State of Idaho
Department of Environmental Quality
Air Quality Division

AIR QUALITY PERMIT
STATEMENT OF BASIS

Permit to Construct No. P-2008.0078

Final

Payette County

Clay Peak Municipal Solid Waste Landfill

Payette, Idaho

Facility ID No. 075-00009

December 12, 2008

Darrin Pampaian D.P.

Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

Table of Contents

Acronyms, Units, and Chemical Nomenclature

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
Btu	British thermal unit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
HAP	Hazardous Air Pollutant
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
m	meter(s)
Mg	Megagram(s), equivalent to 1.102 tons
$\mu g/m^3$	micrograms per cubic meter
MMBtu	million British thermal units
MSW	Municipal Solid Waste
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PC	permit condition
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SIC	Standard Industrial Classification
SM	Synthetic Minor
SO_2	sulfur dioxide
SO_x	sulfur oxides
TAP	Toxic Air Pollutant
T2	Tier II operating permit
T2/PTC	Tier II operating permit and permit to construct
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. FACILITY INFORMATION

1.1 Facility Description

The Clay Peak Municipal Solid Waste Landfill (Clay Peak) is located at 2560 Highway 52 in Payette, ID. The landfill is owned and operated by Payette County. The landfill commenced operations in October 1993. The landfill is a portion of a rural 1,340 acre site of semi-arid mountainous terrain. The landfill has a maximum design capacity of approximately 27.6 million cubic yards which is divided into three cells. On average, the landfill receives 300 to 550 tons of garbage per day. At Clay Peak, it is estimated that approximately four acres of surface soil is disturbed at any one time during normal operations. This cumulative four acres involves three main activities at the landfill:

1) Covering garbage with dirt at the working face of the landfill,
2) Surface mining of dirt for use as cover, and
3) Aerating compost rows and screening compost.

Water trucks are used continuously to suppress fugitive dust emissions from vehicles driving on unpaved roads at the landfill.

1.2 Permitting Action and Facility Permitting History

This PTC is a modification of existing PTC P-020034 at an existing facility.

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

February 24, 2004 PTC permit P-020034 was issued (S).

2. APPLICATION SCOPE AND APPLICATION CHRONOLOGY

2.1 Application Scope

This application modifies PTC No. P-020034 by allowing the installation of three new landfill gas flares (for a total of seven flares) and the expansion of the landfill gas collection system.

2.2 Application Chronology

May 15, 2008	DEQ Received Permit to Construct application.
May 21, 2008	DEQ declared the application incomplete.
September 2, 2008	DEQ declared the application complete.
October 27, 2008	DEQ sent a draft PTC to the facility for review.
November 6, 2008	$5,000 PTC processing fee was received.
December 16, 2008	Final permit and statement of basis were issued.

3. TECHNICAL ANALYSIS

3.1 Emission Unit and Control Device

Table 3.1 EMISSION UNIT AND CONTROL DEVICE INFORMATION

Emission Unit /ID No.	Emissions Unit Description	Control Device Description	Emissions Discharge Point ID No. and/or Description
Municipal Waste Landfill	Landfill gas: 505,000 cubic feet per day	Seven flares	N/A
Landfill Gas Flare/NW Flare 1.1	Manufacturer: Landfill Services Corp. Model No.: CF-5 Rated Heat Input: 2.160 MMBtu/hr Date of Installation: 2001	N/A (Note: Is considered an emission control device when combusting landfill gas)	NW FLARE 1.1 Exit height: 12.00 ft Exit diameter: N/A[1] Exit flow rate: 30 acfm Exit temperature: 1,832 °F
Landfill Gas Flare/NE Flare 1.1	Manufacturer: Landfill Services Corp. Model No.: CF-5 Rated Heat Input: 2.160 MMBtu/hr Date of Installation: 2001	N/A (Note: Is considered an emission control device when combusting landfill gas)	NE FLARE 1.1 Exit height: 12.00 ft Exit diameter: N/A Exit flow rate: 30 acfm Exit temperature: 1,832 °F
Landfill Gas Flare/NW Flare 1.2	Manufacturer: Landfill Services Corp. Model No.: CF-5 Rated Heat Input: 2.160 MMBtu/hr Date of Installation: 2004	N/A (Note: Is considered an emission control device when combusting landfill gas)	NW FLARE 1.2 Exit height: 12.00 ft Exit diameter: N/A Exit flow rate: 30 acfm Exit temperature: 1,832 °F
Landfill Gas Flare/NE Flare 1.2	Manufacturer: Landfill Services Corp. Model No.: CF-5 Rated Heat Input: 2.160 MMBtu/hr Date of Installation: 2005	N/A (Note: Is considered an emission control device when combusting landfill gas)	NE FLARE 1.2 Exit height: 12.00 ft Exit diameter: N/A Exit flow rate: 30 acfm Exit temperature: 1,832 °F
Landfill Gas Flare/SW Flare 1.1	Manufacturer: Landfill Services Corp. Model No.: CF-5 Rated Heat Input: 2.160 MMBtu/hr Date of Installation: 2007	N/A (Note: Is considered an emission control device when combusting landfill gas)	SW FLARE 1.1 Exit height: 12.00 ft Exit diameter: N/A Exit flow rate: 30 acfm Exit temperature: 1,832 °F
Landfill Gas Flare/SE Flare 1.1	Manufacturer: Landfill Services Corp. Model No.: CF-5 Rated Heat Input: 2.160 MMBtu/hr Date of Installation: 2007	N/A (Note: Is considered an emission control device when combusting landfill gas)	SE FLARE 1.1 Exit height: 12.00 ft Exit diameter: N/A Exit flow rate: 30 acfm Exit temperature: 1,832 °F
Landfill Gas Flare/SE Flare 1.2	Manufacturer: Landfill Services Corp. Model No.: CF-5 Rated Heat Input: 2.160 MMBtu/hr Date of Installation: proposed for 2008	N/A (Note: Is considered an emission control device when combusting landfill gas)	SE FLARE 1.2 Exit height: 12.00 ft Exit diameter: N/A Exit flow rate: 30 acfm Exit temperature: 1,832 °F

[1] – The opening of a flare is not considered a stack since combustion takes place beyond the tip of the flare.

3.2 Emissions Inventory

An emissions inventory for the landfill and the flares was developed and submitted by the facility. The emissions inventory is based on landfill gas estimates using LandGEM, emission factors from sections in AP-42 (section 2.4-5), the sources and emission controls descriptions summarized in the application, and the following operational limits: a maximum H_2S concentration of 46.9 ppmv for the landfill gas, a maximum methane gas flow rate of 17.98 cfm, a total maximum gas flow rate of 46.9 cfm, a maximum NMOC flow rate of 0.0194 cfm (all determined using LandGEM), and worst-case maximum operation of the equipment of 8,760 hours per year.

A summary of the uncontrolled and controlled point source emissions are shown in Tables 3.2, 3.3, and 3.4. The controlled emissions inventories are provided in Appendix C.

Table 3.2 POST PROJECT UNCONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS

Emissions Unit	PM_{10} T/yr	SO_2 T/yr	NOx T/yr	CO T/yr	VOC T/yr	Lead lb/quarter
Point Sources Affected by this Permitting Action						
Landfill (Total gas sent to the flares to be combusted)[1]	0	0	0	0	8.005	0
Total, Point Sources	**0.0**	**0.0**	**0.0**	**0.0**	**8.005**	**0**
Process Fugitive/Volume Sources Affected by this Permitting Action						
Heavy Equipment Operation (Hvy Equip)	1.11	5.79	57.24	4.18	0	0
Landfill Road Dust (Road-1)	4.59	0	0	0	0	0
Earthwork activity (Dirt-1)	57.60	0	0	0	0	0
Wood chip/Grinding (Chip-1)	0.71	1.25	8.95	1.42	0	0
Rock and compost screening (SCR-1)	0.05	0.32	3.03	0.22	0	0
Rock and compost screening (SCR-2)	0.05	0.32	3.03	0.22	0	0
Total, Process Fugitives	**64.11**	**7.68**	**72.25**	**6.04**	**0.0**	**0**

[1] – Calculated using LandGEM to determine maximum uncontrolled NMOC emissions from the landfill (see Appendix B). Note: Worst-case (highest) VOC emissions from the landfill will occur in year 2011. This worst-case scenario was used to determine potential emissions from the flares.

Table 3.3 PRE-PROJECT CONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS

Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC		Lead	
	lb/hr[1]	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Sources Affected by the Permitting Action												
NW Flare 1.1	0.033	0.146	0.00552	0.0242	0.079	0.344	1.473	6.450	0.0019	0.008	0	0
NE Flare 1.1	0.033	0.146	0.00552	0.0242	0.079	0.344	1.473	6.450	0.0019	0.008	0	0
NW Flare 1.2	0.033	0.146	0.00552	0.0242	0.079	0.344	1.473	6.450	0.0019	0.008	0	0
NE Flare 1.2	0.033	0.146	0.00552	0.0242	0.079	0.344	1.473	6.450	0.0019	0.008	0	0
Pre-Project Totals	**0.13**	**0.58**	**0.02**	**0.10**	**0.32**	**1.38**	**5.89**	**25.80**	**0.01**	**0.03**	**0.0**	**0.0**

Table 3.4 POST PROJECT CONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS

Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC		Lead	
	lb/hr[1]	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Sources Affected by the Permitting Action												
NW Flare 1.1	0.033	0.146	0.00552	0.0242	0.079	0.344	1.472	6.449	0.0019	0.008	0	0
NE Flare 1.1	0.033	0.146	0.00552	0.0242	0.079	0.344	1.472	6.449	0.0019	0.008	0	0
NW Flare 1.2	0.033	0.146	0.00552	0.0242	0.079	0.344	1.472	6.449	0.0019	0.008	0	0
NE Flare 1.2	0.033	0.146	0.00552	0.0242	0.079	0.344	1.472	6.449	0.0019	0.008	0	0
SW Flare 1.1	0.033	0.146	0.00552	0.0242	0.079	0.344	1.472	6.449	0.0019	0.008	0	0
SE Flare 1.1	0.033	0.146	0.00552	0.0242	0.079	0.344	1.472	6.449	0.0019	0.008	0	0
SE Flare 1.2	0.033	0.146	0.00552	0.0242	0.079	0.344	1.472	6.449	0.0019	0.008	0	0
Post Project Totals	**0.23**	**1.02**	**0.04**	**0.17**	**0.55**	**2.41**	**10.30**	**45.14**	**0.01**	**0.06**	**0.0**	**0.0**

Table 3.5 CHANGES IN EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS

Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Sources Affected by the Permitting Action												
Pre-Project Totals	0.13	0.58	0.02	0.10	0.32	1.38	5.89	25.80	0.01	0.03	0	0
Post Project Totals	0.23	1.02	0.04	0.17	0.55	2.41	10.30	45.14	0.01	0.06	0	0
Facility Total Change in Emissions	**0.10**	**0.44**	**0.02**	**0.07**	**0.23**	**1.03**	**4.41**	**19.34**	**0.00**	**0.03**	**0**	**0**

Table 3.6 CONTROLLED TAP AND HAP EMISSIONS SUMMARY

Non-Carcinogenic Toxic Air Pollutants	24-hour Average Emissions Rates for Units at the Facility[1,2] (lb/hr)	Non-Carcinogenic Screening Emission Level[3] (lb/hr)	Exceeds Screening Level? (Y/N)
Acetone	2.898E-04	1.67	N
Carbon disulfide	3.148E-05	2	N
Carbonyl sulfide	2.098E-05	0.027	N
Chlorobenzene	2.006E-05	23.3	N
Dichlorobenzene	2.200E-05	20	N
Dichlorofluoromethane	1.908E-04	2.67	N
Ethylbenzene	3.482E-04	29	N
Ethyl chloride	5.980E-05	176	N
Ethyl mercaptan	1.019E-04	0.067	N
Hexane	4.054E-04	12	N
Hydrogen sulfide	8.748E-04	0.933	N
Isopropyl alcohol	2.14E-03	65.3	N
Mercury (total)	4.148E-08	0.001	N
Methyl chloroform	4.566E-05	127	N
Methyl ethyl ketone	3.650E-04	39.3	N
Methyl isobutyl ketone	1.356E-04	13.7	N
Methyl mercaptan	8.572E-05	0.033	N
Pentane	1.697E-04	118	N
Propylene dichloride	1.450E-05	23.133	N
Toluene - No or Unknown Co-disposal	2.562E-03	25	N
Toluene - Co-disposal	1.116E-02	25	N
Trichloroethylene	2.622E-04	17.93	N
Xylenes	9.080E-04	29	N

[1] – The facility modeled total emissions for all units located at the facility.
[2] – These emissions were calculated using LandGEM to determine maximum uncontrolled emissions from the landfill (see Appendix B). The flare is assumed to provide 98% control. Therefore, the emission levels presented have been reduced by 98%.

Table 3.7 CONTROLLED TAP AND HAP EMISSIONS SUMMARY

Carcinogenic Toxic Air Pollutants	Annual Average Emissions Rates for Units at the Facility[1,2] (lb/hr)	Carcinogenic Screening Emission Level[2] (lb/hr)	Exceeds Screening Level? (Y/N)
Acrylonitrile	2.38E-04	9.8E-05	Y
Benzene - No or Unknown Co-disposal	1.058E-04	8.0E-04	N
Benzene - Co-disposal	6.12E-04	8.0E-04	N
Carbon tetrachloride	4.386E-07	4.4E-04	N
Chloroform	2.560E-06	2.8E-04	N
1,1-Dichloroethane (ethylidene dichloride)	1.693E-04	2.5E-04	N
1,2-Dichloroethane (ethylene dichloride)	2.892E-05	2.5E-04	N
t-1 ,2-Dichloroethene	1.935E-04	2.5E-04	N
Dichloromethane (Methylene chloride)	8.476E-04	1.6E-03	N
Ethylene dibromide	1.339E-07	3.0E-05	N
Tetrachloroethylene	4.374E-04	1.3E-02	N
1,1,2,2-Tetrachloro-ethane	1.316E-04	1.1E-05	Y
Vinyl chloride	3.252E-04	9.4E-04	N

[1] – The facility modeled total emissions for all units located at the facility.
[2] – These emissions were calculated using LandGEM to determine maximum uncontrolled emissions from the landfill (see Appendix B). The flare is assumed to provide 98% control. Therefore, the emission levels presented have been reduced by 98%.

3.3 Ambient Air Quality Impact Analysis

Table 3.8 FULL IMPACT ANALYSIS RESULTS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Period	Facility Ambient Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Ambient Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}	24-hour	< 5.0	N/A	N/A	150	N/A
	Annual	< 1.0	N/A	N/A	50	N/A
NO_2	Annual	< 1.0	N/A	N/A	100	N/A
SO_2	3-hr	< 25	N/A	N/A	1,300	N/A
	24-hr	< 5	N/A	N/A	365	N/A
	Annual	< 1.0	N/A	N/A	80	N/A
CO	1-hour	< 2,000	N/A	N/A	40,000	N/A
	8-hour	< 500	N/A	N/A	10,000	N/A
Pb	Quarterly	N/A	N/A	N/A	1.5	N/A

N/A: The emissions rate is below the modeling threshold; modeling is not required in accordance with State of Idaho Air Quality Modeling Guidance DEQ Publication, December 2002, or alternative threshold approved by DEQ Modeling Coordinator.

Table 3.9 FULL IMPACT ANALYSIS RESULTS FOR TAPs

Pollutant	Average Period	Concentration (mg/m^3 or $\mu g/m^3$)	Regulatory AAC/AACC (mg/m^3 or $\mu g/m^3$)	Percent of Limit
Acrylonitrile	Annual	1.13E-3	1.5E-2	7.5%
1,1,2,2-Tetrachloro-ethane	Annual	6.24E-4	1.7E-2	3.7%

Note: AACs are in units of milligrams per meter cubed whereas AACCs are in units of micrograms per meter cubed. Convert AACs from milligrams per meter cubed to micrograms per meter cubed.

4. REGULATORY REVIEW

4.1 Attainment Designation (40 CFR 81.313)

Clay Peak is located in Payette County (AQCR 63) which is designated as unclassifiable/attainment for $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, and ozone for federal and state criteria air pollutants. Reference 40 CFR 81.313.

4.2 Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ..... Permit to Construct Required

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

4.3 Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 ..... Tier II Operating Permit

The facility does not have or is required to have a Tier II permit in accordance with IDAPA 58.01.01.401. Therefore, the requirements of IDAPA 58.01.01.401 do not apply.

4.4 Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 ..... Tier I Operating Permit

The facility is not a Tier I source in accordance with IDAPA 58.01.01.006.113. Therefore, the requirements of IDAPA 58.01.01.301 do not apply.

4.5 Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.312..... Visible Emissions

The flares located at this facility are subject to the state of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Condition 2.3.

4.6 Rules for the Control of Odors (IDAPA 58.01.01.775-776)

IDAPA 58.01.01.775-776..... Rules for the Control of Odors

The facility is subject to the general restrictions for the control of odors from the Clay Peak facility. This requirement is assured by Permit Condition 2.4.

4.7 Rules for Control of Incinerators-Emissions Limits (IDAPA 58.01.01.785)

IDAPA 58.01.01.785..... Rules for Control of Incinerators-Emissions Limits

The flares at this facility were previously determined to be subject to the particulate matter emission rate standard for refuse incinerators. This was because an incinerator is defined by IDAPA 58.01.01.006.55, which reads in part:

> "Any source consisting of a furnace and all appurtenances thereto designed for the destruction of refuse by burning. For purposes of these rules, the destruction of any combustible liquid or gaseous material by burning in a flare stack shall be considered incineration."

However, the intent of this Rule is to limit particulate matter emissions from the combustion of refuse. Refuse is not defined in IDAPA 58.01.01.006; therefore, the common definition is applied as follows.

> "Refuse: Something that is discarded as worthless or useless; rubbish; trash; garbage."

Since the flares at this facility combust landfill gas exclusively and do not combust "refuse," it was determined that this Rule does not apply.

4.8 Startup, Shutdown, Scheduled Maintenance, Safety Measures, Upset, and Breakdown (IDAPA 58.01.01.130-136)

IDAPA 58.01.01.312..... Startup, Shutdown, Scheduled Maintenance, Safety Measures, Upset, and Breakdown

The flares located at this facility are subject to the state of Idaho procedures and requirements to be implemented in all excess emissions events when the excess emissions are caused by startup, shutdown, scheduled maintenance, upset, or breakdown of any emissions unit or which occur as a direct result of the implementation of any safety measure. This requirement is assured by Permit Condition 2.5.

4.9 Rules for the Control of Open Burning - Flares (IDAPA 58.01.01.610)

IDAPA 58.01.01.610..... Rules for the Control of Open Burning - Flares

The flares located at this facility are subject to the rules for open burning, specifically IDAPA 58.01.01.610, which reads, in part:

> "Industrial flares, used for the combustion of flammable gases are allowable forms of open burning. Industrial flares are subject to permitting requirements in Sections 200 through 223."

IDAPA 58.01.01.200 - 223 establishes uniform procedures and requirements for the issuance of "Permits to Construct." This requirement is assured by Permit Condition 2.6.

4.10 PSD Classification (40 CFR 52.21)

40 CFR 52.21 ..... Prevention of Significant Deterioration Of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source, not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore, in accordance with 40 CFR 52.21(a)(2), the PSD requirements do not apply.

4.11 NSPS Applicability (40 CFR 60)

40 CFR 60-Subpart WWW Standards of Performance for Municipal Solid Waste Landfills

To be subject to Subpart WWW the MSW landfill must meet the requirements set forth in Subpart Cc - Emissions Guidelines and Compliance Times for MSW Landfills. In accordance with 40 CFR 60.33c of Subpart Cc, the MSW landfill must meet all of the following conditions to be applicable to this section. These conditions are:

- The landfill has accepted waste at any time since November 8, 1987,
- The landfill has a design capacity greater than or equal to 2.5 million Mg, and
- The landfill has a NMOC emission rate of 50 Mg per year or more.

Only the first condition applies to Clay Peak, as this facility was opened in October 1993. However, the second and third requirements do not apply to this landfill. The garbage design capacity for Clay Peak is 0.909 million Mg, which is less than the threshold of this subpart of 2.5 million Mg. Also, the third condition doesn't apply to Clay Peak because the NMOC emissions rate from Clay Peak is estimated to be 7.262 Mg/yr (this maximum emissions rate will occur in 2011), which is less than the 50 Mg/yr of this subpart requirement. The NMOC emissions rate for Clay Peak was determined using LandGEM v. 3.02 (see Appendix B).

Therefore, the requirements of 40 CFR 60, Subpart WWW, do not apply to Clay Peak.

4.12 NESHAP Applicability (40 CFR 61)

No NESHAP applies to this facility.

4.13 MACT Applicability (40 CFR 63)

No MACT applies to this facility because it is a minor source of HAPs.

4.14 CAM Applicability (40 CFR 64)

The facility is a minor facility for purposes of Title V, and is therefore not subject to CAM requirements.

4.15 Permit Conditions Review

This section describes the permit conditions for this initial permit or only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Old Table 1.1 from PTC No. P-020034 has been updated per current DEQ practices.

Old Permit Condition 2.1 from PTC No. P-020034 has been updated to reflect the addition of three flares per the Applicant.

Table 2.1 has been added to properly identify the sources of emissions at the facility per current DEQ practices.

Old Permit Condition 2.3 from PTC No. P-020034 has been removed since the requirements of IDAPA 58.01.01.786, *Emissions Limits*, are no longer applicable.

Old Permit Condition 2.8 from PTC No. P-020034 has been removed since the requirements of IDAPA 58.01.01.550, *Air Pollution Emergency Rule*, are no longer applicable.

Old Permit Conditions 2.9 through 2.11 from PTC No. P-020034 have been renumbered to new permit conditions 2.7 through 2.9. In addition, the language of new permit condition 2.7 has been updated to reflect that the flares have been operating at the facility since 2004.

New Permit Condition 2.10 has been added to require recordkeeping per General Condition 7 of the updated permit.

5. PERMIT FEES

Table 5.1 lists the processing fee associated with this permitting action. The facility is subject to a processing fee of $5,000.00 because its permitted annual change in emissions is 20.91 T/yr. Refer to the chronology for fee receipt dates.

Table 5.1 PTC PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)**	**Annual Emissions Change (T/yr)**
PM_{10}	0.44	0	0.44
SO_2	0.07	0	0.07
NO_x	1.03	0	1.03
CO	19.34	0	19.34
VOC	0.03	0	0.03
HAPS[1]	0	0	0
Totals:	**20.91**	**0.00**	**20.91**
Fee Due	**$5,000.00 Based upon an annual increase in emissions of > 10 T/yr to < 100 t/yr for a modification to an existing source**		

6. PUBLIC COMMENT

An opportunity for public comment period on the PTC application was provided from May 21, 2008, to June 5, 2008, in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application, and there was not a request for a public comment period on DEQ's proposed action.

Appendix A – AIRS Information

AIRS/AFS Facility-wide Classification Form

Facility Name: Clay Peak Municipal Solid Waste Landfill

Facility Location: 2560 Hwy. 52, Payette, ID 83661

Facility ID: 075-00009 **Date:** October 30, 2008

Project/Permit No.: P-2008.0078 **Completed By:** Darrin Pampaian

☒ Check if there are no changes to the facilitywide classification resulting from this action. (compare to form with last permit)

☐ Yes, this facility is an SM80 source.

Identify the facility's area classification as A (attainment), N (nonattainment), or U (unclassified) for the following pollutants:

	SO2	PM10	VOC
Area Classification:	U	U	U

DO NOT LEAVE ANY BLANK

Check one of the following:

☒ **SIP** [0] - Yes, this facility is subject to SIP requirements. (do not use if facility is Title V)

OR

☐ **Title V** [V] - Yes, this facility is subject to Title V requirements. (If yes, do not also use SIP listed above.)

For SIP or TV, identify the classification (A, SM, B, C, or ND) for the pollutants listed below. Leave box blank if pollutant is not applicable to facility.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	B	B	B	B	B	B	B

☐ **PSD** [6] - Yes, this facility has a PSD permit.

If yes, identify the pollutant(s) listed below that apply to PSD. Leave box blank if pollutant does not apply to PSD.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **NSR - NAA** [7] - Yes, this facility is subject to NSR nonattainment area (IDAPA 58.01.01.204) requirements.

Note: As of 9/12/08, Idaho has no facility in this category.

If yes, identify the pollutant(s) listed below that apply to NSR-NAA. Leave box blank if pollutant does not apply to NSR - NAA.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **NESHAP** [8] - Yes, this facility is subject to NESHAP (Part 61) requirements. (THAP only)

If yes, what CFR Subpart(s) is applicable?

☐ **NSPS** [9] - Yes, this facility is subject to NSPS (Part 60) requirements.

If yes, what CFR Subpart(s) is applicable?

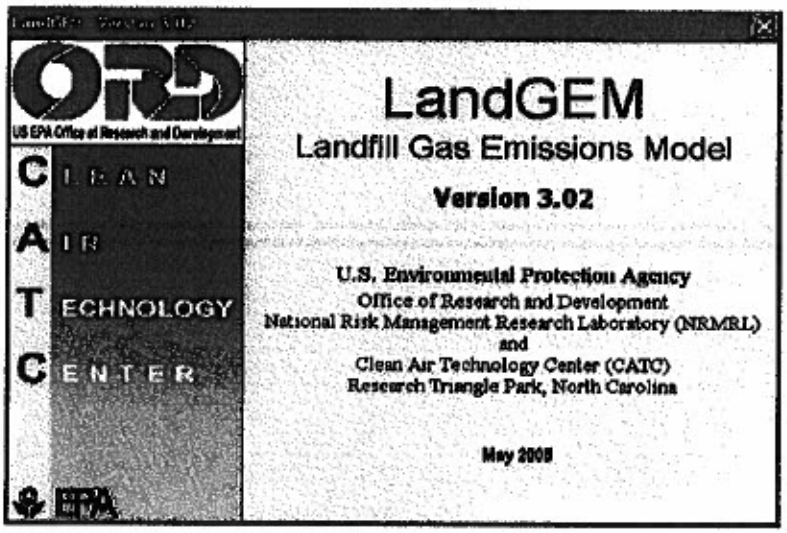
If yes, identify the pollutant(s) regulated by the subpart(s) listed above. Leave box blank if pollutant does not apply to the NSPS.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **MACT** [M] - Yes, this facility is subject to MACT (Part 63) requirements. (THAP only)

If yes, what CFR Subpart(s) is applicable?

Appendix B – LandGEM Calculations



Summary Report

Landfill Name or Identifier: Clay Peak Landfill, Payette County, Idaho

Date: Thursday, July 03, 2008

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH4} = annual methane generation in the year of the calculation ($m^3/year$)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate ($year^{-1}$)
L_o = potential methane generation capacity (m^3/Mg)
M_i = mass of waste accepted in the i^{th} year (Mg)
t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	1994	
Landfill Closure Year (with 80-year limit)	2010	
Actual Closure Year (without limit)	*2010*	
Have Model Calculate Closure Year?	Yes	
Waste Design Capacity	1,200,000	*short tons*

MODEL PARAMETERS

Methane Generation Rate, k	0.020	$year^{-1}$
Potential Methane Generation Capacity, L_o	100	m^3/Mg
NMOC Concentration	595	*ppmv as hexane*
Methane Content	55	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	Total landfill gas
Gas / Pollutant #2:	Methane
Gas / Pollutant #3:	Carbon dioxide
Gas / Pollutant #4:	NMOC

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-in-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1994	34,000	37,400	0	0
1995	49,500	54,450	34,000	37,400
1996	51,500	56,650	83,500	91,850
1997	52,000	57,200	135,000	148,500
1998	58,000	63,800	187,000	205,700
1999	69,000	75,900	245,000	269,500
2000	71,000	78,100	314,000	345,400
2001	71,000	78,100	385,000	423,500
2002	71,190	78,309	456,000	501,600
2003	73,296	80,626	527,190	579,909
2004	72,510	79,761	600,486	660,535
2005	70,064	77,070	672,996	740,296
2006	72,909	80,200	743,060	817,366
2007	72,652	79,917	815,969	897,566
2008	68,349	75,184	888,621	977,483
2009	68,349	75,184	956,970	1,052,667
2010	65,590	72,149	1,025,319	1,127,851
2011	0	0	1,090,909	1,200,000
2012	0	0	1,090,909	1,200,000
2013	0	0	1,090,909	1,200,000
2014	0	0	1,090,909	1,200,000
2015	0	0	1,090,909	1,200,000
2016	0	0	1,090,909	1,200,000
2017	0	0	1,090,909	1,200,000
2018	0	0	1,090,909	1,200,000
2019	0	0	1,090,909	1,200,000
2020	0	0	1,090,909	1,200,000
2021	0	0	1,090,909	1,200,000
2022	0	0	1,090,909	1,200,000
2023	0	0	1,090,909	1,200,000
2024	0	0	1,090,909	1,200,000
2025	0	0	1,090,909	1,200,000
2026	0	0	1,090,909	1,200,000
2027	0	0	1,090,909	1,200,000
2028	0	0	1,090,909	1,200,000
2029	0	0	1,090,909	1,200,000
2030	0	0	1,090,909	1,200,000
2031	0	0	1,090,909	1,200,000
2032	0	0	1,090,909	1,200,000
2033	0	0	1,090,909	1,200,000

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2034	0	0	1,090,909	1,200,000
2035	0	0	1,090,909	1,200,000
2036	0	0	1,090,909	1,200,000
2037	0	0	1,090,909	1,200,000
2038	0	0	1,090,909	1,200,000
2039	0	0	1,090,909	1,200,000
2040	0	0	1,090,909	1,200,000
2041	0	0	1,090,909	1,200,000
2042	0	0	1,090,909	1,200,000
2043	0	0	1,090,909	1,200,000
2044	0	0	1,090,909	1,200,000
2045	0	0	1,090,909	1,200,000
2046	0	0	1,090,909	1,200,000
2047	0	0	1,090,909	1,200,000
2048	0	0	1,090,909	1,200,000
2049	0	0	1,090,909	1,200,000
2050	0	0	1,090,909	1,200,000
2051	0	0	1,090,909	1,200,000
2052	0	0	1,090,909	1,200,000
2053	0	0	1,090,909	1,200,000
2054	0	0	1,090,909	1,200,000
2055	0	0	1,090,909	1,200,000
2056	0	0	1,090,909	1,200,000
2057	0	0	1,090,909	1,200,000
2058	0	0	1,090,909	1,200,000
2059	0	0	1,090,909	1,200,000
2060	0	0	1,090,909	1,200,000
2061	0	0	1,090,909	1,200,000
2062	0	0	1,090,909	1,200,000
2063	0	0	1,090,909	1,200,000
2064	0	0	1,090,909	1,200,000
2065	0	0	1,090,909	1,200,000
2066	0	0	1,090,909	1,200,000
2067	0	0	1,090,909	1,200,000
2068	0	0	1,090,909	1,200,000
2069	0	0	1,090,909	1,200,000
2070	0	0	1,090,909	1,200,000
2071	0	0	1,090,909	1,200,000
2072	0	0	1,090,909	1,200,000
2073	0	0	1,090,909	1,200,000

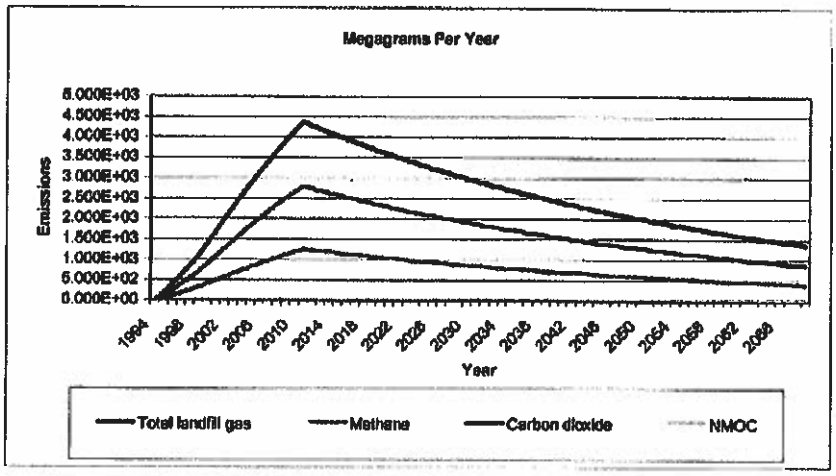
Pollutant Parameters

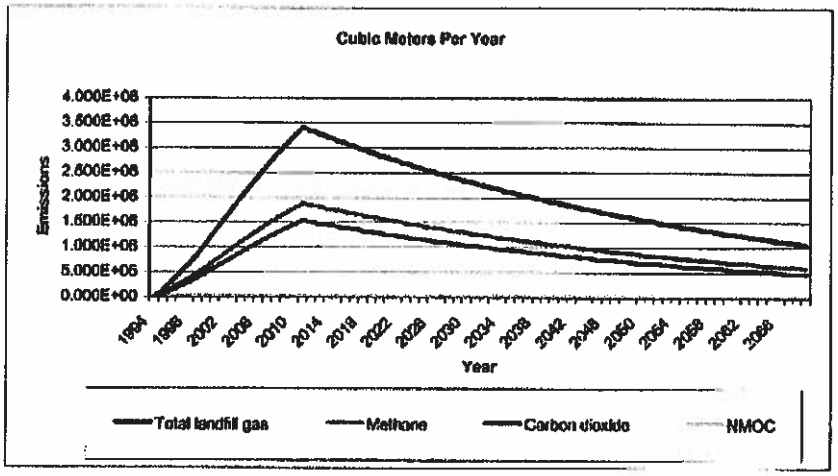
		Gas / Pollutant Default Parameters:		User-specified Pollutant Parameters:	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

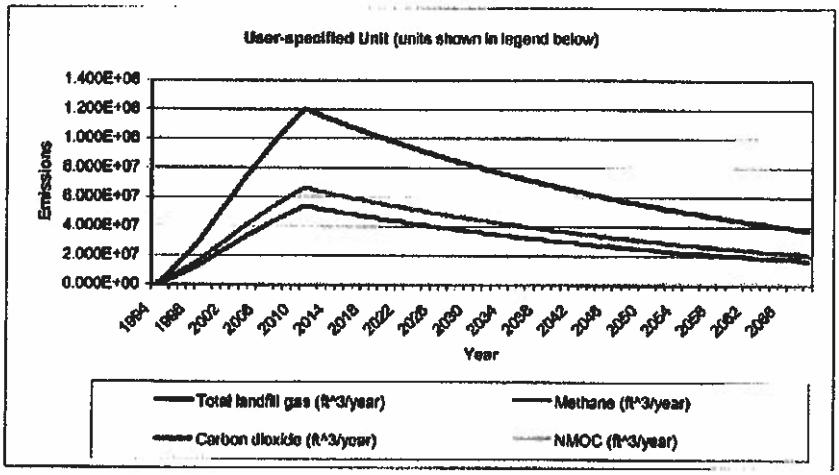
Pollutant Parameters (Continued)

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

Graphs


Megagrams Per Year
Emissions
5.000E+03
4.500E+03
4.000E+03
3.500E+03
3.000E+03
2.500E+03
2.000E+03
1.500E+03
1.000E+03
5.000E+02
0.000E+00
1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
4.000E+06
3.500E+06
3.000E+06
2.500E+06
2.000E+06
1.500E+06
1.000E+06
5.000E+05
0.000E+00
1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
1.400E+08
1.200E+08
1.000E+08
8.000E+07
6.000E+07
4.000E+07
2.000E+07
0.000E+00
1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066
Year
Total landfill gas (ft^3/year)
Methane (ft^3/year)
Carbon dioxide (ft^3/year)
NMOC (ft^3/year)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	(m^3/year)	(ft^3/year)	(Mg/year)	(m^3/year)	(ft^3/year)
1994	0	0	0	0	0	0
1995	1.571E+02	1.225E+05	4.327E+06	4.496E+01	6.739E+04	2.380E+06
1996	3.827E+02	2.985E+05	1.054E+07	1.095E+02	1.642E+05	5.798E+06
1997	6.131E+02	4.782E+05	1.689E+07	1.755E+02	2.630E+05	9.288E+06
1998	8.413E+02	6.561E+05	2.317E+07	2.407E+02	3.609E+05	1.274E+07
1999	1.093E+03	8.521E+05	3.009E+07	3.127E+02	4.687E+05	1.655E+07
2000	1.390E+03	1.084E+06	3.828E+07	3.977E+02	5.962E+05	2.105E+07
2001	1.690E+03	1.318E+06	4.656E+07	4.837E+02	7.251E+05	2.561E+07
2002	1.965E+03	1.548E+06	5.467E+07	5.681E+02	8.515E+05	3.007E+07
2003	2.275E+03	1.774E+06	6.266E+07	6.509E+02	9.757E+05	3.446E+07
2004	2.566E+03	2.003E+06	7.074E+07	7.350E+02	1.102E+06	3.891E+07
2005	2.852E+03	2.225E+06	7.858E+07	8.163E+02	1.224E+06	4.321E+07
2006	3.120E+03	2.433E+06	8.593E+07	8.928E+02	1.338E+06	4.726E+07
2007	3.395E+03	2.648E+06	9.350E+07	9.715E+02	1.456E+06	5.143E+07
2008	3.663E+03	2.857E+06	1.009E+08	1.048E+03	1.571E+06	5.549E+07
2009	3.907E+03	3.047E+06	1.076E+08	1.118E+03	1.676E+06	5.918E+07
2010	4.145E+03	3.233E+06	1.142E+08	1.186E+03	1.778E+06	6.279E+07
2011	4.366E+03	3.405E+06	1.203E+08	1.249E+03	1.873E+06	6.614E+07
2012	4.280E+03	3.338E+06	1.179E+08	1.225E+03	1.838E+06	6.483E+07
2013	4.195E+03	3.272E+06	1.155E+08	1.200E+03	1.799E+06	6.355E+07
2014	4.112E+03	3.207E+06	1.133E+08	1.177E+03	1.764E+06	6.229E+07
2015	4.030E+03	3.143E+06	1.110E+08	1.153E+03	1.729E+06	6.105E+07
2016	3.951E+03	3.081E+06	1.088E+08	1.131E+03	1.695E+06	5.985E+07
2017	3.872E+03	3.020E+06	1.067E+08	1.108E+03	1.661E+06	5.866E+07
2018	3.798E+03	2.960E+06	1.045E+08	1.086E+03	1.628E+06	5.750E+07
2019	3.721E+03	2.902E+06	1.025E+08	1.065E+03	1.596E+06	5.636E+07
2020	3.647E+03	2.844E+06	1.004E+08	1.044E+03	1.564E+06	5.524E+07
2021	3.575E+03	2.788E+06	9.846E+07	1.023E+03	1.533E+06	5.415E+07
2022	3.504E+03	2.733E+06	9.651E+07	1.003E+03	1.503E+06	5.308E+07
2023	3.434E+03	2.679E+06	9.460E+07	9.829E+02	1.473E+06	5.203E+07
2024	3.366E+03	2.626E+06	9.272E+07	9.634E+02	1.444E+06	5.100E+07
2025	3.300E+03	2.574E+06	9.089E+07	9.443E+02	1.415E+06	4.999E+07
2026	3.234E+03	2.523E+06	8.909E+07	9.256E+02	1.387E+06	4.900E+07
2027	3.170E+03	2.473E+06	8.732E+07	9.073E+02	1.360E+06	4.803E+07
2028	3.108E+03	2.424E+06	8.559E+07	8.893E+02	1.333E+06	4.708E+07
2029	3.046E+03	2.376E+06	8.390E+07	8.717E+02	1.307E+06	4.614E+07
2030	2.986E+03	2.329E+06	8.224E+07	8.545E+02	1.281E+06	4.523E+07
2031	2.927E+03	2.283E+06	8.061E+07	8.375E+02	1.256E+06	4.434E+07
2032	2.869E+03	2.237E+06	7.901E+07	8.210E+02	1.231E+06	4.346E+07
2033	2.812E+03	2.193E+06	7.745E+07	8.047E+02	1.206E+06	4.260E+07
2034	2.756E+03	2.150E+06	7.591E+07	7.888E+02	1.182E+06	4.175E+07
2035	2.702E+03	2.107E+06	7.441E+07	7.732E+02	1.159E+06	4.093E+07
2036	2.648E+03	2.065E+06	7.294E+07	7.578E+02	1.136E+06	4.012E+07
2037	2.596E+03	2.024E+06	7.149E+07	7.428E+02	1.113E+06	3.932E+07
2038	2.544E+03	1.984E+06	7.008E+07	7.281E+02	1.091E+06	3.854E+07
2039	2.494E+03	1.945E+06	6.869E+07	7.137E+02	1.070E+06	3.778E+07
2040	2.445E+03	1.907E+06	6.733E+07	6.998E+02	1.049E+06	3.703E+07
2041	2.398E+03	1.869E+06	6.600E+07	6.857E+02	1.028E+06	3.630E+07
2042	2.349E+03	1.832E+06	6.469E+07	6.721E+02	1.007E+06	3.558E+07
2043	2.302E+03	1.796E+06	6.341E+07	6.588E+02	9.875E+05	3.488E+07

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m^3/year)	(ft^3/year)	(Mg/year)	(m^3/year)	(ft^3/year)
2044	2.257E+03	1.760E+06	6.215E+07	6.458E+02	9.660E+05	3.418E+07
2045	2.212E+03	1.725E+06	6.092E+07	6.330E+02	9.468E+05	3.351E+07
2046	2.168E+03	1.691E+06	5.972E+07	6.205E+02	9.300E+05	3.284E+07
2047	2.125E+03	1.657E+06	5.853E+07	6.082E+02	9.116E+05	3.219E+07
2048	2.083E+03	1.625E+06	5.738E+07	5.961E+02	8.936E+05	3.156E+07
2049	2.042E+03	1.592E+06	5.624E+07	5.843E+02	8.759E+05	3.093E+07
2050	2.001E+03	1.561E+06	5.513E+07	5.728E+02	8.585E+05	3.032E+07
2051	1.962E+03	1.530E+06	5.403E+07	5.614E+02	8.415E+05	2.972E+07
2052	1.923E+03	1.500E+06	5.296E+07	5.503E+02	8.249E+05	2.913E+07
2053	1.885E+03	1.470E+06	5.192E+07	5.394E+02	8.085E+05	2.855E+07
2054	1.848E+03	1.441E+06	5.089E+07	5.287E+02	7.925E+05	2.799E+07
2055	1.811E+03	1.412E+06	4.988E+07	5.183E+02	7.768E+05	2.743E+07
2056	1.775E+03	1.384E+06	4.889E+07	5.080E+02	7.614E+05	2.689E+07
2057	1.740E+03	1.357E+06	4.792E+07	4.979E+02	7.464E+05	2.636E+07
2058	1.706E+03	1.330E+06	4.697E+07	4.881E+02	7.316E+05	2.584E+07
2059	1.672E+03	1.304E+06	4.604E+07	4.784E+02	7.171E+05	2.532E+07
2060	1.639E+03	1.278E+06	4.513E+07	4.689E+02	7.029E+05	2.482E+07
2061	1.606E+03	1.253E+06	4.424E+07	4.597E+02	6.890E+05	2.433E+07
2062	1.574E+03	1.228E+06	4.336E+07	4.506E+02	6.753E+05	2.385E+07
2063	1.543E+03	1.204E+06	4.250E+07	4.416E+02	6.620E+05	2.338E+07
2064	1.513E+03	1.180E+06	4.166E+07	4.329E+02	6.489E+05	2.291E+07
2065	1.483E+03	1.156E+06	4.084E+07	4.243E+02	6.360E+05	2.246E+07
2066	1.453E+03	1.133E+06	4.003E+07	4.159E+02	6.234E+05	2.202E+07
2067	1.425E+03	1.111E+06	3.924E+07	4.077E+02	6.111E+05	2.158E+07
2068	1.396E+03	1.089E+06	3.846E+07	3.996E+02	5.990E+05	2.116E+07
2069	1.369E+03	1.067E+06	3.770E+07	3.917E+02	5.871E+05	2.073E+07
2070	1.342E+03	1.046E+06	3.695E+07	3.839E+02	5.755E+05	2.032E+07
2071	1.315E+03	1.026E+06	3.622E+07	3.763E+02	5.641E+05	1.992E+07
2072	1.289E+03	1.005E+06	3.550E+07	3.689E+02	5.529E+05	1.953E+07
2073	1.263E+03	9.854E+05	3.480E+07	3.616E+02	5.420E+05	1.914E+07
2074	1.238E+03	9.659E+05	3.411E+07	3.544E+02	5.312E+05	1.876E+07
2075	1.214E+03	9.468E+05	3.344E+07	3.474E+02	5.207E+05	1.839E+07
2076	1.190E+03	9.280E+05	3.277E+07	3.405E+02	5.104E+05	1.803E+07
2077	1.166E+03	9.096E+05	3.212E+07	3.338E+02	5.003E+05	1.767E+07
2078	1.143E+03	8.916E+05	3.149E+07	3.272E+02	4.904E+05	1.732E+07
2079	1.121E+03	8.740E+05	3.086E+07	3.207E+02	4.807E+05	1.698E+07
2080	1.098E+03	8.567E+05	3.025E+07	3.143E+02	4.712E+05	1.664E+07
2081	1.077E+03	8.397E+05	2.965E+07	3.081E+02	4.618E+05	1.631E+07
2082	1.055E+03	8.231E+05	2.907E+07	3.020E+02	4.527E+05	1.599E+07
2083	1.034E+03	8.068E+05	2.849E+07	2.960E+02	4.437E+05	1.567E+07
2084	1.014E+03	7.908E+05	2.793E+07	2.902E+02	4.349E+05	1.536E+07
2085	9.939E+02	7.752E+05	2.737E+07	2.844E+02	4.263E+05	1.506E+07
2086	9.742E+02	7.598E+05	2.683E+07	2.788E+02	4.179E+05	1.476E+07
2087	9.549E+02	7.448E+05	2.630E+07	2.733E+02	4.096E+05	1.447E+07
2088	9.360E+02	7.300E+05	2.578E+07	2.679E+02	4.016E+05	1.418E+07
2089	9.175E+02	7.156E+05	2.527E+07	2.626E+02	3.936E+05	1.390E+07
2090	8.993E+02	7.014E+05	2.477E+07	2.574E+02	3.858E+05	1.362E+07
2091	8.815E+02	6.875E+05	2.428E+07	2.523E+02	3.781E+05	1.335E+07
2092	8.640E+02	6.739E+05	2.380E+07	2.473E+02	3.706E+05	1.309E+07
2093	8.469E+02	6.605E+05	2.333E+07	2.424E+02	3.633E+05	1.283E+07
2094	8.302E+02	6.475E+05	2.287E+07	2.376E+02	3.561E+05	1.258E+07

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m^3/year)	(ft^3/year)	(Mg/year)	(m^3/year)	(ft^3/year)
2095	8.137E+02	6.346E+05	2.241E+07	2.329E+02	3.491E+05	1.233E+07
2096	7.976E+02	6.221E+05	2.197E+07	2.283E+02	3.421E+05	1.208E+07
2097	7.818E+02	6.098E+05	2.153E+07	2.237E+02	3.354E+05	1.184E+07
2098	7.663E+02	5.977E+05	2.111E+07	2.193E+02	3.287E+05	1.161E+07
2099	7.512E+02	5.858E+05	2.069E+07	2.150E+02	3.222E+05	1.138E+07
2100	7.363E+02	5.742E+05	2.028E+07	2.107E+02	3.158E+05	1.115E+07
2101	7.217E+02	5.629E+05	1.988E+07	2.065E+02	3.096E+05	1.093E+07
2102	7.074E+02	5.517E+05	1.948E+07	2.024E+02	3.035E+05	1.072E+07
2103	6.934E+02	5.408E+05	1.910E+07	1.984E+02	2.974E+05	1.050E+07
2104	6.797E+02	5.301E+05	1.872E+07	1.945E+02	2.916E+05	1.030E+07
2105	6.662E+02	5.196E+05	1.835E+07	1.907E+02	2.858E+05	1.009E+07
2106	6.530E+02	5.093E+05	1.799E+07	1.869E+02	2.801E+05	9.892E+06
2107	6.401E+02	4.992E+05	1.763E+07	1.832E+02	2.746E+05	9.697E+06
2108	6.274E+02	4.893E+05	1.728E+07	1.796E+02	2.691E+05	9.505E+06
2109	6.150E+02	4.797E+05	1.694E+07	1.760E+02	2.638E+05	9.316E+06
2110	6.028E+02	4.702E+05	1.660E+07	1.725E+02	2.586E+05	9.132E+06
2111	5.909E+02	4.608E+05	1.627E+07	1.691E+02	2.535E+05	8.951E+06
2112	5.792E+02	4.517E+05	1.595E+07	1.657E+02	2.484E+05	8.774E+06
2113	5.677E+02	4.428E+05	1.564E+07	1.625E+02	2.436E+05	8.600E+06
2114	5.566E+02	4.340E+05	1.533E+07	1.593E+02	2.387E+05	8.430E+06
2115	5.455E+02	4.254E+05	1.502E+07	1.561E+02	2.340E+05	8.263E+06
2116	5.347E+02	4.170E+05	1.473E+07	1.530E+02	2.293E+05	8.099E+06
2117	5.241E+02	4.087E+05	1.443E+07	1.500E+02	2.248E+05	7.939E+06
2118	5.137E+02	4.006E+05	1.415E+07	1.470E+02	2.204E+05	7.782E+06
2119	5.035E+02	3.927E+05	1.387E+07	1.441E+02	2.160E+05	7.628E+06
2120	4.935E+02	3.849E+05	1.359E+07	1.412E+02	2.117E+05	7.477E+06
2121	4.838E+02	3.773E+05	1.332E+07	1.384E+02	2.075E+05	7.329E+06
2122	4.742E+02	3.698E+05	1.306E+07	1.357E+02	2.034E+05	7.183E+06
2123	4.648E+02	3.625E+05	1.280E+07	1.330E+02	1.994E+05	7.041E+06
2124	4.556E+02	3.553E+05	1.255E+07	1.304E+02	1.954E+05	6.902E+06
2125	4.466E+02	3.483E+05	1.230E+07	1.278E+02	1.916E+05	6.765E+06
2126	4.377E+02	3.414E+05	1.206E+07	1.253E+02	1.878E+05	6.631E+06
2127	4.291E+02	3.346E+05	1.182E+07	1.228E+02	1.841E+05	6.500E+06
2128	4.206E+02	3.280E+05	1.158E+07	1.204E+02	1.804E+05	6.371E+06
2129	4.122E+02	3.215E+05	1.135E+07	1.180E+02	1.768E+05	6.245E+06
2130	4.041E+02	3.152E+05	1.113E+07	1.156E+02	1.733E+05	6.121E+06
2131	3.961E+02	3.089E+05	1.091E+07	1.133E+02	1.699E+05	6.000E+06
2132	3.882E+02	3.028E+05	1.069E+07	1.111E+02	1.665E+05	5.881E+06
2133	3.806E+02	2.968E+05	1.048E+07	1.089E+02	1.632E+05	5.765E+06
2134	3.730E+02	2.909E+05	1.027E+07	1.067E+02	1.600E+05	5.651E+06

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m^3/year)	(ft^3/year)	(Mg/year)	(m^3/year)	(ft^3/year)
1994	0	0	0	0	0	0
1995	1.009E+02	5.514E+04	1.947E+06	2.613E-01	7.291E+01	2.575E+03
1996	2.459E+02	1.343E+05	4.744E+06	6.366E-01	1.776E+02	6.272E+03
1997	3.939E+02	2.152E+05	7.599E+06	1.020E+00	2.845E+02	1.005E+04
1998	5.405E+02	2.953E+05	1.043E+07	1.399E+00	3.904E+02	1.379E+04
1999	7.019E+02	3.835E+05	1.354E+07	1.817E+00	5.070E+02	1.791E+04
2000	8.929E+02	4.878E+05	1.723E+07	2.312E+00	6.449E+02	2.278E+04
2001	1.086E+03	5.933E+05	2.095E+07	2.812E+00	7.844E+02	2.770E+04
2002	1.275E+03	6.967E+05	2.460E+07	3.302E+00	9.211E+02	3.253E+04
2003	1.461E+03	7.983E+05	2.819E+07	3.784E+00	1.056E+03	3.728E+04
2004	1.650E+03	9.014E+05	3.183E+07	4.272E+00	1.192E+03	4.209E+04
2005	1.833E+03	1.001E+06	3.535E+07	4.745E+00	1.324E+03	4.675E+04
2006	2.004E+03	1.095E+06	3.867E+07	5.189E+00	1.448E+03	5.113E+04
2007	2.181E+03	1.191E+06	4.208E+07	5.647E+00	1.575E+03	5.563E+04
2008	2.353E+03	1.286E+06	4.540E+07	6.094E+00	1.700E+03	6.003E+04
2009	2.510E+03	1.371E+06	4.842E+07	6.498E+00	1.813E+03	6.402E+04
2010	2.663E+03	1.455E+06	5.138E+07	6.895E+00	1.924E+03	6.793E+04
2011	2.805E+03	1.532E+06	5.411E+07	7.262E+00	2.026E+03	7.155E+04
2012	2.749E+03	1.502E+06	5.304E+07	7.119E+00	1.986E+03	7.013E+04
2013	2.695E+03	1.472E+06	5.199E+07	6.978E+00	1.947E+03	6.875E+04
2014	2.642E+03	1.443E+06	5.096E+07	6.840E+00	1.908E+03	6.738E+04
2015	2.589E+03	1.415E+06	4.995E+07	6.704E+00	1.870E+03	6.605E+04
2016	2.538E+03	1.387E+06	4.898E+07	6.571E+00	1.833E+03	6.474E+04
2017	2.488E+03	1.359E+06	4.800E+07	6.441E+00	1.797E+03	6.346E+04
2018	2.439E+03	1.332E+06	4.704E+07	6.314E+00	1.761E+03	6.220E+04
2019	2.390E+03	1.306E+06	4.611E+07	6.189E+00	1.727E+03	6.097E+04
2020	2.343E+03	1.280E+06	4.520E+07	6.066E+00	1.692E+03	5.976E+04
2021	2.296E+03	1.255E+06	4.431E+07	5.946E+00	1.659E+03	5.858E+04
2022	2.251E+03	1.230E+06	4.343E+07	5.828E+00	1.626E+03	5.742E+04
2023	2.206E+03	1.205E+06	4.257E+07	5.713E+00	1.594E+03	5.628E+04
2024	2.163E+03	1.182E+06	4.173E+07	5.600E+00	1.562E+03	5.517E+04
2025	2.120E+03	1.158E+06	4.090E+07	5.489E+00	1.531E+03	5.408E+04
2026	2.078E+03	1.135E+06	4.009E+07	5.380E+00	1.501E+03	5.301E+04
2027	2.037E+03	1.113E+06	3.930E+07	5.274E+00	1.471E+03	5.196E+04
2028	1.996E+03	1.091E+06	3.852E+07	5.169E+00	1.442E+03	5.093E+04
2029	1.957E+03	1.069E+06	3.775E+07	5.067E+00	1.414E+03	4.992E+04
2030	1.918E+03	1.048E+06	3.701E+07	4.967E+00	1.386E+03	4.893E+04
2031	1.880E+03	1.027E+06	3.627E+07	4.868E+00	1.358E+03	4.796E+04
2032	1.843E+03	1.007E+06	3.556E+07	4.772E+00	1.331E+03	4.701E+04
2033	1.806E+03	9.869E+05	3.485E+07	4.677E+00	1.305E+03	4.608E+04
2034	1.771E+03	9.673E+05	3.416E+07	4.585E+00	1.279E+03	4.517E+04
2035	1.736E+03	9.482E+05	3.349E+07	4.494E+00	1.254E+03	4.427E+04
2036	1.701E+03	9.294E+05	3.282E+07	4.405E+00	1.229E+03	4.340E+04
2037	1.668E+03	9.110E+05	3.217E+07	4.318E+00	1.205E+03	4.254E+04
2038	1.636E+03	8.930E+05	3.154E+07	4.232E+00	1.181E+03	4.170E+04
2039	1.602E+03	8.753E+05	3.091E+07	4.148E+00	1.157E+03	4.087E+04
2040	1.570E+03	8.580E+05	3.030E+07	4.066E+00	1.134E+03	4.006E+04
2041	1.539E+03	8.410E+05	2.970E+07	3.986E+00	1.112E+03	3.927E+04
2042	1.509E+03	8.243E+05	2.911E+07	3.907E+00	1.090E+03	3.849E+04
2043	1.479E+03	8.080E+05	2.853E+07	3.829E+00	1.068E+03	3.773E+04

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m^3/year)	(ft^3/year)	(Mg/year)	(m^3/year)	(ft^3/year)
2044	1.450E+03	7.920E+05	2.797E+07	3.754E+00	1.047E+03	3.698E+04
2045	1.421E+03	7.763E+05	2.742E+07	3.679E+00	1.026E+03	3.625E+04
2046	1.393E+03	7.609E+05	2.687E+07	3.606E+00	1.006E+03	3.553E+04
2047	1.365E+03	7.459E+05	2.634E+07	3.535E+00	9.862E+02	3.483E+04
2048	1.338E+03	7.311E+05	2.582E+07	3.465E+00	9.667E+02	3.414E+04
2049	1.312E+03	7.166E+05	2.531E+07	3.396E+00	9.475E+02	3.346E+04
2050	1.286E+03	7.024E+05	2.481E+07	3.329E+00	9.288E+02	3.280E+04
2051	1.260E+03	6.885E+05	2.432E+07	3.263E+00	9.104E+02	3.215E+04
2052	1.235E+03	6.749E+05	2.383E+07	3.199E+00	8.924E+02	3.151E+04
2053	1.211E+03	6.615E+05	2.336E+07	3.135E+00	8.747E+02	3.089E+04
2054	1.187E+03	6.484E+05	2.290E+07	3.073E+00	8.574E+02	3.028E+04
2055	1.163E+03	6.356E+05	2.245E+07	3.012E+00	8.404E+02	2.968E+04
2056	1.140E+03	6.230E+05	2.200E+07	2.953E+00	8.237E+02	2.909E+04
2057	1.118E+03	6.107E+05	2.157E+07	2.894E+00	8.074E+02	2.851E+04
2058	1.096E+03	5.986E+05	2.114E+07	2.837E+00	7.914E+02	2.795E+04
2059	1.074E+03	5.867E+05	2.072E+07	2.781E+00	7.758E+02	2.740E+04
2060	1.053E+03	5.751E+05	2.031E+07	2.726E+00	7.604E+02	2.685E+04
2061	1.032E+03	5.637E+05	1.991E+07	2.672E+00	7.454E+02	2.632E+04
2062	1.011E+03	5.526E+05	1.951E+07	2.619E+00	7.306E+02	2.580E+04
2063	9.914E+02	5.416E+05	1.913E+07	2.567E+00	7.161E+02	2.529E+04
2064	9.718E+02	5.309E+05	1.875E+07	2.516E+00	7.020E+02	2.479E+04
2065	9.525E+02	5.204E+05	1.838E+07	2.466E+00	6.881E+02	2.430E+04
2066	9.337E+02	5.101E+05	1.801E+07	2.417E+00	6.744E+02	2.382E+04
2067	9.152E+02	5.000E+05	1.766E+07	2.370E+00	6.611E+02	2.335E+04
2068	8.971E+02	4.901E+05	1.731E+07	2.323E+00	6.480E+02	2.288E+04
2069	8.793E+02	4.804E+05	1.696E+07	2.277E+00	6.352E+02	2.243E+04
2070	8.619E+02	4.709E+05	1.663E+07	2.232E+00	6.226E+02	2.199E+04
2071	8.448E+02	4.615E+05	1.630E+07	2.187E+00	6.102E+02	2.155E+04
2072	8.281E+02	4.524E+05	1.598E+07	2.144E+00	5.982E+02	2.112E+04
2073	8.117E+02	4.434E+05	1.566E+07	2.102E+00	5.863E+02	2.071E+04
2074	7.956E+02	4.347E+05	1.535E+07	2.060E+00	5.747E+02	2.030E+04
2075	7.799E+02	4.260E+05	1.505E+07	2.019E+00	5.633E+02	1.989E+04
2076	7.644E+02	4.176E+05	1.475E+07	1.979E+00	5.522E+02	1.950E+04
2077	7.493E+02	4.093E+05	1.446E+07	1.940E+00	5.412E+02	1.911E+04
2078	7.345E+02	4.012E+05	1.417E+07	1.902E+00	5.305E+02	1.874E+04
2079	7.199E+02	3.933E+05	1.389E+07	1.864E+00	5.200E+02	1.836E+04
2080	7.057E+02	3.855E+05	1.361E+07	1.827E+00	5.097E+02	1.800E+04
2081	6.917E+02	3.779E+05	1.334E+07	1.791E+00	4.996E+02	1.764E+04
2082	6.780E+02	3.704E+05	1.308E+07	1.755E+00	4.897E+02	1.730E+04
2083	6.646E+02	3.631E+05	1.282E+07	1.721E+00	4.800E+02	1.695E+04
2084	6.514E+02	3.559E+05	1.257E+07	1.687E+00	4.705E+02	1.662E+04
2085	6.385E+02	3.488E+05	1.232E+07	1.653E+00	4.612E+02	1.629E+04
2086	6.259E+02	3.419E+05	1.207E+07	1.620E+00	4.521E+02	1.597E+04
2087	6.135E+02	3.351E+05	1.184E+07	1.588E+00	4.431E+02	1.565E+04
2088	6.013E+02	3.285E+05	1.160E+07	1.557E+00	4.344E+02	1.534E+04
2089	5.894E+02	3.220E+05	1.137E+07	1.526E+00	4.258E+02	1.504E+04
2090	5.777E+02	3.156E+05	1.115E+07	1.496E+00	4.173E+02	1.474E+04
2091	5.663E+02	3.094E+05	1.093E+07	1.466E+00	4.091E+02	1.445E+04
2092	5.551E+02	3.032E+05	1.071E+07	1.437E+00	4.010E+02	1.416E+04
2093	5.441E+02	2.972E+05	1.050E+07	1.409E+00	3.930E+02	1.388E+04
2094	5.333E+02	2.914E+05	1.029E+07	1.381E+00	3.852E+02	1.360E+04

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m^3/year)	(ft^3/year)	(Mg/year)	(m^3/year)	(ft^3/year)
2095	5.228E+02	2.856E+05	1.009E+07	1.354E+00	3.778E+02	1.334E+04
2096	5.124E+02	2.799E+05	9.886E+06	1.327E+00	3.701E+02	1.307E+04
2097	5.023E+02	2.744E+05	9.690E+06	1.300E+00	3.628E+02	1.281E+04
2098	4.923E+02	2.690E+05	9.498E+06	1.275E+00	3.556E+02	1.256E+04
2099	4.826E+02	2.636E+05	9.310E+06	1.249E+00	3.486E+02	1.231E+04
2100	4.730E+02	2.584E+05	9.126E+06	1.225E+00	3.417E+02	1.207E+04
2101	4.637E+02	2.533E+05	8.945E+06	1.200E+00	3.349E+02	1.183E+04
2102	4.545E+02	2.483E+05	8.768E+06	1.177E+00	3.283E+02	1.159E+04
2103	4.456E+02	2.434E+05	8.594E+06	1.153E+00	3.218E+02	1.136E+04
2104	4.367E+02	2.385E+05	8.424E+06	1.131E+00	3.154E+02	1.114E+04
2105	4.280E+02	2.338E+05	8.257E+06	1.108E+00	3.092E+02	1.092E+04
2106	4.195E+02	2.292E+05	8.094E+06	1.086E+00	3.030E+02	1.070E+04
2107	4.112E+02	2.247E+05	7.934E+06	1.065E+00	2.970E+02	1.049E+04
2108	4.031E+02	2.202E+05	7.776E+06	1.044E+00	2.912E+02	1.028E+04
2109	3.951E+02	2.158E+05	7.622E+06	1.023E+00	2.854E+02	1.008E+04
2110	3.873E+02	2.116E+05	7.472E+06	1.003E+00	2.797E+02	9.879E+03
2111	3.796E+02	2.074E+05	7.324E+06	9.829E-01	2.742E+02	9.683E+03
2112	3.721E+02	2.033E+05	7.179E+06	9.634E-01	2.688E+02	9.492E+03
2113	3.647E+02	1.992E+05	7.036E+06	9.443E-01	2.635E+02	9.304E+03
2114	3.575E+02	1.953E+05	6.897E+06	9.256E-01	2.582E+02	9.120E+03
2115	3.504E+02	1.914E+05	6.761E+06	9.073E-01	2.531E+02	8.939E+03
2116	3.435E+02	1.876E+05	6.627E+06	8.893E-01	2.481E+02	8.762E+03
2117	3.367E+02	1.839E+05	6.495E+06	8.717E-01	2.432E+02	8.588E+03
2118	3.300E+02	1.803E+05	6.367E+06	8.545E-01	2.384E+02	8.418E+03
2119	3.235E+02	1.767E+05	6.241E+06	8.375E-01	2.337E+02	8.252E+03
2120	3.171E+02	1.732E+05	6.117E+06	8.210E-01	2.290E+02	8.088E+03
2121	3.108E+02	1.698E+05	5.996E+06	8.047E-01	2.245E+02	7.928E+03
2122	3.046E+02	1.664E+05	5.877E+06	7.888E-01	2.201E+02	7.771E+03
2123	2.986E+02	1.631E+05	5.761E+06	7.732E-01	2.157E+02	7.617E+03
2124	2.927E+02	1.599E+05	5.647E+06	7.578E-01	2.114E+02	7.466E+03
2125	2.869E+02	1.567E+05	5.535E+06	7.428E-01	2.072E+02	7.319E+03
2126	2.812E+02	1.536E+05	5.425E+06	7.281E-01	2.031E+02	7.174E+03
2127	2.757E+02	1.506E+05	5.318E+06	7.137E-01	1.991E+02	7.032E+03
2128	2.702E+02	1.476E+05	5.213E+06	6.996E-01	1.952E+02	6.892E+03
2129	2.648E+02	1.447E+05	5.110E+06	6.857E-01	1.913E+02	6.756E+03
2130	2.596E+02	1.418E+05	5.008E+06	6.721E-01	1.875E+02	6.622E+03
2131	2.545E+02	1.390E+05	4.909E+06	6.588E-01	1.838E+02	6.491E+03
2132	2.494E+02	1.363E+05	4.812E+06	6.458E-01	1.802E+02	6.362E+03
2133	2.445E+02	1.336E+05	4.717E+06	6.330E-01	1.766E+02	6.236E+03
2134	2.396E+02	1.309E+05	4.623E+06	6.205E-01	1.731E+02	6.113E+03

Appendix C – Emissions Inventory

Flares PTE Emissions Calculations:

Table C.1 FLARES 1-7 PRE- AND POST PROJECT HOURLY AND ANNUAL PTE FOR PM_{10}, NO_x, AND CO EMISSIONS

Emissions Unit	Methane Gas Flow[1] (cfm)	Annual Hours of Operation (hrs/yr)	Criteria Pollutant	Emissions Factors (lb/MMdscf)[2]	Hourly Emissions (lb/hr)	Annual Emissions (ton/yr)
Flares 1-7	17.98	8,760	PM_{10}	17	0.033	0.146
			NO_x	40	0.079	0.344
			CO	750	1.473	6.450

[1] – Estimated using LandGEM (see Appendix B) to determine the methane gas to be combusted in each flare. Note: The highest estimated landfill gas flow rate is in year 2011.
[2] – Based on AP-42 Table 2.4-5 (11/98) for PM_{10}, NO_x, and CO.

Table C.2 FLARES 1-7 PRE- AND POST PROJECT HOURLY AND ANNUAL PTE FOR SO_2 EMISSIONS

Emissions Unit	Total Gas Flow[1] (cfm)	Sulfur Concetration[2] (ppmv)	Molecular weight of SO_2 (lb/lb-mol)	Stack Temperature (°R)	Hourly SO_2 Emissions (lb/hr)	Annual SO_2 Emissions (ton/yr)
Flares 1-7	32.68	46.9	64	1,460	0.00552	0.0242

[1] – Estimated using LandGEM (see Appendix B) to determine the total gas to be combusted in each flare. Note: The highest estimated landfill gas flow rate is in year 2011.
[2] – Because site specific sulfur content is not available, the value of 46.9ppmv was used as recommended by AP-42 2.4 (11/98), pg. 8, for the concentration of total reduced sulfur compounds.

Table C.3 FLARES 1-7 PRE- AND POST PROJECT HOURLY AND ANNUAL PTE FOR VOC EMISSIONS

Emissions Unit	NMOC Gas Flow[1] (cfm)	Molecular weight of NMOC (as Hexane) (lb/lb-mol)	Stack Temperature (°R)	Control Efficiency %[2]	Hourly VOC Emissions (lb/hr)	Annual VOC Emissions (T/yr)
Flares 1-7	0.0194	86.18	1,460	98	0.0019	0.008

[1] – Estimated using LandGEM (see Appendix B) to determine the total NMOC gas to be combusted in each flare. Note: The highest estimated landfill gas flow rate is in year 2011.
[2] – 98% control efficiency for the flare is assumed by the Applicant.

Appendix D – Ambient Air Quality Impact Analysis

MEMORANDUM

DATE: October 25, 2008

TO: Darrin Pampaian, Air Quality Analyst, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT NUMBER: P-2008.0078

SUBJECT: Modeling Review for the Payette County Permit to Construct Application for Modifications to the Clay Peak Municipal Solid Waste Landfill, located near Payette, Idaho

1.0 SUMMARY

Payette County submitted a Permit to Construct (PTC) application for operation of three new landfill gas flares to be operated at the Clay Peak Municipal Solid Waste Landfill, located near Payette, Idaho. Air quality analyses involving atmospheric dispersion modeling of emissions associated with the proposed project were performed to demonstrate the new facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]). DEQ dispersion modeling staff performed the ambient air quality impact analyses using the data and information submitted with the application.

The air impact analyses : 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the proposed facility were below significant contribution levels (SCLs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all locations outside of the required setback distance (closest distance from pollutant emission points to the property boundary). Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Criteria pollutant emissions increases associated with the proposed modification were below DEQ modeling thresholds, and project specific dispersion modeling was not required.	DEQ contends that when emissions are below established modeling thresholds, impacts of criteria pollutants are assured to be below significant contribution levels.
Modeled TAP concentrations of controlled emissions were below applicable TAP increments.	Since controlled emissions rates were used in the modeling analyses, the permit must require that all landfill gas emissions be controlled by the flares.

2.0 BACKGROUND INFORMATION

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The Clay Peak Municipal Solid Waste Landfill is located near Payette, Idaho. The area is designated as attainment or unclassifiable for all criteria pollutants.

2.1.2 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the proposed modifications exceed the significant contribution levels (SCLs) of Idaho Air Rules Section 006.102, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1st highest[h]
	24-hour	5.0	150[i]	Maximum 6th highest[j]
$PM_{2.5}$[k]	Annual	Not established	15	Use PM_{10} as surrogate
	24-hour	Not established	35	Use PM_{10} as surrogate
Carbon monoxide (CO)	8-hour	500	10,000[l]	Maximum 2nd highest[h]
	1-hour	2,000	40,000[l]	Maximum 2nd highest[h]
Sulfur Dioxide (SO_2)	Annual	1.0	80[g]	Maximum 1st highest[h]
	24-hour	5	365[l]	Maximum 2nd highest[h]
	3-hour	25	1,300[l]	Maximum 2nd highest[h]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1st highest[h]
Lead (Pb)	Quarterly	NA	1.5[i]	Maximum 1st highest[h]

[a]Idaho Air Rules Section 006.102
[b]Micrograms per cubic meter
[c]Idaho Air Rules Section 577 for criteria pollutants
[d]The maximum 1st highest modeled value is always used for the significant impact analysis or analyses using the model SCREEN3
[e]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f]The annual PM_{10} standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a PM_{10} analysis that demonstrates compliance with the revoked PM_{10} standard.
[g]Never expected to be exceeded in any calendar year
[h]Concentration at any modeled receptor
[i]Never expected to be exceeded more than once in any calendar year
[j]Concentration at any modeled receptor when using five years of meteorological data
[k]Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
[l]Not to be exceeded more than once per year

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been completed and promulgated into regulation. EPA has asserted through a policy memorandum that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard.

2.1.3 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permit requirements for toxic air pollutants from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated. If DEQ determines T-RACT is used to control emissions of carcinogenic TAPs, then modeled concentrations of 10 times the AACC are considered acceptable, as per Idaho Air Rules Section 210.12.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Background concentrations were not needed for the air impact analyses, since emissions associated with the proposed modification were below DEQ modeling thresholds, assuring impacts are below significant contribution levels,.

3.0 MODELING IMPACT ASSESSMENT

3.1 Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate compliance with applicable air quality standards.

3.1.1 Overview of Analyses

SCREEN3 was used for the air impact analyses. SCREEN3 generates maximum one-hour concentrations for a single source. Since there are three identical flares, impacts were evaluated by multiplying the emissions from one flare by three. The model was then run, using the stack characteristics associated with a single flare.

Persistence factors are used to convert one-hour concentrations from SCREEN3 output to concentrations associated with other averaging periods. The following are readily accepted persistence factors that were used (as specified in the *State of Idaho Air Quality Modeling Guideline*):

1-hour to 3-hour	0.9
1-hour to 8-hour	0.7
1-hour to 24-hour	0.4
1-hour to quarterly	0.13
1-hour to annual (criteria pollutants)	0.08
1-hour to annual (carcinogenic TAPs)	0.125 (specified by Idaho Air Rules)

Table 3 provides a brief description of parameters used in the modeling analyses.

Table 3. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General facility location	Near Payette	
Model	SCREEN3	
Meteorological data	Worst Case	Used the "Full Meteorology" option in SCREEN3
Terrain	Not Considered	Terrain effects are not anticipated to substantially affect modeled impacts for these sources.
Building downwash	Not Considered	
Receptor Grid	Automated distance	SCREEN3 determines the maximum concentration between two specified downwind distances

3.1.2 Modeling protocol and Methodology

Screening-level air impact analyses were performed by DEQ dispersion modeling staff. Modeling was generally conducted using data and methods described in *State of Idaho Air Quality Modeling Guideline*.

3.1.3 Model Selection

SCREEN3 was used for the air impact analyses. SCREEN3 is an acceptable model until EPA promulgates AERSCREEN as a replacement for SCREEN3.

3.1.4 Meteorological Data

SCREEN3 was run using the "Full Meteorology" option. The model uses an algorithm that generates worst-case meteorology for the specific source/receptor characteristics that results in highest concentrations.

3.1.5 Terrain Effects

Terrain effects were not considered in the analyses. For sources with relatively low emissions release heights, such as the proposed flares, maximum impacts will be relatively close to the source and will not be substantially affected by small terrain features.

3.1.6 Facility Layout

The only critical facility layout criteria is the distance to the nearest ambient air boundary, since SCREEN3 only assesses plume centerline concentrations in the horizontal dimension and only assesses single source impacts. Ambient air was assumed to be all locations inside the landfill. Therefore, the location of the flares does not affect the air impact analyses.

3.1.7 Building Downwash

Building downwash was not considered in the analyses. There are few buildings at the landfill and most flares are located far from those buildings and any downwash effects potentially caused by them.

3.1.8 Ambient Air Boundary

Ambient air was assumed to be all locations within and outside of the landfill property boundary. Therefore, an ambient air boundary was not used in the analyses.

3.1.9 Receptor Network and Generation of Setback Distances

SCREEN3 was run to calculate the maximum concentration at a distance between 1.0 meters and 1,000 meters downwind of the flare modeled.

3.2 Emission Rates

Emissions rates used in the modeling analyses for the proposed project were equal to those presented in other sections of the permit application or the DEQ Statement of Basis.

3.2.1 Criteria Pollutant Emissions Rates

Table 4 provides criteria pollutant emissions rates used in the modeling analyses for short-term and long-term averaging periods. All emissions rates of criteria pollutants were below DEQ modeling thresholds. Therefore, no additional analyses were necessary to demonstrate compliance with NAAQS.

Table 4. EMISSIONS RATES USED FOR FULL NAAQS IMPACT MODELING

Emissions Point	Description	Emissions Rates (lb/hr)			
		PM_{10}[a]	Sulfur Dioxide	Carbon Monoxide	Oxides of Nitrogen
Flares	Total emissions increase for the three flares	0.033	0.0055	1.47	0.079

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

3.2.2 TAP Emissions Rates

Table 5 provides controlled TAP emissions used in the modeling analyses. Modeling was performed using total TAP emissions from all seven flares, not just the emissions associated with the proposed three flares. The table only includes those TAPs having total emissions exceeding emissions screening levels (ELs) of Idaho Air Rules Section 585 and 586.

Table 5. EMISSIONS RATES USED FOR TAPS IMPACT MODELING

TAP	Averaging Period	Emissions Rates (lb/hr)
		All Seven Flares
acrylonitrile	Annual	2.8E-2
1,1,2,2 – tetrachloroethane	Annual	4.2E-3

3.3 Emission Release Parameters

Table 6 provides emissions release parameters used in the modeling analyses, including stack height, stack diameter, exhaust temperature, and exhaust velocity. The flare algorithm within SCREEN3 was used to model impacts. This algorithm uses the physical flare height and the heat release rate when operating (in calories per second) to calculate an effective stack height. The model assigns an exit velocity of 20 meters per second and a stack temperature of 1,273 Kelvin.

Table 6. EMISSIONS RELEASE PARAMETERS						
Release Point	*Source Type*	*Flare Height (m)*[a]	*Heat Release Rate (cal/sec)*[b]	*Effective Stack Height (m)*[c]	*Stack Gas Flow Velocity (m/sec)*[d]	*Stack Gas Temp. (K)*[e]
Flare	Flare	3.66	75,600	4.64	20	1,273

[a]Meters
[b]Calories per second
[c]Calculated by SCREEN3
[d]Automatically selected by SCREEN3 for the Flare algorithm
[e]Kelvin

3.4 Results for Significant and Cumulative NAAQS Impact Analyses

A significant impact analysis was not required for any criteria pollutants because emissions rates for all criteria pollutants were below DEQ established modeling thresholds.

3.5 Results for TAPs Analyses

DEQ performed TAPs impact analyses to evaluate compliance with applicable increments for those TAPs having emissions above screening emissions levels (ELs) of Idaho Air Rules Section 585 and 586. Table 7 provides SCREEN3 modeling results. The dispersion factor for the flares' impact on flat terrain, in combination with the emissions rates and a 0.125 persistence factor to convert 1-hour concentrations to annual concentrations, were used to calculate all TAP impacts. Results of the TAPs impact analyses are provided in Table 8. All maximum modeled impacts are below applicable AACCs.

Table 7. SCREEN3 MODEL RESULTS FOR 1.0 GRAM PER SECOND EMISSIONS		
Scenario	**Dispersion Factor[a] ($\mu g/m^3$ / g/sec)[b]**	**Location of Maximum Impact**
Flares impact	301.0	88 m downwind

[a]SCREEN3 maximum 1-hour output divided by the emissions rate used in the model (1.0 g/sec)
[b]Micrograms per cubic meter concentration per gram per second emissions

Table 8. RESULTS FOR TAP IMPACT ANALYSES			
Pollutant	**Averaging Period**	**Modeled Impact ($\mu g/m^3$)[a]**	**AAC/AACC[b] ($\mu g/m^3$)**
Acrylonitrile	Annual	1.13E-3	1.5E-2
1,1,2,2-tetrachloroethane	Annual	6.24E-4	1.7E-2

[a]Micrograms per cubic meter.
[b]Defined in Idaho Air Rules Section 585 and 586

4.0 CONCLUSIONS

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.

Appendix E – Facility Comments

The following comments were received from the facility on November 11, 2008:

Facility Comment: After reviewing the Statement of Basis for the permit, I [Patti S. Nitz] do not find any need for comment or correction.

DEQ Response: The final permit will be issued with no changes being requested by the facility.