Bay Area Air Quality Management District

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

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

for

Redwood Landfill, Inc.
Facility #A1179

Facility Address:
8950 Redwood Highway
Novato, CA 94948

Mailing Address:
P. O. Box 793
Novato, CA 94948

Application Engineer: Carol Allen
Site Engineer: Carol Allen

Applications: 10873 and 10874

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ENGINEERING EVALUATION and STATEMENT of BASIS

Redwood Landfill, Inc.; PLANT # 1179

APPLICATIONS # 10873 and 10874

A. BACKGROUND

Site Description:

Redwood Landfill, Inc. operates the Redwood Landfill Facility in Novato, CA. This facility includes the active landfill (S-5 with about 12 million tons of refuse in place), a 120 MM BTU/hour landfill gas flare (A-50), a 5 MM BTU/hour leachate evaporator (S-50), sludge handling and composting operations (S-2, S-25, S-28, S-34, S-35, S-37, S-38, S-39, and S-41), soil stockpiles (S-42), a non-retail gasoline dispensing facility (S-55), and five diesel engines providing portable or standby power (S-45, S-46, S-37, S-48, and S-49).

The A-50 Landfill Gas Flare is currently the sole operational device for controlling the landfill gas that is generated at this facility. Although the S-50 Leachate Evaporator is permitted to burn up to 5 MM BTU/hour of landfill gas, this equipment is not currently operating and any future operation of this unit is uncertain.

Redwood Landfill is planning to expand the design capacity of the S-5 landfill. Pursuant to Application # 11371, Redwood has proposed to increase the amount of decomposable waste that will ultimately be placed in the landfill from the current permitted limit of 17.1 million tons to 32.3 million tons. This request will generate additional landfill gas and will require additional control capacity. A new 3000 cfm enclosed landfill gas flare was requested as part of the expansion project. This request is currently under review by the District. In addition, this action is the subject of a CEQA EIR. A draft EIR was circulated for public comment in 2004. The lead agency, Marin County, is expected to respond to comments later this year.

Landfill Gas Control Issue:

In January 2005, Redwood Landfill reported that existing flare (A-50) is experiencing operational problems. It has become apparent that the flare cannot burn (in a compliant manner) the full permitted landfill gas flow rate of 4000 cfm. In fact the flare is having difficulty maintaining proper operation at the minimum landfill gas flow rates that are currently necessary to prevent surface leaks from the landfill (1600-1700 cfm). As a long-term solution to these compliance issues, Redwood Landfill has accelerated the planned installation of a second flare at this site (see Applications # 11371 and # 11757). This second flare has been sized to handle at least 3000 cfm of landfill gas and will provide sufficient control capacity for the landfill (as it is currently permitted). However, the new flare will not be delivered until early May 2005. Redwood Landfill and the District's Legal, Engineering, and Enforcement Divisions are discussing several options to improve compliance and minimize air emissions between now and June 2005, when the new flare is expected to be operating.

Due to the current operational problems with A-50, a third flare may be necessary to provide full control capacity for the expanded landfill and/or back-up control capacity. The operational capability of A-50 will be fully evaluated later this year after the 3000 cfm flare has been installed. If A-50 is found to be not repairable, the District anticipates that another application for a third flare may be submitted in late 2005.

Other Compliance Issues:

Redwood Landfill conducted their required annual compliance demonstration tests in July 2004. Test results indicated that the concentrations of total reduced sulfur (TRS) compounds and several toxic organic

compounds in the landfill gas exceeded permitted concentration levels. Condition # 19235, Part 18 requires the facility to submit a permit application to increase the permitted limits, if testing indicates that NMOC, TRS, or toxic compound concentration levels exceed the limits in Part 18. At the District's request, Redwood Landfill submitted the test results for all of the quarterly landfill gas sulfur content testing conducted to date. These results indicated that the sulfur concentration exceeded the limit of 231 ppmv of TRS in landfill gas on at least three other test dates. Consequently, Redwood Landfill submitted Application # 10874 to increase the permitted concentration levels of TRS, benzene, and methylene chloride and submitted Application # 10873 to modify the Title V permit at this facility.

The proposed condition revisions are discussed in more detail below.

Landfill Gas Concentration Limit Revisions:

Initially, Redwood Landfill proposed the following changes to the Part 18 concentration limits:
(a) to increase the landfill gas sulfur content limit from 231 ppmv to 750 ppmv,
(b) to increase the benzene limit from 340 ppbv to 1000 ppbv, and
(c) to increase the methylene chloride limit from 320 ppbv to 1000 ppbv
These changes would result in emission increases of hydrogen sulfide (and other sulfur compounds), benzene, and methylene chloride at the S-5 landfill, A-50 flare, and S-50 leachate evaporator and emission increases of sulfur dioxide at the A-50 flare and S-50 leachate evaporator.

Since the S-50 leachate evaporator is not currently operating and may be removed from this site in the future, Redwood has withdrawn their request for emission increases at S-50.

Shortly after Redwood Landfill submitted Application # 10874 to increase concentration limits for landfill gas constituents, Redwood Landfill submitted Application # 11371 to expand the landfill. Since these two projects are related, the District plans to conduct a single health risk screening analysis for this larger project. This health risk analysis will be conducted pursuant to Application # 11371. This health risk screening analysis will fully evaluate the health risks from the expanded landfill and larger landfill gas control system as well as higher concentrations of benzene and methylene chloride.

Application # 10874 will now only address the necessary increase to the landfill gas sulfur content limit. The District has discussed several alternatives for sulfur content limits and monitoring procedures with Redwood Landfill. Redwood Landfill is now requesting to increase the landfill gas sulfur content to a peak limit on any day of 1300 ppmv as H_2S and an annual average limit of 425 ppmv as H_2S. This request will result in hydrogen sulfide and carbon disulfide emission increases at the S-5 Landfill and A-50 Flare and sulfur dioxide emission increases at the A-50 Flare. Permit application fees have been adjusted pursuant to this revised request.

B. EMISSIONS

From Application # 17752, the current maximum permitted annual emission rates for toxic sulfur compounds from the landfill are 4245 pounds/year of hydrogen sulfide (H_2S) and 13.2 pounds/year of carbon disulfide (CS_2). From Application # 8501, the current maximum permitted emission rates from the flare are: 2074.6 pounds/year of H_2S, 0.6 pounds/year CS_2, 221.6 pounds/day of SO_2, and 28.661 tons/year of SO_2. Note that for Application # 8501, the proposed emission rate for H_2S was only 607.2 pounds/year, which was well below the previously permitted rate of 2074.6 pounds/year. Therefore, Application # 8501 resulted in no H_2S increases. Total permitted emissions are 6320 pounds/year of H_2S and 13.8 pounds/year of CS_2.

Hydrogen sulfide is usually the only reduced sulfur compound detected in Redwood's landfill gas. Carbon disulfide has only been detected on one test, and it was less than 0.01% of the TRS concentration. Mercaptans and thiophenes have occasionally been detected, but these compounds are not on the risk

screen trigger level list. Maximum permitted toxic sulfur compound emissions will be determined by a ratio of the proposed to current concentration. Hydrogen sulfide emissions are calculated by assuming that all TRS is H_2S. Maximum potential carbon disulfide emissions are calculated by assuming CS_2 is 1% of the TRS.

Landfill:	(425 ppmv TRS/231 ppmv TRS)*(1 lb H_2S/1 lb TRS)*(4245 lbs/yr H_2S)	=	4186 lbs/yr H_2S
Flare:	(425 ppmv TRS/231 ppmv TRS)*(1 lb H_2S/1 lb TRS)*(607.2 lbs/yr H_2S)	=	1117 lbs/yr H_2S
Total Proposed Hydrogen Sulfide Emissions:			5303 lbs/yr H_2S

Since the current permitted emission rate is 6320 pounds/year of H_2S, this application will not result in any H_2S emission increases.

Landfill:	(4186 lbs/yr of TRS)*(0.01 lb CS_2/1 lb TRS)	=	42 lbs/yr CS_2
Flare:	(1117 lbs/yr of TRS)*(0.01 lb CS_2/1 lb TRS)	=	11 lbs/yr CS_2
Total Proposed Carbon Disulfide Emissions:			53 lbs/yr CS_2

Since the risk screen trigger level for CS_2 is 14,000 pounds/year, a risk screen is not required for a proposed project emission rate of 53 pounds/year.

Maximum permitted sulfur dioxide emissions from the A-50 Flare will be determined by a ratio of the proposed to current TRS concentration limits:

Daily:	(1300 ppmv TRS/231 ppmv TRS)*(221.6 pounds/day SO_2)	=	1247 pounds/day SO_2
Annual:	(425 ppmv TRS/231 ppmv TRS)*(28.661 tons/year SO_2)	=	52.731 ton/year SO_2

Cumulative Emission Increases:

Total Plant CEI for SO_2:		51.206 tons/year of SO_2 *
Flare Emission Increases:	52.731 tons/year - 28.661 tons/year =	24.070 tons/year of SO_2
New Total Plant CEI:		75.276 tons/year of SO_2

(* This CEI includes increases for several sources that have now been shut down. The database will be corrected shortly.)

Current Facility Wide Potential to Emit:	30.577 tons/year of SO_2
Flare Emission Increases:	24.070 tons/year of SO_2
New Facility Wide Potential to Emit:	54.647 tons/year of SO_2

C. STATEMENT OF COMPLIANCE

Regulation 2, Rule 1:

This application is for a change of permit conditions at the S-5 Redwood Landfill and A-50 Landfill Gas Flare. The largest emission increases are due to the abatement of landfill gas and the secondary combustion emission of sulfur dioxide from the A-50 Flare. The permitting of abatement equipment such as the A-50 Landfill Gas Flare meets the requirements of District Regulation 2-1-312.2. Therefore, the permitting of a change of conditions at A-50 is categorically exempt from CEQA review. In addition, this project will comply with the no net increase provisions of the new source review rule, because the SO_2 emission increases are not subject to offset requirements and the flare will comply with RACT for SO_2 emissions. This project will not trigger a risk screen pursuant to the District's Toxic Risk Management Policy. Therefore, this application complies with all requirements of Regulations 2-1-312.11.1-4 and is categorically exempt from CEQA review pursuant to Regulation 2-1-312.11.

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:

This project will result in both daily and annual emission increases of SO_2 at the A-50 Landfill Gas Flare. Therefore, A-50 is considered a modified device and is subject to Regulation 2, Rule 2: New Source Review (NSR). Since the A-50 Flare satisfies a BARCT requirement (Regulation 8-34-301.3) for control of NMOC emissions from the S-5 Redwood Landfill, the secondary pollutant emissions (NO_x, CO, PM_{10}, and SO_2) are exempt from BACT requirements pursuant to Regulation 2-2-112. Regulation 2-2-112 requires that Reasonably Available Control Technology (RACT) be used to control secondary pollutant emissions. This project will not increase emissions of NO_x, CO or PM_{10}. RACT for SO_2 will be discussed below.

RACT for SO_2: Landfill gas contains reduced sulfur compounds (mainly hydrogen sulfide with small percentages of mercaptans, carbon disulfide, and other sulfur compounds). Gypsum (from wallboard) decomposition and sewage sludge decomposition are the main sources of these sulfur compounds. Landfill gas combustion produces sulfur dioxide (SO_2) as a byproduct.

The only reasonable method of reducing SO_2 emissions from landfill gas combustion is to reduce the amount of sulfur compounds in the landfill gas. This can be accomplished by using pollution prevention (i.e. reducing gypsum or sewage sludge disposal) or by treating the landfill gas to remove the sulfur compounds. For Redwood Landfill, most of the H_2S in the landfill gas is coming from sewage sludge that is mixed with other materials and used as a daily cover material. In the last few years, Redwood Landfill has made significant reductions in the amount of sewage sludge accepted at the site. Much of the sludge that is used in cover materials today is coming from the on-site storage pond, which must be eliminated. Although the use of sewage sludge in cover materials will continue in the future (at a much lower rate than past years), most of the sulfur in the landfill gas now is coming from sludge that has already been placed in the landfill. Therefore, sulfur contents are expected to decline in future years from the current annual average of about 380 ppmv. Additional waste stream restrictions are not necessary at this time. This issue will be reviewed again under the landfill expansion application.

The only other available sulfur dioxide control method for the A-50 Flare is treatment of the landfill gas to remove the sulfur compounds prior to combustion. Although an internet search did find several commercially available methods for removing sulfur compounds from landfill gas (iron sponges, liquid scrubbers, and catalytic iron-redox systems), these removal systems were generally only applied to gases containing more than 500 ppmv of TRS. Searches of EPA's RACT/BACT/LAER Clearinghouse, ARB's BACT Clearinghouse, and South Coast's Major Source BACT Determinations found no cases where a sulfur removal system was required in order to meet BACT for SO_2 emissions from a landfill gas flare. Therefore, no landfill gas treatment options are considered to be BACT for controlling SO_2 emissions from a landfill gas flare.

In the Bay Area, RACT for SO_2 emissions from landfill gas fired combustion equipment is usually achieved by limiting the average landfill gas sulfur content to 150 ppmv (expressed as H_2S). This 150 ppmv sulfur limit was based on South Coast Air Quality Management District Rule 431.1, which limits the sulfur content of landfill gas to 150 ppmv, averaged on a daily basis. The staff report for this rule indicated that all landfills were expected to meet this sulfur content limit without any gas treatment and that no South Coast landfills were expected to exceed a peak sulfur content of 200 ppmv in the raw landfill gas. At one time, the South Coast rule required that all fuel gas meet a sulfur content limit of 40 ppmv. Several South Coast landfills operated under a variance from this requirement while the commercially available sulfur removal systems were evaluated for landfill gas applications. Although the sulfur removal systems proved feasible, the landfill operators experienced difficulty with the realistic operation and high operating costs of these sulfur removal systems. Ultimately, South Coast revised Rule 431.1 and established the 150 ppmv daily average limit for landfill gas with no landfill gas sulfur treatment systems required for any South Coast landfills. Although landfill gas sulfur treatment systems are available, these systems are not being used on a wide spread basis and have not been required to meet BARCT, RACT, or BACT for landfill gas combustion operations. Therefore, landfill gas sulfur treatment systems do not constitute a "reasonably"

available control measure. Instead, RACT for SO_2 emissions from landfill gas combustion operations will be compliance with reasonable landfill gas sulfur content limits.

The Regulation 9-1-302 limit of 300 ppmv of SO_2 in the exhaust gas will be used to establish a reasonable peak sulfur content limit (a limit applied to any single test for sulfur content of the landfill gas). The landfill gas contains a minimum of 45% methane with a minimum heat content of 447 BTU/scf and an F-factor of 9830 dscf of flue gas at 0% O_2 per MM BTU. Under these conditions, an exhaust concentration limit of 300 ppmv SO_2 is equivalent to an inlet TRS concentration limit of about 1300 ppmv as H_2S, as shown below.

(300 ft^3 SO_2/MM ft^3 flue)*(1 ft^3 H_2S/1 ft^3 SO_2)*(0.00983 MM ft^3 flue/MM BTU)*(447 MM BTU/MM scf LFG)
= 1318 ft^3 of H_2S/MM ft^3 LFG = 1318 ppmv of TRS as H_2S

For most landfills, an average sulfur content limit of 150 ppmv is easily met and is considered RACT for the landfill gas combustion operations associated with these landfills. However, landfill gas from the S-5 Redwood Landfill has the highest sulfur content of any of the Bay Area landfills due to this site's past extensive use of dried sewage sludge in daily cover material. For the past 2 years, quarterly testing has indicated a range of 186-370 ppmv TRS plus one test at 1171 ppmv TRS. The average concentration including the one high test was 376 ppmv TRS. Considering the variability of the test data, Redwood's proposed annual average limit of 425 ppmv TRS is reasonable. Furthermore, this limit is below the 500 ppmv level normally necessary before sulfur removal controls become cost effective. For the A-50 Landfill Gas Flare, an annual average landfill gas sulfur content limit of 425 ppmv (expressed as H_2S) shall be considered RACT for SO_2 emissions.

Offsets for SO_2: The SO_2 offset requirements in Regulation 2-2-303 only apply if the facility is considered a Major Facility for that pollutant. Total facility wide emissions will be 54.64 tons/year of SO_2. Since facility-wide SO_2 emissions are less than 100 tons/year, this facility is not a Major Facility for SO_2, and Regulation 2-2-303 does not apply.

Regulation 2, Rule 2 (PSD)

Since this facility will not emit more than 100 tons/year of non-fugitive emissions of SO_2, this facility is not a Major Facility for SO_2. Consequently, the PSD requirements of Regulation 2-2-304 do not apply.

New Source Review for Toxic Air Contaminants:

This application will result in emission increases of carbon disulfide above the current permitted level. However, the proposed emission rate is less than the risk screen trigger level for CS_2. Therefore, a risk screening analysis was not required, and TBACT does not 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, as defined by Regulation 2-6-212. This facility has the "potential to emit," as defined by Regulation 2-6-218, more than 100 tons per year of a regulated air pollutant, specifically more than 100 tons per year of 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 (m^3) to obtain an operating permit pursuant to Part 70. The landfill at this facility is subject to 40 CFR, Part 60, Subpart WWW and has

design capacities of 14.6 million m^3 and 15.5 million Mg. Therefore, this facility is a designated facility and is required to have an MFR permit pursuant to 2-6-304.

The initial MFR Permit for this facility was issued on November 10, 2003 and was revised on November 10 2004. This application will require a revision of the current MFR permit. The definition of significant revision is discussed below to determine if this application constitutes a significant MFR revision.

- Regulation 2-6-226.1 and 226.2: This application does not involve the incorporation of a change considered to be a major modification, or a modification under NSPS, NESHAPs, or Section 112 of the CAA.
- Regulation 2-6-226.3: This application does not involve the relaxation of any monitoring, record keeping or reporting requirements.
- Regulation 2-6-226.4: This application does not involve limits imposed to avoid an applicable requirement.
- Regulation 2-6-226.5: This application involves the establishment of or change to a case-by-case emission limit or standard (specifically a case-by-case RACT determination for SO_2 emissions from the Flare).
- Regulation 2-6-226.7: This application does not involve the incorporation of any requirements promulgated by the EPA.

Since this application triggers Regulation 2-6-226.5, it will be processed as a significant MFR permit revision. The proposed MFR permit revisions related to this application are described later in this document.

Regulation 8, Rule 34:

The S-5 Redwood Landfill and A-50 Landfill Gas Flare are subject to Regulation 8, Rule 34 "Solid Waste Disposal Sites". As discussed in the background section, the S-5 Landfill has been experiencing intermittent compliance problems with Regulation 8, Rule 34 due to the unexpected deterioration of the landfill gas flow rate that the A-50 Flare can properly destroy. Regulation 8-34-301.3 limits the organic emissions from landfill gas flares and requires A-50 to either achieve 98% destruction of non-methane hydrocarbons (NMHC) or to emit no more than 30 ppmv of NMHC, expressed as methane, at 3% oxygen. A July 2004 source test indicated that the A-50 Flare was complying with all applicable requirements, including the 8-34-301.3 outlet NMOC concentration limit, at an average landfill gas flow rate of 1427 dscfm (50.102% methane) and an average flare combustion temperature of 1700 °F. In order to ensure that no surface leaks will occur, Redwood Landfill needs to collect more than 1427 dscfm of landfill gas due to higher landfill gas generation rates in 2005 and future years. However the flare cannot reach higher combustion temperatures without risking irreparable damage. Redwood Landfill is currently discussing their compliance options with the District to determine the best course of action until a new flare can be installed on site, which is scheduled for June 2005.

Although the landfill and flare are currently having intermittent compliance difficulties with Regulation 8, Rule 34, this application concerns only the sulfur content of the landfill gas. Changing this sulfur content limit will have no impact on the ability of the landfill or flare to comply with Regulation 8, Rule 34.

Regulation 9, Rule 1:

Regulation 9-1-302 limits the sulfur dioxide concentration in any exhaust gas to 300 ppmv of SO_2. Note that this limit is not referenced to any particular oxygen concentration, and therefore applies to the as measured conditions of the exhaust stream. The revised condition # 19867, Part 18a will limit the landfill gas sulfur content to a maximum of 1300 ppmv of sulfur expressed as hydrogen sulfide. This limit will ensure compliance with the Regulation 9-1-302 limit and shown below (assuming the landfill gas contains a minimum of 45% methane with a minimum heat content of 447 BTU/scf and an F-factor of 9830 dscf of flue gas at 0% O_2 per MM BTU).

(1300 ft^3 H_2S/MM ft^3 LFG)*(1 ft^3 SO_2/1 ft^3 H_2S)/(447 MM BTU/MM ft^3 LFG)/(0.00983 MM ft^3 flue/MM BTU)

= 296 ft^3 of SO_2/MM ft^3 flue gas at 0% oxygen = 296 ppmv of SO_2 at 0% oxygen

The exhaust gas from the landfill gas landfill gas typically contains 10%-15% oxygen. Assuming the flare exhaust stream contains 10% oxygen, the outlet SO_2 concentration from the flare will be no more than: (296 ppmv of SO_2 at O% O_2)*(20.9-10)/(20.9-0) = 154 ppmv of SO_2

The compliance ratio with the Regulation 9-1-302 limit is about 2:1. In order to ensure compliance with the 9-1-302 limit, the District is proposing to continue the quarterly landfill gas sulfur content testing by laboratory analysis, and the District is proposing to add weekly testing of the landfill gas H_2S content using a Draeger tube. Draeger tube testing has been used by other Title V landfills to show compliance with the Regulation 9-1-302 limit and is an acceptable method of demonstrating compliance with this limit.

Although most other landfill gas sites are conducting quarterly Draeger tube analyses to determine the landfill gas hydrogen sulfide content, the District is proposing a weekly testing frequency at this site in order to better evaluate the variability of the landfill gas sulfur content at this site. A recent quarterly test found 1171 ppmv of TRS in the landfill gas at this site. Subsequent testing by both the District and an outside test firm found between 186 ppmv and 308 ppmv of TRS. The proposed weekly testing regimen will aid in determining: (a) if the sulfur content is highly variable as is indicated by the testing to date (186-1171 ppmv of TRS), or (b) if the single test showing 1171 ppmv of TRS was flawed and the sulfur content range is really 186-370 ppmv of TRS. If the latter is true, the flare's compliance ratio with the Regulation 9-1-302 limit is about 6:1 rather than 2:1 (for the proposed condition change). Since Draeger tube testing is inexpensive, the District feels that a weekly testing frequency is not overly burdensome.

Federal Requirements:

NSPS for MSW Landfills: The landfill at this facility is subject to the 40 CFR Part 60, Subpart WWW, the NSPS for Municipal Solid Waste (MSW) Landfills. The A-50 Landfill Gas Flare is subject to 40 CFR 60.752(b)(2)(iii)(B), which requires the control system to achieve either 98% removal of NMOC or emit no more than 20 ppmv of NMOC, expressed as hexane at 3% O_2. The outlet concentration limit is equivalent to a limit of 120 ppmv of NMOC expresses as methane and is less stringent than Regulation 8-34-301.3. As discussed above for Regulation 8-34-301.3, the flare is complying with the 8-34-301.3 outlet concentration limit at 1427 sdcfm and 1700 °F and is therefore complying with 40 CFR 60.752(b)(2)(iii)(B). The flare will also comply with the temperature and gas flow monitoring requirements of 40 CFR 60.756(b)(1) and 60.756(b)(2), respectively. All applicable requirements are contained in the current Title V permit. The change to the landfill gas sulfur content limit will not impact any of these applicable requirements or the landfill or flare's ability to comply with these requirements.

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.

D. MFR PERMIT MODIFICATIONS

Sections I-V:

No changes are proposed to these sections.

Section VI:

This MFR Permit revision will modify Condition # 19867, Parts 18 and 31. The landfill gas sulfur content

limit will be changed from a single limit (no averaging time specified, but based on annual emission rates) to a peak limit (applies to any single test) and an annual average limit (annual average of weekly and quarterly tests). The current quarterly laboratory analysis of the landfill gas will continue. Weekly testing using a Draeger tube will be added to gather more data about the variability of the sulfur content at this site and to improve compliance assurance with the equivalent limit to the Regulation 9-1-302 standard (300 ppmv of SO_2 in the flare exhaust).

Condition # 19867

FOR: S-5, REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM; A-18, WATER SPRAYS; AND A-50, LANDFILL GAS FLARE

18. If a gas characterization test indicates that this site's landfill gas contains compounds in excess of any of the concentrations listed below, then the Permit Holder shall submit an application for a Change of Permit Conditions, within no later than 30 days from receipt of the test results.

a. Total Non-Methane Organic Compounds: 750 ppmv
(calculated as hexane equivalent)
Total Reduced Sulfur (TRS) Content: ~~231 ppmv~~
(calculated as hydrogen sulfide equivalent)
Peak TRS Limit (any single test): 1300 ppmv
Annual Average TRS Limit: 425 ppmv
(Basis: Cumulative Increase and RACT)

*b. For toxic air contaminants (TACs):

Compound	Concentration
Acrylonitrile	280 ppbv
Benzene	340 ppbv
Carbon Tetrachloride	70 ppbv
Chloroform	70 ppbv
1,4 Dichlorobenzene	400 ppbv
1,1 Dichloroethane	150 ppbv
Ethylene Dibromide	70 ppbv
Ethylene Dichloride	70 ppbv
Methylene Chloride	320 ppbv
Perchloroethylene	450 ppbv
1,1,2,2 Tetrachloroethane	70 ppbv
Trichloroethylene	250 ppbv
Vinyl Chloride	880 ppbv

(Basis: Toxic Risk Management Policy)

31. a. The Permit Holder shall conduct a characterization of the landfill gas on a quarterly basis with one test concurrent with the annual source test required by Part 30 above. The landfill gas sample shall be drawn from the main landfill gas header. Each quarterly landfill gas sample shall be analyzed for the sulfur compounds listed below. Once per year (concurrent with the Part 30 annual source test) the landfill gas shall be analyzed for all the organic and sulfur compounds listed below. All concentrations shall be reported on a dry basis. The test report shall be submitted to the Compliance and Enforcement Division and the Source Test Section within 45 days of the test date. (Basis: Toxic Risk Management Policy and Regulations 8-34-412 and 9-1-302)

Organic Compounds	Organic Compounds	Sulfur Compounds
acrylonitrile	ethylene dibromide	carbon disulfide
benzene	fluorotrichloromethane	carbonyl sulfide
carbon tetrachloride	hexane	dimethyl sulfide
chlorobenzene	isopropyl alcohol	ethyl mercaptan
chlorodifluoromethane	methyl ethyl ketone	hydrogen sulfide

chloroethane	methylene chloride	methyl mercaptan
chloroform	perchloroethylene	
1,1 dichloroethane	toluene	
1,1 dichlorethene	1,1,1 trichloroethane	
1,2 dichlorethane	1,1,2,2 tetrachloroethane	
1,4 dichlorbenzene	trichloroethylene	
dichlorodifluoromethane	vinyl chloride	
dichlorofluoromethane	xylenes	
ethylbenzene		

b. Once per week, beginning no later than March 31, 2005, the Permit Holder shall analyze the landfill gas for hydrogen sulfide (H2S) concentration using a Draeger tube to further demonstrate compliance with Part 18 and Regulation 9-1-302. The landfill gas sample shall be drawn from the main landfill gas header. The Permit Holder shall follow the manufacturer's procedures for using the Draeger tube and interpreting the results. The total reduced sulfur (TRS) content of the landfill gas shall be calculated using the average ratio of TRS/H2S for this site according to the following equation: TRS = 1.015* H2S measured by Draeger tube. The Permit Holder shall maintain records of all Draeger tube test dates and test results and shall summarize the average H2S concentrations and the calculated TRS content of the landfill gas on a quarterly basis. Each Draeger tube test result (after conversion to TRS content) and the quarterly laboratory analysis in Part 31a shall be compared to the Peak TRS Limit in Part 18. On a rolling quarterly basis, the Permit Holder shall determine the annual average TRS content for comparison to the Annual Average TRS Limit in Part 18. (Basis: RACT and Regulation 9-1-302).

Section VII:

The sulfur content limits in Table VII-B will be revised as indicated below.

Table VII – B
Applicable Limits and Compliance Monitoring Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM
AND A-50 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
...							
SO_2	BAAQMD 9-1-301	Y		Property Line Ground Level Limits: ≤ 0.5 ppm for 3 minutes and ≤ 0.25 ppm for 60 min. and ≤0.05 ppm for 24 hours (applies to A-50 Flare only)	None	N	NA
SO_2	BAAQMD 9-1-302	Y		≤ 300 ppm, dry basis (applies to A-50 Flare only)	BAAQMD Condition # 19867, Parts 18a and 31	P/W, Q	Weekly Draeger tube analysis and Quarterly ~~Landfill Gas~~ Laboratory Analysis of Landfill Gas

Table VII – B
Applicable Limits and Compliance Monitoring Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM
AND A-50 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
H_2S	BAAQMD 9-2-301	N		Property Line Ground Level Limits: ≤ 0.06 ppm, averaged over 3 minutes and ≤ 0.03 ppm, averaged over 60 minutes	None	N	NA
Total Reduced Sulfur (TRS)	BAAQMD Condition # 19867, Part 18a	Y		~~≤ 231 ppmv of TRS in landfill gas, expressed as H_2S, dry basis~~ Peak TRS Limit (any single test): 1300 ppmv of TRS (expressed as H_2S) in landfill gas Annual Average TRS Limit: 425 ppmv of TRS (expressed as H_2S) in landfill gas	BAAQMD Condition # 19867, Part 31	P/W, Q	Weekly Draeger tube analysis and Quarterly ~~Landfill Gas~~ Laboratory Analysis of Landfill Gas and Records
…							

Section VIII:

The acceptable method for the Draeger tube analysis will be added to Table VIII as indicated below.

Table VIII
Test Methods

Applicable Requirement	Description of Requirement	Acceptable Test Methods
…		
BAAQMD Condition # 19867, Part 18a	Concentration of Total Reduced Sulfur (TRS) Compounds in Landfill Gas (Peak and Annual Average Limits)	Draeger tube used in accordance with manufacturer's recommendations and calculation procedures described in Condition # 19867, Part 31b; and Manual of Procedures, Volume III, Method 5 Determination of Total Mercaptans in Effluents and Method 25 Determination of Hydrogen Sulfide in Effluents, or Method 44 Determination of Reduced Sulfur Gases and Sulfur Dioxide in Effluent Samples by Gas Chromatographic Methods
…		

Sections IX:

No changes are proposed to this section.

Section X:

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

X. REVISION HISTORY

Title V Permit Issuance (Application 17363): November 10, 2003

Significant Revision (Application 8501): November 10, 2004

- In Table II-B, change the capacity of the A-50 Flare from 75 MM BTU/hour to 120 MM BTU/hour.
- Add several missing sections of 40 CFR Part 60, Subpart WWW (flare operating and monitoring requirements) to Table IV-B.
- Delete future effective dates that have passed from Tables IV-B, IV-M, VII-B, VII-M and Condition # 19867, Part 22.
- Delete unnecessary requirements of Condition # 19867 (Parts 27 and 28) and delete references to these parts in Tables IV-B, VII-B, and VIII.
- Correct errors in Tables IV-B and IV-M and in Condition # 19867, Parts 16 and 30.
- Revise landfill gas throughput limits for A-50 in Condition # 19867, Part 20 and Table VII-B.
- Revise the NMOC emission limit for A-50 in Condition # 19867, Part 23 and Table VII-B.
- Revise the non-federally enforceable TAC destruction efficiency limit for A-50 in Condition # 19867, Part 24 and Table VII-B.

Minor Revision (Applications 6943 and 9565): November 10, 2004

- In Table II-A and Section VI, Condition # 19867, Part 17a, update collection system description to reflect gas collection system components that are operating as of August 1, 2004.
- In Section VI, Condition # 19867, Part 17b, add the description of the collection system component changes that have been authorized pursuant to Application # 9565.

Significant Revision (Applications 10873 and 10874): [Insert Approval Date]

- In Condition # 19867, Part 18a and Table VII-B, replace the current TRS content limit for landfill gas with a new peak TRS limit and a higher annual average TRS content limit.
- In Condition # 19867, Part 31, add a new subpart b that describes the Draeger tube hydrogen sulfide analysis

requirements, testing frequency, TRS calculation procedures, and record keeping requirements.

- Add the weekly Draeger tube monitoring requirements and TRS calculation procedures to Table VII-B and Table VIII.

Sections XI-XII:

No changes are proposed to these sections.

E. RECOMMENDATION

Issue a Change of Permit Conditions for the following equipment:

S-5 Redwood Landfill; abated by A-50 Landfill Gas Flare

Issue a proposed significant revision of the MFR Permit for the following facility:

A1179 Redwood Landfill, Inc.

	signed by Carol S. Allen	February 23, 2005
By:	Carol S. Allen	Date
	Senior Air Quality Engineer	

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