, John Zink ZTOF, 3000 scfm maximum capacity; 91.26 MMBtu/hour

And archive the following abatement device:

A-3 Enclosed Landfill Gas Flare, John Zinc, 2740 scfm maximum capacity; 83.3 MMBtu/hour

The A-3 flare (83.3 MMBtu/hour capacity) at Sonoma will be moved to the inactive West Contra Costa Sanitary Landfill (WCCSL, Plant# 1840) and the A-120 flare at the West Contra Costa Sanitary Landfill will be moved to Sonoma and identified as a new abatement device, A-4, at the Sonoma site. The A-120 flare at the West Contra Costa Sanitary Landfill was initially permitted under Application # 21826 and the Authority to Construct was issued in August 2011.

Currently, at the Sonoma site, permit condition # 4044, part 13, limits the heat input to the A-3 flare to 547,680 MM BTU/year, which is an average of 62.52 MM BTU/hour. A-4 will provide 91.26 MM BTU/hour and 2190 MM BTU/day of flaring capacity. The additional flaring capacity supplied by A-4 is necessary to handle increases in gas collection rates resulting from increases in the cumulative waste disposal amount at this active landfill. However, this flare will only be used when the engines are down. To avoid emission increases, the facility has requested to limit the annual heat rate for A-4 to the current limit for A-3, which is 547,680 MM BTU/year.

Landfill Gas Control System Capacity Requirements:

The federal Emission Guidelines for Municipal Solid Waste Landfills (40 CFR Part 60, Subpart Cc) requires that landfills subject this requirement have sufficient landfill gas control system capacity to control all of the landfill gas that is expected to be generated by the landfill during the life of the collection system (typically about 10-15 years). For this site, the existing permitted landfill (S-1, S-22, S-23) is expected to reach its peak landfill gas generation rate in the year 2031 (14 years from now). Therefore, the landfill gas collection and control system for S-1 should be equipped to handle this peak landfill gas generation rate. The EPA's LandGEM program was used to estimate the peak landfill as generation rate for this landfill. From the Title V permit, the maximum cumulative capacity is 19.59 million tons of decomposable materials, and the landfill can accept up to 2500 tons/day of waste. The site provided estimated waste acceptance rates for 1971-1980 and actual waste acceptance rates for 1981-2016. The District used this historical waste acceptance data and a projected waste acceptance rate of 310,000 tons/year for all future years to determine the peak landfill gas generation rate for the currently permitted Sonoma County Central Landfill. The District used the default methane generation rate ($k = 0.04 \text{ year}^{-1}$) for non-arid areas (> 25 inches of precipitation per year), since Petaluma has an annual average precipitation rate of about 26.65

inches/year. The District used the default potential methane generation capacity ($L_0 = 100 \text{ m}^3/\text{Mg}$). The landfill gas methane content is assumed to be 50%. Based on these inputs, the LandGEM model calculates a peak landfill generation rate of 1,750,248,000 ft^3/year for the year 2032, which is equivalent to an annual average landfill gas flow rate of 3330 cfm or an annual average heat capacity of 99.9 MM BTU/hour. At 75% collection efficiency, the maximum flow rate from the collection system to the control devices will be 2498 scfm and 74.94 MM BTU/hour. Although the current LFG to energy facility (with 10 IC engines) has a combined heat input limit of 921,990 MM BTU/year (100.5 MM BTU/hour) and will be capable of burning about 3500 scfm of landfill gas, the new flare A-4 (91.26 MM BTU/hour, 3000 scfm) has sufficient capacity to accommodate at least 75% of peak LFG generated at this site in the event all (10) IC engines in the LFGTE facility simultaneously go offline or need maintenance.

EMISSIONS

The District has determined the maximum permitted and potential emissions for the proposed new A-4 Landfill Gas Flare (see Table 1). The facility requested to have limited (6000 hours) annual operating hours for the proposed flare, to ensure the flare stays within the current limit of 547,680 MMBtu/yr (set for current A-3 flare). However, the daily emission limit is calculated based on 24-hour operation at the maximum heat input of the A-4 flare considering the worst scenario that the flare will be the only operating LFG control device with all 10 IC engines offline. Detailed emission calculations are presented in the attached spreadsheets. The basis or derivation of the emission factors for these flares are discussed below.

Criteria Pollutants:

NOx and CO Emission Factors:

The facility has proposed that the A-4 flare meet a NOx emission rate of 0.05 lbs/MMBtu. The flare manufacturer has indicated that this NOx emission rate and a CO emission rate of 0.2 lbs/MMBtu can be achieved if the operating temperature is maintained at 1600 degrees F. The vendor has guaranteed compliance with these emission limits for this flare operating between 4.5 MM Btu/hr and 91.6 MM Btu/hr.

PM Emission Factors:

EPA's AP-42, Compilation of Air Pollutant Emission Factors, Table 2.4-5 "Emission Rates for Secondary Compounds Exiting Control Devices" specifies a PM emission factor of 17 lbs/million dscf methane. Sonoma Central Landfill gas is assumed to contain 50% methane with a heat content of 1013 BTU/dscf. Therefore, the AP-42 emission factor is equivalent to

$$(17 \text{ lbs PM}_{10}/10^6 \text{ dscf CH}_4)(0.5 \text{ dscf CH}_4/1.0 \text{ dscf LFG})/(496.94 \text{ BTU/dscf LFG})^*$$

$$(10^6 \text{ Btu/MMBtu}) = 0.0171 \text{ lbs PM}_{10}/\text{MMBtu}$$

SO₂ Emission Factors:

Assuming all the TRS in the landfill gas is converted to SO₂, the proposed TRS limit (300 ppmv as H₂S) is equivalent to the SO₂ emission factors derived below:

$$(300 \times 10^{-6} \text{ lb-mole S/lb-mole gas})(\text{lb-mole SO}_2/\text{lb-mol S})(64.059 \text{ lbs SO}_2/\text{lb-mol SO}_2)(\text{lb-mol gas}/386.765 \text{ scf})/(496.94 \text{ Btu/scf}) = 9.9989 \times 10^{-8} \text{ lb SO}_2/\text{BTU gas} = 0.09999 \text{ lb SO}_2/\text{MMBtu gas}$$

Annual source tests conducted from 2014 to 2016 show 100 ppm (2014), 62.9 ppm (2015), 107 ppm (2016) of TRS at the inlet of A-3 flare.

Regulation 9-1-302 limits sulfur dioxide concentrations in any exhaust point to 300 ppmv (dry basis). The exhaust gas from the landfill gas flare typically contains 10%-15% oxygen. Assuming the flare exhaust stream contains 10% oxygen, the outlet SO₂ concentration from the flare will be:

$$\begin{aligned}
 & (300 \text{ ft}^3 \text{ H}_2\text{S/MM ft}^3 \text{ LFG}) (1 \text{ ft}^3 \text{ SO}_2/1 \text{ ft}^3 \text{ H}_2\text{S}) / (4.785 \text{ ft}^3 \text{ flue at 0\% O}_2/1 \text{ ft}^3 \text{ LFG}) \\
 & = 62.7 \text{ ft}^3 \text{ of SO}_2/\text{MM ft}^3 \text{ flue gas at 0\% oxygen} = 62.7 \text{ ppmv of SO}_2 \text{ at 0\% oxygen} \\
 & (62.7 \text{ ppmv of SO}_2 \text{ at 0\% O}_2)(20.9-10)/(20.9-0) = 32.70 \text{ ppmv of SO}_2 \text{ at 10\% oxygen.}
 \end{aligned}$$

Therefore, the 300 ppm TRS limit in LFG should ensure compliance with the Regulation 9-1-302 sulfur dioxide limit of 300 ppmv (dry basis).

POC & NPOC Emission Factors:

Total non-methane organic compound (NMOC) emission rates are based on the District's regulatory limit for landfill gas flares (Regulation 8-34-301.3: 30 ppmv of NMOC in the exhaust at 3% O₂, expressed as methane). Maximum precursor organic compounds (POC) emissions are calculated by assuming that the NMOC emissions are 100% POC. Non-precursor organic compound (NPOC) emissions are calculated using the District's standard assumption that NMOC emissions are no more than 5% NPOC.

The 30 ppmv NMOC outlet concentration is equivalent to an NMOC emission rate of 1.306×10^{-2} lbs/MMBtu, as determined below.

$$\begin{aligned}
 & (30 \text{ ppmv at 3\% O}_2) (20.9-0)/(20.9-3) = 35.0279 \text{ ppmv at 0\% O}_2 \\
 & (35.0279 \text{ scf NMOC}/1 \times 10^6 \text{ scf flue}) * (9628.4 \text{ scf flue/MMBtu}) / (386.765 \text{ scf NMOC/lbmol}) * \\
 & (16.04 \text{ lbs/lbmol}) = 0.01399 \text{ lbs NMOC/MMBtu}
 \end{aligned}$$

Since the Regulation 8-34-301.3 outlet concentration limit will allow a higher NMOC emission rate than the destruction efficiency criteria, this outlet concentration limit will be used as the basis for the maximum POC and NPOC emission rate calculations. The NMOC in the outlet could be as much as 100% POC, but NPOCs are expected to make up no more than 5% of the total NMOC in the outlet.

$$(0.01399 \text{ lbs POC/MM BTU}) * (0.05 \text{ lbs NPOC/lbs POC}) = 6.99\text{E-}4 \text{ lbs NPOC/MM BTU}$$

Assuming continuous use of the flare at the maximum capacity for any single day, the maximum daily heat input from A-4 will be:

$$(91.26 \text{ MM BTU/hour}) * (24 \text{ hours/day}) = 2190.24 \text{ MM BTU/day}$$

Maximum permitted annual emissions will be based on the Applicant's proposed maximum annual heat input limit of 547,680 MM BTU/year.

Maximum criteria pollutant emissions from A-4 are presented below in Table 1.

TACs and HAPs:

Toxic air contaminant (TAC) emissions are calculated based on site-specific landfill gas constituent data and standard District assumptions. Hazardous air pollutant (HAP) emissions are a subset of these TAC emissions as determined by the current EPA list of HAPs. Residual TAC emissions are calculated by assuming 98% destruction efficiency for each individual compound detected in the landfill gas at this site. Secondary TAC emissions include formaldehyde and acid gases (hydrogen chloride and hydrogen fluoride) that form due to the presence of halogenated compounds in the landfill gas. Formaldehyde emissions are calculated using the District's standard factor for enclosed landfill gas flares (0.18 lbs/million scf of landfill gas burned), which is based on a landfill gas fired turbine emission factor from the California Air Toxic Emission Factor (CATEF) database. Site-specific landfill gas data is used to determine the maximum expected concentrations of chlorine and fluorine (85,500 ppbv and 6,560 ppbv, respectively) in the landfill gas. These ions are converted to hydrogen chloride and hydrogen fluoride during combustion (100% conversion is assumed). The largest single HAP is hydrogen chloride with an estimated emission rate of

0.016 pounds/MMBtu. TAC emissions from the proposed new flare (A-4) are summarized in Table 2; detailed spreadsheets are attached.

Table 1. Maximum Permitted Emissions for the Proposed A-4 Landfill Gas Flare

		MMBtu/hour	MMBtu/day	MMBtu/year
Capacity		91.26	2,190	547,680
	Emission Factors	Maximum Permitted Emissions		
	lbs/MM BTU	lbs/hour	lbs/day	tons/year
NOx	0.05	4.563	109.51	13.692
CO	0.20	18.252	438.05	54.768
SO2	0.0999	9.119	218.86	27.364
PM10	0.0171	1.561	37.46	4.684
POC	0.014	1.276	30.62	3.828
NPOC	0.0007	0.064	1.53	0.191
Total HAPs	1.810E-02			4.957
Single HAP (HCl)	1.621E-02			4.439

GHG:

Since landfills are not in one of the 28 PSD source categories and Sonoma agreed to accept a site-wide CO emissions cap of 225 tons/year to prevent triggering PSD for CO, the facility is not a PSD facility and does not exceed the 250-ton major PSD facility thresholds for any pollutants. Therefore, GHGs are not a PSD pollutant for this facility per Regulation 2-2-223. GHG emissions are not discussed and calculated for this application.

Cumulative Increases

Republic will be removing the existing A-3 flare, when the new flare is put online. The cumulative emission increases for this application are calculated pursuant to Regulation 2-2-604 and 2-2-605: the maximum permitted emission levels for the proposed new flare (A-4) minus the baseline actual emissions for the flare that will be shutdown (A-3). The cumulative emission increases for this application are summarized in Table 3. Baseline actual emissions for A-3 were determined using 2014-2016 source test data and actual throughput data reported by the facility.

Table 2. Maximum Permitted TAC Emissions for the Proposed A-4 Landfill Gas Flare

	Maximum Expected LFG Concentration PPBV	Emission Factor (After Combustion) lbs/MM BTU	Maximum Permitted Emissions lbs/hour	Maximum Permitted Emissions lbs/year
Acrylonitrile*	6330	3.493E-05	3.19E-03	1.91E+01
Benzene*	2500	2.031E-05	1.85E-03	1.11E+01
Carbon Disulfide*	580	4.593E-06	4.19E-04	2.52E+00
Carbon Tetrachloride*	50	7.998E-07	7.30E-05	4.38E-01
Chlorobenzene*	254	2.973E-06	2.71E-04	1.63E+00
Chlorodifluoromethane	1300	1.169E-05	1.07E-03	6.40E+00
Chloroethane*	1250	8.386E-06	7.65E-04	4.59E+00
Chloroform*	30	3.724E-07	3.40E-05	2.04E-01
1,1 Dichloroethane*	2350	2.418E-05	2.21E-03	1.32E+01
1,1 Dichloroethene*	200	2.016E-06	1.84E-04	1.10E+00
1,2 Dichloroethane*	410	4.219E-06	3.85E-04	2.31E+00
1,4 Dichlorobenzene*	210	3.210E-06	2.93E-04	1.76E+00
Dichlorodifluoromethane	1000	1.257E-05	1.15E-03	6.89E+00
Dichlorofluoromethane	1200	1.284E-05	1.17E-03	7.03E+00
Ethyl benzene*	4610	5.090E-05	4.64E-03	2.79E+01
Ethylene Dibromide*	1	1.954E-08	1.78E-06	1.07E-02
Fluorotrichloromethane	760	1.086E-05	9.91E-04	5.95E+00
Hexane*	6570	5.888E-05	5.37E-03	3.22E+01
Hydrogen Sulfide	300000	1.063E-03	9.70E-02	5.82E+02
2-Propanol (IPA)	50100	3.131E-04	2.86E-02	1.71E+02
2-Butanone (MEK)	7090	5.316E-05	4.85E-03	2.91E+01
Methylene Chloride*	20000	1.766E-04	1.61E-02	9.67E+01
Perchloroethylene*	3000	5.174E-05	4.72E-03	2.83E+01
Toluene*	14000	1.341E-04	1.22E-02	7.35E+01
1,1,1 Trichloroethane*	480	6.659E-06	6.08E-04	3.65E+00
1,1,2,2, Tetrachloroethane*	1110	1.938E-05	1.77E-03	1.06E+01
Trichloroethylene*	3000	4.099E-05	3.74E-03	2.24E+01
Vinyl Chloride*	2500	1.625E-05	1.48E-03	8.90E+00
Xylenes*	17000	1.877E-04	1.71E-02	1.03E+02
Formaldehyde *		3.622E-04	3.31E-02	1.98E+02
Hydrogen Chloride *	85494	1.621E-02	1.48E+00	8.88E+03
Hydrogen Fluoride *	6560	6.824E-04	6.23E-02	3.74E+02

* The compound is an EPA hazardous air pollutant (HAP).

Table 3a. Actual Emission Increases for Application # 28326

	Proposed Emissions from A-4	Actual Emissions from A-3	Actual Emission Increases
	tons/year	tons/year	tons/year
NOx	13.692	0.729	12.963
CO	54.768	0.073	54.695
SO2	27.364	0.740	26.624
PM10	4.684		4.684
POC	3.828	0.011	3.817
NPOC	0.191		0.191

Table 3b. Cumulative Emission Increases for Application # 28326

	Proposed Permitted Emissions from A-4	Current Permitted Emissions from A-3	Increases in Permitted Annual Emissions?	Proposed Permitted Emissions from A-4	Baseline Emission Reductions from A-3	Cumulative Emission Increases
	tons/year	tons/year	tons/year	tons/year	tons/year	tons/year
NOx	13.692	13.692	No	13.692	- 13.692 *	0.000
CO	54.768	54.768	No	54.768	- 0.073	54.695
SO2	27.364	26.562	Yes	27.364	-0.740	26.624
PM10	4.684	4.684	No	4.684		4.684
POC	3.828	3.828	No	3.828	- 3.828 *	0.000
NPOC	0.191	0.191	No	0.191		0.191

* NOx and POC offsets were previously provided from the small facility banking account for all NOx and POC emissions from the A-3 Flare pursuant to Application #13632 . Therefore, emission reduction credits due to the shut down of A-3 are determined pursuant to 2-2-605.2 for NOx and POC only. For a fully offset source, the emission reduction credit is the PTE, or amount that has been offset. Section 2-2-605.1 (actual emission reductions) applies to CO, SO2, and PM10 emissions from A-3.

Facility wide PTE

The facility agreed to voluntarily accept a NOx emission limit of 0.8 g/bhp-hr on all 10 IC engines pursuant to Application 6178. CO EFs of 2.1 lb/MMBtu for 10 identical engines are based on emission data provided by the manufacturer. The site-wide Potential to Emit emissions are summarized in Table 4. Since site-wide CO PTE emission is 286.394 tons per year, Sonoma requests a site-wide carbon monoxide (CO) emission cap for the entire facility to avoid being considered a major source of CO emissions under federal Prevention of Significant Deterioration (PSD) requirements. The PSD threshold for this facility is 250 tons/year of CO emissions. Sonoma has agreed to accept a site-wide CO emissions cap of 225 tons/year. A new Condition # 26057 imposing the 225 tons/year CO limit will be added upon District approval of the application 28326. The District expects that Sonoma will be able to meet this cap because the 10 engines and the A-4 flare are not expected to ever operate simultaneously at maximum capacity (about 6500 scfm of landfill gas) because the maximum projected landfill gas generation rate for this landfill is 3330 scfm.

Table 4. Site-wide Potential to Emit Emissions from all non-mobile sources

Description	NMOC/POC tons/yr	NOx tons/yr	CO tons/yr	PM10 tons/yr	SO2 tons/yr	Estimated under A/N

Landfill S-1	36.683					A/N 19313
IC Engine, S-4	2.637	8.791	23.076	1.099	3.297	A/N 6914 ^a
IC Engine, S-5	2.637	8.791	23.076	1.099	3.297	A/N 6914 ^a
IC Engine, S-6	2.637	8.791	23.076	1.099	3.297	A/N 6914 ^a
IC Engine, S-7	2.637	8.791	23.076	1.099	3.297	A/N 6914 ^a
IC Engine, S-9	2.637	8.791	23.076	1.099	3.297	A/N 13314 ^a
IC Engine, S-10	2.637	8.791	23.076	1.099	3.297	A/N 13314 ^a
IC Engine, S-11	2.637	8.791	23.076	1.099	3.297	A/N 13314 ^a
IC Engine, S-12	2.637	8.791	23.076	1.099	3.297	A/N 13314 ^a
IC Engine, S-13	2.637	8.791	23.076	1.099	3.297	A/N 6178 ^b
IC Engine, S-14	2.637	8.791	23.076	1.099	3.297	A/N 6178 ^b
Landfill Tipper Propane engine, S-24	0.289	0.417	0.866	0.037	0.000	A/N 27467
A-4 Flare	3.828	13.692	54.768	4.684	27.364	A/N 28326 (547680 MMBtu/yr permitted)
PTE Totals	67.170	102.018	286.394	15.711	60.334	

a. NO_x EF (0.8 g/bhp-hr), PM₁₀ EF (0.1 g/bhp-hr) and SO₂ EF (0.3 g/bhp-hr) were updated in A/N 6178.

b. switched to composition Biogas fueled under A/N 22950.

STATEMENT OF COMPLIANCE

Regulation 2, Rule 1 (CEQA and Public Notification Requirements):

This application involves the permitting of an abatement device with no modification of the landfill source. This device will provide additional control capacity for the landfill that is necessary to comply with District, state, and federal regulations that require this facility to collect and control landfill gas from the Sonoma County Central Landfill. This project will have no significant impact on biological resources, water quality, dust, smoke, odors, noise, or the need for municipal services. Since this application involves a permit for an abatement device only and there is no possibility that this device will have any significant adverse environmental impact, this application is categorically exempt from CEQA review pursuant to Regulation 2-1-312.2. No further CEQA review is required.

As shown in Table 4, the site-wide PTEs will be: 102.018 tons/year of NO_x, 286.394 tons/year of CO, 60.334 tons/year of SO₂, 15.711 tons/year of PM₁₀, and 67.170 tons/year of POC (30.487 tons/year of Non-fugitive POC). Since landfills and landfill gas combustion equipment are not in one of the 28 listed categories that are subject to the lower PSD Major Facility threshold of 100 tons/year, this site is subject to a PSD threshold of 250 tons/year. This site is not a PSD “major facility” of NO_x emissions.

At the current maximum permitted emission levels for A-4 (0.20 lbs CO/MM BTU) and the combined maximum operating rates for 10 IC engines (1,389,095 MM BTU/year, 0.21 lbs CO/MMBTU), the CO emissions from A-4 and IC engines combined would be 286.394 tons/year of CO. However, the highest detected CO emission rate from current flare A-3 was 0.04 lbs/MM BTU during the last 3 annual source tests (which is equal to less than 11 tons/year of CO at the maximum permitted throughout rate above). In

addition, the landfill is not expected to ever generate enough landfill gas to support simultaneous operation of the ten engines and the flare at full capacity. Therefore, it is highly unlikely that this site could ever have CO emissions greater than 250 tons/year. The site-wide CO emissions will not exceed 225 tons/year to ensure that this site is not a PSD “major facility” of CO emissions.

Since landfills and compost facilities are not in one of the 28 PSD source-categories for which fugitive emissions must be included when making “major facility” applicability determinations, the fugitive emissions of PM₁₀ and POC may be excluded from this “major facility” applicability determination. All of the PM₁₀ and POC from the landfill operations (S-1, S-22, and S-23) are fugitive in nature. Therefore, the only non-fugitive emissions of PM₁₀ and POC are those from the flares and IC engines. For these operations, the total non-fugitive PTEs (at the proposed annual throughput limit of 547,680 MMBtu/year for A-4) will be: 15.711 for PM₁₀ and 30.487 tons/year of POC.

As seen in Table 3, the emission increase from this project is below the “significant” levels as defined in Regulation 2-2-227.2 (same as the Major Modification emission increase thresholds), therefore, this site will not be subject to the Regulation 2-2-404 publication and public comment requirements.

This facility is also subject to Title V requirements because it is a designated facility. NSPS and EG requirements for MSW landfills state that any site with a landfill that is subject to the collection and control requirements of the federal NSPS or EG for MSW Landfills (40 CFR Part 60, Subpart WWW or Subpart Cc) is considered to be a designated facility and must have a Title V permit.

The project is over 1000 feet from the nearest school and is therefore not subject to the public school notification requirements of Regulation 2-1-412.

Regulation 2, Rule 2 (New Source Review: BACT/RACT)

Regulation 2, Rule 1, Section 234 defines the term “Modify” for the purposes of new source review applicability. Although the landfill (S-1) is not being modified as part of this permit application, the proposed replacement of abatement equipment for this landfill (replacing A-3 with a larger flare A-4) will result in increases in the daily potential to emit for secondary criteria pollutants and TACs and for residual POC and TACs. Therefore, this project is deemed a modification pursuant to Regulation 2-1-234.1. Any modified source or project is subject to Regulation 2, Rule 2 New Source Review.

BACT Exemption for Secondary Pollutants

Regulation 8, Rule 34 requires that the S-1 Sonoma County Central Landfill be equipped to collect and control landfill gas in landfill gas flares or energy recovery devices in order to reduce POC emissions caused by waste decomposition in the landfill. The proposed A-4 Landfill Gas Flare is necessary to meet these BARCT requirements of Regulation 8, Rule 34. Pursuant to Regulation 2-2-112, the secondary emission increases from the new A-4 Flare (NO_x, CO, SO₂, and PM₁₀) are exempt from the BACT requirements of Regulation 2-2-301, because A-4 is complying with BARCT for POC emissions. Regulation 2-2-112 requires that NO_x, CO, SO₂, and PM₁₀ emissions from A-4 comply with RACT instead of BACT. As discussed in more detail below, A-4 will comply with RACT for each of these pollutants.

BACT for POC: As shown in Table 1, maximum daily residual POC emissions from A-4 are 30.6 pounds/day. Since POC emissions from A-4 will exceed 10 pounds/day, BACT is triggered per 2-2-301. A landfill gas collection and control system that is meeting the requirements of Regulation 8, Rule 34 satisfies the BARCT and BACT control requirements for POC emissions from the landfill waste decomposition process. The proposed A-4 flare and the residual POC emissions from this flare are expected to meet all applicable requirements of Regulation 8, Rule 34. In addition, the A-4 Flare will have an

operating temperature ≥ 1400 °F, minimum residence time of 0.6 seconds, automatic controls. Therefore, BACT is met for the residual POC emissions from A-4.

RACT for Secondary Pollutants

RACT for NO_x: The District's BACT/TBACT Workbook (Document # 80.1 12/16/91) indicates that the RACT limit for NO_x emissions from a landfill gas flare is 0.06 pounds NO_x/MM BTU. The manufacturer has indicated that the proposed A-4 Flare will meet a lower NO_x emission level of 0.05 pounds NO_x/MM BTU. Therefore, A-4 will comply with RACT. The Applicant will demonstrate compliance with this limit by conducting initial and annual source tests. Annual source testing is a standard method of demonstrating compliance with NO_x RACT limits.

RACT for CO: RACT for CO is the same as the BACT requirements for POC and includes the use of an enclosed ground flare with (1) a minimum retention time of 0.6 seconds, (2) a minimum combustion zone temperature of 1400 °F, and (3) automatic controls for combustion air, gas shut-off, and flare restart. The proposed new A-4 Flare is an enclosed ground flare that meet the three design criteria identified above. Therefore, A-4 satisfies the RACT requirements for CO emissions. To ensure adequate POC destruction, permit conditions will require that the new A-4 Flare be maintained at a minimum combustion zone temperature of at least 1400 °F. The Applicant will demonstrate compliance with this temperature limit by continuously monitoring and recording the combustion zone temperature. The District typically issues a RACT CO limit of 0.20 pounds CO/MM BTU for new landfill gas flares, the Applicant has indicated that A-4 will meet 0.20 pounds CO/MM BTU. The Applicant will demonstrate compliance with this limit by conducting initial and annual source tests. Annual source testing is a standard method of demonstrating compliance with CO RACT limits.

RACT for PM₁₀: PM₁₀ emissions from landfill gas flares are low with emission rates that are similar to natural gas combustion. PM₁₀ emissions monitoring is not justified for this replacement flare, because the emissions are low (4.684 tons/year) and the expected grain loading rate of 0.0124 gr/dscf (see discussion for Regulation 6, Rule 1 below for calculations) is less than 10% of the applicable limit (0.15 gr/dscf).

RACT for SO₂: Application # 10874 contains a detailed discussion of the SO₂ RACT determination for landfill gas flares. The District determined that landfill gas sulfur treatment systems do not constitute a "reasonably" available control measure for landfill gas containing less than about 500 ppmv of total reduced sulfur compounds. Instead, RACT for SO₂ emissions from landfill gas combustion operations was determined to be compliance with reasonable landfill gas sulfur content limits for the site. The District previously determined that an annual average of 300 ppmv of TRS was a reasonable sulfur content limit for this site. The proposed A-4 Flare will be subject to this same existing limit.

Regulation 2, Rule 2: Major Modification determination:

Per Regulation 2-2-218, Major Modification is defined as a new source, or a modified source, or any combination of such new and modified sources at a facility that are part of a single common project, that (i) are or will be located at an existing major facility and (ii) will cause an increase in emissions of a pollutant for which the facility is a major facility, calculated according to Section 2-2-604, of the following amounts or more:

POC: 40 tons per year
NO_x: 40 tons per year
SO₂: 40 tons per year
PM₁₀: 15 tons per year
PM_{2.5}: 10 tons per year
CO: 100 tons per year

As seen in Table 3a, the CO increase from the new flare is less than 100 tons/year, the SO₂, POC and NO_x increases are all less than 40 tons/year, and the PM increase is less than 10 tons/year; therefore, this project is not a major modification.

Regulation 2, Rule 2 (New Source Review: Offsets)

As shown Table 4, site wide NO_x and POC emissions will each exceed 10 tons/year; therefore, offsets are required for these pollutants. Since NO_x and POC emissions at this site will also exceed 35 tons/year, the facility is typically responsible for providing any required offsets. As shown in Table 3b, NO_x and POC emission increases from A-4 will be fully offset by on-site contemporaneous emission reductions from A-3.

In accordance with Regulation 2-2-303, SO₂ and PM₁₀ offsets are only required for major facilities that emit more than 100 tons/year of these pollutants. This site will not emit more than 100 tons/year of PM₁₀ or SO₂, therefore; offsets are not required for these pollutants.

Since this project involves installation of abatement equipment that is necessary to meet BARCT requirements (specifically Regulation 8, Rule 34) and this project does not involve any modifications to the landfill, this project qualifies for the California Health and Safety Code exemption from offset requirements: H&SC § 42301.2, which states:

42301.2. A district shall not require emission offsets for any emission increase at a source that results from the installation, operation, or other implementation of any emission control device or technique used to comply with a district, state, or federal emission control requirement, including, but not limited to, requirements for the use of reasonably available control technology or best available retrofit control technology, unless there is a modification that results in an increase in capacity of the unit being controlled.

The proposed landfill gas flare is an abatement device as defined in Regulation 1-240, which is being installed to meet the control requirements in Regulation 8, Rule 34. There is no modification proposed to the landfill itself, so there is no increase in the capacity of the 'unit being controlled.' Therefore, the site will not be required to provide or reimburse the District for any the emission offsets (if they would otherwise be required) for secondary pollutant emissions from A-4.

Regulation 2, Rule 5 (NSR of Toxic Air Contaminants):

Regulation 2, Rule 5 applies to projects, as defined in Regulation 2-5-216. As explained in the attached HRA report for this application, the secondary TAC emissions from the proposed new flare (A-4) are considered to be the project emission increases for this application, but the District also evaluated both the secondary and residual emissions from A-4 to ensure that this flare does not contribute significantly to site-wide health impacts under the Air Toxic Hot Spots Act.

Based on the calculations (spreadsheet attached), emissions of acrylonitrile, benzene, ethyl benzene, methylene chloride, perchloroethylene, 1,1,2,2, tetrachloroethane, vinyl chloride and secondary hydrogen chloride, hydrogen fluoride, formaldehyde from the flare exceed the District's risk screen trigger.

The District conducted this HRA using the AERMOD air dispersion model. Rural dispersion coefficients, Santa Rosa meteorological data, and elevated terrain data (USGS Sonoma County 10m digital elevation map) were used in the dispersion model to determine maximum 1-hour and maximum annual average ground level concentrations.

Detailed health risk calculation procedures are presented in the attached HRA. Maximum health impacts due to the total TAC emissions from A-4 (while it is operating at full capacity) are presented in Table 5. For cancer risk, acrylonitrile is the major contributor, Hydrogen chloride is the major contributor to the chronic HI, and xylenes are the major contributor to the acute HI.

Table 5. Health Impacts Due to TAC Emissions (secondary and residual) from A-4 Flare

Receptor	NAD 27 UTM Coordinates (meters)		Cancer Risk (in a million)	Chronic HI	Acute HI
	Easting (x)	Northing (y)			
Resident	521,896	4,240,763	0.0098	0.0011	N/A
Worker	523,425	4,240,245	0.00067	0.00015	N/A
PMI	522,951	4,240,483	N/A	N/A	0.0013

Since the health risks from A-4 are less than the TBACT trigger levels of 1 in a million cancer risk and 0.2 chronic HI, TBACT is not required for A-4. Project health risks are less than the Regulation 2-5-302 limits of 10 in a million cancer risk, 1.0 chronic HI, and 1.0 acute HI. Therefore, this project will satisfy all Toxic NSR requirements.

Regulation 2, Rule 6 (Major Facility Review):

This facility is subject to MFR Permit requirements pursuant to Regulation 2-6-304, because it is a designated facility that is subject to the requirements of 40 CFR, Part 60, Subpart Cc Emission Guidelines for MSW Landfills.

The District issued the initial MFR Permit for this facility (Site # A2254) on February 27, 2001. The Title V permit has since undergone two Significant Revisions and three Minor Revisions. This MFR Permit was renewed on April 23, 2007, and 05/20/13. The Applicant has submitted Application # 28195 for the MFR permit changes necessary to include this new flare and site-wide CO 225 tons/year cap. These MFR permit revisions will be discussed in the Statement of Basis for Application # 28195.

Regulation 6, Rule 1 (General Requirements):

Particulate matter emissions from the A-4 Landfill Gas Flare are subject to Regulation 6, Rule 1. Section 6-1-310 limits PM emissions to 0.15 grains/dscf of exhaust. At the expected PM₁₀ emission rate of 0.0171 lbs/MM BTU, the PM₁₀ grain loading in the exhaust will be 0.0124 grains/sdcf at 0% O₂, 0.004 grains/sdcf at 15% O₂. This expected PM₁₀ emission rate is far below the Regulation 6-1-310 grain-loading limit. Periodic source testing to demonstrate compliance with this particulate emissions rate would be expensive and is not justified in light of the relatively low particulate emissions levels from this flare (4.684 tons/year of PM₁₀) and the high compliance margin with this grain loading limit (12:1).

$$(17 \text{ lbs PM}_{10}/10^6 \text{ ft}^3 \text{ CH}_4) * (0.50 \text{ ft}^3 \text{ CH}_4/\text{ft}^3 \text{ LFG}) / (4.78469 \text{ ft}^3 \text{ flue}/1 \text{ ft}^3 \text{ LFG}) * (7000 \text{ grains}/\text{lb})$$

$$= 0.0124 \text{ grains PM}_{10}/\text{dscf flue gas}$$

Regulation 8, Rule 34 (Solid Waste Disposal Sites):

Landfill gas flares are required to meet the requirements of Regulation 8, Rule 34. Regulation 8-34-301.3 requires the use of enclosed ground flares that have either a destruction efficiency of 98% by weight for

NMOC or that emit no more than 30 ppmv of NMOC (as methane at 3% O₂, dry basis) from the flare. The manufacturer indicated that A-4 will comply with these NMOC destruction efficiency and outlet concentration limits. Continuous temperature monitoring (pursuant to Regulation 8-34-507) will ensure that this flare complies with 8-34-301.3 on an on-going basis. The flare will also be equipped with a data recording system that will maintain all records required pursuant to Sections 501.2 and 501.3.

Regulation 9, Rule 1 (Sulfur Dioxide):

For gaseous combustion operations, Regulation 9-1-302 limits the sulfur dioxide (SO₂) concentration in an exhaust stream to 300 ppmv (dry basis). As discussed in the SO₂ emissions calculation section, Condition # 4044, Part 7 will be updated that the total reduced sulfur compounds (TRS) in the collected landfill gas will be limited to 300 ppmv of TRS (expressed as H₂S). For A-4 burning landfill gas containing 50% methane (heat content = 496.943 BTU/scf), the flue gas factor is: 9628 scdf of flue gas (at 0% oxygen) generated per MM BTU of landfill gas burned. A-4 is expected to operate at a minimum outlet oxygen level of 10% by volume, dry basis. The maximum expected outlet SO₂ concentration for any single test is calculated below, assuming that 100% of the TRS is converted to SO₂.

$$(300 \text{ ft}^3 \text{ S}/1 \text{ MM ft}^3 \text{ LFG}) * (1 \text{ ft}^3 \text{ SO}_2/1 \text{ ft}^3 \text{ S}) / (496.943 \text{ MM BTU}/1 \text{ MM ft}^3 \text{ LFG}) / (9628 \text{ ft}^3 \text{ flue gas at 0\% O}_2/\text{MM BTU}) = 6.27\text{E-}3 \text{ ft}^3 \text{ SO}_2/\text{ft}^3 \text{ flue gas at 0\% O}_2 \\ = 62.7 \text{ ppmv of SO}_2 \text{ in flue gas at 0\% O}_2$$

$$(62.7 \text{ ppmv SO}_2) * (20.9-10)/(20.9-0) = 31.2 \text{ ppmv of SO}_2 \text{ in A-4 flue gas at 10\% O}_2$$

For the current landfill gas sulfur content limit of annual average 300 ppmv TRS, the maximum expected outlet concentration is 31.2 ppmv of SO₂, which is around 10% of the Regulation 9-1-302 limit (300 ppmv of SO₂ at the as found oxygen concentration.)

During the last three years, source test measurements ranged from 62.9-107 ppmv of TRS in the LFG. Therefore, A-4 is expected to comply with the Regulation 9-1-302 limit with a high margin of compliance.

Federal Requirements:

The Sonoma County Central Landfill is currently subject to the Emission Guidelines (EG) for MSW Landfills (40 CFR Part 60, Subpart Cc), which in this District is implemented through compliance with Regulation 8, Rule 34. All existing applicable requirements are identified in the MFR Permit for Site # A2254/B2987. The addition of the A-4 Flare will ensure that this site has the minimum required flaring capacity, but it will not change any of the applicable requirements for the landfill. The federal NSPS/EG requirements have no specific throughput limits for flares. The only applicable emission limit for this flare is a 98% NMOC destruction efficiency requirement or an outlet concentration of 20 ppmv of NMOC (expressed as hexane) at 3% O₂. This outlet concentration limit is equivalent to 120 ppmv of NMOC (expressed as methane) at 3% O₂ and is less stringent than the Regulation 8-34-301.3 limit (30 ppmv of NMOC at 3% O₂). Thus, compliance with Regulation 8, Rule 34 and with the Title V reporting requirements for this site will ensure compliance with these federal EG requirements.

Since the Sonoma County Central Landfill is subject to the collection and control requirements of the EG discussed above, it is also subject to the NESHAP for MSW Landfills (40 CFR Part 63, Subpart AAAA). To assess applicable requirements under Subpart AAAA, the District calculated HAP emissions for this site based on the maximum projected landfill gas generation rate and the maximum detected concentration for each HAP, determined from recent site-specific landfill gas analyses. Site-wide HAP emissions were found to be less than 10 tons/year for any single HAP and less than 25 tons/year for all HAPs combined. Therefore, this site is not a major source of HAP emissions. In this case, the only applicable requirements

from this Subpart AAAA NESHAP are the requirement to have and follow a start-up, shutdown, and malfunction plan and a requirement to submit semi-annual reports instead of the annual report required under Part 60, Subpart Cc above. This site has been complying with these Subpart AAAA requirements.

State Requirements:

CARB Methane Rule: CCR Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Regulations to Achieve Greenhouse Gas Emission Reductions Subarticle 6, Methane Emissions from Municipal Solid Waste Landfills, Sections 95460-95476 is the state regulation adopted to reduce methane emissions from municipal solid waste landfills and applies to all MSW landfills that received waste after January 1, 1977. This landfill is subject to this state regulation and is expected to comply with all applicable sections. In particular, this rule requires operation of an enclosed flare that achieves a methane destruction efficiency of at least 99% by weight and specifies monitoring and operational requirements for shutdown, restart, and startup scenarios. It also contains periodic source testing, monitoring, and recording requirements. The A-4 Flare is expected to comply with the 99% destruction efficiency limit and the monitoring and testing requirements. After three years of annual testing shows compliance with the methane limit, the regulation allows testing to be reduced to once every three years.

PERMIT CONDITIONS

The current permit conditions for the S-1 Sonoma County Central Landfill and A-3 flare will be revised to include the proposed A-4 Flare and to allow for the shut-down of the A-3 Flare. Site-wide 225 tons/year of CO will be added. For A-4, CO emission limits will be added to these conditions. The changes to each part are identified below in strike through and underline formatting.

Condition # 4044

For S-1 Sonoma County Central Landfill, S-22 Waste and Cover Material, S-23 Mobile Surface Equipment, A-3 and A-4 Landfill Gas Flares, and A-8 Water Sprays

1. Except for temporary emergency situations approved by the Local Enforcement Agency, the total amount of municipal solid waste received at the Sonoma County Central Landfill (S-1) shall not exceed 2,500 tons per day nor 897,500 tons per year. The total cumulative amount of all wastes and cover materials (excluding final cover material) placed in the landfill shall not exceed both 32.65 million cubic yards and 19.59 million tons.
(basis: Cumulative Increase and 2-1-301)
2. Particulate emissions from any operation of the Landfill (S-1) shall be abated by Water Spray (A-8), if necessary, so that visible dust emissions shall not exceed Ringelmann 0.5 or result in fallout on adjacent property in such quantities as to cause a public nuisance per Regulation 1-301. (basis: BACT and 1-301)
- *3. If the plant receives two or more Violation Notices from the District for "Public Nuisance" related to dust emissions in any consecutive 12-month period, the Permit Holder shall submit to the District, within 30 days, an application to modify the Permit to Operate to include the following control measures as applicable or any other measures that the District deems necessary and appropriate. (basis: Regulation 1-301)
 - a. The paving of all significant roads associated with landfill operations, or
 - b. The use of chemical suppressant to control fugitive dust emissions from roadways associated with this landfill.

4. The Sonoma County Central Landfill includes the landfill gas collection system components listed below. Well and collector locations, depths, and lengths are as described in detail in the current Landfill Collection and Control System Design Plan.
- a. Total Number of Vertical Wells: 167
Total Number of Horizontal Collectors: 30
- b. The Permit Holder has been authorized to make the landfill gas collection system alterations described below pursuant to Permit Applications #26628 and #28194. All collection system alterations shall comply with subparts 4b(i-vii) below.
- i. The authorized collection system alterations are:
-Install up to 100 new gas collection wells
-Permanently decommission up to 100 gas collection wells
-Modify wellhead monitoring locations, as needed, provided that each landfill gas collection system component identified in Part 4a and each new collection system component installed per Part 4b is adequately represented by a wellhead monitoring location. The Permit Holder shall maintain documentation on site that identifies all landfill gas collection system components that are represented by each wellhead monitoring location.
- ii. The Permit Holder shall apply for and receive a Change of Conditions before altering the landfill gas collection components described in subpart 4a, other than those authorized by Part 4b. Installing, altering, or permanently decommissioning a vertical well, horizontal collector, or other gas collection component is subject to this requirement, unless this change constitutes a replacement as defined in subpart 4b(iii) below.
- iii. Replacement of landfill gas collection system components with identical or functionally equivalent components will not be deemed an alteration and will not be subject to subpart 4b(ii) under the following circumstances. If a well or collector will be shut down and replaced by a new well or collector in essentially the same location as the old component and this decommission/installation will be accomplished in accordance with Regulations 8-34-117 and 8-34-118, then this activity shall be considered a component replacement that is not subject to the Authority to Construct requirement. For each individual well or collector replacement, this subpart authorizes a maximum vacuum disconnection time of five consecutive days for compliance with Regulation 8-34-117.5. The disconnected component and the new component shall not be counted toward the subpart 4b(i) limits; the numbers of replacement wells and replacement collectors are not limited. Alterations, repairs, or replacements of non-perforated piping sections (such as risers, laterals, or header pipes), piping connectors, or valves are not subject to an Authority to Construct requirement.
- iv. At least three days prior to initiating operation of a well or collector installed pursuant to subpart 4b, the Permit Holder shall submit a start-up notice to the District that contains the component ID number for each new well or collector and the anticipated initial start-up date for each new component.
- v. For each well or collector that is permanently decommissioned after January 13, 2017, the Permit Holder shall submit a decommissioning notice to the District within no later than three working days after the component was disconnected from

vacuum system. This decommissioning notice shall contain the component ID for each well or collector that was decommissioned, the date and time that each component was disconnected from the vacuum system, and the reason the component was decommissioned.

vi. Within six months of installing a new component or permanently decommissioning an existing component, the Permit Holder shall prepare an updated map of the landfill gas collection system that identifies the ID numbers and locations of all operable wells and collectors. On this map or in accompanying documentation, the Permit Holder shall summarize all component changes that were made since the last map was prepared. The previous collection system map, the updated collection system map, and the component change summary shall be provided to District staff upon request.

vii. If the Permit Holder has a net reduction (number of decommissioned components minus the number of installed components) of more than five components within a 120-day period, the Permit Holder shall submit a more comprehensive decommissioning notice to the District. In addition to the information required by subpart 4b(v), this comprehensive decommissioning notice shall include the maps and documentation required by subpart 4b(vi), shall identify all component changes that have occurred but that are not included on the most recently updated map, shall include a list of all well installations that are expected to occur within the next 120 days, and shall discuss the reasons why this reduction in gas collection components is not expected to result in surface emission leaks. Upon request, the Permit Holder shall provide wellhead monitoring data, surface leak monitoring data, records of repair attempts made to date, and other information to support the need for a net collection component reduction of more than five wells. The District may require additional surface monitoring to verify that this net component reduction is not causing landfill surface leaks. The District will notify the Permit Holder in writing of any additional surface monitoring that is required pursuant to this subpart.

5. Operating Requirements for Landfill Gas Collection Systems and Collection System Components:

- a. The landfill gas collection systems described in part 4 shall be operated continuously. Wells shall not be disconnected or removed, nor isolation valves shut completely off, unless the Permit Holder complies with all applicable requirements of Regulation 8, Rule 34, Sections 113, 116, 117, and 118. (Basis: Regulation 8-34-301.1)
- b. Each landfill gas collection system component listed in Part 4 shall be operated in compliance with the wellhead limits of Regulation 8-34-305, unless an alternative wellhead limit has been approved for that component, as identified in subpart b(i), and the Permit Holder complies with all of the additional requirements for that component, as identified in subparts b(ii-vii). (Basis: Regulations 8-34-303, 8-34-304, 8-34-305, 40 CFR 60.755(a) and 60.759)
 - i. The nitrogen and oxygen concentration limits in Regulation 8-34-305.3 and 8-34-305.4 shall not apply to the landfill gas collection wells listed below, provided that the oxygen concentration in each of the following wells does not exceed 15% by volume: V-058, V-061,

- V-062, and V-117; EC-9.1, EC-15, EC-19, EC-24, EC-25, EC-26, and EC-26.1.
- ii. The Permit Holder shall demonstrate compliance with the alternative wellhead oxygen limit in subpart b(i) by monitoring each wellhead for oxygen on a monthly basis, in accordance with the provisions of Regulations 8-34-505 and 8-34-604.
 - iii. All test dates, wellhead oxygen concentration data, any deviations from the subpart b(i) limit, repair actions, repair dates, re-monitoring dates and results, and compliance restoration dates shall be recorded in a District approved log and made available to District staff upon request in accordance with Regulations 8-34-34-501.4, 8-34-501.9, and 8-34-414.
 - iv. To demonstrate that the alternative wellhead oxygen limit in subpart b(i) will not cause surface emission leaks, the Permit Holder shall conduct additional surface emission monitoring in the vicinity of each component listed in subpart b(i). For each component in subpart b(i), the Permit Holder shall maintain a map showing the location of the buried collection component and identifying the approximate radius of influence for the component. For each component in subpart b(i), the Permit Holder shall monitor for landfill surface emissions – in accordance with Regulations 8-34-506 and 8-34-607 – at three representative points on the landfill surface that are within the radius of influence of the component and that are not more than 15 meters from the surface location of the component. This additional surface emission monitoring shall be conducted on a monthly basis for a period of at least six consecutive months.
 - v. If no excesses of the Regulation 8-34-303 surface emission limit are detected in the vicinity of a component for six consecutive months, the Permit Holder may discontinue the additional monthly surface emission monitoring in the vicinity of that component and shall continue with the routine quarterly surface emission monitoring requirements in the vicinity of that component.
 - vi. If one or more excesses of the Regulation 8-34-303 surface emission limit are detected in the vicinity of a component during a six-consecutive month period, the Permit Holder shall follow all applicable requirements for recording and reporting the excess and shall follow the Regulation 8-34-415 repair schedule for landfill surface leak excesses. The additional monthly surface emission monitoring in the vicinity of that component shall continue until either the no surface excess requirements of subpart b(v) have been achieved or the repair and compliance restoration requirements of subpart b(vii) have been satisfied.
 - vii. If excesses of the Regulation 8-34-303 surface emission limit are detected in the vicinity of a component for three or more monitoring events during a six-consecutive month period, the subpart b(i) alternative wellhead oxygen limit shall be revoked for that component. The Permit Holder shall conduct all necessary repairs to the landfill gas collection well, to any piping associated with the well or the remote wellhead monitoring system, to valves, flanges, or other connectors, and to any test ports or other openings that are necessary to eliminate air intrusion into the well or the monitoring point, to

prevent impairment of vacuum application or vacuum adjustment at the collection well, and to restore the collection well and associated monitoring point to proper function. The Permit Holder shall complete all of the above repairs and any necessary landfill surface and shall restore compliance with the Regulation 8-34-303 surface emission limit (in the vicinity of that component) and the Regulation 8-34-305.4 wellhead oxygen concentration limit by the earlier of the following dates: (a) within 120 days of the date that the first excess was discovered if the three excess events are discovered within a single quarterly period pursuant to the re-monitoring requirements of 8-34-415 or (b) within 60 days of detection of the third excess.

- *6. If the concentrations (dry basis) of toxic air contaminants in the collected landfill gas exceed any of the limits listed below, the Permit Holder shall submit a permit application for a Change of Permit Conditions within 30 days of receiving the test results.

Benzene	=	2.5 ppmv
Trichloroethylene	=	3.0 ppmv
Perchloroethylene	=	3.0 ppmv
Methylene Chloride	=	20.0 ppmv
Vinyl Chloride	=	2.5 ppmv

(basis: ~~Toxic Risk Management Policy~~ Regulation 2-5-302 and AB2588 Air Toxic Hot Spots Act)
- 7. Total reduced sulfur compounds in the collected landfill gas shall be monitored as a surrogate for monitoring sulfur dioxide in control systems exhaust. The concentration of total reduced sulfur compounds in the collected landfill gas shall not exceed ~~1300~~300 ppmv (dry). (basis: Regulation 9-1-302)
- 8. All collected landfill gas shall be vented to properly operating abatement equipment including the Internal Combustion Engines (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14) and/or the Landfill Gas Flares (A-3 or A-4). Under no circumstances shall raw landfill gas be vented to the atmosphere. This limitation does not apply to unavoidable landfill gas emissions that occur during collection system installation, maintenance, or repair that is performed in compliance with Regulation 8, Rule 34, Sections 113, 116, 117, or 118 or to inadvertent component or surface leaks that do not exceed the limits specified in 8-34-301.2 or 8-34-303. (basis: Regulation 8-34-301)
- 9. The A-3 or A-4 Landfill Gas Flare shall be operated as necessary to combust excess gas whenever the flow of landfill gas exceeds the capacity of the Internal Combustion Engines in service. (basis: Regulation 8-34-301)
- 10. During operation, tThe combustion temperature of the A-3 or A-4 Landfill Gas Flare shall be maintained at a minimum of 1400 degrees Fahrenheit, each averaged over any 3-hour period. (basis: 8-34-301, ~~Toxic Risk Management Policy~~BACT, and Regulation 2-5-302)
- 11. Emissions of Nitrogen Oxides (NOx) from the Flare A-3 or A-4 shall not exceed 0.05 pounds per million BTU (calculated as NO₂) per flare. (basis: RACT and Offsets)
- 12. Emissions of Carbon Monoxide (CO) from the Flare A-3 or A-4 shall not exceed 0.20

pounds per million BTU per flare. (basis: RACT and Offsets).

13. The Heat Input to the A-3 or A-4 Landfill Gas Flare shall not exceed 2,190 MMBtu per day per flare and 547,680 million BTU per year combined. In order to demonstrate compliance with this part, the Permit Holder shall calculate and record on a daily and monthly basis the total ~~monthly~~ heat input to the flares based on the landfill gas flow rate recorded pursuant to part 14, the average methane concentration in the landfill gas based on the most recent source test, and a high heating value for methane of 1013 BTU/scf. The records shall be retained for five years and shall be available to the District staff upon request. (basis: Cumulative Increase, Regulation 2-1-301)
14. A flow meter to measure gas flow into the A-3 and A-4 Landfill Gas Flares shall be installed and maintained in good working condition. (basis: Regulation 8-34-301)
15. The A-3 and A-4 Landfill Gas Flares shall be equipped with both local and remote alarm systems, which shall be enabled whenever the flare is required to be operated under the requirements of Part 9 above. (basis: Regulation 8-34-301.41)
16. The A-3 and A-4 Landfill Gas Flares shall be equipped with a combustion temperature readout monitor and continuous recorder. (basis: Regulation 8-34-507, BACT, and Regulation 2-5-302 and Toxic Risk Management Policy)
17. In order to demonstrate compliance with Regulation 8, Rule 34, Section 301.3, parts 11 and 12 above, ~~and~~ 40 CFR 60.752(b)(2)(iii)(B), and CCR, Title 17, Section 95464 (b)(2)(A)(1), the Permit Holder shall ensure that a District approved source test is conducted annually on the Landfill Gas Flare (A-3 or A-4). As a minimum, the annual source test shall determine the following:
 - a. landfill gas flow rate to the flare (dry basis);
 - b. concentrations (dry basis) of carbon dioxide (CO₂), nitrogen (N₂), oxygen (O₂), methane (CH₄), and total non-methane organic compounds (NMOC) , and total hydrocarbons (THC) in the landfill gas;
 - c. stack gas flow rate from the flare (dry basis);
 - d. concentrations (dry basis) of CH₄, NMOC, THC, NOx, CO, and O₂ in the flare stack gas;
 - e. emission rates (lb/MMBTU) of nitrogen oxides (NOx) and carbon monoxide (CO)
 - f. the CH₄, and NMOC, and THC destruction efficiencies achieved by the flare; and
 - g. the average combustion temperature in the flare during the test period.Annual source tests shall be conducted ~~no sooner than 9 months and~~ no later than 12 months after the previous source test. The Source Test Section of the District shall be contacted to obtain their approval of the source test procedures at least 14 days in advance of each source test. They 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 within 60 days of the test date. [Basis: Cumulative Increase, Regulations 8-34-301.3 and 8-34-412 ~~and~~, 40 CFR 60.752(b)(2)(iii)(B), and CCR, Title 17, Section 95464 (b)(2)(A)(1)]
- *18. In order to demonstrate compliance with Part 6 above, the Permit Holder shall conduct a characterization of the landfill gas at least once per year. The landfill gas sample shall be drawn from the main landfill gas header. The landfill gas shall be analyzed for

methane (CH₄), carbon dioxide (CO₂), nitrogen (N₂), oxygen (O₂), total sulfur, and all compounds listed in the most recent version of EPA's AP-42 Table 2.4-1, excluding acetone, carbon monoxide, and mercury. All concentrations shall be reported on a dry basis. The test report shall be submitted to the Compliance and Enforcement Division within 60 days of the test date. After conducting three annual landfill gas characterization tests, the Permit Holder may request to remove specific compounds from the list of compounds to be tested for if the compounds have not been detected, have no significant impact on the cancer risk determination for the site, and have no significant impact on the hazard index determination for the site. If the Permit Holder has excluded any NPOCs from the POC emission calculations for the site, then the Permit Holder shall continue to test for these NPOCs on an annual basis. (basis: Regulation 2-1-403 [and AB2588 Air Toxic Hot Spots Act](#))

19. In order to demonstrate compliance with the above conditions, the Permit Holder shall maintain the following records in a District approved logbook.
- a. Record the total amount of municipal solid waste received at S-1 on a daily basis.
 - b. Summarize the daily waste acceptance records for each calendar month.
 - c. Summarize monthly waste acceptance records for each preceding 12-month period.
 - d. For each area or cell that is not controlled by a landfill gas collection system, maintain a record of the date that waste was initially placed in the area or cell.
 - e. Record the cumulative amount of waste placed in each uncontrolled area or cell on a monthly basis.
 - f. If the Permit Holder plans to exclude an uncontrolled area or cell from the collection system requirement, the Permit Holder shall also record the types and amounts of all non-decomposable waste placed in the area and the percentage (if any) of decomposable waste placed in the area.
 - g. Record the initial operation date for each new landfill gas well and collector.
 - h. Maintain an accurate map of the landfill which indicates the locations of all refuse boundaries and the locations of all wells and collectors (using unique identifiers) that are required to be operating continuously pursuant to Part 5.a. Any areas containing only non-decomposable waste shall be clearly identified. This map shall be updated at least every six months to indicate changes in refuse boundaries and to include any newly installed wells and collectors.
 - i. Record the operating times for the A-3 [and A-4 Landfill Gas Flares](#) on a daily basis.
 - j. Record the total amount of landfill gas vented to A-3 [and A-4](#) on a daily basis.
 - k. Summarize the amount of landfill gas vented to A-3 [and A-4](#) on a monthly basis.
 - l. Maintain continuous records of the combustion temperature achieved at A-3 during all hours of operation.
 - m. Maintain records of all test dates and test results performed to maintain compliance these permit conditions.
 - n. For each dust suppressant application, maintain records of the date the dust suppressant was applied, the areas that it was applied to, the type of dust suppressant used, and the amount of dust suppressant that was applied.
 - o. Maintain daily records of the water application frequency for construction areas, unpaved roads, and dirt and rock stockpiles.

All records shall be maintained on site or shall be made readily available to District staff upon request for 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 and Regulations 6-301, 6-305, 8-34-304, 8-34-501.3, and 8-34-501.8)

- *20. Handling Procedures for Soil Containing Volatile Organic Compounds
- a. The procedures listed below in subparts b-k do not apply if the following criteria are satisfied. However, the record keeping requirements in subpart l below are applicable.
 - i. The Permit Holder has appropriate documentation demonstrating that either the organic content of the soil or the organic concentration above the soil is below the “contaminated” level (as defined in Regulation 8, Rule 40, Sections 205, 207, and 211).
 - ii. The Permit Holder has no documentation to prove that soil is not contaminated, but source of the soil is known and there is no reason to suspect that the soil might contain organic compounds.
 - b. Any soil received at the facility that is known or suspected to contain volatile organic compounds (VOCs) shall be handled as if the soil were contaminated, unless the Permit Holder receives test results proving that the soil is not contaminated. To prove that the soil is not contaminated, the Permit Holder shall collect soil samples in accordance with Regulation 8-40-601 within 24 hours of receipt of the soil by the facility. The organic content of the collected soil samples shall be determined in accordance with Regulation 8-40-602.
 - i. If these test results indicate that the soil is still contaminated or if the soil was not sampled within 24 hours of receipt by the facility, the Permit Holder must continue to handle the soil in accordance with the procedures subparts c-k below, until the soil has completed treatment or has been placed in a final disposal location and adequately covered. Storing soil in a temporary stockpile or pit is not considered treatment. Co-mingling, blending, or mixing of soil lots is not considered treatment.
 - ii. If these test results indicate that the soil – as received at the facility – has an organic content of 50 ppmw or less, then the soil may be considered to be not contaminated and need not be handled in accordance with the procedures listed in subparts c-k below.
 - c. Any contaminated soil received at the facility shall be clearly identified as contaminated soil, shall be handled in accordance with subparts d-k below, and shall be segregated from non-contaminated soil. Contaminated soil lots may not be co-mingled, blended, or otherwise mixed with non-contaminated soil lots prior to treatment, reuse, or disposal. Mixing soil lots in an attempt to reduce the overall concentration of the contaminated soil or to circumvent any requirements or limits is strictly prohibited.
 - d. On-site handling of contaminated soil shall be limited to no more than 2 on-site transfers per soil lot. For instance, unloading soil from off-site transport vehicles into a temporary storage pile would be considered 1 transfer. Moving soil from a temporary storage to a staging area would be considered 1 transfer. Moving soil from a temporary storage pile to a final disposal site would be considered 1 transfer. Moving soil from a staging area to a final disposal site would be considered 1 transfer. Therefore, unloading soil from off-site transport into a temporary storage pile and then moving the soil from that temporary storage pile to the final disposal site would be allowed. Unloading

soil from off-site transport into a staging area and then moving the soil from that staging area to the final disposal site would be allowed. However, unloading soil from off-site transport to a temporary storage pile, moving this soil to a staging area, and then moving the soil again to a final disposal site would be 3 on-site transfers and would not be allowed.

- e. If the contaminated soil has an organic content of less than 500 ppmw, the contaminated soil shall be treated, deposited in a final disposal site, or transported off-site for treatment within 90 days of receipt at the facility.
- f. If the contaminated soil has an organic content 500 ppmw or more, the contaminated soil shall be treated, deposited in a final disposal site, or transported off-site for treatment within 45 days of receipt at the facility.
- g. All active storage piles shall meet the requirements of Regulation 8-40-304 by using water sprays, vapor suppressants or approved coverings to minimize emissions. The exposed surface area of any active storage pile (including the active face at a landfill) shall be limited to 6000 ft². The types of storage piles that may become subject to these provisions include (but are not limited to) truck unloading areas, staging areas, temporary stockpiles, soil on conveyors, bulldozers or trucks, the active face of a landfill, or other permanent storage pile at the final disposal location.
- h. All inactive storage piles shall meet the requirements of Regulation 8-40-305 including the requirement to cover contaminated soil during periods of inactivity longer than one hour. The types of storage piles that may become subject to these provisions include (but are not limited to) soil on trucks or other on-site equipment, staging areas, temporary stockpiles, and the permanent storage pile at the final disposal location. District approved coverings for inactive storage piles include continuous heavy-duty plastic sheeting (in good condition, joined at the seams, and securely anchored) or encapsulating vapor suppressants (with re-treatment as necessary to prevent emissions).
- i. For landfills, Permit Holders must:
 - i. Keep contaminated soil covered with continuous heavy-duty plastic sheeting (in good condition, joined at the seams, and securely anchored) whenever soil is to be stored in temporary stockpiles or during on-site transport in trucks. Soil in trucks shall not be left uncovered for more than 1 hour.
 - ii. Establish a tipping area for contaminated soils near the active face that is isolated from the tipping area for other wastes.
 - iii. Spray contaminated soil with water or vapor suppressant immediately after dumping the soil from a truck at the tipping area.
 - iv. Ensure that all contaminated soil is transferred from the tipping area to the active face immediately after spraying with water or vapor suppressant.
 - v. Ensure that contaminated soil in the tipping area is not disturbed by subsequent trucks. Trucks shall not drive over contaminated soil in the tipping area or track contaminated soil out of the tipping area on their wheels.
 - vi. Spray contaminated soil on the active face with water or vapor suppressant (to keep the soil visibly moist) until the soil can be covered with an approved covering.
 - vii. Limit the area of exposed soil on the active face to no more than 6000 ft².

- viii. Ensure that contaminated soil that has been spread on the active face is completely covered on all sides with one of the following approved coverings: at least 6 inches of clean compacted soil, at least 12 inches of compacted garbage, or at least 12 inches of compacted green waste.
- ix. Ensure that covering of soil on the active face is completed within one hour of the time that the soil was first dumped from a truck at the tipping area.
- j. Contaminated soil shall not be used as daily, intermediate, or final cover material for landfill waste operations unless the requirements of Regulation 8, Rule 40, Sections 116 or 117 have been satisfied.
- k. Contaminated soil is considered to be a decomposable solid waste pursuant to Regulation 8, Rule 34. All contaminated soil disposed of at a site shall be included in any calculations of the amount of decomposable waste in place that are necessary for annual reporting requirements or for determining the applicability of 8-34-111 or 8-34-304.
- l. The Permit Holder shall keep the following records for each lot of soil received, in order to demonstrate on-going compliance with the applicable provisions of Regulation 8, Rule 40.
 - i. For all soil received by the facility (including soil with no known contamination), record the arrival date at the facility, the soil lot number, the amount of soil in the lot, the organic content or organic concentration of the lot (if known), the type of contamination (if any), and keep copies of any test data or other information that documents whether the soil is contaminated (as defined in 8-40-205) or not contaminated, with what, and by how much.
 - ii. If the soil is tested for organic content after receipt by the facility, record the sampling date, test results, and the date that these results were received.
 - iii. For all on-site handling of contaminated soil, use a checklist or other approved method to demonstrate that appropriate procedures were followed during all on-site handling activities. One checklist shall be completed for each day and for each soil lot (if multiple lots are handled per day).
 - iv. For soil aerated in accordance with 8-40-116 or 117 record the soil lot number, the amount of soil in the lot, the organic content, the final placement date, the final placement location, and describe how the soil was handled or used on-site.
 - v. For final disposal at a landfill, record on a daily basis the soil lot number, the amount of soil placed in the landfill, the disposal date, and the disposal location.

All records shall be retained for at least 5 years from the date of entry and shall be made available for District inspection upon request.

(basis: Regulation 8-40-301, 8-40-304 and 8-40-305)

- 21. The Permit Holder shall limit the quantity of soil (that contains VOCs) disposed of per day so that no more than 15 pounds of total carbon could be emitted to the atmosphere per day. In order to demonstrate compliance with this condition, the Permit Holder shall maintain the following records in a District approved log.
 - a. Record on a daily basis the amount of soil (that contains VOCs) disposed of in the landfill and used as cover material in the landfill. This total amount (in units of pounds per day) is Q in the equation in subpart c. below.

- b. Record on a daily basis the VOC content of all soils disposed of or used as cover material. This VOC Content (C in the equation below) should be expressed as parts per million by weight as total carbon (or C_i).
- c. Calculate and record on a daily basis the VOC Emission Rate (E) using the following equation:

$$E = Q * C / 1E6$$

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

(basis: Regulation 8-2-301)

Condition # 19933

For S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, S-14 Lean Burn Internal Combustion Engines and Generator Sets

Note: S-13 and S-14 are permitted to combust either landfill gas or compost biogas. While fueled by biogas or on inactive status (no landfill gas combusted during the annual reporting period), S-13 and S-14 are not subject to the provisions of these conditions. While fueled by biogas they are subject to Permit Condition #24894.

1. All collected landfill gas shall be vented to properly operating abatement equipment including the Internal Combustion Engines (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14) ~~and/or at the~~ Landfill Gas Flare (A-3 or A-4). Under no circumstances shall raw landfill gas be vented to the atmosphere. This limitation does not apply to unavoidable landfill gas emissions that occur during control system installation, maintenance, or repair that is performed in compliance with Regulation 8, Rule 34, Sections 113, 116, 117, or 118 or to inadvertent component or surface leaks that do not exceed the limits specified in 8-34-301.2 or 8-34-303. (basis: Regulation 8-34-301)
2. The A-3 or A-4 Landfill Gas Flare shall be operated as necessary to combust excess gas whenever the flow of landfill gas exceeds the capacity of the IC engines in service. (basis: Regulation 8-34-301)
3. The Internal Combustion Engines (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14) shall be fired exclusively on landfill gas. If required, natural gas can be used as a supplemental fuel, but it shall not reduce or replace landfill gas available for use in these engines. Natural gas shall not be used as supplemental fuel when the A-3 or A-4 Flare is operating concurrently with these engines. (basis: Offsets and Cumulative Increase)
4. District approved flowmeters, to measure landfill gas flow into the engines, shall be installed prior to any operation and maintained in good working condition. (basis: Regulation 2-1-403)
5. Nitrogen Oxide (NO_x) emissions, calculated as NO₂, from each Internal Combustion Engine (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14) shall not exceed 0.80 grams per brake horsepower hour (g/bhp-hr). (basis: BACT, Offsets, and Cumulative Increase)

6. Carbon Monoxide (CO) emissions from each Internal Combustion Engine (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13 and S-14) shall not exceed 2.1 g/bhp-hr. (basis: BACT)

7. Each Internal Combustion Engine (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13 and S-14) shall comply with either the destruction efficiency requirements or the non-methane organic compound (NMOC) outlet concentration limit specified in Regulation 8-34-301.4. (basis: BACT, Offsets, and Regulation 8-34-301.4)

8. In order to demonstrate compliance with Parts #5, #6, and #7 above, Regulation 8, Rule 34, Sections 114 and 301.4, Regulation 9, Rule 8, Sections 302.1 and 302.3 the Permit Holder shall ensure that a District approved source test is conducted annually on each Internal Combustion Engine (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14). As a minimum, the annual source tests shall determine the following:

- a. landfill gas flow rate to each engine (dry basis);
- b. concentrations (dry basis) of carbon dioxide (CO₂), nitrogen (N₂), oxygen (O₂), CH₄, NMOC, and total hydrocarbons (THC) in the landfill gas;
- c. exhaust gas flow rate from each engine (dry basis);
- d. concentrations (dry basis) of NO_x, CO, CH₄, NMOC, THC, and O₂ in the exhaust gas from each engine;
- e. the CH₄, NMOC, and THC destruction efficiencies achieved by each engine; and
- f. the average exhaust temperature measured for each engine during the test period.

Source tests for each engine shall be conducted no sooner than 9 months and no later than 12 months after the previous source test. The Source Test Section of the District shall be contacted to obtain their approval of the source test procedures at least 14 days in advance of each source test. They 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 within 60 days of the test date.

(basis: BACT, Offsets, Regulations 8-34-114, 8-34-301.4, 8-34-412, 9-8-302.1, and 9-8-302.3)

9. The Permit Holder shall maintain the following records in a District approved logbook:

- a. On a daily basis, record the operating times for each engine.
- b. On a daily basis, calculate and record the amount of landfill gas burned in each engine.
- c. On any day that natural gas is burned in an engine, record the amount of natural gas burned in each engine.
- d. On a monthly basis, summarize all daily records for each engine.
- e. On a monthly basis, calculate and record the maximum daily and total monthly heat input rate (in BTU) to each engine based on the average methane concentration in the landfill gas (as measure during the most recent source test), a high heating value for methane of 1013 BTU/scf, a high heating value for natural gas of 1050 BTU/scf, and the amounts of landfill gas and natural gas burned in each engine (recorded pursuant to subparts b. and c. above).
- f. On an annual basis: record the fuel-to-air-ratio setting for each engine during the source test required in Part #8.

All records shall be maintained on site or shall be made readily available to District staff upon request for 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: Regulation 2-1-403, Cumulative Increase, and Offsets)

10. The heat input to each Internal Combustion Engine (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14) shall not exceed 252.6 million BTU per day nor 92,199 million BTU per year based on the higher heating value (HHV) of the fuel. (basis: Regulation 2-1-301)

Condition # 26507

For: All Non-Mobile Combustion Equipment at Site # B2987 including but not limited to Landfill Gas Fired Devices (A-3, A-4, S-4, S-5, S-6, S-7, S-9, S-10, S-11, and S-12), biogas Fired Engines (S-13, S-14), and portable engine (S-24):

1. Carbon monoxide (CO) emissions from each landfill gas fired combustion device located at Site # B2987 shall not exceed the emission rate identified below, during any consecutive rolling 12-month period. Each CO limit in this part is derived from but does not replace source-specific emissions related limitations that may be contained in other permit conditions for these devices. (Basis: Cumulative Increase and Regulation 2-1-301)

<u>A-3 and A-4 Combined (Landfill Gas Flares): 54.768 tons of CO per year</u>	
<u>S-4</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-5</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-6</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-7</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-9</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-10</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-11</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-12</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-13</u>	<u>IC Engine: 23.076 tons of CO per year</u>
<u>S-14</u>	<u>IC Engine: 23.076 tons of CO per year</u>

2. Total site-wide carbon monoxide (CO) emissions from all non-mobile combustion equipment located at Site # A2987 shall not exceed 225.0 tons of CO during any consecutive rolling 12-month period. For the purposes of this condition, non-mobile combustion equipment includes all stationary and portable combustion devices other than mobile sources, as defined in 40 CFR Part 51.50. (Basis: Regulation 2-1-403: Avoidance of PSD)

3. To demonstration compliance with Parts 1 and 2, the owner or operator of Site # B2987 shall comply with the following record keeping procedures. (Basis: Regulations 2-1-301 and 2-1-403)

a. For each stationary or portable non-mobile combustion device that is operated at Site # B2987 and has the potential to emit more than 2 tons per year of a regulated air pollutant, the owner or operator shall, on a monthly basis, calculate and record the CO emissions (tons of CO per calendar month) from the device. The CO emissions shall be calculated using District approved procedures, emission factors, and operating records, as described below for each type of device.

i. For the A-3 and A-4 Landfill Gas Flares, the monthly CO emissions from the flare shall be calculated using the monthly heat input rate (MM BTU per month) to each flare and the District approved CO emission factor (pounds of CO per MM BTU). The monthly heat input rate to the flare is recorded pursuant to

Condition # 4044, Part 13. The District approved CO emission factor for each flare is the highest of the CO emission rates measured for any particular flare operating condition during the most recent annual source test for that flare. These CO emission rates shall be determined from data collected pursuant to Condition # 4044, Parts 17a-d.

ii. For the Internal Combustion Engines, the monthly CO emissions from each engine shall be calculated using the monthly actual operating hours and the CO emission factor 5.27 pounds of CO per hour for each engine.

iii. For the portable engine S-24, the monthly CO emissions shall be calculated using the monthly actual operating hours and the CO emission factor 0.86 pounds of CO per hour.

b. Using the monthly CO emissions data from each device recorded pursuant to subpart a above, the owner or operator shall calculate and record the total monthly CO emissions from all non-mobile combustion devices operated at this site.

c. Using the monthly site-wide CO emissions total from subpart a, the owner or operator shall calculate and record the total annual site-wide CO emissions from all non-mobile combustion devices, for each rolling consecutive 12-month period.

d. All records required by Parts 3a-c above shall be available for District inspection within 6 months of the final APCO approval date for the Change of Conditions associated with Application # 28326. All records shall be kept on-site or made readily available to District staff upon request, and all records shall be retained for at least five years from the date of entry.

RECOMMENDATION

Issue an Authority to Construct for the following abatement equipment subject to Condition # 4044.

A-4 Enclosed Landfill Gas Flare, John Zink ZTOF, 3000 scfm maximum capacity; 91.26 MMBtu/hour

And archive the following abatement device upon issuance of Permit of Operate for A-4:

A-3 Enclosed Landfill Gas Flare, John Zinc, 2740 scfm maximum capacity; 83.3 MMBtu/hour

Issue a Change of Permit Conditions for the following equipment, subject to Condition # 26507 for

S-1 Sonoma County Central Landfill - Waste Decomposition Process.

Issue a Change of Permit Conditions for the following equipment, subject to Condition # 19933 for

S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, S-14 Lean Burn Internal Combustion Engines and Generator Sets

By: _____

Date: _____

Davis Zhu
Air Quality Engineer

APPENDIX E

**NSR Permit Evaluations
Application #29060**

ENGINEERING EVALUATION

Application # 29060

Sonoma County Central Landfill; Site # 22987

Plant Address: 500 Mecham Road, Petaluma, CA 94952

BACKGROUND

Republic Service, Inc (Republic) operates the Sonoma County Central Landfill (Sonoma) in Petaluma, CA. This site includes an active landfill (S-1, S-22, S-23), a LFG to energy electrical generation facility consisting of 10 internal combustion (IC) engines, and one enclosed landfill gas flare (A-3).

Per Application 28194, as of September 6, 2016, the landfill gas collection system for the S-1 Sonoma County Central Landfill consisted of the following collection system components: 167 active vertical wells (VW, including 3 dual extraction wells), 30 horizontal LFG trench collectors (HC). Condition # 4044, Part 4, reflects this current list of collection system components.

The landfill gas collection system, source S-1 is subject to 8-34-305 which requires each well to operate at a negative pressure and at a maximum wellhead landfill gas temperature of 131 °F (55 °C) and either N₂ concentration less than 20% or O₂ concentration less than 5%.

In the present case, Republic has discovered 6 wells, SVC107-0, SVC109-0, SVC112-0, SVC113-0, SVC114-0, and SVC115-0 are operating at temperatures above the 131 °F upper limit of 8-34-305. Republic requests higher operation values (145 °F) for the following wells (Table 1). Regulation 8-34 allows the District to establish such alternative levels as long as the alternative limits do not cause subsurface fires or in any way inhibit anaerobic decomposition.

Table 1. HOV well list

Well ID	Start-up Date	Date of Initial Exceedance Detection
SVC107-0	5/27/2004	7/13/2016
SVC109-0	6/1/2004	7/13/2016
SVC112-0	10/20/2004	7/6/2016
SVC113-0	10/20/2004	9/1/2016
SVC114-0	10/20/2004	10/5/2016
SVC115-0	10/20/2004	7/6/2016

WELLHEAD REQUIREMENTS

Regulation 8-34-305 specifies wellhead performance standards designed to minimize the potential for subsurface fires and/or landfill gas emissions. Section 8-34-305 requires each wellhead to operate under vacuum conditions with a maximum temperature of 131 °F, and either N₂ concentration less than 20% or O₂ concentration less than 5%. Nitrogen concentration values <20% or oxygen concentration values < 5% indicate well extraction rates are not causing excessive air infiltration into the landfill. An elevated LFG temperature is an indicator of subsurface fires and aerobic conditions within the landfill.

Exceptions are allowed “if the operator has discovered the excess and has satisfied all requirements of Section 8-34-414 (Repair Schedule for Wellhead Excesses) or has received permit conditions containing alternative operating levels”. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

Republic has evaluated these wells for the presents of a subsurface combustion (oxidation). No indications of subsurface oxidation were noted for the 6 wells. Republic also sampled CO at proposed well temperature of 145 °F. Low concentrations of CO (10 ppm) were not indicative of an oxidation event (Table 2). With the HOV temperature limited to 145 °F, and oxygen concentration limited to <5%, Republic believes that methanogens will not be significantly impacted. Republic has concluded that the elevated temperature profiles are normal for these wells, and is therefore seeking an alternative temperature limits (145 °F) for these wells.

Table 1. HOV wells operating data

Well ID	Temp Range (°F)	Ave Temp (°F)	Methane Range (%)	Ave Methane (%)	Ave Pressure (in H ₂ O)	Ave Oxygen (%)	Ave CO, (ppmv)
SVC107-0 (13 tests)	129.4-136.6	132.4	50-56.3	53.7	-0.8	0	10
SVC109-0 (31 tests)	120-142	134.4	52.8-57.6	55.6	-2.0	0.05	10
SVC112-0 (22 tests)	109-135.3	130.1	51-58.1	55.1	-4.8	0.15	10
SVC113-0 (4 tests)	129.9-131.4	130.7	55.7-56.3	55.9	-7.8	0.2	10
SVC114-0 (18 tests)	88.9-145.5	125.9	8.4-58	45.1	-1.0	4.0	10
SVC115-0 (38 tests)	77-144.7	129	8.7-57.7	47.9	-0.01	3.0	10

In all monitoring cases, the oxygen levels are too low to sustain subsurface combustion of methane in the landfill gas. Average CO levels are very low at 10 ppm. It should be noted that CO is not typically detected in landfill gas. Per EPA, a landfill gas CO concentration greater than 1000 ppm with a gas temperature greater than 140 °F and a waste mass temperature greater than 170 °F are some of the indicators that a subsurface fire exists. Therefore it can be concluded that no subsurface combustion is taking place. Methane levels and elevated temperatures are indicative of microbial decomposition of the in-place refuse. Condition 4044, part 5 will be modified accordingly.

No emission increases are expected for the alternative temperature limits (145 °F) for the 6 wells.

STATEMENT OF COMPLIANCE

Regulation 1: General Provisions and Definitions

The facility is subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. The proposed permit condition changes will not result in any increase in emissions and therefore is not expected to be a source of public nuisance.

Regulation 2, Rule 1 (CEQA and Public Notice Requirements):

This application is for a change of permit conditions at the S-1 Landfill with Gas Collection System that involves no physical alterations of the gas collection system. The gas collection system is part of the landfill gas abatement systems for the landfill. The change of permit conditions does not result in any emission increases. Therefore, this application is categorically exempt from CEQA review pursuant to Regulation 2-1-312.2. In addition, the Engineering Evaluation for this application uses fixed standards and objective measurements and does not involve any element of discretion. Consequently, no further CEQA review is required.

The project is over 1000 feet from the nearest school and is therefore not subject to the public notification requirements of Regulation 2-1-412.

Regulation 2, Rule 2:

Since this application does not result in any emission increase, this project is not subject to New Source Review (NSR). No new BACT, Offset or PSD requirements will apply.

New Source Review for Toxic Air Contaminants:

This application does not result in any increases of Toxic Air Contaminants (TACs). Therefore, NSR for TACs is not triggered, and no new T-BACT requirements will apply.

Regulation 2, Rule 6:

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act (40 CFR, Part 70) and BAAQMD Regulation 2, Rule 6, Major Facility Review (MFR), because it is a major facility for NO_x and CO emissions and also because it is a designated facility (since it is subject to the control requirements of the Emission Guidelines for MSW Landfills). Therefore, this facility is required to have an MFR permit pursuant to Regulations 2-6-301 and 2-6-304.

The MFR Permit for this facility was last revised on May 20, 2013. Republic submitted an application to the BAAQMD for MFR permit renewal on November 20, 2017 (Application Number 29009). Since this application will result in permit condition modifications, minor revision of the Title V permit will be incorporated into the MFR Renew Application 29009.

Regulation 8, Rule 34:

Sonoma County Central Landfill (S-1) is subject to Regulation 8, Rule 34. S-1 is expected to comply with Regulation 8-34-301 by:

- (a) continuously operating the gas collection system and continuously operating gas control systems (including S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, S-14 and A-3),
- (b) having no leaks (exceeding 1000 ppmv) from the gas collection system, and
- (c) processing all collected gases in control devices achieving at least 98% NMOC destruction efficiency (or emitting less than 120 ppmv of NMOC from the IC engines and gas turbines).

The S-1 Sonoma County Central Landfill is also subject to Regulation 8-34-303, which limits leaks on the surface of the landfill to less than 500 ppmv as methane. This site has generally been complying with the surface leak requirements. However, surface leaks above the standard are occasionally discovered by the facility and are typically eliminated within a few days of discovery.

The proposed collection system alterations will keep pace with the expected increases in gas production rate at this site and are expected to prevent excessive surface leaks at this landfill.

For deep interior wells, well spacing should be less than 300 feet with each well achieving a radius of influence of about 150 feet. For perimeter wells, well spacing should be less than 200 feet apart. Based on maps of the gas collection system, the current vertical wells are 150-300 feet apart and appear to be of sufficient density.

The proposed collection system alterations are necessary to maintain compliance with the collection system installation dates specified in Regulation 8-34-304. This site is complying with all applicable monitoring requirements (8-34-505-510).

Federal Requirements:

The landfill at this facility is subject to the 40 CFR Part 60, Subpart WWW NSPS for Municipal Solid Waste (MSW) Landfills. Compliance with the District's Regulation 8, Rule 34 operating requirements is expected to ensure compliance with all applicable federal NSPS operating provisions.

NESHAPs for MSW Landfills: Any landfills that are subject to the landfill gas collection and control requirements of either the NSPS for MSW Landfills or the EG for MSW Landfills are also subject to the NESHAPs for MSW Landfills (40 CFR, Part 63, Subpart AAAA). This NESHAP requires that subject facilities prepare and implement startup, shutdown, malfunction plans and additional reporting requirements. All applicable requirements are contained in the existing MFR permit, and this facility is expected to comply with these requirements.

Permit Condition Revisions

The District is proposing to revise Condition # 4044, Part 5, as shown below in strike through and underline formatting. The proposed revisions to Part 5 identify the alternative wellhead limits that are being authorized pursuant to this Change of Conditions. No other condition changes are proposed.

Condition # 4044

For S-1 Sonoma County Central Landfill, S-22 Waste and Cover Material, S-23 Mobile Surface Equipment, A-3 and A-4 Landfill Gas Flares, and A-8 Water Sprays

1. Except for temporary emergency situations approved by the Local Enforcement Agency, the total amount of municipal solid waste received at the Sonoma County Central Landfill (S-1) shall not exceed 2,500 tons per day nor 897,500 tons per year. The total cumulative amount of all wastes and cover materials (excluding final cover material) placed in the landfill shall not exceed both 32.65 million cubic yards and 19.59 million tons.
(basis: Cumulative Increase and 2-1-301)
2. Particulate emissions from any operation of the Landfill (S-1) shall be abated by Water Spray (A-8), if necessary, so that visible dust emissions shall not exceed Ringelmann

0.5 or result in fallout on adjacent property in such quantities as to cause a public nuisance per Regulation 1-301. (basis: BACT and 1-301)

- *3. If the plant receives two or more Violation Notices from the District for "Public Nuisance" related to dust emissions in any consecutive 12-month period, the Permit Holder shall submit to the District, within 30 days, an application to modify the Permit to Operate to include the following control measures as applicable or any other measures that the District deems necessary and appropriate. (basis: Regulation 1-301)
 - a. The paving of all significant roads associated with landfill operations, or
 - b. The use of chemical suppressant to control fugitive dust emissions from roadways associated with this landfill.

- 4. The Sonoma County Central Landfill includes the landfill gas collection system components listed below. Well and collector locations, depths, and lengths are as described in detail in the current Landfill Collection and Control System Design Plan.
 - a. Total Number of Vertical Wells: 167
Total Number of Horizontal Collectors: 30
 - b. The Permit Holder has been authorized to make the landfill gas collection system alterations described below pursuant to Permit Applications #26628 and #28194. All collection system alterations shall comply with subparts 4b(i-vii) below.
 - i. The authorized collection system alterations are:
 - Install up to 100 new gas collection wells
 - Permanently decommission up to 100 gas collection wells
 - Modify wellhead monitoring locations, as needed, provided that each landfill gas collection system component identified in Part 4a and each new collection system component installed per Part 4b is adequately represented by a wellhead monitoring location. The Permit Holder shall maintain documentation on site that identifies all landfill gas collection system components that are represented by each wellhead monitoring location.
 - ii. The Permit Holder shall apply for and receive a Change of Conditions before altering the landfill gas collection components described in subpart 4a, other than those authorized by Part 4b. Installing, altering, or permanently decommissioning a vertical well, horizontal collector, or other gas collection component is subject to this requirement, unless this change constitutes a replacement as defined in subpart 4b(iii) below.
 - iii. Replacement of landfill gas collection system components with identical or functionally equivalent components will not be deemed an alteration and will not be subject to subpart 4b(ii) under the following circumstances. If a well or collector will be shut down and replaced by a new well or collector in essentially the same location as the old component and this decommission/installation will be accomplished in accordance with Regulations 8-34-117 and 8-34-118, then this activity shall be considered a component replacement that is not subject to the Authority to Construct requirement. For each individual well or collector replacement, this subpart authorizes a maximum vacuum disconnection time of five consecutive days for compliance with Regulation 8-34-117.5. The disconnected component and the new component shall not be counted toward the subpart 4b(i) limits; the numbers of replacement wells and replacement collectors are not limited.

Alterations, repairs, or replacements of non-perforated piping sections (such as risers, laterals, or header pipes), piping connectors, or valves are not subject to an Authority to Construct requirement.

iv. At least three days prior to initiating operation of a well or collector installed pursuant to subpart 4b, the Permit Holder shall submit a start-up notice to the District that contains the component ID number for each new well or collector and the anticipated initial start-up date for each new component.

v. For each well or collector that is permanently decommissioned after January 13, 2017, the Permit Holder shall submit a decommissioning notice to the District within no later than three working days after the component was disconnected from vacuum system. This decommissioning notice shall contain the component ID for each well or collector that was decommissioned, the date and time that each component was disconnected from the vacuum system, and the reason the component was decommissioned.

vi. Within six months of installing a new component or permanently decommissioning an existing component, the Permit Holder shall prepare an updated map of the landfill gas collection system that identifies the ID numbers and locations of all operable wells and collectors. On this map or in accompanying documentation, the Permit Holder shall summarize all component changes that were made since the last map was prepared. The previous collection system map, the updated collection system map, and the component change summary shall be provided to District staff upon request.

vii. If the Permit Holder has a net reduction (number of decommissioned components minus the number of installed components) of more than five components within a 120-day period, the Permit Holder shall submit a more comprehensive decommissioning notice to the District. In addition to the information required by subpart 4b(v), this comprehensive decommissioning notice shall include the maps and documentation required by subpart 4b(vi), shall identify all component changes that have occurred but that are not included on the most recently updated map, shall include a list of all well installations that are expected to occur within the next 120 days, and shall discuss the reasons why this reduction in gas collection components is not expected to result in surface emission leaks. Upon request, the Permit Holder shall provide wellhead monitoring data, surface leak monitoring data, records of repair attempts made to date, and other information to support the need for a net collection component reduction of more than five wells. The District may require additional surface monitoring to verify that this net component reduction is not causing landfill surface leaks. The District will notify the Permit Holder in writing of any additional surface monitoring that is required pursuant to this subpart.

5. Operating Requirements for Landfill Gas Collection Systems and Collection System Components:

- a. The landfill gas collection systems described in part 4 shall be operated continuously. Wells shall not be disconnected or removed, nor isolation valves shut completely off, unless the Permit Holder complies with all applicable requirements of Regulation 8, Rule 34, Sections 113, 116, 117, and 118. (Basis:

Regulation 8-34-301.1)

- b. Each landfill gas collection system component listed in Part 4 shall be operated in compliance with the wellhead limits of Regulation 8-34-305, unless an alternative wellhead limit has been approved for that component, as identified in subpart b(i), and the Permit Holder complies with all of the additional requirements for that component, as identified in subparts b(iii-viii). (Basis: Regulations 8-34-303, 8-34-304, 8-34-305, 40 CFR 60.755(a) and 60.759)
 - i. The nitrogen and oxygen concentration limits in Regulation 8-34-305.3 and 8-34-305.4 shall not apply to the landfill gas collection wells listed below, provided that the oxygen concentration in each of the following wells does not exceed 15% by volume: V-058, V-061, V-062, and V-117; EC-9.1, EC-15, EC-19, EC-24, EC-25, EC-26, and EC-26.1.
 - ii. The wellhead temperature limits in Regulation 8-34-305.2 shall not apply to the landfill gas collection wells listed below, provided that the wellhead temperature in each of the following wells does not exceed 145 °F: SCV107-0, SCV109-0, SCV112-0, SCV113-0, SCV114-0, and SCV115-0.
 - ~~iii.~~ The Permit Holder shall demonstrate compliance with the alternative wellhead oxygen limit in subpart b(i) by monitoring each wellhead for oxygen on a monthly basis, in accordance with the provisions of Regulations 8-34-505 and 8-34-604.
 - ~~iv.~~ All test dates, wellhead oxygen concentration data, any deviations from the subpart b(i) limit, repair actions, repair dates, re-monitoring dates and results, and compliance restoration dates shall be recorded in a District approved log and made available to District staff upon request in accordance with Regulations 8-34-34-501.4, 8-34-501.9, and 8-34-414.
 - ~~v.~~ To demonstrate that the alternative wellhead oxygen limit in subpart b(i) will not cause surface emission leaks, the Permit Holder shall conduct additional surface emission monitoring in the vicinity of each component listed in subpart b(i). For each component in subpart b(i), the Permit Holder shall maintain a map showing the location of the buried collection component and identifying the approximate radius of influence for the component. For each component in subpart b(i), the Permit Holder shall monitor for landfill surface emissions – in accordance with Regulations 8-34-506 and 8-34-607 – at three representative points on the landfill surface that are within the radius of influence of the component and that are not more than 15 meters from the surface location of the component. This additional surface emission monitoring shall be conducted on a monthly basis for a period of at least six consecutive months.
 - ~~vi.~~ If no excesses of the Regulation 8-34-303 surface emission limit are detected in the vicinity of a component for six consecutive months, the Permit Holder may discontinue the additional monthly surface emission monitoring in the vicinity of that component and shall

continue with the routine quarterly surface emission monitoring requirements in the vicinity of that component.

~~v~~vii. If one or more excesses of the Regulation 8-34-303 surface emission limit are detected in the vicinity of a component during a six-consecutive month period, the Permit Holder shall follow all applicable requirements for recording and reporting the excess and shall follow the Regulation 8-34-415 repair schedule for landfill surface leak excesses. The additional monthly surface emission monitoring in the vicinity of that component shall continue until either the no surface excess requirements of subpart b(v) have been achieved or the repair and compliance restoration requirements of subpart b(vii) have been satisfied.

~~vi~~viii. If excesses of the Regulation 8-34-303 surface emission limit are detected in the vicinity of a component for three or more monitoring events during a six-consecutive month period, the subpart b(i) alternative wellhead oxygen limit shall be revoked for that component. The Permit Holder shall conduct all necessary repairs to the landfill gas collection well, to any piping associated with the well or the remote wellhead monitoring system, to valves, flanges, or other connectors, and to any test ports or other openings that are necessary to eliminate air intrusion into the well or the monitoring point, to prevent impairment of vacuum application or vacuum adjustment at the collection well, and to restore the collection well and associated monitoring point to proper function. The Permit Holder shall complete all of the above repairs and any necessary landfill surface and shall restore compliance with the Regulation 8-34-303 surface emission limit (in the vicinity of that component) and the Regulation 8-34-305.4 wellhead oxygen concentration limit by the earlier of the following dates: (a) within 120 days of the date that the first excess was discovered if the three excess events are discovered within a single quarterly period pursuant to the re-monitoring requirements of 8-34-415 or (b) within 60 days of detection of the third excess.

c. If any other well has a temperature of 131 degrees F or higher, the owner/operator may elect to add this component to the list of alternative temperature limit wells in Part 5b(ii) if all of the following requirements are met:

- i. The wellhead temperature does not exceed 145 degrees F.
- ii. The carbon monoxide (CO) concentration in the wellhead gases does not exceed 500 ppmv.
- iii. The component does not exceed any wellhead limit other than temperature and had no excesses of wellhead limits (other than temperature) during the past 120 days prior to adding this component to the list in this subpart, unless the excess is positive pressure at the well from the well vacuum being reduced to eliminate any potential over pull that could contribute to a landfill fire.
- iv. Prior to adding a component to the list in Part 5b(ii), the owner/operator shall monitor the gas in the wellhead for CO concentration at least two times, with no more than 15 days between tests. CO monitoring shall continue on a monthly basis, or more frequently if required below, until the owner/operator is allowed to discontinue CO monitoring per subpart e(ii)(3).

v. The owner/operator shall comply with all applicable monitoring and recordkeeping requirements below:

1) The owner/operator shall demonstrate compliance with the alternative wellhead temperature limit by monitoring and recording the temperature of the landfill gas in the wellhead on a monthly basis, in accordance with Regulations 8-34- 501.4, 8-34-501.9, and 8-34-505.

2) If the temperature of the landfill gas in the wellhead exceeds 140 degrees F, the owner/operator shall investigate the possibility of a subsurface fire at the wellhead by monitoring CO concentration in the wellhead gases and by searching for smoke, smoldering odors, combustion residues, and other fire indicators in the wellhead and in the landfill area near the wellhead. Within 5 days of triggering a fire investigation, the owner/operator shall measure the CO concentration in the landfill gas at the wellhead using a portable CO monitor, CO Draeger tube, or an EPA-approved test method. CO monitoring shall continue according to the frequency specified below:

a. If the CO concentration is greater than 500 ppmv, the owner/operator shall immediately take all steps necessary to prevent or extinguish the subsurface fire, including disconnecting the well from the vacuum system if necessary. If the well is not disconnected from the vacuum system or upon reconnecting the well to the vacuum system, the owner/operator shall monitor the well for CO concentration, wellhead temperature, and other fire indicators on at least a weekly basis until CO concentration drops to 500 ppmv or less.

b. If the CO concentration is less than or equal to 500 ppmv but great than 100 ppmv, the owner/operator shall monitor for CO concentration at least twice per month (not less than once every 15 days) until the CO concentration drops to 100 ppmv or less. Wellhead temperature and other fire indicators shall be evaluated at each of these semi-monthly monitoring events.

c. If the CO concentration is less than or equal to 100 ppmv, the owner/operator shall monitor for CO concentration on a monthly basis. CO monitoring may be discontinued if three consecutive CO measurements are 100 ppmv or less and the wellhead temperature during each of these three monitoring events is 140 degrees F or less. If the component has three or more CO measurement of 100 ppmv or less but the wellhead temperature was greater than 140 degrees F, the owner/operator must receive written approval from the District before discontinuing the monthly CO monitoring at that component.

3) The owner/operator shall record the dates and results of all monitoring events required by this subpart in a District- approved log. If subpart 5c(v)(2) or 5c(v)(2)(a) applies, the owner/operator shall also record all actions taken to prevent or extinguish the fire.

- *6. If the concentrations (dry basis) of toxic air contaminants in the collected landfill gas exceed any of the limits listed below, the Permit Holder shall submit a permit application for a Change of Permit Conditions within 30 days of receiving the test results.
- | | | |
|--------------------|---|-----------|
| Benzene | = | 2.5 ppmv |
| Trichloroethylene | = | 3.0 ppmv |
| Perchloroethylene | = | 3.0 ppmv |
| Methylene Chloride | = | 20.0 ppmv |
| Vinyl Chloride | = | 2.5 ppmv |
- (basis: Regulation 2-5-302 and AB2588 Air Toxic Hot Spots Act)
7. Total reduced sulfur compounds in the collected landfill gas shall be monitored as a surrogate for monitoring sulfur dioxide in control systems exhaust. The concentration of total reduced sulfur compounds in the collected landfill gas shall not exceed 300 ppmv (dry). (basis: Regulation 9-1-302)
8. All collected landfill gas shall be vented to properly operating abatement equipment including the Internal Combustion Engines (S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14) and/or the Landfill Gas Flares (A-3 or A-4). Under no circumstances shall raw landfill gas be vented to the atmosphere. This limitation does not apply to unavoidable landfill gas emissions that occur during collection system installation, maintenance, or repair that is performed in compliance with Regulation 8, Rule 34, Sections 113, 116, 117, or 118 or to inadvertent component or surface leaks that do not exceed the limits specified in 8-34-301.2 or 8-34-303. (basis: Regulation 8-34-301)
9. The A-3 or A-4 Landfill Gas Flare shall be operated as necessary to combust excess gas whenever the flow of landfill gas exceeds the capacity of the Internal Combustion Engines in service. (basis: Regulation 8-34-301)
10. During operation, the combustion temperature of the A-3 or A-4 Landfill Gas Flare shall be maintained at a minimum of 1400 degrees Fahrenheit, each averaged over any 3-hour period. (basis: 8-34-301, BACT, and Regulation 2-5-302)
11. Emissions of Nitrogen Oxides (NO_x) from the Flare A-3 or A-4 shall not exceed 0.05 pounds per million BTU (calculated as NO₂) per flare. (basis: RACT and Offsets)
12. Emissions of Carbon Monoxide (CO) from the Flare A-3 or A-4 shall not exceed 0.20 pounds per million BTU per flare. (basis: RACT and Offsets).
13. The Heat Input to the A-3 or A-4 Landfill Gas Flare shall not exceed 2,190 MMBtu per day per flare and 547,680 million BTU per year combined. In order to demonstrate compliance with this part, the Permit Holder shall calculate and record on a daily and monthly basis the total heat input to the flares based on the landfill gas flow rate recorded pursuant to part 14, the average methane concentration in the landfill gas based on the most recent source test, and a high heating value for methane of 1013 BTU/scf. The records shall be retained for five years and shall be available to the District staff upon request. (basis: Cumulative Increase, Regulation 2-1-301)

14. A flow meter to measure gas flow into the A-3 and A-4 Landfill Gas Flares shall be installed and maintained in good working condition. (basis: Regulation 8-34-301)
15. The A-3 and A-4 Landfill Gas Flares shall be equipped with both local and remote alarm systems, which shall be enabled whenever the flare is required to be operated under the requirements of Part 9 above. (basis: Regulation 8-34-301.41)
16. The A-3 and A-4 Landfill Gas Flares shall be equipped with a combustion temperature readout monitor and continuous recorder. (basis: Regulation 8-34-507, BACT, and Regulation 2-5-302)
17. In order to demonstrate compliance with Regulation 8, Rule 34, Section 301.3, parts 11 and 12 above, 40 CFR 60 .752(b)(2)(iii)(B), and CCR, Title 17, Section 95464 (b)(2)(A)(1), the Permit Holder shall ensure that a District approved source test is conducted annually on the Landfill Gas Flare (A-3 or A-4). As a minimum, the annual source test shall determine the following:
 - a. landfill gas flow rate to the flare (dry basis);
 - b. concentrations (dry basis) of carbon dioxide (CO₂), nitrogen (N₂), oxygen (O₂), methane (CH₄), and total non-methane organic compounds (NMOC) in the landfill gas;
 - c. stack gas flow rate from the flare (dry basis);
 - d. concentrations (dry basis) of CH₄, NMOC, THC, NO_x, CO, and O₂ in the flare stack gas;
 - e. emission rates (lb/MMBTU) of nitrogen oxides (NO_x) and carbon monoxide (CO)
 - f. the CH₄ and NMOC destruction efficiencies achieved by the flare; and
 - g. the average combustion temperature in the flare during the test period.

Annual source tests shall be conducted no later than 12 months after the previous source test. The Source Test Section of the District shall be contacted to obtain their approval of the source test procedures at least 14 days in advance of each source test. They 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 within 60 days of the test date. [Basis: Cumulative Increase, Regulations 8-34-301.3 and 8-34-412, 40 CFR 60.752(b)(2)(iii)(B), and CCR, Title 17, Section 95464 (b)(2)(A)(1)]
- *18. In order to demonstrate compliance with Part 6 above, the Permit Holder shall conduct a characterization of the landfill gas at least once per year. The landfill gas sample shall be drawn from the main landfill gas header. The landfill gas shall be analyzed for methane (CH₄), carbon dioxide (CO₂), nitrogen (N₂), oxygen (O₂), total sulfur, and all compounds listed in the most recent version of EPA's AP-42 Table 2.4-1, excluding acetone, carbon monoxide, and mercury. All concentrations shall be reported on a dry basis. The test report shall be submitted to the Compliance and Enforcement Division within 60 days of the test date. After conducting three annual landfill gas characterization tests, the Permit Holder may request to remove specific compounds from the list of compounds to be tested for if the compounds have not been detected, have no significant impact on the cancer risk determination for the site, and have no significant impact on the hazard index determination for the site. If the Permit Holder has excluded any NPOCs from the POC emission calculations for the site, then the Permit Holder shall continue to test for these NPOCs on an annual basis. (basis: Regulation 2-1-403 and AB2588 Air Toxic Hot Spots Act)

19. In order to demonstrate compliance with the above conditions, the Permit Holder shall maintain the following records in a District approved logbook.
- a. Record the total amount of municipal solid waste received at S-1 on a daily basis.
 - b. Summarize the daily waste acceptance records for each calendar month.
 - c. Summarize monthly waste acceptance records for each preceding 12-month period.
 - d. For each area or cell that is not controlled by a landfill gas collection system, maintain a record of the date that waste was initially placed in the area or cell.
 - e. Record the cumulative amount of waste placed in each uncontrolled area or cell on a monthly basis.
 - f. If the Permit Holder plans to exclude an uncontrolled area or cell from the collection system requirement, the Permit Holder shall also record the types and amounts of all non-decomposable waste placed in the area and the percentage (if any) of decomposable waste placed in the area.
 - g. Record the initial operation date for each new landfill gas well and collector.
 - h. Maintain an accurate map of the landfill which indicates the locations of all refuse boundaries and the locations of all wells and collectors (using unique identifiers) that are required to be operating continuously pursuant to Part 5.a. Any areas containing only non-decomposable waste shall be clearly identified. This map shall be updated at least every six months to indicate changes in refuse boundaries and to include any newly installed wells and collectors.
 - i. Record the operating times for the A-3 and A-4 Landfill Gas Flares on a daily basis.
 - j. Record the total amount of landfill gas vented to A-3 and A-4 on a daily basis.
 - k. Summarize the amount of landfill gas vented to A-3 and A-4 on a monthly basis.
 - l. Maintain continuous records of the combustion temperature achieved at A-3 during all hours of operation.
 - m. Maintain records of all test dates and test results performed to maintain compliance these permit conditions.
 - n. For each dust suppressant application, maintain records of the date the dust suppressant was applied, the areas that it was applied to, the type of dust suppressant used, and the amount of dust suppressant that was applied.
 - o. Maintain daily records of the water application frequency for construction areas, unpaved roads, and dirt and rock stockpiles.

All records shall be maintained on site or shall be made readily available to District staff upon request for 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 and Regulations 6-301, 6-305, 8-34-304, 8-34-501.3, and 8-34-501.8)

- *20. Handling Procedures for Soil Containing Volatile Organic Compounds
- a. The procedures listed below in subparts b-k do not apply if the following criteria are satisfied. However, the record keeping requirements in subpart l below are applicable.
 - i. The Permit Holder has appropriate documentation demonstrating that either the organic content of the soil or the organic concentration

- above the soil is below the “contaminated” level (as defined in Regulation 8, Rule 40, Sections 205, 207, and 211).
- ii. The Permit Holder has no documentation to prove that soil is not contaminated, but source of the soil is known and there is no reason to suspect that the soil might contain organic compounds.
- c. Any soil received at the facility that is known or suspected to contain volatile organic compounds (VOCs) shall be handled as if the soil were contaminated, unless the Permit Holder receives test results proving that the soil is not contaminated. To prove that the soil is not contaminated, the Permit Holder shall collect soil samples in accordance with Regulation 8-40-601 within 24 hours of receipt of the soil by the facility. The organic content of the collected soil samples shall be determined in accordance with Regulation 8-40-602.
 - i. If these test results indicate that the soil is still contaminated or if the soil was not sampled within 24 hours of receipt by the facility, the Permit Holder must continue to handle the soil in accordance with the procedures subparts c-k below, until the soil has completed treatment or has been placed in a final disposal location and adequately covered. Storing soil in a temporary stockpile or pit is not considered treatment. Co-mingling, blending, or mixing of soil lots is not considered treatment.
 - ii. If these test results indicate that the soil – as received at the facility – has an organic content of 50 ppmw or less, then the soil may be considered to be not contaminated and need not be handled in accordance with the procedures listed in subparts c-k below.
 - c. Any contaminated soil received at the facility shall be clearly identified as contaminated soil, shall be handled in accordance with subparts d-k below, and shall be segregated from non-contaminated soil. Contaminated soil lots may not be co-mingled, blended, or otherwise mixed with non-contaminated soil lots prior to treatment, reuse, or disposal. Mixing soil lots in an attempt to reduce the overall concentration of the contaminated soil or to circumvent any requirements or limits is strictly prohibited.
 - d. On-site handling of contaminated soil shall be limited to no more than 2 on-site transfers per soil lot. For instance, unloading soil from off-site transport vehicles into a temporary storage pile would be considered 1 transfer. Moving soil from a temporary storage to a staging area would be considered 1 transfer. Moving soil from a temporary storage pile to a final disposal site would be considered 1 transfer. Moving soil from a staging area to a final disposal site would be considered 1 transfer. Therefore, unloading soil from off-site transport into a temporary storage pile and then moving the soil from that temporary storage pile to the final disposal site would be allowed. Unloading soil from off-site transport into a staging area and then moving the soil from that staging area to the final disposal site would be allowed. However, unloading soil from off-site transport to a temporary storage pile, moving this soil to a staging area, and then moving the soil again to a final disposal site would be 3 on-site transfers and would not be allowed.
 - e. If the contaminated soil has an organic content of less than 500 ppmw, the contaminated soil shall be treated, deposited in a final disposal site, or transported off-site for treatment within 90 days of receipt at the facility.
 - f. If the contaminated soil has an organic content 500 ppmw or more, the contaminated soil shall be treated, deposited in a final disposal site, or transported off-site for treatment within 45 days of receipt at the facility.

- g. All active storage piles shall meet the requirements of Regulation 8-40-304 by using water sprays, vapor suppressants or approved coverings to minimize emissions. The exposed surface area of any active storage pile (including the active face at a landfill) shall be limited to 6000 ft². The types of storage piles that may become subject to these provisions include (but are not limited to) truck unloading areas, staging areas, temporary stockpiles, soil on conveyors, bulldozers or trucks, the active face of a landfill, or other permanent storage pile at the final disposal location.
- h. All inactive storage piles shall meet the requirements of Regulation 8-40-305 including the requirement to cover contaminated soil during periods of inactivity longer than one hour. The types of storage piles that may become subject to these provisions include (but are not limited to) soil on trucks or other on-site equipment, staging areas, temporary stockpiles, and the permanent storage pile at the final disposal location. District approved coverings for inactive storage piles include continuous heavy-duty plastic sheeting (in good condition, joined at the seams, and securely anchored) or encapsulating vapor suppressants (with re-treatment as necessary to prevent emissions).
- i. For landfills, Permit Holders must:
 - i. Keep contaminated soil covered with continuous heavy-duty plastic sheeting (in good condition, joined at the seams, and securely anchored) whenever soil is to be stored in temporary stockpiles or during on-site transport in trucks. Soil in trucks shall not be left uncovered for more than 1 hour.
 - ii. Establish a tipping area for contaminated soils near the active face that is isolated from the tipping area for other wastes.
 - iii. Spray contaminated soil with water or vapor suppressant immediately after dumping the soil from a truck at the tipping area.
 - iv. Ensure that all contaminated soil is transferred from the tipping area to the active face immediately after spraying with water or vapor suppressant.
 - v. Ensure that contaminated soil in the tipping area is not disturbed by subsequent trucks. Trucks shall not drive over contaminated soil in the tipping area or track contaminated soil out of the tipping area on their wheels.
 - vi. Spray contaminated soil on the active face with water or vapor suppressant (to keep the soil visibly moist) until the soil can be covered with an approved covering.
 - vii. Limit the area of exposed soil on the active face to no more than 6000 ft².
 - viii. Ensure that contaminated soil that has been spread on the active face is completely covered on all sides with one of the following approved coverings: at least 6 inches of clean compacted soil, at least 12 inches of compacted garbage, or at least 12 inches of compacted green waste.
 - ix. Ensure that covering of soil on the active face is completed within one hour of the time that the soil was first dumped from a truck at the tipping area.
- j. Contaminated soil shall not be used as daily, intermediate, or final cover material for landfill waste operations unless the requirements of Regulation 8, Rule 40, Sections 116 or 117 have been satisfied.

- k. Contaminated soil is considered to be a decomposable solid waste pursuant to Regulation 8, Rule 34. All contaminated soil disposed of at a site shall be included in any calculations of the amount of decomposable waste in place that are necessary for annual reporting requirements or for determining the applicability of 8-34-111 or 8-34-304.
- l. The Permit Holder shall keep the following records for each lot of soil received, in order to demonstrate on-going compliance with the applicable provisions of Regulation 8, Rule 40.
 - ii. For all soil received by the facility (including soil with no known contamination), record the arrival date at the facility, the soil lot number, the amount of soil in the lot, the organic content or organic concentration of the lot (if known), the type of contamination (if any), and keep copies of any test data or other information that documents whether the soil is contaminated (as defined in 8-40-205) or not contaminated, with what, and by how much.
 - ii. If the soil is tested for organic content after receipt by the facility, record the sampling date, test results, and the date that these results were received.
 - iii. For all on-site handling of contaminated soil, use a checklist or other approved method to demonstrate that appropriate procedures were followed during all on-site handling activities. One checklist shall be completed for each day and for each soil lot (if multiple lots are handled per day).
 - iv. For soil aerated in accordance with 8-40-116 or 117 record the soil lot number, the amount of soil in the lot, the organic content, the final placement date, the final placement location, and describe how the soil was handled or used on-site.
 - v. For final disposal at a landfill, record on a daily basis the soil lot number, the amount of soil placed in the landfill, the disposal date, and the disposal location.

All records shall be retained for at least 5 years from the date of entry and shall be made available for District inspection upon request.

(basis: Regulation 8-40-301, 8-40-304 and 8-40-305)

- 21. The Permit Holder shall limit the quantity of soil (that contains VOCs) disposed of per day so that no more than 15 pounds of total carbon could be emitted to the atmosphere per day. In order to demonstrate compliance with this condition, the Permit Holder shall maintain the following records in a District approved log.
 - a. Record on a daily basis the amount of soil (that contains VOCs) disposed of in the landfill and used as cover material in the landfill. This total amount (in units of pounds per day) is Q in the equation in subpart c. below.
 - b. Record on a daily basis the VOC content of all soils disposed of or used as cover material. This VOC Content (C in the equation below) should be expressed as parts per million by weight as total carbon (or C₁).
 - c. Calculate and record on a daily basis the VOC Emission Rate (E) using the following equation:

$$E = Q * C / 1E6$$

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

(basis: Regulation 8-2-301)

RECOMMENDATION

Issue a Change of Conditions for Condition # 4044 for following source:

S-1 Sonoma County Center Landfill

By:

Davis Zhu
Air Quality Engineer

Date