

Bay Area Air Quality Management District

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October 2005

**Permit Evaluation and
Statement of Basis
for
MAJOR FACILITY REVIEW PERMIT
Minor Revision**

**for
Sonoma County Central Landfill
Facility #A2254**

Facility Address:
500 Mecham Road
Petaluma, CA 94952

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Site Engineer: Robert Hull
Application Engineer: Robert Hull

Application 9276

Title V – Minor Revision

A. BACKGROUND

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

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

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

The Sonoma County Central Landfill (Site #A2254) was issued a Major Facility Operating Permit (Title V Permit) on February 27, 2001, with an expiration date of January 31, 2006. The Title V permit has since undergone two Significant Revisions and was reissued on March 29, 2004 and October 3, 2005. An Application for a Renewal Title V permit was received by the District on July 29, 2005.

The current proposal is to “correct” the maximum heat input capacity for the Landfill Gas Fired Internal Combustion Engine/Generator Sets S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14. The maximum heat input used to describe the capacity of the engines has since 1992 been reported by Sonoma County as 8.61 million BTU per hour (MMBTU/hr). However, after a careful review of the heat input to the engines as necessitated by current Title V permit conditions, Sonoma County has concluded that the actual heat input is higher than the nominal value originally reported.

The requested changes to the permit resulting from correcting the heat input capacities of the IC Engines will constitute a “Minor Permit Revision” as defined in BAAQMD Regulation 2-6-215, because the proposed revision is neither “Administrative” nor “Significant”. As discussed below, no quantifiable increase of emissions will result from this revision.

B. DISCUSSION OF PROPOSED CHANGE TO HEAT CAPACITY LIMITS

The IC Engines S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14 currently operating at the Sonoma County Central Landfill are identical Caterpillar Model 3516 S.I.T.A. lean burn engines, which have been permitted in groups under various Authority to Construct applications beginning in 1992. Up until the initial issuance of the Title V permit for the facility on February 27, 2001, there were no fuel capacity limits placed on the engines.

During the initial Title V permitting process, fuel consumption limits were placed on the engines in order to establish an emissions baseline. These limits were initially imposed on the existing IC Engines S-4, S-5, S-6, S-7, S-9, S-10, S-11, and S-12 in the form of a new permit condition (Condition #6117, part 10), which limited the heat input to each of the engines to 206.64 million BTU per day (MMBTU/day) and 75,423.6 MMBTU/yr. Based on the information that Sonoma County had historically provided to the District, these were the maximum fuel usage rates for these engines. The basis for this condition is given as BAAQMD Regulation 2-1-301 “Authority to Construct”, the intent being to prevent a modification of the IC engines that would increase their capacity without first obtaining an Authority to Construct from the District. There were no New Source Review decisions based on these limits.

When the new IC Engines S-13 and S-14 were added under Application #006178 a new permit condition including all landfill gas fired IC engines at the facility was created (Condition #19933). This new permit condition retained the previous limits on heat input.

Sonoma County has requested an increase in the permitted heat input rate for each of the IC Engines to 252.6 MMBTU/day and 92,199 MMBTU/yr. This increase is not intended to change the operation of the engines in any way, but rather to correct systematic errors regarding fuel consumption that occurred during the permitting of the engines. Sonoma County has stated that the maximum firing rates for the engines were underestimated for the following reasons:

- Heat input was reported in lower heating value (LHV) in the permit applications and the BAAQMD uses higher heating value (HHV) as a reference. This results in a heat input underestimation of approximately 10.9%.
- The nominal heat input rating assigned by the manufacturer is not intended to be an upper limit, but rather an indication of the fuel requirements necessary to achieve the maximum rated power output. The nominal heat input rating is established by testing under controlled conditions. Accumulated test data for the engines at the Sonoma County Landfill shows that the actual heat capacity can vary as much as 10% from the rated capacity.

Sonoma County has stated that there has not and will not be any physical changes made to the engines to increase the capacity. The engines had the higher capacity all along, but have been systematically misrepresented due to improperly conveyed information, beginning with the permitting of the initial four engines and carried over for all subsequent engine permits.

However, since they have proposed an increase of fuel consumption over that which has previously been permitted, it is prudent to review the calculated baseline emissions for these sources to determine if the increased heat capacity limits will increase potential to emit at the facility. Potential emissions from the landfill gas fired IC engines at the Sonoma County Central Landfill have been determined as follows:

NO_x and CO:

In permitting these engines, the highest potential emissions of nitrogen oxides (NO_x) and carbon monoxide (CO) were based on the District’s BACT standards and the manufacturer’s guaranteed emission factors in units of grams per brake horsepower-hour (g/bhp-hr). The engines currently have the following limits: NO_x = 0.80 g/bhp-hr, CO = 2.1 g/bhp-hr. Assuming continuous

operation at the maximum rated horsepower for these engines (i.e. 1138 bhp), the baseline NO_x and CO emissions are as follows:

- NO_x: 87.91 tons/yr
- CO: 230.76 tons/yr

These emissions are not affected by a higher fuel use limit because the rated horsepower of the engines limits them. They represent the maximum allowable emissions at any fuel use rate. Therefore, no additional emissions limits are necessary for NO_x and CO.

PM10:

Particulate (PM10) emissions are based on an AP-42 emission factor also expressed in g/bhp-hr (0.10 g/bhp-hr). Based on this factor, the assumed PM10 emissions are:

- PM10: 10.99 tons/yr

Since these emissions are also based on the rated engine horsepower they are assumed to be maximum, so no additional emission limit is necessary.

SO₂ and POC:

Sulfur dioxide (SO₂) and precursor organic compound (POC) emissions are based on the fuel use rate. SO₂ is calculated based on the maximum sulfur content of the fuel and the highest fuel usage rate and POC is based on the Regulation 8-34-301.4 allowable NMOC limit.

SO₂:

All collected landfill gas from this facility is controlled either by the IC engines or the Flare A-2, (the flare being used as a secondary control system and currently operating at less than half its capacity). SO₂ emissions are based solely on the amount of sulfur in the landfill gas and the total amount of gas collected and controlled. Per unit of heat input the emissions are the same whether the gas is combusted in the IC engines or in the flare. Therefore, any additional heat input that we now assign to the IC engines previously was assumed to go to the flare so there is no net increase of SO₂ emissions.

POC

Non-methane organic compound (i.e. POC) emissions from landfill gas occur as either fugitive emissions from uncollected gas or as the small fraction of POC that passes through the control device unabated. For permitting purposes, these emissions are assigned to the landfill source and are based on the amount of decomposable refuse that the landfill receives. In this case, the IC Engines S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14 act as abatement devices for the landfill POC emissions. As abatement devices for POC, it is assumed that the maximum potential emissions are up to the limits of Regulation 8-34-301.4 (i.e. destruction efficiency $\geq 98\%$ by weight or outlet emission < 120 ppm vol. dry basis, expressed as methane, corrected to 3% oxygen).

Although technically, an increase heat input to the engines would allow for greater potential POC emissions, the reality is that the landfill only generates so much landfill gas and any collected gas above and beyond what the engines can (or are permitted to) combust is sent to the Flare A-2. Source test results for both the Flare and IC Engines have consistently demonstrated

very low (non-detectable in most cases) POC emissions in the exhaust gases. Therefore, any attempt to quantify incremental emissions resulting from more gas combusted at the IC engines versus less at the flare would not be meaningful.

C. PROPOSED CHANGES TO PERMIT CONDITIONS

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; all “underline” language will be retained.

It is recommended that Part 10 of Condition #19933 be amended as shown below to reflect the higher heat input rates requested by Sonoma County:

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 ~~206.64~~252.6 million BTU per day nor ~~75,423.692,199~~ million BTU per year based on the higher heating value (HHV) of the fuel. (basis: Regulation 2-1-301)

D. COMPLIANCE WITH APPLICABLE REQUIREMENTS

BAAQMD Regulation 2, Rule 2 “New Source Review”

New Source Review is not triggered for the proposed permit revision because the proposed changes to monitoring will not result in an increase of emissions at the facility. Furthermore, the current heat input limits were added during the initial Title V permitting process and were not associated with a NSR permitting decision.

BAAQMD Regulation 2, Rule 6 “Major Facility Review”

The proposed changes to monitoring constitute a “Minor Permit Revision” as defined in BAAQMD Regulation 2-6-215, because the proposed revision is neither “Administrative” nor “Significant”.

E. OTHER CHANGES TO THE PERMIT

In addition to the Minor Permit Revision described above, the District intends to make the following “Administrative” and “Minor” permit revisions:

Section I: Standard Conditions

- Standard Condition I.B.12 will be added at the request of Sonoma County to clarify that the permit holder is responsible for compliance, and certification of compliance, with all conditions of the permit, regardless whether it acts through employees, agents, contractors, or subcontractors.

Section II: Equipment

- Table II-A: The maximum heat input capacity for each of IC Engines S-4, S-5, S-6, S-7, S-9, S-10, S-11, S-12, S-13, and S-14 will be raised from 8.61 to 10.5 MMBTU/hr as discussed in this Permit Evaluation and Statement of Basis.

Section III: Generally Applicable Requirements

- The website address for SIP requirements will be updated.

Section IV: Source-Specific Applicable Requirements

- The website address for SIP requirements will be updated.
- SIP Regulation 1-523.5 “Maintenance and Calibration” will be deleted from Tables IV-A and IV-B. BAAQMD Regulation 1-523.5 is now SIP approved and federally enforceable.

Section VII: Applicable Limits and Compliance Monitoring Requirements

- Table VII-B will be updated to account for the proposed changes to IC engine heat input.

F. RECOMMENDATION:

Issue a Minor Permit Revision to the Title V permit for the Sonoma County Landfill as shown in the Proposed Major Facility Review Permit and described in this evaluation.

By: _____
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