Bay Area Air Quality Management District

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

Statement of Basis
for
MAJOR FACILITY REVIEW PERMIT
MINOR 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

Application: 11948

TABLE OF CONTENTS

STATEMENT of BASIS

Redwood Landfill, Inc.; SITE # A1179

APPLICATION # 11948

A. BACKGROUND

As discussed in the most recent Statement of Basis for the Major Facility Review (MFR) Permit for the Redwood Landfill, Inc. (Site # A1179), this facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Volume 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. 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. This MFR Permit was revised on November 10 2004 and on July 27, 2005.

The main purposes of this current action are to include additional landfill gas control equipment (A-51 Landfill Gas Flare) and to clarify several existing permit conditions. These proposed revisions are minor, because the revisions do not include any of the criteria that would require a significant revision. The District is also proposing to make administrative amendments by adding two terms to the glossary.

This document will discuss the minor revisions proposed pursuant to Applications # 11948. The engineering evaluations for Applications # 11757 and 12003 are attached and contain detailed discussions of the proposed permit revisions. The proposed permit shows all changes to the existing permit in strikeout/underline format. The permit will be formally re-issued after EPA's 45-day review period is complete.

Facility 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.

Future Plans:

Redwood Landfill has requested 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, has recently responded to comments on the draft EIR and is expected to hold a hearing on the final EIR later this year.

Landfill Gas Control Issue:

In January 2005, Redwood Landfill reported that existing flare (A-50) was 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 (1600-1700 cfm) that are currently necessary to maintain vacuum at each wellhead and prevent surface leaks from the landfill.

As a short-term interim control measure, which was necessary to improve the landfill gas collection rate and prevent continued surface leaks, Redwood Landfill proposed to install a Temporary Candlestick Flare (A-52) that will burn up to 1200 scfm of landfill gas. This temporary flare combined with operation of the existing flare (A-50) at a reduced flow rate was expected to prevent future surface leaks. On March 10, 2005, the District's Hearing Board granted Redwood Landfill a variance from the Regulation 8-34-301.3 requirement to use an enclosed flare in order to allow the use of a candlestick flare as a temporary control measure. The variance allowed operation of the candlestick flare from March 16, 2005 through July 11, 2005 only. Pursuant to Application # 12003, the District issued a Permit to Operate for the A-52 Temporary Landfill Gas on March 23, 2005 subject to Condition # 22120.

As a long-term solution to these compliance issues, Redwood Landfill has accelerated the planned installation of a second flare at this site. This second flare (A-51) has been sized to handle at least 3000 cfm of landfill gas (90 MM BTU/hour) and will provide sufficient control capacity for the landfill (as it is currently permitted). The combined operation of the existing A-50 flare and new A-51 flare will be subject to all existing emission and throughput limits as A-50 alone. The District issued an Authority to Construct for the new enclosed flare, A-51 Landfill Gas Flare, pursuant to Application # 11757 on June 2, 2005. This flare was subject to both Condition # 19867 and Condition # 22120.

Redwood Landfill began operating the A-52 Temporary Candlestick Flare on March 25, 2005. Redwood Landfill began operating the A-51 Landfill Gas Flare on June 21, 2005. The A-52 Temporary Candlestick Flare was permanently shut down on June 22, 2005. Condition # 22120 expired on July 11, 2005.

Application # 11948:

Initially, Redwood Landfill submitted Application # 11948 to request an Administrative Amendment to their MFR Permit in order to change the responsible official from James Devlin to Ramin Khany. This administrative amendment was approved on July 27, 2005 with the final issuance package for Application # 10873. On June 6, 2005, the Applicant amended Application # 11948 by requesting the MFR permit revisions that are necessary in order to include A-51 and A-52 in the MFR Permit for this site. Since the A-52 Temporary Candlestick Flare has already been permanently shut down and Condition # 22120 has expired, the District is not proposing to include A-52 or Condition # 22120 in the proposed MFR Permit. However, A-52 and Condition # 22120 are discussed in this Statement of Basis in order to provide a complete picture of the recent landfill gas control issues for this site and the resolution of these issues.

B. EMISSIONS

The emission factors and emission calculation procedures for the A-51 Landfill Gas Flare and the A-52 Temporary Candlestick Flare are described in detail in the Engineering Evaluations for Application # 12003 and Application # 11757, which are attached as Appendices A and B, respectively.

Maximum permitted emissions from A-51 are summarized in Table 1, and maximum permitted emissions from A-52 are summarized in Table 2. Residual and secondary TAC emissions from the combined operation of A-50 and A-51 will be no higher than the current maximum permitted TAC emission rates from A-50 alone. Compliance with the throughput limits, landfill gas concentration levels, and the destruction efficiency limit in Part 24 will ensure that residual and secondary TAC emissions from the combined operation of A-50 and A-51 will not exceed the abated emission rates that were evaluated in previous applications for A-50 and found to comply with the District's Toxic Risk Management Policy.

Although Applications # 11757 and 12003 involve the addition of new devices to the landfill gas control system, these applications will not result in any changes in the total permitted landfill gas flow rate to the entire landfill gas control system. The permit conditions will authorize the following control system operating scenarios:
Scenario 1: A-50 and A-52 operating March-July 2005 and subject to Condition # 22120 and
Scenario 2: A-50 and A-51 operating concurrently but subject to all current limits for A-50.

Scenario 1: For the year 2005, the maximum landfill gas collection rate is expected to be 2400 scfm. Condition # 22120, Part 3 limited the maximum flow rate for A-52 and A-50 combined to a rate equivalent to 2400 scfm. When A-52 and A-50 were both operating, emissions were based on flow rates of 1200 scfm to A-50 and 1200 scfm to A-52. During any time that A-52 was not operating, emissions were based on operating A-50 (or an equivalent control system such as A-50 and A-51) at 2400 scfm. The proposed emissions from A-50 and A-52 are compared to the maximum permitted emission rates for A-50 in Table 3. As illustrated in Table 3, the combined operation of A-50 and A-52 will not exceed any current maximum permitted emission rates for A-50 operating alone. Therefore, the permitting of A-52 (Application # 12003) will not result in any cumulative emission increases.

Scenario 2: After July 11, 2005, A-52 is no longer allowed to operate. (Operation of A-52 was actually discontinued on June 22, 2005.) The combined operation of A-50 and A-51 will be limited to the current landfill gas throughput rate limits for A-50 alone. As shown in Table 3, the combined operation of A-50 and A-51 will not exceed any current maximum permitted emission rates (except for hydrogen bromide) for A-50 operating alone. Therefore, the permitting of A-51 (Application # 11757) will not result in any cumulative emission increases for criteria pollutants.

A detailed comparison of the toxic emissions resulting from each landfill gas control system operating scenario is also presented in Table 3. For each TAC except hydrogen bromide (HBr), which is not a HAP, each operating scenario will emit no more residual or secondary pollutants than the existing permitted control system operating scenario (A-50 alone). The HBr emissions are expected to be higher than the previously evaluated emission rate; however, the proposed emissions of HBr will be lower than the risk screen trigger level of 4600 pounds/year of HBr. Therefore, a risk screening analysis was not required.

Table 1. Maximum Permitted Emissions from A-51 Landfill Gas Flare

Secondary Emissions from A-51 at: **4347 M scf/Day of LFG and 1490000 M scf/Year of LFG**	**Abated Emission Factor lbs / M scf**	**Abated Emission Factor lbs / MM BTU**	**Maximum Daily Emissions lbs/day**	**Maximum Annual Emissions lbs/year**	**Maximum Annual Emissions tons/year**
NOx, RACT Limit of 0.06 lbs/MM BTU	0.03000	0.06000	129.60	44700	22.350
CO, RACT Limit of 0.30 lbs/MM BTU	0.15000	0.30000	648.00	223500	111.750
PM10, AP-42 Emission Factor	0.00850	0.01700	36.72	12665	6.333
SO2, Annual TRS Limit for LFG, C#19867, Part 18c	0.07035	0.14070		104818	52.409
SO2, Daily TRS Limit for LFG, C#19867, Part 18c	0.21518	0.43036	929.58		
Formaldehyde (CATEF for LFG Turbines)	0.00018	0.00036		268	
Hydrogen Bromide (Br ions = 5,000 ppbv in LFG)	0.00105	0.00209		1558	
Hydrogen Chloride (Cl ions = 20,000 ppbv in LFG)	0.00188	0.00377		2808	
Hydrogen Fluoride (F ions = 2,000 ppbv in LFG)	0.00010	0.00021		154	
Residual Emissions from A-51 at 98% Control	**lbs / M scf**	**lbs / MM BTU**	**lbs/day**	**lbs/year**	**tons/year**
Total POC, maximum NMOC as methane – NPOC	6.92E-03	1.38E-02	29.91	10317	5.158
Total NPOC, sum of individual NPOCs	2.36E-05	4.72E-05	0.10	35	0.018
Acrylonitrile	7.68E-07	1.54E-06		1.1	
Benzene	1.37E-06	2.75E-06		2.0	
1,3 Butadiene	7.78E-07	1.56E-06		1.2	
Carbon Tetrachloride	5.56E-07	1.11E-06		0.8	
Chloroform	4.32E-07	8.64E-07		0.6	
1,4 Dichlorobenzene	3.04E-06	6.08E-06		4.5	
1,1 Dichloroethane	7.67E-07	1.53E-06		1.1	
Ethylene Dibromide	6.80E-07	1.36E-06		1.0	
Ethylene Dichloride	3.58E-07	7.16E-07		0.5	
Hydrogen Sulfide	7.48E-04	1.50E-03		1115.2	
Methylene Chloride	1.40E-06	2.81E-06		2.1	
Perchloroethylene	3.86E-06	7.71E-06		5.7	
1,1,2,2 Tetrachloroethane	6.07E-07	1.21E-06		0.9	
1,1,2 Trichloroethane	4.76E-07	9.52E-07		0.7	
Trichloroethylene	1.70E-06	3.40E-06		2.5	
Vinyl Chloride	2.84E-06	5.68E-06		4.2	

Table 2. Maximum Permitted Emissions from A-52 Temporary Landfill Gas Flare

Secondary Emissions from A-52 at: **1728 M scf/Day of LFG and 203904 M scf/Year of LFG**	**Abated Emission Factor lbs / M scf**	**Abated Emission Factor lbs / MM BTU**	**Maximum Daily Emissions lbs/day**	**Maximum Annual Emissions lbs/year**	**Maximum Annual Emissions tons/year**
NOx, SCS Estimate of 0.11 lbs NOx/MM BTU	0.05500	0.11000	95.04	11215	5.607
CO, SCS Estimate of 0.30 lbs CO/MM BTU	0.15000	0.30000	259.20	30586	15.293
PM10, AP-42 Emission Factor	0.00850	0.01700	14.69	1733	0.867
SO2, Annual TRS Limit for LFG, C#19867, Part 18c	0.07035	0.14070		14344	7.172
SO2, Daily TRS Limit for LFG, C#19867, Part 18c	0.21518	0.43036	371.83		
Formaldehyde (CATEF for LFG Turbines)	0.00018	0.00036		36.7	
Hydrogen Bromide (Br ions = 5,000 ppbv in LFG)	0.00105	0.00209		213.2	
Hydrogen Chloride (Cl ions = 20,000 ppbv in LFG)	0.00188	0.00377		384.2	
Hydrogen Fluoride (F ions = 2,000 ppbv in LFG)	0.00010	0.00021		21.1	
Residual Emissions from A-52 at 95% Control	**lbs / M scf**	**lbs / MM BTU**	**lbs/day**	**lbs/year**	**tons/year**
Total POC, maximum NMOC as methane – NPOC	9.27E-03	1.85E-02	16.02	1890	0.945
Total NPOC, sum of individual NPOCs	5.90E-05	1.18E-04	0.10	12	0.006
Acrylonitrile	1.92E-06	3.84E-06		0.39	
Benzene	3.43E-06	6.86E-06		0.70	
1,3 Butadiene	1.95E-06	3.89E-06		0.40	
Carbon Tetrachloride	1.39E-06	2.78E-06		0.28	
Chloroform	1.08E-06	2.16E-06		0.22	
1,4 Dichlorobenzene	7.60E-06	1.52E-05		1.55	
1,1 Dichloroethane	1.92E-06	3.84E-06		0.39	
Ethylene Dibromide	1.70E-06	3.40E-06		0.35	
Ethylene Dichloride	8.95E-07	1.79E-06		0.18	
Hydrogen Sulfide	7.48E-04	1.50E-03		152.6	
Methylene Chloride	3.51E-06	7.02E-06		0.72	
Perchloroethylene	9.64E-06	1.93E-05		1.97	
1,1,2,2 Tetrachloroethane	1.52E-06	3.04E-06		0.31	
1,1,2 Trichloroethane	1.19E-06	2.38E-06		0.24	
Trichloroethylene	4.24E-06	8.49E-06		0.87	
Vinyl Chloride	7.11E-06	1.42E-05		1.45	

Table 3. Proposed Emissions from A-50, A-51, and A-52 Compared to Current Maximum Permitted Emissions from A-50

	Proposed Emissions for 2005 (Operating A-50 and A-52)				Proposed Emissions for A-50 and A-51		
	Proposed A-52 at 1200 cfm Pounds/Day	Proposed A-50 at 1200 cfm Pounds/Day	Total Proposed A-52+A-50 Pounds/Day	Max Permitted A-50 at 4000 cfm Pounds/Day		Total Proposed A-50+A-51 Pounds/Day	Max Permitted A-50 at 4000 cfm Pounds/Day
NOx	95.04	51.84	146.88	172.80	NOx	172.80	172.80
CO	259.20	259.20	518.40	864.00	CO	864.00	864.00
PM10	14.69	14.69	29.38	49.26	PM10	48.96	49.26
SO2	371.83	371.83	743.67	1239.60	SO2	1239.44	1239.60
POC	16.02	11.96	27.98	40.13	POC	39.88	40.13
NPOC	0.10	0.04	0.14	0.14	NPOC	0.14	0.14
	Proposed A-52 at 1200 cfm Tons/Year	A-50: 1200 cfm for 118 days, 2400 cfm remdr Tons/Year	2005 Proposed A-52+A-50 Tons/Year	Max Permitted A-50 at 1490 MM ft^3/yr Tons/Year		Total Proposed A-50+A-51 Tons/Year	Max Permitted A-50 at 1490 MM ft^3/yr Tons/Year
NOx	5.607	15.811	21.419	22.350	NOx	22.350	22.350
CO	15.293	79.056	94.349	111.750	CO	111.750	111.750
PM10	0.867	4.480	5.346	6.371	PM10	6.333	6.371
SO2	7.172	37.076	44.248	52.411	SO2	52.409	52.411
POC	0.945	3.649	4.594	5.190	POC	5.158	5.190
NPOC	0.006	0.012	0.018	0.018	NPOC	0.018	0.018

Table 3. Continued

Proposed Emissions for 2005 (Operating A-50 and A-52)					Proposed Emissions for A-50 and A-51		
Secondary TACs	Proposed A-52 at 1200 cfm Pounds/Year	A-50: 1200 cfm for 118 days, 2400 cfm remdr Pounds/Year	2005 Proposed A-52+A-50 Pounds/Year	Max Permitted A-50 at 1490 MM ft^3/yr Pounds/Year	Secondary TACs	Total Proposed A-50+A-51 Pounds/Year	Max Permitted A-50 at 1490 MM ft^3/yr Pounds/Year
Formaldehyde	36.7	189.7	226	268	Formaldehyde	268	268
HBr	213.2	1101.9	1315	464	HBr	1558	464
HCl	384.2	1986.2	2370	4340	HCl	2808	4340
HF	21.1	109.0	130	479	HF	154	479
Residual TACs	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Residual TACs	Pounds/Year	Pounds/Year
Acrylonitrile	0.39	0.81	1.2	9.7	Acrylonitrile	1.1	9.7
Benzene	0.70	1.45	2.1	17.0	Benzene	2.0	17.0
1,3 Butadiene	0.40	0.82	1.2	9.9	1,3 Butadiene	1.2	9.9
Carbon Tet.	0.28	0.59	0.9	7.0	Carbon Tet.	0.8	7.0
Chloroform	0.22	0.46	0.7	5.4	Chloroform	0.6	5.4
1,4 Dichlorobenz	1.55	3.20	4.8	28.0	1,4 Dichlorobenz	4.5	28.0
1,1 Dichloroeth	0.39	0.81	1.2	9.4	1,1 Dichloroeth	1.1	9.4
Ethylene DiBr	0.35	0.72	1.1	8.6	Ethylene DiBr	1.0	8.6
Ethylene DiCl	0.18	0.38	0.6	19.5	Ethylene DiCl	0.5	19.5
H2S	152.6	788.90	941.5	1115.3	H2S	1115.2	1115.3
Methylene Chl.	0.72	1.48	2.2	13.3	Methylene Chl.	2.1	13.3
Perchl.	1.97	4.07	6.0	42.8	Perchl.	5.7	42.8
1,1,2,2 TetCl Eth	0.31	0.64	0.9	7.6	1,1,2,2 TetCl Eth	0.9	7.6
1,1,2 TriCl Eth.	0.24	0.50	0.7	6.1	1,1,2 TriCl Eth.	0.7	6.1
TCE	0.87	1.79	2.7	21.4	TCE	2.5	21.4
Vinyl Chloride	1.45	3.00	4.4	721.9	Vinyl Chloride	4.2	721.9

C. PERMIT CONTENT

Since Statements of Basis were prepared for the initial MFR Permit and the subsequent revisions of this permit that fully describe and explain the legal and factual basis for the current MFR Permit, this report will only address the proposed revisions to the current MFR Permit associated with Application # 11948.

The definition of significant revision is discussed below to determine if this current 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 and 226.6: This application does not involve the establishment of or change to any case-by-case emission limits or standards or any facility-specific determinations.
- Regulation 2-6-226.7: This application does not involve the incorporation of any requirements promulgated by the EPA.

Since this application does not involve any of the above actions, it does not require a significant revision. This application will involve MFR permit revisions other than those allowed under the definition of administrative amendment in Regulation 2-6-201. Therefore, this revision will be handled as a minor revision of the MFR Permit.

Changes to the permit sections are described below in the order that they are presented in the permit.

Section I:

No changes are proposed for this section.

Section II:

This section of the permit lists all permitted or significant sources and all abatement or control devices for these sources. This minor revision action will add the A-51 Landfill Gas Flare to this permit. The proposed revisions to Table II-B are shown below.

Table II – B
Abatement Devices

A-#	Description	Source(s) Controlled	Applicable Requirement	Operating Parameters	Limit or Efficiency
A-18	Water Sprays	S-5, S-25, S-34, S-35, S-37, S-39, and S-42	BAAQMD Regulation 6-301	None	Ringelmann No. 1
A-41	Water Sprays	S-41	BAAQMD Regulation 6-301	None	Ringelmann No. 1

Table II – B
Abatement Devices

A-#	Description	Source(s) Controlled	Applicable Requirement	Operating Parameters	Limit or Efficiency
A-50	Landfill Gas Flare, Power Strategies, EV-4000 120 MM BTU/hour	S-5	BAAQMD 8-34-301.3, see also Table IV-B	Minimum combustion zone temperature of 1475 °F, see also Table VII-B	98% destruction of NMOC or < 30 ppmv of NMOC, as CH_4, at 3% O_2, dry
A-51	Landfill Gas Flare, Perennial Energy, Inc., FL-144-38-E, 90 MM BTU/hour	S-5	BAAQMD 8-34-301.3, see also Table IV-B	Minimum combustion zone temperature of 1400 °F, see also Table VII-B	98% destruction of NMOC or < 30 ppmv of NMOC, as CH_4, at 3% O_2, dry

Section III:

No changes are proposed for this section.

Section IV:

This section of the permit lists all the applicable requirements that apply to permitted or significant sources. The text of the requirements is found in the regulations, which are readily available on the District's or EPA's 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 statement of basis. Permit condition revisions are discussed in Section C.VI of this statement of basis.

The District is proposing to include the A-51 Landfill Gas Flare in Table IV-B as indicated below. The District is clarifying that requirements that currently apply to A-50 will also apply to A-51. The District is also proposing to update regulatory amendment dates in Tables IV-B and IV-M.

Table IV – B
Source-Specific Applicable Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM;
A-18 WATER SPRAYS; ~~AND~~ A-50 LANDFILL GAS FLARE, AND A-51 LANDFILL GAS FLARE

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
…			
BAAQMD Regulation 6	**Particulate Matter and Visible Emissions (12/19/90)**		
6-301	Ringelmann No. 1 Limitation	Y	
6-305	Visible Particles	Y	
6-310	Particle Weight Limitation (applies to ~~A-50~~ flares only)	Y	
…			

Table IV – B
Source-Specific Applicable Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM;
A-18 WATER SPRAYS; ~~AND~~ A-50 LANDFILL GAS FLARE, AND A-51 LANDFILL GAS FLARE

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
BAAQMD Regulation 8, Rule 34	**Organic Compounds – Solid Waste Disposal Sites (~~10/6/99~~6/15/05)**		
…			
8-34-301.3	Limits for Enclosed Flares (applies to ~~A-50-~~flares)	Y	
…			
8-34-501.3	Continuous Temperature Records for Enclosed Combustors (applies to ~~A-50-~~flares)	Y	
…			
8-34-507	Continuous Temperature Monitor and Recorded (applies to ~~A-50-~~flares)	Y	
…			
BAAQMD Regulation 8, Rule 40	**Organic Compounds – Aeration of Contaminated Soil and Removal of Underground Storage Tanks (~~12/15/99~~6/15/05)**		
…			
BAAQMD Regulation 9, Rule 1	**Inorganic Gaseous Pollutants – Sulfur Dioxide (3/15/95)**		
9-1-301	Limitations on Ground Level Concentrations (applies to ~~A-50-~~flares only)	Y	
9-1-302	General Emission Limitations (applies to ~~A-50-~~flares only)	Y	
…			
BAAQMD Condition # 19867			
…			
Part 19	Allowable fuels for flares (RACT and Regulation 2-2-112)	Y	
Part 20	Landfill gas throughput limit and gas flow meter requirement for flares (Cumulative Increase and 40 CFR 60.756(b)(2)(i))	Y	
Part 21	~~Operating and alarm requirements for flare (Regulation 8-34-301.1)~~[deleted]	~~Y~~	
Part 22	~~Flare c~~Combustion zone temperature limits and monitoring requirements for flares (Toxic Risk Management Policy, Regulations 8-34-301.1 and 8-34-501.3, and 40 CFR 60.756(b)(1))	Y	
Part 23	NMOC limit for flares (Cumulative Increase, Regulation 8-34-301.3, and 40 CFR 60.752(b)(2)(iii)(B))	Y	
Part 24	Flare destruction efficiency requirements for HAPs and toxic compounds (Toxic Risk Management Policy)	N	
Part 25	NOx emission limit for flares (RACT and Offsets)	Y	

Table IV – B
Source-Specific Applicable Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM;
A-18 WATER SPRAYS; ~~AND~~ A-50 LANDFILL GAS FLARE, AND A-51 LANDFILL GAS FLARE

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
Part 26	CO emission limit for flares (RACT and Cumulative Increase)	Y	
Part 27	[deleted]		
Part 28	[deleted]		
Part 29	Record keeping and reporting requirements for flares (Regulations 2-6-501, 8-34-501, and 40 CFR 60.758)	Y	
Part 30	Annual source test requirements (Cumulative Increase, Toxic Risk Management Policy, RACT, Offsets, Regulations 8-34-301.3~~,~~ and 8-34-412, ~~9-1-302,~~ and 40 CFR 60.8 and 60.752(b)(2)(iii)(B))	Y	
Part 31	Annual landfill gas characterization test requirements (Cumulative Increase, RACT, Toxic Risk Management Policy and Regulations 8-34-412 and 9-1-302)	Y	
Part 32	Reporting periods and report submittal due dates for the Regulation 8, Rule 34 report (Regulation 8-34-411 and 40 CFR 63.1980(a))	Y	

Table IV – M
Source-Specific Applicable Requirements
S-50 LEACHATE VAPORATOR

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
…			
BAAQMD Regulation 8, Rule 34	**Organic Compounds – Solid Waste Disposal Sites (~~10/6/99~~6/15/05)**		
…			

Section V:

No changes to this section are proposed.

Section VI:

Each permit condition is identified with a unique numerical identifier, up to five digits.

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

For this minor revision, the District is proposing the revisions of Condition # 19867 to include the A-51 Landfill Gas Flare and to clarify several parts. A detailed explanation of the reasons for the change to each part of Condition # 19867 is presented below.

Part 16: The revisions to this part include the new enclosed flare (A-51) and more clearly described the approved control system operating scenarios. This revision also clarifies that landfill gas is required to be abated by the flares only during times when the landfill gas collection system is operating. The flare alarm and auto restart requirements were moved to Part 16 from Part 21.

Part 18: The landfill gas sulfur content limits in this part are federally enforceable limits that were imposed to ensure compliance with Regulation 9-1-302 and as a RACT requirement for the flares. While an exceedance of an organic compound limit in Parts 18a or 18b only requires Redwood Landfill to submit a permit application, the exceedance of a sulfur content limit should be subject to enforcement action due to the bases for these sulfur limits. The sulfur limit requirements were moved to Part 18c to clarify that these limits cannot be exceeded without enforcement consequences.

Part 19: The new enclosed flare (A-51) was added to this part to allow A-51 to burn leachate vapors from S-50.

Part 20: This part was revised to reflect that the landfill gas throughput limits now apply to the combined operation of A-50 and A-51.

Part 21: With the revisions to Part 16, it is no longer necessary to require the A-50 flare to operate continuously. The flare alarm and auto restart requirements were moved to Part 16. Part 21 is now unnecessary and will be deleted.

Part 22: The minimum combustion zone temperature requirement for the new enclosed flare (A-51) will be added to this part.

Parts 23, 24, 25, 26, 29, and 30: A-51 will be subject to the same emission limits and monitoring, testing, and record keeping requirements as the current A-50 Flare. These parts are being revised to include A-51 in addition to A-50.

Part 31: This part is being revised to clarify that the results of any annual tests need to be reported to the District after the test is completed but the results of the weekly and quarterly landfill gas sulfur content tests do not need to be reported to the District after each test, unless the test shows an excess of a limit. Any excess of a sulfur limit that is found by these tests must be reported to the District in accordance with Section I. The facility must maintain all test results with the records for S-5. A summary of the results of the weekly and quarterly sulfur tests should be included with the semi-annual compliance monitoring reports.

All proposed changes to the permit conditions are clearly shown below in strikeout/underline format.

Condition # 19867

FOR: S-5~~,~~ REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM; A-18~~,~~ WATER SPRAYS; ~~AND~~ A-50~~,~~ LANDFILL GAS FLARE, AND A-51 LANDFILL GAS FLARE

No Changes to Parts 1-15.

16. During all times that the landfill gas collection system is operating, ~~A~~all collected landfill gas ~~collected by the Landfill Gas Collection System~~ shall be vented to either the A-50 Landfill Gas Flare alone or A-50 and the S-50 Leachate Vaporator. Upon start-up of the A-51 Landfill Gas Flare, collected landfill gas shall be vented to one of the following control system configurations: A-50 and A-51 operating concurrently; A-51 operating alone; A-50, A-51, and S-50 operating concurrently; or A-51 and S-50 operating concurrently. Up to 5 MM BTU/hour (approximately 167 scfm) of landfill gas may be diverted from ~~the~~ a flare and used as fuel at the S-50 Leachate Vaporator. In order to assure compliance with this condition, the A-50 and A-51 Landfill Gas Flares shall be equipped with local and remote alarms and auto restart capabilities.
(Basis: 8-34-301.1, 8-34-301.3, and 40 CFR 60.752(b)(2)(iii))

No Changes to Part 17.

18. If a gas characterization test indicates that this site's landfill gas contains organic compounds in excess of any of the concentrations listed in Parts 18a or 18b 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:~~
~~(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)

c. The concentration of total reduced sulfur compounds (TRS) in collected landfill gas shall not exceed a peak of 1300 ppmv (calculated as H2S) and shall not exceed an annual average of 425 ppmv (calculated as H2S). The peak and annual average TRS concentrations shall be measured and calculated in accordance with Parts 31a and 31b.
(Basis: Cumulative Increase, RACT, and Regulation 9-1-302)

19. The A-50 and A-51 Landfill Gas Flares shall be fired on landfill gas and may also be used to abate leachate vapors from the S-50 Leachate Vaporator. (Basis: RACT and Regulation 2-2-112)

20. The total combined throughput of landfill gas (with an HHV of 500 BTU/scf) to the A-50 Landfill Gas Flare and the A-51 Landfill Gas Flare shall not exceed 1,490,000,000 scf during any consecutive 12-month period and shall not exceed 5,760,000 scf during any one day. In order to demonstrate compliance with this condition, the A-50 and A-51 Flares shall be equipped with ~~a~~ one or more properly operating continuous gas flow meters. (Basis: Cumulative Increase, 40 CFR 60.756(b)(2)(i))

21. ~~The A-50 Landfill Gas Flare shall be operated continuously unless:~~
~~a. The owner/operator of A-50 is performing inspection and maintenance activities meeting the requirements of 8-34-113.~~
~~In order to assure compliance with this condition, the A-50 Landfill Gas Flare shall be equipped with local and remote alarms and auto restart capability. The A-50 Flare and associated systems shall be properly maintained.~~
~~(Basis: 8-34-301.1)~~ [deleted]

22. The temperature in the combustion zone of ~~A-50~~ each flare shall be maintained at ~~a~~ the minimum ~~of 1475 degrees F~~ temperature listed below, averaged over any 3-hour period. In order to demonstrate compliance with this condition, A-50 and A-51 shall each be equipped with a continuous temperature monitor and recorder. If a source test demonstrates compliance with all applicable requirements at a different temperature, the APCO may revise ~~this~~ these temperature limits, in accordance with the procedures identified in Regulation 2-6-414 or 2-6-415, based on the following criteria. The minimum combustion zone temperature for ~~A-2~~ the flare shall be equal to the average combustion zone temperature determined during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature is not less than 1400 degrees F.
a. The minimum combustion zone temperature for A-50 is 1475 degrees F, averaged over any 3-hour period.

b. Upon start-up of A-51, the minimum combustion zone temperature for A-51 is 1400 degrees F, averaged over any 3-hour period.

(Basis: Toxic Risk Management Policy, Regulations 8-34-301.3 and 8-34-501.3, and 40 CFR 60.756(b)(1))

23. The A-50 and A-51 Landfill Gas Flares shall comply with the NMOC emission limit in Regulation 8-34-301.3.
(Basis: Cumulative Increase, 8-34-301.3, and 40 CFR 60.752(b)(2)(iii)(B))

*24. The A-50 and A-51 Landfill Gas Flares shall each achieve a minimum destruction efficiency of 83% by weight for any EPA Hazardous Air Pollutants or any District toxic compounds that are determined to be present in the landfill gas or leachate vapors. (Basis: Toxic Risk Management Policy)

25. Nitrogen oxides (NO_x) emissions from ~~the A-50 Landfill Gas Flare~~ each enclosed flare (A-50 and A-51) shall not exceed 0.06 pounds of NO_x, calculated as NO_2, per million BTU. Compliance with this emission limit may be demonstrated by ~~meeting~~ not exceeding the following flue gas concentration limit~~.~~: ~~The concentration of NO_x in the flue gas from A-50 shall not exceed~~ 15 ppmv of NO_x, corrected to 15% oxygen, dry basis.
(Basis: RACT and Offsets)

26. Carbon monoxide (CO) emissions from ~~the A-50 Landfill Gas Flare~~ each enclosed flare (A-50 and A-51) shall not exceed 0.30 pounds of CO per million BTU. Compliance with this emission limit may be demonstrated by ~~meeting~~ not exceeding the following flue gas concentration limit~~.~~: ~~The concentration of CO in the flue gas from A-50 shall not exceed~~ 123 ppmv of CO, corrected to 15% oxygen, dry basis.
(Basis: RACT and Cumulative Increase)

No Changes to Parts 27-28.

29. The Permit Holder shall maintain records of all planned and unanticipated shut downs of the A-50 and A-51 Flares and of any temperature excursions. The records shall include the date, time, duration, and reason for any shut down or excursion. Any unanticipated shut downs or temperature excursions shall be reported to the Enforcement Division immediately. All inspection and maintenance records, records of shut downs and excursions, gas flow records, temperature records, analytical results, source test results, and any other records required to demonstrate compliance with the above permit conditions, Regulation 8 Rule 34, or 40 CFR Part 60 Subpart WWW shall be retained on site for a minimum of five years and shall be made available to District staff upon request.
(Basis: 2-6-501, 8-34-501, 40 CFR 60.758)

30. In order to demonstrate compliance with Parts 23, 25, and 26 above, Regulation 8, Rule 34, Sections 301.3 and 412, and 40 CFR 60.8 and 60.752(b)(2)(iii)(B), the Permit Holder shall ensure that a District approved source test is conducted annually on the A-50 Landfill Gas Flare and the A-51 Landfill Gas Flare. Each annual source test shall determine the following:
    a. landfill gas flow rate to the flare (dry basis);
    b. concentrations (dry basis) of carbon dioxide (CO_2), nitrogen (N_2), oxygen (O_2), total hydrocarbons (THC), methane (CH_4), 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 NO_x, CO, NMOC, and O_2 in the flare stack gas;
    e. NMOC destruction efficiency achieved by the flare;
    f. NO_x and CO emission rates from the flare in units of pounds per MM BTU,
    g. average combustion zone temperature in the flare during the test period.

    The first source test for A-51 shall be conducted no later than 60 days after the initial start-up date for A-51. Each annual source test shall be conducted no earlier than 9 months and no later than 12 months after the previous annual source test. The Source Test Section of the District shall be contacted to obtain approval of the source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. The source test report shall be submitted to the Compliance and Enforcement Division and the Source Test Section within ~~45~~60 days of the test date.

    (Basis: Cumulative Increase, Toxic Risk Management Policy, RACT, Offsets, Regulations 8-34-301.3, 8-34-412, 40 CFR 60.8 and 40 CFR 60.752(b)(2)(iii)(B))

31. Landfill Gas Testing:
    a. The Permit Holder shall conduct a characterization of the landfill gas on a quarterly basis with one test concurrent with one of the annual source tests 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~~ a 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 laboratory analysis ~~test~~ report for the annual organic and sulfur compound gas characterization test shall be included with the Part 30 source test report and shall be submitted to the Compliance and Enforcement Division and the

Source Test Section within ~~45~~60 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 18c 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 18c. 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 18c. (Basis: Cumulative Increase, RACT, and Regulation 9-1-302).

No Changes to Part 32.

Section VII:

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

The monitoring requirements for the new A-51 Landfill Gas Flare are the same as those for the existing A-50 Landfill Gas Flare. The District is proposing revisions in Table VII-B below that will add or correct several monitoring citations and will clarify reporting requirements for sulfur tests in accordance with the permit condition changes described in Section VI above. However, the District is not proposing any changes to the monitoring procedures or frequency. New emission limits applicable to the A-51 Landfill Gas Flare for which no monitoring is proposed are discussed in detail after the proposed revisions listed below for Table VII-B.

Table VII – B
Applicable Limits and Compliance Monitoring Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM, ~~AND~~ A-50 LANDFILL GAS FLARE, AND A-51 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
...							
Gas Flow	BAAQMD 8-34-301, 301.1, 301.3, and 301.4, and BAAQMD Condition # 19867, Part~~s~~ 16~~ and 21~~	Y		Vent all collected gases to a properly operating control system and operate control system continuously.	BAAQMD 8-34-501.10 and 508 and BAAQMD Condition # 19867, Parts ~~21~~16 and 29	C P/E	Gas Flow Meter and Recorder (every 15 minutes); Alarms; and Records
...							
Landfill Gas Through-put	BAAQMD Condition # 19867, Part 20	Y		≤ 5,760,000 scf per day and ≤ 1,490,000,000 scf per 12-month period (applies to A-50 and A-51 ~~Flare only~~ combined)	BAAQMD Condition # 19867, Parts 20 and 29	C	Gas Flow Meter and Recorder
...							
NMOC	BAAQMD 8-34-301.3 and BAAQMD Condition # 19867, Part 23	Y		98% removal by weight OR < 30 ppmv, dry basis @ 3% O_2, expressed as methane (applies to ~~A-50~~ Flare~~s only~~)	BAAQMD 8-34-412 and 8-34-501.4 and BAAQMD Condition # 19867, Part 30	P/A	Annual Source Tests and Records

Table VII – B
Applicable Limits and Compliance Monitoring Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM, ~~AND~~ A-50 LANDFILL GAS FLARE, AND A-51 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
NMOC	40 CFR 60.752(b)(2)(iii)(B)	Y		98% removal by weight OR < 20 ppmv dry @ 3% O_2, expressed as hexane (applies to ~~A-50~~ Flares~~-only~~)	40 CFR 60.8 and 60.752(b)(2)(iii)(B) and 60.758 (b)(2)(ii)	P/E	Initial Source Test and Records
Temperature of Combustion Zone (CT)	BAAQMD Condition # 19867, Part 22a	Y		A-50: CT ≥ 1475 °F, averaged over any 3-hour period ~~(applies to A-50 Flare only)~~	BAAQMD 8-34-501.3, 8-34-507, and BAAQMD Condition # 19867, Part 22	C	Temperature Sensor and Recorder (continuous)
Temperature of Combustion Zone (CT)	BAAQMD Condition # 19867, Part 22b	Y		A-51: CT > 1400 °F, averaged over any 3-hour period	BAAQMD 8-34-501.3, 8-34-507, and BAAQMD Condition # 19867, Part 22	C	Temperature Sensor and Recorder (continuous)
CT	40 CFR 60.758 (c)(1)(i)	Y		A-50: CT ≥ 1475 °F A-51: CT > 1400 °F (3-hour average) from ($CT \geq CT_{PF} - 28$ °C), where CT_{PF} is the average combustion temperature during the most recent complying performance test (applies to ~~A-50~~ Flares~~-only~~)	40 CFR 60.756(b)(1) and 60.758 (b)(2)(i)	C	Temperature Sensor and Recorder (measured every 15 minutes and averaged over 3 hours)
Opacity	BAAQMD 6-301 and BAAQMD Condition # 19867, Part 11	Y		Ringelmann No. 1 for < 3 minutes/hr (applies to S-5)	BAAQMD Condition # 19867 Part 11	P/E, D	Records of all site watering and road cleaning events
Opacity	BAAQMD 6-301	Y		Ringelmann No. 1 for < 3 minutes/hr (applies to ~~A-50~~ Flares)	None	N	NA

Table VII – B
Applicable Limits and Compliance Monitoring Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM, ~~AND~~ A-50 LANDFILL GAS FLARE, AND A-51 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
FP	BAAQMD 6-310	Y		≤ 0.15 grains/dscf (applies to ~~A-50~~ Flares ~~only~~)	None	N	NA
NOx	BAAQMD Condition # 19867, Part 25	Y		≤ 0.06 pounds per MM BTU, calculated as NO_2, or ≤ 15 ppmv @ 15% O_2, dry (applies to A-50 ~~Flare only~~ and A-51, each)	BAAQMD Condition # 19867, Part 30	P/A	Annual Source Test
CO	BAAQMD Condition # 19867, Part 26	Y		≤ 0.30 pounds per MM BTU, or ≤ 123 ppmv @ 15% O_2, dry (applies to A-50 ~~Flare only~~ and A-51, each)	BAAQMD Condition # 19867, Part 30	P/A	Annual Source Test
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~~ Flares ~~only~~)	None	N	NA
SO_2	BAAQMD 9-1-302	Y		≤ 300 ppm, dry basis (applies to A-50 ~~Flare only~~ and A-51, each)	BAAQMD Condition # 19867, Parts 18~~a~~c and 31	P/W, Q	Weekly Draeger Tube Analysis and Quarterly Laboratory Analysis of Landfill Gas
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

Table VII – B
Applicable Limits and Compliance Monitoring Requirements
S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM, ~~AND~~ A-50 LANDFILL GAS FLARE, AND A-51 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
Total Reduced Sulfur (TRS)	BAAQMD Condition # 19867, Part 18~~a~~c	Y		Peak TRS Limit (any single test): 1300 ppmv of TRS (expressed as H_2S) in landfill gas and 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 Laboratory Analysis of Landfill Gas and Records
...							
Total Aeration Project Emissions	BAAQMD 8-40-118	Y		150 pounds per project and toxic air contaminant emissions per year <BAAQMD Table ~~2-1-316 limits~~ 2-5-1 trigger levels	BAAQMD Condition # 19867, Part 15m	P/E	Records
...							

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) the 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) 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. When 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 only when it can support a conclusion that existing monitoring is inadequate**.**

The tables below contain only the new emission limits for A-51 for which there is no monitoring proposed in the applicable requirements. The District has examined the monitoring for other limits and has determined that monitoring is adequate to provide a reasonable assurance of compliance. Calculations for potential to emit will be provided when no monitoring is proposed due to the size of a source.

SO_2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
A-51 Landfill Gas Flare	BAAQMD 9-1-301	Property Line Ground Level SO_2 Limits: $\leq$ 0.5 ppm for 3 minutes and $\leq$ 0.25 ppm for 60 min. and $\leq$ 0.05 ppm for 24 hours	None
A-51 Landfill Gas Flare	BAAQMD 9-1-302	Gas Stream SO_2 Limit: $\leq$ 300 ppm (dry)	Landfill Gas Sulfur Content Testing: Weekly Draeger Tube Analysis for H_2S and Quarterly Laboratory Analysis for TRS

SO_2 Discussion:

Maximum potential sulfur dioxide (SO_2) emissions are calculated below for A-51 followed by a discussion of each applicable limit related to sulfur dioxide emissions.

Potential to Emit Calculations for the A-51 Landfill Gas Flare:

As discussed in Application # 11757, maximum potential SO_2 emissions from A-51 are based on the maximum annual average total reduced sulfur compound concentration of 425 ppmv as H_2S from BAAQMD Condition # 19867, Part 18c and the maximum possible landfill gas usage rate of 1490 MM scf/year from Condition # 19867, Part 20.

(1490 E6 ft^3 LFG/year)*(425 ft^3 $H_2S/10^6$ ft^3 LFG)/(387.006 ft^3 H_2S/lbmol H_2S)*(1 lbmol SO_2/
1 lbmol H_2S)*(64.0588 pounds SO_2/lbmol SO_2)/(2000 pounds SO_2/ton SO_2)
= 52.41 tons SO_2/year

BAAQMD Regulation 9-1-301: As discussed below for BAAQMD Regulation 9-1-302, this facility will be subject to federally enforceable limits, which will ensure compliance with the Regulation 9-1-302 gas stream emission limit of 300 ppmv of SO_2 in the exhaust from the new flare. Based on modeling analyses conducted at another landfill site, sources complying with the Regulation 9-1-302 limits are not expected to result in an excess of the ground level concentration limits listed in Regulation 9-1-301. Monitoring for ground level SO_2 concentrations in addition to the proposed landfill gas monitoring would not be appropriate.

BAAQMD Regulation 9-1-302: This facility will be subject to a federally enforceable limit for peak TRS concentration in landfill gas of 1300 ppmv as H_2S (BAAQMD Condition # 19867, Part 18c). The landfill gas is assumed to contain a minimum of 45% methane, and the exhaust gas is assumed to have a minimum of 10% oxygen. As shown by the calculation below, the maximum SO_2 exhaust concentration that will result from this limit is about half of the BAAQMD Regulation 9-1-302 limit (300 ppmv of SO_2 in the exhaust).

(1300 ft^3 H_2S / 10^6 ft^3 LFG)*(1 ft^3 SO_2/1 ft^3 H_2S)/(4.3959 ft^3 dry flue gas at 0% O_2 / ft^3 LFG)
= 2.9573E-4 ft^3 SO_2 / ft^3 dry flue gas at 0% O_2 = 296 ppmv of SO_2 at 0% O_2, dry basis
(295.7 ppmv of SO_2 at 0% O_2)*(20.9-10)/(20.9-0) = 154 ppmv of SO_2 at 10% O_2, dry basis

The annual average sulfur dioxide concentration in the exhaust will be much lower:
(425/1300*154) = 50 ppmv of SO_2 at 10% O_2, dry basis.

Staff has proposed using the existing monitoring procedures for A-50 at A-51: BAAQMD Condition # 19867, Part 31b, which include testing for H_2S concentration (from the main landfill gas header) on a

weekly basis using a Draeger tube and testing for TRS concentration on a quarterly basis using laboratory analytical methods. Typically, the District requires quarterly testing for sulfur content at landfill gas combustion devices. However, the landfill gas sulfur content at this site has been found to be both higher on average and more variable than other Bay Area sites. Therefore, weekly monitoring is appropriate for this site.

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
A-51 Landfill Gas Flare	BAAQMD 6-301	Ringelmann 1.0	None
A-51 Landfill Gas Flare	BAAQMD 6-310	0.15 gr/dscf	None

PM Discussion:

Maximum potential PM_{10} emissions are described below for sources listed above that have a PM limit and no proposed monitoring for that limit.

Potential to Emit for A-51 Landfill Gas Flare:

As discussed in Application # 11757, maximum potential PM_{10} emissions from A-51 are based on the AP-42 emission factor for flares of 17 pounds PM_{10} per MM scf of methane and the maximum possible landfill gas usage rate (Condition # 19867, Part 20) of 1490 MM scf/year of landfill gas with 50% methane.

(1490 MM ft^3 LFG/year)*(0.5 MM ft^3 CH_4/ MM ft^3 LFG)*(17 lbs PM_{10}/1 MM ft^3 CH_4)/(2000 lbs/ton)
= 6.33 tons/year of PM_{10}

BAAQMD Regulation 6-301: Visible particulate emissions are normally not associated with combustion of gaseous fuels, such as natural gas or landfill gas. Particulate emissions from A-51 are low (6.3 tons/year). Since violations of Ringelmann 1.0 limit are not expected and particulate emissions are low, periodic monitoring for the Ringelmann limit would not be appropriate for this flare.

BAAQMD Regulation 6-310: Regulation 6-310 limits filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. The maximum grain-loading rate for A-51 is calculated below for landfill gas containing a maximum of 55% methane.

(17 lbs PM_{10}/1 E6 ft^3 CH_4)*(7000 grains PM_{10}/lb PM_{10})*(0.55 ft^3 CH_4/1 ft^3 LFG)/
(5.1506 ft^3 dry flue gas at 0% O_2/1 ft^3 LFG) = 0.013 grains PM_{10}/ft^3 dry flue gas at 0% O_2

The compliance ratio with the Regulation 6-310 limit is (0.15/0.013) = 11.5 to 1. Since the Regulation 6-310 grain-loading limit is far above any expected PM emissions, and the PM emissions from A-51 are low, it would not be appropriate to add periodic monitoring for this standard.

H_2S Sources

S# & Description	Emission Limit Citation	Emission Limit (Not Federally Enforceable)	Monitoring
A-51 Landfill Gas Flare	BAAQMD 9-2-301	Property line ground level limits: $\leq$ 0.06 ppm Averaged over 3 minutes and $\leq$ 0.03 ppm Averaged over 60 minutes	None

Hydrogen Sulfide (H_2S) Discussion:

Hydrogen sulfide can be detected by its odor at concentrations as low as 0.0005 ppmv and is generally identified by its characteristic rotten egg smell at a concentration of 0.005 ppmv or less. Therefore, H_2S emissions are typically discovered by smell well before the concentration approaches the lowest Regulation 9-2-301 emission limit of 0.03 ppmv.

The District rarely receives complaints about hydrogen sulfide odors from Bay Area landfills. Since H_2S odors have generally not been detected at landfills, the concentration of H_2S at the property line is expected to be well below the Regulation 9-2-301 limits. Monitoring for ground level H_2S concentrations is not appropriate when no H_2S odor problem exists. Furthermore, the BAAQMD Regulation 9-2-301 emission limits are not federally enforceable. Therefore, the District has not required H_2S monitoring for any Bay Area landfill sites.

Landfill gas flares emit small amounts of residual H_2S compared to fugitive H_2S emissions from landfills. In addition, these residual H_2S emissions will be quickly diluted in the atmosphere due to high stack temperatures and high exit velocities. As illustrated below for A-51, landfill gas flares have a negligible impact on compliance with the property line H_2S levels for a site. Therefore, H_2S monitoring is not appropriate for landfill gas flares.

For landfill gas containing a maximum of 1300 ppmv of H_2S and a minimum of 45% methane and for exhaust gas containing a minimum of 10% oxygen, the maximum H_2S concentration in the flare exhaust will be 3 ppmv of H_2S in dry flue gas at 10% O_2. Using dispersion modeling (ISCST3 with screen3 met data), the maximum 1 hour average ground level concentration resulting from residual H_2S emissions at A-51 was determined to be 0.0002 ppmv of H_2S. This maximum ground level concentration is less than the lowest odor detection level for H_2S and is two orders of magnitude below the property line H_2S limits. Therefore, landfill gas flare emissions are never expected to result in an excess of the Regulation 9-1-301 property line H_2S limits, and monitoring landfill gas flares for compliance with these property line limits is not necessary.

Section VIII:

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.

The District is proposing to correct several citations in Table III for consistency with the proposed permit condition revisions described in Section VI above.

Table VIII
Test Methods

Applicable Requirement	Description of Requirement	Acceptable Test Methods
...		
BAAQMD Condition # 19867, Part 18~~a~~c	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
BAAQMD Condition # 19867, Part 18b	Concentrations of Toxic Air Contaminants (TACs) in Landfill Gas	EPA Reference Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography
BAAQMD Condition # 19867, Part 20	Landfill Gas Throughput Limit for Flares	APCO Approved Gas Flow Meter and Recorder
BAAQMD Condition # 19867, Part 22	Flare Combustion Zone Temperature Limits	APCO Approved Device
BAAQMD Condition # 19867, Part 23	NMOC Emission Limits for Flares	Manual of Procedures, Volume IV, ST-14, Oxygen, Continuous Sampling; and Manual of Procedures, Volume IV, ST-7, Organic Compounds; or EPA Reference Method 18, 25, 25A, or 25C
BAAQMD Condition # 19867, Part 24	TAC or HAP Compound Destruction Efficiency for Flares	EPA Reference Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography
BAAQMD Condition # 19867, Part 25	NOx Emission Limit for Flares	Manual of Procedure, Volume IV, ST-13A, Oxides of Nitrogen, Continuous Sampling; and Manual of Procedure, Volume IV, ST-14, Oxygen, Continuous Sampling
BAAQMD Condition # 19867, Part 26	CO Emission Limit for Flares	Manual of Procedure, Volume IV, ST-6, Carbon Monoxide, Continuous Sampling; and Manual of Procedure, Volume IV, ST-14, Oxygen, Continuous Sampling
...		

Section IX:

No changes are proposed for this section.

Section X:

This section summarizes the revisions that have been made to the permit since it was initially issued. The changes associated with this proposed minor revision will be summarized in Section X as indicated below.

...

Minor Revision (Applications 11948, 11757, 12003): [Insert Approval Date]

- Add the new A-51 Landfill Gas Flare to Tables II-B, IV-B, VII-B, and VIII, and to Condition # 19867, Parts 16, 19, 20, 22-26, 29, and 30.
- Clarify allowable control system operating scenarios by combining Condition # 19867, Parts 16 and 21 into Part 16 and by deleting Part 21. Delete Part 21 from Table IV-B and update related citations in Table VII-B.
- In Condition # 19867, Parts 18 and 31, clarify reporting requirements and condition basis associated with the landfill gas sulfur content limits and update related citations and basis in Tables IV-B, VII-B, and VIII.
- Update regulatory amendment dates in Tables IV-B and IV-M.
- Add two terms to the Glossary in Section XI.

Section XI:

This section explains words, phrases, acronyms, symbols, and usage unit abbreviations that are used in this permit. The following terms will be added to the Glossary:

ATCM
Airborne Toxic Control Measure

CCR
California Code of Regulations

Section XII:

No changes are proposed for this section.

D. ALTERNATE OPERATING SCENARIOS:

No alternate operating scenarios have been requested for this facility.

E. COMPLIANCE STATUS:

As discussed in the Background section of this statement of basis, this facility has been intermittently operating out of compliance with Regulation 8, Rule 34 since December 2004. The performance of the A-50 Landfill Gas Flare has deteriorated, and A-50 (operating alone) is no longer providing sufficient control capacity for the S-5 Redwood Landfill. Low landfill gas collection and control rates resulted in excesses of the Regulation 8, Rule 34 landfill surface leak and wellhead limits. Repair attempts were unsuccessful at bringing the landfill back into full compliance.

Redwood Landfill is planning to resolve this compliance issue by installing a new enclosed flare (A-51) that will provide an additional 3000 cfm of control capacity for the landfill. Initially, Redwood Landfill submitted an application for a variance from Regulations 8-34-301.1, 8-34-303, and 8-34-305 on January 13, 2005. After several meetings with District staff, the Permit Holder amended the variance application by requesting to install a temporary candlestick flare that would improve the total landfill gas collection rate for the landfill and by requesting a variance from Regulation 8-34-301.3 (which requires use of an enclosed flare) to allow the operation of this candlestick flare. The candlestick flare is intended to increase the control capacity for the landfill until a new enclosed flare can be installed and commence operating. On March 30, 2005, pursuant to Docket # 3484, the District's Hearing Board granted Redwood Landfill a variance from Regulation 8-34-301.3 from March 16, 2005 through July 11, 2005. The District's Hearing Board denied the request for variance from Regulations 8-34-301.1, 8-34-303, and 8-34-305.

Redwood Landfill began operating the A-52 Temporary Candlestick Flare on March 25, 2005. Redwood Landfill began operating the new enclosed flare, A-51, on June 21, 2005 and shut down A-52 on June 22, 2005. Operation of A-52 and, subsequently, operation of A-51 has improved compliance with Regulations 8-34-301, 8-34-303, and 8-34-305. The District expects that the initial compliance demonstration test for A-51 will be conducted soon. The continued operation of the new A-51 Landfill Gas Flare is expected to resolve the control capacity issues for the landfill. Since the A-52 Temporary Candlestick Flare is no longer operating, a Schedule of Compliance is not necessary at this time. However, the District is continuing to investigate this compliance issue.

F. DIFFERENCES BETWEEN THE APPLICATION AND THE PROPOSED PERMIT:

The application materials for the minor MFR revision are contained in Application # 11948. The applicant applied to add two flares: A-51 Landfill Gas Flare (a permanent enclosed flare) and A-52 Temporary Candlestick Flare (a temporary open flare). Since A-52 has now been shut down, the District determined that it was not necessary to add A-52 to the MFR Permit for this temporary source. The Applicant indicated that a Schedule of Compliance was necessary for A-52, because the use of an open flare does not comply with Regulation 8-34-301.3. However, the District determined that a Schedule of Compliance was no longer necessary because A-52 has been permanently shut down and the operation of two enclosed flares (A-50 and A-51) is expected to ensure compliance with all applicable requirements of Regulation 8, Rule 34 and 40 CFR Part 60, Subpart WWW. The applicant did not discuss applicable requirements in detail for A-51, while the District's proposed permit includes a detailed list of applicable requirements and compliance monitoring requirements for A-51. The District has proposed clarifying revisions to Condition # 19867 that the applicant did not request. The District is also proposing to make administrative revisions to the permit that were not identified in the application materials.

APPENDIX A

APPLICATION # 12003

Bay Area Air Quality Management District

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

Engineering Evaluation
for
Application # 12003
Temporary Candlestick Flare (A-52)

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

TABLE OF CONTENTS

ENGINEERING EVALUATION

Redwood Landfill, Inc.; PLANT # 1179

APPLICATION # 12003

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 (1600-1700 cfm) that are currently necessary to maintain vacuum at each wellhead and prevent surface leaks from the landfill. 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.

As a short-term interim control measure, which is necessary to improve the landfill gas collection rate and prevent continued surface leaks, Redwood Landfill is proposing to install a Temporary Candlestick Flare (A-52) that will burn up to 1200 scfm of landfill gas. This temporary flare combined with operation of the existing flare (A-50) at a reduced flow rate is expected to prevent future surface leaks. On March 10, 2005, the District's Hearing Board granted Redwood Landfill a variance from the Regulation 8-34-301.3 requirement to use an enclosed flare in order to allow the use of a candlestick flare as a temporary control measure. The variance allows operation of the candlestick flare from March 16, 2005 through July 11, 2005 only.

This application is for the Authority to Construct and Permit to Operate for the A-52 Temporary Candlestick Flare. The capacity of the candlestick flare described in the variance was 800 scfm; however, Redwood is actually applying for a 1200 scfm capacity candlestick flare. This application will also allow the reduction of the maximum flow rate to the existing A-50 Flare from 4000 scfm to 1200 scfm. The combined operation of A-50 and A-52 results in a maximum flow rate of 2400 scfm. Initially, the combined flow rates may approach 2400 scfm until excess landfill gas is drawn out of the landfill. After the system is rebalanced and for the remainder of 2005, the combined flow rate to all control systems is expected to be no more than 2000 scfm.

B. EMISSIONS

As discussed in detail in Applications # 8501 and # 10874, the A-50 Landfill Gas Flare is currently permitted to operate at a maximum landfill gas flow rate of 4000 scfm. Maximum permitted criteria pollutant emission factors for secondary emissions are based on a RACT limit for NOx emissions of 0.06 pounds/MM BTU, a RACT limit for CO emissions of 0.30 pounds/MM BTU, and an AP-42 emission factor of 0.0171 pounds PM10/MM BTU. Sulfur dioxide emissions are based on the new landfill gas sulfur content limits (Application # 10874) of 1300 ppmv of TRS during any one day and 425 ppmv of TRS for annual average. Total NMOC emissions from this flare are based on the Regulation 8-34-301.3 outlet concentration limit of 30 ppmv of NMOC at 3% O_2, which is expected to result in a higher emission rate than the 98% destruction efficiency limit. POC emissions are the difference between NMOC and NPOC emissions and make up more than 99% of the total NMOC emissions. NPOC emissions were determined from the sum of the maximum expected emission rate for each individual NPOC compound (acetone chlorofluorocarbons, methylene chloride, and perchloroethylene).

From Application # 17639, the A-50 Flare was permitted in April 1998 to operate at 75 MM BTU/hr (2500 scfm of LFG) with a minimum toxic compound control efficiency of 80%. The November 1998 revision of AP-42 provided new guidance about the destruction efficiency achieved by enclosed flares for individual compounds: 98% destruction for any halogenated compound and 99.7% destruction for any non-halogenated compound (including acrylonitrile, benzene, and hydrogen sulfide). Consequently, the maximum permitted toxic organic emissions from A-50 are higher than the current expected emission rates. Even after the landfill gas flow rate was increased to 4000 scfm per Application # 8501, the projected toxic emissions from A-50 did not exceed the originally permitted TAC emission rates. Secondary emissions of acid gases are calculated by assuming that all bromine, chlorine, and fluorine ions are converted to HBr, HCl, and HF.

During the time period that the A-52 Temporary Candlestick Flare will be operated (3/16/05 through 7/11/05, which is 118 days), the A-50 flare will operate at a maximum flow rate of 1200 scfm. All emission factors are expected to be the same as those discussed above.

The A-52 Temporary Candlestick Flare is capable of operating at landfill gas flow rates ranging from 120 scfm to 1200 scfm with a minimum heat content of 300 BTU/scf. SCS Engineers provided emission estimates for the A-52 Candlestick Flare of 0.11 pounds NOx/MM BTU and 0.30 pounds CO/MM BTU. PM10 and SO2 emission rates will be the same as those determined above for the A-50 enclosed flare. From Perennial Energy's web site, candlestick flares are expected to achieve either 98% destruction of NMOC or emit less than 20 ppmv of NMOC as C_6 at 3% O_2. EPA's Air Pollution Control Technology Fact Sheet indicates that flares are expected to achieve a minimum of 98% control for any non-halogenated species. To be conservative, the District will estimate toxic emissions from A-52 using a destruction efficiency of 95% for any single toxic compound and 95% for total NMOC. Emission factors for acid gases are the same the factors for A-50.

For the year 2005, the average landfill gas collection rate is expected to be 2000 scfm. The maximum flow rate for A-52 and A-50 combined will be 2400 scfm. When A-52 and A-50 are both operating, emissions will be based on flow rates of 1200 scfm to A-50 and 1200 scfm to A-52. During any time that A-52 is not operating, emissions will be based on operating A-50 (or an equivalent flare) at 2000 scfm. The proposed emissions from A-50 and A-52 are compared to the maximum permitted emission rates for A-50 in the tables on the following page.

Cumulative Emission Increases:

As shown in the tables on the next page, the combined operation of A-52 and A-50 will not result in the emission of any pollutant that is higher than the current maximum permitted emission rate for A-50. Therefore, the temporary operation of the A-52 Candlestick Flare will not result in any emission increases.

Comparison of Proposed and Maximum Permitted Daily Emission Rates

	Proposed A-52 at 1200 cfm Pounds/Day	Proposed A-50 at 1200 cfm Pounds/Day	Total Proposed A-52+A-50 Pounds/Day	Max Permit A-50 at 4000 cfm Pounds/Day	Source of Limit for A-50
NOx	95.04	51.84	146.88	172.80	App # 8501
CO	259.20	259.20	518.40	864.00	App # 8501
PM10	14.69	14.69	29.38	49.26	App # 8501
SO2	371.83	371.83	743.67	1239.60	App # 10874
POC	16.02	11.96	27.98	40.13	App # 8501
NPOC	0.10	0.04	0.14	0.14	App # 8501

Comparison of Proposed Emission Rates for 2005 and Maximum Permitted Annual Emission Rates

	Proposed A-52 at 1200 cfm Tons/Year	Proposed A-50 1200 cfm for 118 days Tons/Year	Proposed A-52+A-50 for 118 days Tons/Year	A-50/A-51 at 2400 cfm for rest of yr Tons/Year	Total Emissions for 2005	Max Permit A-50 at 1490 MM cf/yr Tons/Year
NOx	5.607	3.059	8.666	12.753	21.419	22.350
CO	15.293	15.293	30.586	63.763	94.349	111.750
PM10	0.867	0.867	1.733	3.613	5.346	6.371
SO2	7.172	7.172	14.344	29.904	44.248	52.411
POC	0.945	0.706	1.651	2.943	4.594	5.190
NPOC	0.006	0.002	0.008	0.010	0.018	0.018
	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year
Acrylonitrile	0.39	0.16	0.55	0.65	1.2	
Benzene	0.70	0.28	0.98	1.17	2.1	
1,3 Butadiene	0.40	0.16	0.56	0.66	1.2	
Carbon Tetrachloride	0.28	0.11	0.40	0.47	0.9	
Chloroform	0.22	0.09	0.31	0.37	0.7	
1,4 Dichlorobenzene	1.55	0.62	2.17	2.58	4.8	
1,1 Dichloroethane	0.39	0.16	0.55	0.65	1.2	
Ethylene Dibromide	0.35	0.14	0.49	0.58	1.1	
Ethylene Dichloride	0.18	0.07	0.26	0.30	0.6	
Formaldehyde	36.7	36.70	73.41	153.03	226.4	
Hydrogen Bromide	213.2	213.15	426.31	888.74	1315.0	
Hydrogen Chloride	384.2	384.21	768.42	1601.95	2370.4	
Hydrogen Fluoride	21.1	21.08	42.16	87.90	130.1	
Hydrogen Sulfide	152.61	152.61	305.21	636.29	941.5	
Methylene Chloride	0.72	0.29	1.00	1.19	2.2	
Perchloroethylene	1.97	0.79	2.75	3.28	6.0	
1,1,2,2 Tetrachloroethane	0.31	0.12	0.43	0.52	0.9	
1,1,2 Trichloroethane	0.24	0.10	0.34	0.40	0.7	
Trichloroethylene	0.87	0.35	1.21	1.44	2.7	
Vinyl Chloride	1.45	0.58	2.03	2.42	4.4	

C. STATEMENT OF COMPLIANCE

Regulation 2, Rule 1:

This application is for a temporary abatement device (A-52) that is necessary to control excess surface emission leaks from the S-5 Redwood Landfill. The permitting of abatement equipment such as A-52 meets the requirements of District Regulation 2-1-312.2. Therefore, this application 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 project will not result in any cumulative emission increases and 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 also 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:

The A-52 Temporary Candlestick Flare is considered to be a new source of air emissions and is subject to Regulation 2, Rule 2: New Source Review (NSR). Since the A-52 Flare satisfies a BARCT requirement (Regulation 8-34-301.4) 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. There are no available RACT determinations for candlestick flares. For sites subject to the MSW Landfill NSPS/EG, EPA allows the use of candlestick flares such as the one proposed with no NOx, CO, or other emission limitations. Therefore, this temporary candlestick flare is acceptable as a RACT control device for the landfill without emission limitations.

For the year 2005, maximum daily and maximum annual emissions from the combined operation of A-52 and A-50 are not expected to exceed the current maximum permitted emissions of A-50. Therefore, this application for a temporary flare will not result in any emission increases and Offsets are not required.

The PSD requirements of Regulation 2-2-304 do not apply, because this facility will not emit more than 250 tons/year of any pollutant.

New Source Review for Toxic Air Contaminants:

Although this application will not result in any net emission increases of any toxic air contaminants, the emissions from the temporary candlestick flare (A-52) are considered to be project emission increases pursuant to the District's definition of project in the Risk Management Policy. As shown in the attached tables, none of the toxic air contaminant emission rates from A-52 will exceed a risk screen trigger level. Therefore, a risk screening analysis is 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. A significant revision of the MFR Permit for this site has been proposed. This application will require another MFR Permit Revision. The MFR Permit revisions will be discussed in Application # 11757.

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 compliance problems with Regulation 8, Rule 34, Sections 303 and 305 due to the unexpected deterioration of the landfill gas flow rate that the A-50 Flare can properly destroy. The combined operation of a temporary candlestick flare and the existing enclosed flare (at a reduced flow rate) is expected to provide sufficient landfill gas control capacity to eliminate the surface leaks and positive wellhead pressures.

Landfill gas control devices are subject to either Regulation 8-34-301.3 or 8-34-301.4. Regulation 8-34-301.3 requires the use of an enclosed flare and limits the organic emissions from enclosed flares. The Hearing Board approved a variance for A-52 from the Regulation 8-34-301.3 requirement to have an enclosed flare. Therefore, this section is not applicable and A-52 will be subject to Regulation 8-34-301.4 instead, because this section applies to all control devices other than enclosed flares. Based on information from Perennial Energy, A-52 is expected to comply with either the 98% NMOC destruction efficiency requirement or the outlet concentration limit of 120 ppmv of NMOC as methane at 3% O_2 that is specified in Regulation 8-34-301.4.

Regulation 9, Rule 1:

Any landfill gas combustion devices are subject to Regulation 9-1-302, which limits the sulfur dioxide concentration in any exhaust gas to 300 ppmv of SO_2. Application # 10874 describes in detail how the A-50 Flare will comply with this limit while burning landfill gas from Redwood Landfill that is subject to a TRS limit of 1300 ppmv. The proposed A-52 Temporary Candlestick Flare will burn the same landfill gas and will have the same combustion air requirements. Therefore, A-52 will also comply with Regulation 9-1-302.

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-52 Temporary Candlestick Flare is subject to 40 CFR 60.752(b)(2)(iii)(A) and 60.18. The flare manufacturer has certified that the proposed flare will comply with 40 CFR 60.18. Specifically, the burner tip velocity meets the requirements of 60.18(c)(4). This control system will comply with 40 CFR 60.756(c) by having a thermocouple at the flame to continuously detect the presence of flame and a continuous gas flow monitor and recorder.

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. PERMIT CONDITIONS

The operation of the A-52 Temporary Candlestick Flare and the A-50 Landfill Gas Flare, during the variance period, will be subject to the following new permit condition. This condition will be deleted or modified at the conclusion of the variance period.

Condition # 22120

FOR: S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM; ABATED BY A-50 LANDFILL GAS FLARE AND A-52 TEMPORARY CANDLESTICK FLARE.

1. This condition applies during any time that the A-52 Temporary Candlestick Flare is operated. A-52 shall not be operated before March 16, 2005 and shall not operate after July 11, 2005. (Basis: Docket # 3484)

2. All collected landfill shall be abated by a landfill gas control system consisting of A-50 and A-52 operating in parallel. This landfill gas control system shall operate continuously whenever the landfill gas collection system is operating. Raw landfill gas shall not be vented to the atmosphere. (Basis: Docket # 3484, Regulation 8-34-301, and 40 CFR 60.752(b)(2)(iii))

3. The combined landfill gas flow rate to A-50 and A-52 shall not exceed 3,456,000 standard cubic feet per calendar day. In order to demonstrate compliance with this requirement, each flare shall be equipped with a continuous gas flow meter and recorder. The combined landfill gas flow rate to the two flares shall be recorded in a District approved log book on a daily basis. (Basis: Cumulative Increase, Regulations 8-34-501.10 and 8-34-508, and 40 CFR 60.756(c)(2))

4. The A-52 Temporary Candlestick Flare shall be equipped with a heat sensing device that continuously indicates the presence of a flame. (Basis: 40 CFR 60.756(c)(1))

5. The A-50 Landfill Gas Flare shall comply with all applicable requirements of Condition # 19867 during any time that A-50 and A-52 are operating. (Basis: RACT, Cumulative Increase, Toxic Risk Management Policy, and Regulations 8-34-301.3, 501.2, 501.3, and 507)

E. RECOMMENDATION

Issue an Authority to Construct and Permit to Operate for the following equipment:

A-52 Temporary Candlestick Flare, Perennial Energy Inc, FL-8-C, 1200 cfm; abating S-5 Redwood Landfill.

signed by Carol S. Allen — March 23, 2005

By: Carol S. Allen — Date

Senior Air Quality Engineer

H:\Pub_Data\TITLE V Permit Appls\1 ALL T5 Applications Here\A1179\Minor Rev – 11757-11948-12003\Propose\12003.doc

Plant # 1179, Redwood Landfill, Application # 12003 for A-52 Temporary Candlestick Flare

Comparison of Proposed and Maximum Permitted Daily Emission Rates

	Proposed A-52 at 1200 cfm Pounds/Day	Proposed A-50 at 1200 cfm Pounds/Day	Total Proposed A-52+A-50 Pounds/Day	Max Permit A-50 at 4000 cfm Pounds/Day	Source of Limit for A-50
NOx	95.04	51.84	146.88	172.80	App # 8501
CO	259.20	259.20	518.40	864.00	App # 8501
PM10	14.69	14.69	29.38	49.26	App # 8501
SO2	371.83	371.83	743.67	1239.60	App # 10874
POC	16.02	11.96	27.98	40.13	App # 8501
NPOC	0.10	0.04	0.14	0.14	App # 8501

Comparison of Proposed Emission Rates for 2005 and Maximum Permitted Annual Emission Rates

	Proposed A-52 at 1200 cfm Tons/Year	Proposed A-50 1200 cfm for 118 days Tons/Year	Proposed A-52+A-50 for 118 days Tons/Year	A-50/A-51 at 2400 cfm for rest of yr Tons/Year	Total Emissions for 2005	Max Permit A-50 at 1490 MM cf/yr Tons/Year
NOx	5.607	3.059	8.666	12.753	21.419	22.350
CO	15.293	15.293	30.586	63.763	94.349	111.750
PM10	0.867	0.867	1.733	3.613	5.346	6.371
SO2	7.172	7.172	14.344	29.904	44.248	52.411
POC	0.945	0.706	1.651	2.943	4.594	5.190
NPOC	0.006	0.002	0.008	0.010	0.018	0.018
	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year	Pounds/Year
Acrylonitrile	0.39	0.16	0.55	0.65	1.2	
Benzene	0.70	0.28	0.98	1.17	2.1	
1,3 Butadiene	0.40	0.16	0.56	0.66	1.2	
Carbon Tetrachloride	0.28	0.11	0.40	0.47	0.9	
Chloroform	0.22	0.09	0.31	0.37	0.7	
1,4 Dichlorobenzene	1.55	0.62	2.17	2.58	4.8	
1,1 Dichloroethane	0.39	0.16	0.55	0.65	1.2	
Ethylene Dibromide	0.35	0.14	0.49	0.58	1.1	
Ethylene Dichloride	0.18	0.07	0.26	0.30	0.6	
Formaldehyde	36.7	36.70	73.41	153.03	226.4	
Hydrogen Bromide	213.2	213.15	426.31	888.74	1315.0	
Hydrogen Chloride	384.2	384.21	768.42	1601.95	2370.4	
Hydrogen Fluoride	21.1	21.08	42.16	87.90	130.1	
Hydrogen Sulfide	152.61	152.61	305.21	636.29	941.5	
Methylene Chloride	0.72	0.29	1.00	1.19	2.2	
Perchloroethylene	1.97	0.79	2.75	3.28	6.0	
1,1,2,2 Tetrachloroethane	0.31	0.12	0.43	0.52	0.9	
1,1,2 Trichloroethane	0.24	0.10	0.34	0.40	0.7	
Trichloroethylene	0.87	0.35	1.21	1.44	2.7	
Vinyl Chloride	1.45	0.58	2.03	2.42	4.4	

APPENDIX B

APPLICATION # 11757

Bay Area Air Quality Management District

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

Engineering Evaluation
for
Application # 11757
New Landfill Gas Flare (A-51) and Condition Changes

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

TABLE OF CONTENTS

ENGINEERING EVALUATION

Redwood Landfill, Inc.; PLANT # 1179

APPLICATION # 11757

A. BACKGROUND

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 36.4 MM BTU/hour temporary candlestick flare (A-52), a 5 MM BTU/hour leachate evaporator (S-50, currently not operating), 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 and the A-52 Temporary Candlestick Flare are controlling the collected landfill gas from Redwood Landfill. The performance of the A-50 Landfill Gas Flare has been deteriorating throughout 2005. This flare is no longer capable of adequately controlling of the landfill gas that needs to be collected in order to prevent surface leaks from the landfill. In accordance with Application # 12003 and a variance approved pursuant to Docket # 3484, Redwood Landfill installed a temporary candlestick flare (A-52) in March 2005 so that landfill gas could be collected and controlled at an adequate rate.

To provide a permanent resolution of the A-50 performance deficit issue, Redwood Landfill accelerated the planned installation of a new enclosed flare (A-51) for this site. Redwood Landfill had planned to supplement the control system capacity of this site by requesting an Authority to Construct for a new enclosed landfill gas flare (A-51) in addition to requesting a landfill expansion in Application # 11371. Redwood Landfill is now requesting to separate their request for an additional enclosed flare from the landfill expansion project to expedite the installation of a replacement flare for A-50.

Pursuant to Application # 11757, Redwood Landfill is requesting an Authority to Construct for the A-51 Landfill Gas Flare (90 MM BTU/hour burning landfill gas exclusively). Redwood has requested that the combined operation of the A-50 and A-51 Flares be limited to the same throughput limits and emission rate limits that are currently applicable to A-50 alone. The combined operation of A-50 and A-51 will be functionally equivalent to the current permitted operation of A-50 alone. The A-51 Flare will have the same abatement efficiency as A-50 (both flares will be required to comply with Regulation 8-34-301.3) and will have no higher secondary pollutant emissions than A-50. Therefore, this application will not result in any emission increases. In addition, this application qualifies for the accelerated permit application procedures pursuant to Regulation 2-1-106.

B. EMISSIONS

Flare Emission Factors:

As discussed in detail in Applications # 8501 and # 10874, the A-50 Landfill Gas Flare is currently permitted to operate at a maximum landfill gas flow rate of 4000 scfm. Permit conditions for A-50 limit the landfill gas flow rate to 5,760,000 scf per day and 1,490,000,000 scf per year (based on gas with an HHV of 500 BTU/scf). Maximum permitted criteria pollutant emission factors for secondary emissions are based on a RACT limit for NOx emissions of 0.06 pounds/MM BTU, a RACT limit for CO emissions of 0.30 pounds/MM BTU, and an AP-42 emission factor of 0.0171 pounds PM10/MM BTU. Sulfur dioxide emissions are based on the new landfill gas sulfur content limits (Application # 10874) of 1300 ppmv of

TRS during any one day and 425 ppmv of TRS for annual average. Total NMOC emissions from this flare are based on the Regulation 8-34-301.3 outlet concentration limit of 30 ppmv of NMOC at 3% O_2, which is expected to result in a higher emission rate than the 98% destruction efficiency limit. POC emissions are the difference between NMOC and NPOC emissions and make up more than 99% of the total NMOC emissions. NPOC emissions were determined from the sum of the maximum expected emission rate for each individual NPOC compound (acetone chlorofluorocarbons, methylene chloride, and perchloroethylene).

The proposed A-51 Landfill Gas Flare will have a maximum capacity of 90 MM BTU/hour (~3000 scfm of LFG). The combined landfill gas flow rate to A-50 and A-51 will be limited to 5,760,000 scf per day (maximum capacity of A-51 alone is 4,346,600 scf/day) and 1,490,000,000 scf per year (based on gas with an HHV of 500 BTU/scf). All emission calculations for A-51 will be based on the same factors as those listed above for A-50. Specifically for A-51, maximum permitted criteria pollutant emission factors for secondary emissions are based on a RACT limit for NOx emissions of 0.06 pounds/MM BTU, a RACT limit for CO emissions of 0.30 pounds/MM BTU, and an AP-42 emission factor of 0.0171 pounds PM10/MM BTU. Sulfur dioxide emissions are based on the new landfill gas sulfur content limits (Application # 10874) of 1300 ppmv of TRS during any one day and 425 ppmv of TRS for annual average. Total NMOC emissions from this flare are based on the Regulation 8-34-301.3 outlet concentration limit of 30 ppmv of NMOC at 3% O_2, which is expected to result in a higher emission rate than the 98% destruction efficiency limit. POC emissions are the difference between NMOC and NPOC emissions and make up more than 99% of the total NMOC emissions. NPOC emissions were determined from the sum of the maximum expected emission rate for each individual NPOC compound (acetone chlorofluorocarbons, methylene chloride, and perchloroethylene).

Maximum permitted emissions from A-51 are summarized in Table 1.

Cumulative Emission Increases:

Although this application involves the addition of a new device to the landfill gas control system, this application will not result in any changes in the total permitted landfill gas flow rate to the entire landfill gas control system. After adding this new device (A-51), the landfill gas control system (A-50, A-51, and A-52 combined) will emit no more residual or secondary pollutants than the existing permitted landfill gas control system (A-50 and A-52). Therefore, this application will not result in any cumulative emission increases.

Table 1. Maximum Permitted Emissions from A-51 Landfill Gas Flare

Secondary Emissions from A-51	**Abated Emission Factor lbs / M scf**	**Abated Emission Factor lbs / MM BTU**	**Maximum Daily Emissions lbs/day**	**Maximum Annual Emissions lbs/year**	**Maximum Annual Emissions tons/year**
NOx, RACT Limit of 0.06 lbs/MM BTU	0.02982	0.06000	129.60	44427	22.213
CO, RACT Limit of 0.30 lbs/MM BTU	0.14908	0.30000	648.00	222134	111.067
PM10, AP-42 Emission Factor	0.00850	0.01710	36.95	12665	6.333
SO2, TRS Limit for LFG, C#19867, Part 18a	0.07035	0.14156	305.77	104818	52.409
Formaldehyde (CATEF for LFG Turbines)	0.00018	0.00036		268	
Hydrogen Bromide (Br ions = 5,000 ppbv in LFG)	0.00105	0.00210		1558	
Hydrogen Chloride (Cl ions = 20,000 ppbv in LFG)	0.00188	0.00379		2808	
Hydrogen Fluoride (F ions = 2,000 ppbv in LFG)	0.00010	0.00021		154	
Residual Emissions from A-51	**lbs / M scf**	**lbs / MM BTU**	**lbs/day**	**lbs/year**	**tons/year**
Total POC, maximum NMOC as methane – NPOC	6.92E-03	1.39E-02	30.10	10317	5.158
Total NPOC, sum of individual NPOCs	2.36E-05	4.75E-05	0.10	35	0.018
Acrylonitrile	7.68E-07	1.55E-06		1.1	
Benzene	1.37E-06	2.76E-06		2.0	
1,3 Butadiene	7.78E-07	1.57E-06		1.2	
Carbon Tetrachloride	5.56E-07	1.12E-06		0.8	
Chloroform	4.32E-07	8.69E-07		0.6	
1,4 Dichlorobenzene	3.04E-06	6.11E-06		4.5	
1,1 Dichloroethane	7.67E-07	1.54E-06		1.1	
Ethylene Dibromide	6.80E-07	1.37E-06		1.0	
Ethylene Dichloride	3.58E-07	7.20E-07		0.5	
Hydrogen Sulfide	7.45E-04	1.50E-03		1110.7	
Methylene Chloride	1.40E-06	2.83E-06		2.1	
Perchloroethylene	3.86E-06	7.76E-06		5.7	
1,1,2,2 Tetrachloroethane	6.07E-07	1.22E-06		0.9	
1,1,2 Trichloroethane	4.76E-07	9.58E-07		0.7	
Trichloroethylene	1.70E-06	3.42E-06		2.5	
Vinyl Chloride	2.84E-06	5.72E-06		4.2	

C. STATEMENT OF COMPLIANCE

Regulation 2, Rule 1:

This application is for a new abatement device (A-51) that is necessary to control collected landfill gas from the S-5 Redwood Landfill. The permitting of abatement equipment such as A-51 meets the requirements of District Regulation 2-1-312.2. Therefore, this application 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 project will not result in any cumulative emission increases and 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 also 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 (BACT and RACT):

The A-51 Landfill Gas Flare is considered to be a new source of air emissions and is subject to Regulation 2, Rule 2: New Source Review (NSR). Since residual POC emissions from A-51 will exceed 10 pounds/day of POC, this flare is required to comply with the BACT requirements for POC emissions from landfill gas flares.

BACT for POC: From the District's BACT/TBACT Workbook (Document # 80.1 12/16/91), BACT for POC emissions from a landfill gas flare is 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 A-51 Flare is an enclosed ground flare and meets the three criteria identified above. Therefore, A-51 satisfies the BACT requirements for POC emissions. To ensure adequate POC destruction, permit conditions will that this flare be maintained at a minimum combustion zone temperature of 1400 °F and will require Redwood Landfill to demonstrate compliance with this temperature limit by continuously monitoring and recording the combustion zone temperature.

Since the A-52 Flare satisfies a BARCT requirement (Regulation 8-34-301.3) for control of NMOC emissions from the S-5 Redwood Landfill and BACT for POC emissions from landfill gas flares, 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. As discussed below, A-51 will comply with RACT for each secondary pollutant.

RACT for NO_x and CO: The District's BACT/TBACT Workbook (Document # 80.1 12/16/91), the RACT limit for NO_x emissions from a landfill gas flare is 0.06 pounds NO_x/MM BTU. RACT for CO is the same as the requirements listed above for POC. The District typically issues a CO limit of 0.30 pounds CO/MM BTU for new flares. The District has permitted numerous other new landfill gas fired flares at these emission limits. While it may be feasible to achieve lower emission levels, the proposed NO_x and CO emission limits allow reasonable compliance margins and are accepted as RACT for landfill gas fired flares. Permit conditions will require the A-51 Flare to meet these NOx and CO RACT limits. Redwood Landfill will demonstrate compliance with these limits by conducting an annual source test. Annual source testing is a standard method of demonstrating compliance with NOx and CO RACT limits.

RACT for PM_{10}: PM_{10} emissions from landfill gas flares are low with emission rates that are similar to natural gas combustion. The use of fuel pretreatment systems to remove large particles and excess water are considered RACT for PM_{10} emissions from landfill gas fired flares. Since A-51 will be equipped with a fuel pretreatment system, it will comply with RACT for PM_{10} emissions.

RACT for SO_2: Application # 10874 contains a detailed discussion of the SO_2 RACT determination for the existing A-50 Landfill Gas Flare. The District determined that landfill gas sulfur treatment systems do not constitute a "reasonably" available control measure. Instead, RACT for SO_2 emissions from landfill gas combustion operations was determined to be compliance with reasonable landfill gas sulfur content limits. The Regulation 9-1-302 limit was used to establish a reasonable peak landfill gas sulfur content limit of 1300 ppmv as H_2S. An annual average landfill gas sulfur content limit of 425 ppmv (expressed as H_2S) was determined to be a reasonable RACT limit for the existing flare. These peak and annual average limits on the landfill gas sulfur content are reasonable limits for the new A-51 Landfill Gas Flare as well.

In accordance with the condition revisions approved pursuant to Application # 10874, Redwood Landfill is monitoring the landfill gas sulfur content on a weekly basis using draeger tubes to demonstrate compliance with the 1300 ppmv sulfur content limit. These weekly tests are supplemented by quarterly laboratory analysis for landfill gas sulfur content. All weekly and quarterly tests are averaged to demonstrate compliance with the annual average sulfur content limit of 425 ppmv of TRS in landfill gas. Fuel sulfur content monitoring is a standard method of demonstrating compliance with sulfur dioxide limits from combustion equipment. Quarterly monitoring has been found to be a sufficient monitoring frequency for most landfill gas combustion equipment. However, past testing has found that the landfill gas from this site has variable sulfur content with one test showing sulfur content at 90% of the permit limit. Therefore, weekly testing is necessary to ensure compliance with sulfur content limits at this site. The text of Parts 18 and 31 will be revised to clarify that the sulfur content limits are federally enforceable limits.

Regulation 2, Rule 2 (Offsets):

Maximum daily and maximum annual emissions from the combined operation of A-50, A-51, and A-52 will not exceed the current maximum permitted emissions of A-50 and A-52. Therefore, this application for a new flare (A-51) will not result in any criteria pollutant emission increases. Therefore, offsets are not required.

Regulation 2, Rule 2 (PSD):

The PSD requirements of Regulation 2-2-304 do not apply, because this facility will not emit more than 250 tons/year of any pollutant.

New Source Review for Toxic Air Contaminants:

This application will not result in any emission increases of any toxic air contaminants for the project because the maximum permitted landfill gas flow rate to the control system will not be revised and the maximum permitted emission rates from the combined operation of A-50, A-51, and A-52 will be no higher than the maximum permitted emission rates from the combined operation of A-50 and A-52. Therefore, a risk screening analysis is not required.

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. A significant revision of the MFR Permit for this site was proposed on April 12, 2005. The public comment period for this significant revision ends on May 16, 2005. No comments have been received to date.

The definition of significant revision is discussed below to determine if this current 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 and 226.6: This application does not involve the establishment of or change to any case-by-case emission limits or standards or any facility-specific determinations.
- Regulation 2-6-226.7: This application does not involve the incorporation of any requirements promulgated by the EPA.

Since this application does not involve any of the above actions, it does not require a significant revision. This application will involve MFR permit revisions other than those allowed under the definition of administrative amendment in Regulation 2-6-201. Therefore, this revision will be handled as a minor revision of the MFR Permit. The proposed MFR permit revisions related to this application are described in Application # 11948.

Regulation 6:

Regulation 6 applies to all combustion equipment including landfill gas flares such as A-51. Regulation 6-301 requires that the A-51 Flare have no visible emissions greater than Ringlemann 1 for more than 3 minutes in an hour. As with natural gas combustion, properly operated landfill gas combustion equipment will have no visible emissions. Therefore, A-51 is not expected to ever exceed this Ringelmann 1.0 limit. Since particulate emissions from A-51 are low (6.3 tons/year of PM10) and A-51 is not ever expected to exceed the Ringelmann 1 limit, monitoring to demonstrate compliance with this limit is not justified.

Regulation 6-310 limits particulate emissions from the flare to 0.15 grains/dscf. The maximum expected emissions from A-51 are calculated below:
(17 lbs PM10/10^6 ft^3 CH_4)*(0.50 ft^3 CH_4/ft^3 LFG)/(4.78469 ft^3 flue/1 ft^3 LFG)*(7000 grains/lb)
= 0.0124 grains PM10/dscf flue gas
The maximum expected PM10 emissions are less than 10% of the Regulation 6-310 limit. Particulate emissions from A-51 are low and the expected emissions are far below the limit. Furthermore, particulate emission testing is quite costly. Therefore, monitoring to demonstrate compliance with this limit is not justifiable.

Regulation 8, Rule 34:

The S-5 Redwood Landfill and A-51 Landfill Gas Flare are subject to Regulation 8, Rule 34 "Solid Waste Disposal Sites". Landfill gas control devices are subject to either Regulation 8-34-301.3 or 8-34-301.4. Regulation 8-34-301.3 requires the use of an enclosed flare and limits the organic emissions from enclosed flares. The proposed new flare (A-51) will comply with Regulation 8-34-301.3 by either achieving 98% NMOC destruction efficiency or emitting no more than 30 ppmv of NMOC as methane at 3% O_2. This flare is expected to comply with these limits.

Regulation 8-34-412 requires sites with landfill gas combustion devices to demonstrate compliance with the Regulation 8-34-301.3 limit by conducting annual source testing. Regulation 8-34-507 and 501.3 also require continuous temperature monitoring and recording to demonstrate that the flare is operating at the temperature necessary to maintain the destruction efficiency demonstrated by the annual source tests. This monitoring is adequate for demonstrating compliance with the Regulation 8-34-301.3 limits.

Regulation 9, Rule 1:

All landfill gas combustion devices are subject to Regulation 9-1-302, which limits the sulfur dioxide concentration in any exhaust gas to 300 ppmv of SO_2. As shown below, the peak sulfur content limit of 1300 ppmv of H_2S in the landfill gas will ensure compliance with this limit.

(1300 ft^3 H_2S/MM ft^3 LFG)*(1 ft^3 SO_2/1 ft^3 H_2S) /(4.78469 ft^3 flue at 0% O_2/1 ft^3 LFG)
= 272 ft^3 of SO_2/MM ft^3 flue gas at 0% oxygen = 272 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:
(272 ppmv of SO_2 at O% O_2)*(20.9-10)/(20.9-0) = 142 ppmv of SO_2

This landfill gas sulfur content limit results in maximum a SO_2 exhaust concentration that is less than half of the limit. Condition # 19867, Part 31 requires Redwood Landfill to monitor the landfill gas hydrogen sulfide content on a weekly basis using draeger tubes and to have the landfill gas tested in a laboratory for total reduced sulfur on a quarterly basis. Fuel sulfur content monitoring is a standard method of demonstrating compliance with sulfur dioxide limits from combustion equipment. Due to the high sulfur content at this site, weekly monitoring is necessary to ensure compliance with the Condition # 19867, Part 18 sulfur content limits.

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-51 Landfill Gas Flare is subject to 40 CFR 60.752(b)(2)(iii)(B), which requires landfill gas control systems to either meet 98% NMOC destruction efficiency or emit no more than 20 ppmv of NMOC as hexane (120 ppmv of NMOC as methane) at 3% O_2. The NSPS monitoring requirements (40 CFR 60.756(b)(1) and 60.758(b)(2)(i-ii)) include continuous monitoring of the combustion zone temperature and an initial compliance demonstration test. In the BAAQMD, the Regulation 8, Rule 34 standards and monitoring requirements are at least as stringent as the NSPS for Municipal Solid Waste (MSW) Landfills (40 CFR Part 60, Subpart WWW). Therefore, compliance with Regulation 8, Rule 34 constitutes compliance with the NSPS 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 by updating their SSM Plan to include this new flare.

D. PERMIT CONDITIONS

The A-51 and A-50 Landfill Gas Flares will be subject to Condition # 19867. In addition, the flares at this site are subject to Condition # 22120 during March 16, 2005 through July 11, 2005. During this time, a variance from the Regulation 8-34-301.3 requirement to use an enclosed flare is in effect, which allows the operation of the A-52 Temporary Candlestick Flare until the new A-51 Flare is fully operational. These conditions will be revised as indicated below in order to allow the start-up and operation of the new A-51 Landfill Gas Flare.

Condition # 19867

FOR: S-5~~,~~ REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM; A-18~~,~~ WATER SPRAYS; ~~AND~~ A-50~~,~~ LANDFILL GAS FLARE, AND A-51 LANDFILL GAS FLARE

No Changes to Parts 1-15.

16. During all times that the landfill gas collection system is operating, ~~A~~all collected landfill gas ~~collected by the Landfill Gas Collection System~~ shall be vented to either the A-50 Landfill Gas Flare alone or A-50 and the S-50 Leachate Vaporator. Upon start-up of the A-51 Landfill Gas Flare, collected landfill gas shall be vented to one of the following control system configurations: A-50 and A-51 operating concurrently; A-51 operating alone; A-50, A-51, and S-50 operating concurrently; or A-51 and S-50 operating concurrently. Up to 5 MM BTU/hour (approximately 167 scfm) of landfill gas may be diverted from ~~the~~ a flare and used as fuel at the S-50 Leachate Vaporator. In order to assure compliance with this condition, the A-50 and A-51 Landfill Gas Flares shall be equipped with local and remote alarms and auto restart capabilities.
(Basis: 8-34-301.1, 8-34-301.3, and 40 CFR 60.752(b)(2)(iii))

No Changes to Part 17.

18. If a gas characterization test indicates that this site's landfill gas contains organic compounds in excess of any of the concentrations listed in Parts 18a or 18b 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:~~
~~(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)

c. The concentration of total reduced sulfur compounds (TRS) in collected landfill gas shall not exceed a peak of 1300 ppmv (calculated as H2S) and shall not exceed an annual average of 425 ppmv (calculated as H2S). The peak and annual average TRS concentrations shall be measured and calculated in accordance with Parts 31a and 31b.
(Basis: Cumulative Increase, RACT, and Regulation 9-1-302)

19. The A-50 and A-51 Landfill Gas Flares shall be fired on landfill gas and may also be used to abate leachate vapors from the S-50 Leachate Vaporator. (Basis: RACT and Regulation 2-2-112)

20. The total combined throughput of landfill gas (with an HHV of 500 BTU/scf) to the A-50 Landfill Gas Flare and the A-51 Landfill Gas Flare shall not exceed 1,490,000,000 scf during any consecutive 12-month period and shall not exceed 5,760,000 scf during any one day. In order to demonstrate compliance with this condition, the A-50 and A-51 Flares shall be equipped with ~~a~~ one or more properly operating continuous gas flow meters. (Basis: Cumulative Increase, 40 CFR 60.756(b)(2)(i))

21. The A-50 and A-51 Landfill Gas Flares shall be operated continuously unless:
    a. The owner/operator of A-50 and A-51 is performing inspection and maintenance activities meeting the requirements of 8-34-113.
    b. The operation of A-50 is not required pursuant to Condition # 19867, Part 16.

    In order to assure compliance with this condition, the A-50 and A-51 Landfill Gas Flares shall be equipped with local and remote alarms and auto restart capability~~y~~ies. The A-50 and A-51 Flares and associated systems shall be properly maintained.
    (Basis: 8-34-301.1)

22. The temperature in the combustion zone of ~~A-50~~ each flare shall be maintained at ~~a~~ the minimum ~~of 1475 degrees F~~ temperature listed below, averaged over any 3-hour period. In order to demonstrate compliance with this condition, A-50 and A-51 shall each be equipped with a continuous temperature monitor and recorder. If a source test demonstrates compliance with all applicable requirements at a different temperature, the APCO may revise ~~this~~ these temperature limits, in accordance with the procedures identified in Regulation 2-6-414 or 2-6-415, based on the following criteria. The minimum combustion zone temperature for ~~A-2~~ the flare shall be equal to the average combustion zone temperature determined during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature is not less than 1400 degrees F.
    a. The minimum combustion zone temperature for A-50 is 1475 degrees F, averaged over any 3-hour period.
    b. Upon start-up of A-51, the minimum combustion zone temperature for A-51 is 1400 degrees F, averaged over any 3-hour period.

    (Basis: Toxic Risk Management Policy, Regulations 8-34-301.3 and 8-34-501.3, and 40 CFR 60.756(b)(1))

23. The A-50 and A-51 Landfill Gas Flares shall comply with the NMOC emission limit in Regulation 8-34-301.3.
    (Basis: Cumulative Increase, 8-34-301.3, and 40 CFR 60.752(b)(2)(iii)(B))

*24. The A-50 and A-51 Landfill Gas Flares shall each achieve a minimum destruction efficiency of 83% by weight for any EPA Hazardous Air Pollutants or any District toxic compounds that are determined to be present in the landfill gas or leachate vapors. (Basis: Toxic Risk Management Policy)

25. Nitrogen oxides (NO_x) emissions from ~~the A-50 Landfill Gas Flare~~ each enclosed flare (A-50 and A-51) shall not exceed 0.06 pounds of NO_x, calculated as NO_2, per million BTU. Compliance with this emission limit may be demonstrated by ~~meeting~~ not exceeding the following flue gas concentration limit~~.~~: ~~The concentration of NO_x in the flue gas from A-50 shall not exceed~~ 15 ppmv of NO_x, corrected to 15% oxygen, dry basis.
    (Basis: RACT and Offsets)

26. Carbon monoxide (CO) emissions from ~~the A-50 Landfill Gas Flare~~ each enclosed flare (A-50 And A-51) shall not exceed 0.30 pounds of CO per million BTU. Compliance with this emission limit may be demonstrated by ~~meeting~~ not exceeding the following flue gas concentration limit~~.~~: ~~The concentration of CO in the flue gas from A-50 shall not exceed~~ 123 ppmv of CO, corrected to 15% oxygen, dry basis.
(Basis: RACT and Cumulative Increase)

No Changes to Parts 27-28.

29. The Permit Holder shall maintain records of all planned and unanticipated shut downs of the A-50 and A-51 Flares and of any temperature excursions. The records shall include the date, time, duration, and reason for any shut down or excursion. Any unanticipated shut downs or temperature excursions shall be reported to the Enforcement Division immediately. All inspection and maintenance records, records of shut downs and excursions, gas flow records, temperature records, analytical results, source test results, and any other records required to demonstrate compliance with the above permit conditions, Regulation 8 Rule 34, or 40 CFR Part 60 Subpart WWW shall be retained on site for a minimum of five years and shall be made available to District staff upon request.
(Basis: 2-6-501, 8-34-501, 40 CFR 60.758)

30. In order to demonstrate compliance with Parts 23, 25, and 26 above, Regulation 8, Rule 34, Sections 301.3 and 412, and 40 CFR 60.8 and 60.752(b)(2)(iii)(B), the Permit Holder shall ensure that a District approved source test is conducted annually on the A-50 Landfill Gas Flare and the A-51 Landfill Gas Flare. Each annual source test shall determine the following:
    a. landfill gas flow rate to the flare (dry basis);
    b. concentrations (dry basis) of carbon dioxide (CO_2), nitrogen (N_2), oxygen (O_2), total hydrocarbons (THC), methane (CH_4), 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 NO_x, CO, NMOC, and O_2 in the flare stack gas;
    e. NMOC destruction efficiency achieved by the flare;
    f. NO_x and CO emission rates from the flare in units of pounds per MM BTU,
    g. average combustion zone temperature in the flare during the test period.

    The first source test for A-51 shall be conducted no later than 90 days after the initial start-up date for A-51. Each annual source test shall be conducted no earlier than 9 months and no later than 12 months after the previous annual source test. The Source Test Section of the District shall be contacted to obtain approval of the source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. The source test report shall be submitted to the Compliance and Enforcement Division and the Source Test Section within ~~45~~60 days of the test date.
    (Basis: Cumulative Increase, Toxic Risk Management Policy, RACT, Offsets, Regulations 8-34-301.3, 8-34-412, 40 CFR 60.8 and 40 CFR 60.752(b)(2)(iii)(B))

31. Landfill Gas Testing:
    a. The Permit Holder shall conduct a characterization of the landfill gas on a quarterly basis with one test concurrent with one of the annual source tests 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~~ a 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 laboratory analysis ~~test~~ report for the annual organic and sulfur compound gas characterization test shall be included with the Part 30 source test

report and shall be submitted to the Compliance and Enforcement Division and the Source Test Section within ~~45~~60 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 18c 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 18c. 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 18c. (Basis: Cumulative Increase, RACT, and Regulation 9-1-302).

No Changes to Part 32.

Condition # 22120

FOR: S-5 REDWOOD LANDFILL WITH GAS COLLECTION SYSTEM; ABATED BY A-50 LANDFILL GAS FLARE, A-51 LANDFILL GAS FLARE, AND A-52 TEMPORARY CANDLESTICK FLARE.

1. This condition applies during any time that the A-52 Temporary Candlestick Flare is operated. A-52 shall not be operated before March 16, 2005 and shall not operate after July 11, 2005. (Basis: Docket # 3484)

2. All collected landfill shall be abated by a landfill gas control system consisting of one or more enclosed flares (A-50 and/or A-51) operating in parallel with A-52 ~~operating in parallel~~. This landfill gas control system shall operate continuously whenever the landfill gas collection system is operating. Raw landfill gas shall not be vented to the atmosphere. (Basis: Docket # 3484, Regulation 8-34-301, and 40 CFR 60.752(b)(2)(iii))

3. The combined landfill gas flow rate to A-50 and A-52 shall not exceed 3,456,000 standard cubic feet per calendar day. In order to demonstrate compliance with this requirement, each flare shall be equipped with a continuous gas flow meter and recorder. The combined landfill gas flow rate to the two flares shall be recorded in a District approved log book on a daily basis. (Basis: Cumulative Increase, Regulations 8-34-501.10 and 8-34-508, and 40 CFR 60.756(c)(2))

4. The A-52 Temporary Candlestick Flare shall be equipped with a heat sensing device that continuously indicates the presence of a flame. (Basis: 40 CFR 60.756(c)(1))

5. The A-50 and A-51 Landfill Gas Flares shall comply with all applicable requirements of Condition # 19867 during any time that A-50, A-51, and A-52 are operating. (Basis: RACT, Cumulative Increase, Toxic Risk Management Policy, and Regulations 8-34-301.3, 501.2, 501.3, and 507)

E. RECOMMENDATION

Issue an Authority to Construct for the following equipment:

A-51 Landfill Gas Flare, Perennial Energy, Inc., Model # FL-144-38-E, 90 MM BTU/hour, 3000 cfm of landfill gas; abating S-5 Redwood Landfill.

signed by Carol S. Allen — May 17, 2005
By: Carol S. Allen — Date
Senior Air Quality Engineer

H:\Pub_Data\TITLE V Permit Appls\1 ALL T5 Applications Here\A1179\Minor Rev – 11757-11948-12003\Propose\11757.doc