Bay Area Air Quality Management District

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

Engineering Evaluation
and
Statement of Basis
for
MAJOR FACILITY REVIEW PERMIT
ADMINISTRATIVE AMENDMENT

for

Waste Management of Alameda County
Facility #A2066

Facility Address:
10840 Altamont Pass Road
Livermore, CA 94550

Mailing Address:
10840 Altamont Pass Road
Livermore, CA 94550

Application Engineer: Carol Allen
Site Engineer: Carol Allen

Applications: 11125 and 11126

TABLE OF CONTENTS

ENGINEERING EVALUATION and STATEMENT of BASIS

Waste Management of Alameda, Inc.; PLANT # 2066

APPLICATIONS # 11125 and 11126

This document includes two reports concerning a Change of Permit Conditions request from Waste Management of Alameda County (Plant # 2066 / Site # A2066). Waste Management requested to modify the non-federally enforceable toxic compound concentration limits in BAAQMD Permit Condition # 19235, Part 12. This proposed change of permit conditions will affect emissions from the following equipment: S-2 Altamont Landfill, S-6 and S-7 Gas Turbines, S-23 and S-24 IC Engines, and A-15 Landfill Gas Flare. This request requires both a modification of the District permit (Application # 11125) and a modification of the Major Facility Review (MFR) permit (Application # 11126). The Engineering Evaluation of Application # 11125 is presented in Section I of this report. The Statement of Basis explaining the proposed changes to the MFR permit is presented in Section II of this report.

I. ENGINEERING EVALUATION FOR APPLICATION # 11125

Section I of this document concerns Waste Management of Alameda's request to modify District Permit Condition # 19235, Part 12 pursuant to Application # 11125. The engineering analysis of this proposed condition change is presented below.

A. BACKGROUND

Waste Management of Alameda, Inc. operates the Altamont Landfill and Resource Recovery Facility in Livermore, CA. This facility includes the Bay Area's largest active landfill (S-2 with more than 30 million tons of refuse in place), two 3 MW Gas Turbines (S-6 and S-7, landfill gas fired) equipped with Fogging Systems (A-6 and A-7), two 1877 bhp IC Engines (S-23 and S-24, landfill gas fired), one 71 MM BTU/hour Landfill Gas Flare (A-15), waste water treatment operations (permitted: S-19, S-140, and S-141; exempt: S-12, S-20, S-28, S-130, A-130, and S-180), a non-retail gasoline dispensing facility (S-99), and nine diesel engines providing portable or standby power (S-190, S-191, S-192, S-193, S-194, and S-195, S-196, S-197, and S-198).

The S-2 Altamont Landfill is subject to Condition # 19235. Part 12 requires Waste Management to submit a permit application for a change of permit conditions if the concentrations of certain landfill gas constituents exceed the levels listed in Part 12. Landfill gas characterization analyses that were conducted in August and October of 2004 revealed that actual concentrations in the landfill gas were approaching or exceeding the concentration limits for: benzene, benzyl chloride, ethylene dibromide, ethylene dichloride, and 1,1,2,2 tetrachloroethane. Waste Management submitted this application on October 29, 2004 to request increases of the Part 12 concentration limits for these five compounds.

The toxic compound concentrations limits in Condition # 19235, Part 12 were established pursuant to Application # 6739, which included modifications of the S-23 and S-24 IC Engines and the A-15 Landfill Gas Flare. Maximum potential emissions from the S-2 Altamont Landfill and from the S-6 and S-7 Gas Turbines will also be impacted by changes to the toxic compound concentration limits. Related applications include the following application numbers: 3488, 3821, 6875, 7933, 8583, and 9326. The landfill (S-2), which began accepting waste in 1980, was permitted in 1988 as a grandfathered source and was not subject to the Risk Management Policy. The turbines (S-6 and S-7), engines (S-23 and S-24), and flare (A-15) were all permitted after January 1, 1987 and are subject to the Risk Management Policy. Since a project includes all modifications of a source occurring after January 1, 1987, this project includes all toxic compound emissions from S-6, S-7, S-23, S-24, and A-15, but it does not include any emission changes at S-2.

B. EMISSIONS

The twelve toxic compounds listed in Condition # 19235, Part 12 have a significant impact on the cancer risk from this site. Landfill gas at this site may also have up to 150 ppmv of hydrogen sulfide. While landfill gas includes many other compounds, the emissions of these other compounds have a negligible impact on the health impacts from this site. The current and proposed concentration limits are listed below.

Table 1. Concentration Limits for Landfill Gas Constituents

Organic Compounds	Current Limit ppbv	Proposed Limit ppbv
Acrylonitrile	500	500
Benzene	2200	3300
Benzyl Chloride	100	600
1,4 Dichlorobenzene	1100	1100
Ethylene Dibromide	100	300
Ethylene Dichloride	150	250
Ethylidene Dichloride	1200	1200
Methylene Chloride	2500	2500
Perchloroethylene	2400	2400
1,1,2,2 Tetrachloroethane	100	550
Trichloroethylene	1400	1400
Vinyl Chloride	1100	1100
Sulfur Compounds	Current Limit ppbv	Proposed Limit ppbv
Hydrogen Sulfide	150	150

This project includes emissions from all on-site landfill gas combustion equipment: S-6, S-7, S-23, S-24, and A-15. The maximum permitted combustion capacities and landfill gas throughput rates for these devices are summarized in Table 2 below.

Table 2. Maximum Permitted Capacities of Landfill Gas Combustion Equipment

	S-6	S-7	S-23	S-24	A-15	Total
MM BTU/hour	57.4	57.4	17.5	17.5	71.0	220.8
MM BTU/day	1378	1378	420	420	1704	5300
MM BTU/year	419,240	419,240	153,300	153,300	621,785	1,766,865
For Landfill Gas at 500 BTU/scf						
scfm	1914	1914	583	583	2367	7361
MM scf/year	838.5	838.5	306.6	306.6	1243.6	3534

Previously, each landfill gas combustion device was assumed to destroy at least 85% of any individual toxic compound. This assumption is very conservative. AP-42 indicates that engines will typically achieve 86.1% control for non-halogenated species and 93% control for halogenated species, while flares and gas turbines will achieve at least 98% control for any type of compound. Since 88% of the landfill gas control capacity includes abatement by turbines or a flare, using a minimum control efficiency of 85% for all landfill gas control is overly conservative. Proposed emissions for this project will be calculated by using the minimum AP-42 control efficiency for each type of device: 86% control for the engines and 98% control for the turbines and flare.

In addition to residual amounts of the toxic compounds listed in Table 1, landfill gas combustion equipment also emits secondary toxic air contaminants such as formaldehyde and hydrogen chloride that may have a measurable impact on the health risks for this project. The proposed concentration limit changes will result in increases of some secondary pollutants. Current and proposed toxic emissions for this project, including secondary toxic emissions are summarized in Table 4 below. Detailed calculations are attached.

Table 4. Comparison of Current and Proposed TAC Emissions from Landfill Gas Combustion Devices

	Current Turbine Emissions lbs/year	Proposed Turbine Emissions lbs/year	Current IC Engine Emissions lbs/year	Proposed IC Engine Emissions lbs/year	Current Flare Emissions lbs/year	Proposed Flare Emissions lbs/year	Total Current Permitted Emissions lbs/year	Total Proposed Emissions lbs/year	Risk Screen Trigger Level lbs/year
Acrylonitrile	17.2	2.3	6.3	5.9	12.8	1.7	36.3	9.9	0.67
Benzene	111.7	22.3	40.8	57.2	82.8	16.6	235.4	96.1	6.7
Benzyl Chloride	8.2	6.6	3.0	16.8	6.1	4.9	17.3	28.3	3.9
1,4 Dichlorobenzene	105.1	14.0	38.4	35.9	77.9	10.4	221.5	60.3	18
Ethylene Dibromide	12.2	4.9	4.5	12.5	9.1	3.6	25.7	21.0	2.7
Ethylene Dichloride	9.6	2.1	3.5	5.5	7.2	1.6	20.3	9.2	8.7
Ethylidene Dichloride	77.2	10.3	28.2	26.3	57.2	7.6	162.6	44.3	120
Methylene Chloride	138.0	18.4	50.5	47.1	102.3	13.6	290.8	79.1	190
Perchloroethylene	258.7	34.5	94.6	88.3	191.8	25.6	545.1	148.4	33
1,1,2,2 Tetrachloroethane	10.9	8.0	4.0	20.5	8.1	5.9	23.0	34.4	3.3
Trichloroethylene	119.6	15.9	43.7	40.8	88.7	11.8	251.9	68.6	97
Vinyl Chloride	44.7	6.0	16.3	15.3	33.1	4.4	94.2	25.6	2.5
Hydrogen Sulfide	3.3	0.4	1.2	1.1	2.5	0.3	7.0	1.9	8100
Formaldehyde	301.9	301.9	791.0	791.0	223.8	223.8	1316.7	1316.7	33
Hydrogen Bromide	1086.9	1227.1	397.4	448.7	806.0	910.0	2290.3	2585.8	4600
Hydrogen Chloride	6209.0	6604.0	2270.4	2414.8	4604.4	4897.3	13083.9	13916.2	1400
Hydrogen Fluoride	1109.6	1109.6	405.8	405.8	822.9	822.9	2338.3	2338.3	1100
PAHs	0.0	0.0	1.1	1.1	0.0	0.0	1.1	1.1	0.044

C. STATEMENT OF COMPLIANCE

Regulation 2, Rule 1:

This application is for a change of permit conditions at the S-2 Altamont Landfill that will result in emission changes at the landfill gas combustion devices (S-6, S-7, S-23, S-24, and A-15). The project will not result in any criteria pollutant emission increases. Due to changes in emission calculation procedures (specifically, increases in TAC concentration limits for the landfill gas and increases in abatement efficiency for the control equipment), this project will result in emission increases for some TACs and emission reductions for other TACs. The proposed emission rates from each landfill gas control device were evaluated using a health risk screening analysis. As discussed in more detail below, the project will comply with the Toxic Risk Management Policy by having a project hazard index of less than 1.0, by having a project cancer risk of less than 10.0 in a millions, and by using equipment that complies with TBACT. Therefore, this project will satisfy the requirements of Regulation 2-1-312.11 and is exempt from CEQA review.

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 project does not result in any criteria pollutant emission increases, this project does not trigger any New Source Review (NSR) requirements. No new BACT, Offset or PSD requirements will apply.

New Source Review for Toxic Air Contaminants:

This project will result in emission changes for several Toxic Air Contaminants (TACs) from the on-site landfill gas combustion equipment (S-6, S-7, S-23, S-24, and A-15). Since these landfill gas combustion devices were all installed after January 1, 1987 and this application will result in TAC emission changes at each of these sources, the project will include all TAC emissions from S-6, S-7, S-23, S-24, and A-15. The health risks for this project are summarized below. A detailed Health Risk Screening Analysis is attached.

Table 5. Summary of Project Health Impacts

	Cancer Risk per Million	Chronic Hazard Index
Maximum Residential Receptor	6.3	0.3
Maximum Worker Receptor	1.0	0.04

The project will comply with the Risk Management Policy by having a chronic hazard index of less than 1.0 for all residential and worker receptors.

Since this project will result in a cancer risk of greater than 1.0 in a million, TBACT is required. The landfill gas combustion devices (turbines, engines, and flare) are a TBACT control method for the abatement of collected landfill gas from a landfill. Residual landfill gas emissions contribute to about 60% of the total risk. The remaining 40% of the risk is due to secondary TAC pollutants; however, there are no feasible methods for controlling secondary TAC emissions from landfill gas combustion. Therefore, the gas turbines, IC engines, and flare each satisfy the requirement to use TBACT. The proposed project will comply with the Risk Management Policy by having cancer risk of less than 10.0 in a million for all possible receptors and by using TBACT on all project equipment.

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 NOx 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 initial MFR Permit for this facility was issued on December 1, 2003 and was revised on February 5, 2004, December 21, 2004, and April 5, 2005.

The Applicant's request to modify permit conditions will require a revision of the current MFR permit. The proposed revision of the MFR Permit is discussed in the Statement of Basis for Application # 11126 (see Section II below).

D. RECOMMENDATION

Issue a Change of Permit Conditions for the following equipment:

S-2 Altamont Landfill with Landfill Gas Collection System; abated by S-6 and S-7 Gas Turbines, S-23 and S-24 IC Engines, and A-15 Landfill Gas Flare.

signed by Carol Allen — March 25, 2005

By: Carol S. Allen — Date

Senior Air Quality Engineer

II. STATEMENT OF BASIS FOR APPLICATION # 11126

The above action revises requirements applicable to the facility. The MFR Permit for Site # A2066 must be modified to incorporate the changes. This revision involves non-federally enforceable conditions only. Therefore, this revision may be handled as an administrative amendment. The MFR Permit will be modified as described below.

A. SECTIONS I-V, VIII, IX, XI, AND XII:

No changes are proposed to these sections.

B. SECTION VI:

This MFR Permit revision will modify Condition # 19235, Part 12.

Condition # 19235
FOR: S-2 ALTAMONT LANDFILL WITH LANDFILL GAS COLLECTION SYSTEM, AND A-15 LANDFILL GAS FLARE:

(No Changes to Parts 1-11)

*12. The Permit Holder shall submit a permit application for a Change of Permit Conditions, if any site-specific landfill gas characterization test indicates that the landfill gas at this site contains any of the following compounds at a level greater than the concentration listed below. The Permit Application shall be submitted to the Permit Services Division, within 45 days of receipt of test results indicating a concentration above the levels listed below.

Compound	Concentration (ppbv)
Acrylonitrile	500
Benzene	~~2200~~3300
Benzyl chloride	~~100~~600
1,4 Dichlorobenzene	1100
Ethylene Dibromide	~~100~~300
Ethylene Dichloride	~~150~~250
Ethylidene Dichloride	1200
Methylene Chloride	2500
Perchloroethylene	2400
1,1,2,2 Tetrachloroethane	~~100~~550
Trichloroethylene	1400
Vinyl Chloride	1100

(Basis: Toxic Risk Management Policy)

(No Changes to Parts 13-23)

C. SECTIONS VII:

The TAC concentration limits in Condition # 19235 Part 12 will be reflected Table VII-A as shown below. This application will not change any monitoring requirements for these non-federally enforceable limits.

Table VII – A
Applicable Limits and Compliance Monitoring Requirements
S-2 ALTAMONT LANDFILL WITH LANDFILL GAS COLLECTION SYSTEM AND A-15 LANDFILL GAS FLARE

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Toxic Compound Concentration Limits for Landfill Gas	BAAQMD Condition # 19235, Part 12	N		Compound ≤ ppbv Acrylonitrile 500 Benzene ~~2200~~3300 Benzyl Chloride ~~100~~600 1,4 Dichlorobenzene 1100 Ethylene Dibromide ~~100~~300 Ethylene Dichloride ~~150~~250 Ethylidene Dichloride 1200 Methylene Chloride 2500 Perchloroethylene 2400 1,1,2,2 Tetrachloro-~~ethylene~~ethane ~~100~~550 Trichloroethylene 1400 Vinyl Chloride 1100	BAAQMD Condition # 19235, Parts 14-15	P/A	Gas Characterization Analysis and Records

D. SECTION X:

These above revisions are summarized in the revision history section as shown below.

X. Revision History

...

Administrative Amendment (Applications # 11125 and 11126):[insert approval date]

- Modify TAC Concentration limits in Condition # 19235, Part 12 (non-FE) and Table VII-A.