San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

JUL 02 2013

Paul Turek
Chemical Waste Management, Inc
P.O. Box 471
Kettleman City, CA 93239

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: C-283
Project Number: C-1083923

Dear Mr. Turek:

Enclosed for your review and comment is the District's analysis of Chemical Waste Management, Inc's application for an Authority to Construct for the increase of the useful life of hazardous waste landfill B-18, at 35251 Old Skyline Road in Kettleman City, CA.

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. After addressing all comments made during the public notice period, the District intends to issue the Authority to Construct. Please submit your written comments on this project by September 4, 2013, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Stanley Tom of Permit Services at (559) 230- 5900.

Sincerely,

David Warner
Director of Permit Services

DW:st

Enclosures

cc: Wayne Lorentzen, DTSC (w/ enclosure) via email
Gerardo Rios, EPA (w/ enclosure) via email
Mike Tollstrup, CARB (w/ enclosure) via email

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Executive Director/Air Pollution Control Officer

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4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
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Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: (661) 392-5500 FAX: (661) 392-5585

www.valleyair.org

Hanford Sentinel

Newspaper notice for publication in Hanford Sentinel and for posting on valleyair.org

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NOTICE OF PRELIMINARY DECISION
FOR THE PROPOSED ISSUANCE OF
AN AUTHORITY TO CONSTRUCT

NOTICE IS HEREBY GIVEN that the San Joaquin Valley Unified Air Pollution Control District solicits public comment on the proposed issuance of Authority to Construct to Chemical Waste Management, Inc for the increase of the useful life of the hazardous waste landfill B-18, at 35251 Old Skyline Road, Kettleman City, CA.

The analysis of the regulatory basis for this proposed action, Project #C-1083923, is available for public inspection at http://www.valleyair.org/notices/public_notices_idx.htm and at any District office. In conjunction with the Department of Toxic Substances Control, the District will hold an open house on July 31, 2013 at 5:30 p.m and public hearing on August 27, 2013 at 6:30 p.m. in the Cafeteria of the Kettleman City Elementary School located at 701 General Petroleum Ave, Kettleman City, CA. For additional information, please contact the District at (559) 230-6000. Written comments on this project must be submitted by September 4, 2013 to **DAVID WARNER, DIRECTOR OF PERMIT SERVICES, SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT, 1990 E. GETTYSBURG AVE, FRESNO, CALIFORNIA 93726-0244.**

San Joaquin Valley Air Pollution Control District
Authority to Construct Application Review
Hazardous Waste Landfill Expansion

Facility Name:	Chemical Waste Management, Inc	Date:	July 2, 2013
Mailing Address:	P.O. Box 471	Engineer:	Stanley Tom
	Kettleman City, CA 93239	Lead Engineer:	Joven Refuerzo
Contact Person:	Paul Turek		
Telephone:	(559) 386-6151		
Application #(s):	C-283-11-6		
Project #:	C-1083923		
Deemed Complete:	August 5, 2009		

I. Proposal

Chemical Waste Management, Inc is proposing to increase the useful life of the hazardous waste landfill B-18 (permit C-283-11) vertically by approximately 53 feet and laterally by 14 acres. This modification will create an additional 4.9 million cubic yards of volume to create a total of 15.6 million cubic yards of volume. This modification is expected to extend the life of the landfill by approximately 8 to 9 years. The B-18 footprint will be increased from 53 acres to 67 acres (see Attachment I) and elevation increase from 965 feet to 1,018 feet above mean sea level. The proposed project will take place in a single phase by essentially extending the landfill expansion project laterally to the west by approximately 220 feet from the existing waste footprint.

Initially, Chemical Waste Management, Inc proposed to calculate VOC emissions from the hazardous waste landfill using a flux chamber study. Chemical Waste Management, Inc performed flux chamber tests on incoming waste at the facility to develop a flux VOC emission factor (mass of compound emissions per exposed surface area per unit time). To provide a more conservative estimate of VOC emissions from the hazardous waste landfill, the District and Chemical Waste Management, Inc agreed to base the emission calculations on the EPA Land Treatment Model.

Pursuant to Rule 2201, Section 4.1.1, Best Available Control Technology (BACT) is required for the VOC emissions for the daily cover from landfill B-18 (C-283-11-6) because the emission of these air contaminants is expected to be greater than 2 pounds per day. BACT was determined through a top-down analysis, which established the most effective control technology that is cost effective. BACT for control of VOC emissions is:

> Daily clean-fill cover (minimum one inch of compacted, District approved soil) onto the exposed VOC contaminated soil

Chemical Waste Management has received their Title V Permit. This modification can be classified as a Title V minor modification pursuant to Rule 2520, Section 3.20, and can be processed with a Certificate of Conformity (COC). But the facility has not requested that this project be processed in that manner; therefore, Chemical Waste Management will be required to submit a Title V minor modification application prior to operating under the revised provisions of the ATC issued with this project.

II. Applicable Rules

Rule 2201 New and Modified Stationary Source Review Rule (9/21/06)
Rule 2410 Prevention of Significant Deterioration (6/16/11)
Rule 2520 Federally Mandated Operating Permits (6/21/01)
Rule 4001 New Source Performance Standards (4/14/99)
Rule 4002 National Emission Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101 Visible Emissions (2/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4105 Commercial Offsite Multi-user Hazardous Waste & Non-hazardous Waste Disposal Facilities (12/17/92)
Rule 4202 Particulate Matter Emission Rate (12/17/92)
Rule 4642 Solid Waste Disposal Sites (4/16/98)
California Health & Safety Code 41700 and 42301.6
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The project is located at 35251 Old Skyline Road in Kettleman City, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

The B-18 landfill is an active hazardous waste disposal landfill. The Draft Subsequent Environmental Impact Report (SEIR) for the B-18/B-20 Hazardous Waste Disposal Project dated March 2008 is based on a 400 truck per day waste acceptance limit. The average truck carries approximately 18 cubic yards of waste making the facility capable of receiving 7,200 cubic yards of waste per day.

Potential emissions of criteria pollutants from Class I/II waste disposal at the B-18 landfill occur from:

1. Diffusion of VOCs from the waste through the exposed surface at the working face of the landfill (active face).

2. Potential diffusion of VOCs in the waste through the exposed daily cover surface in the non-working face (inactive area).
3. Potential diffusion of VOCs from the use of alternative daily cover (ADC) soils.
4. PM10 emissions from handling waste and daily cover soils.

For the soils used for daily cover throughout the entire footprint of the landfill, the facility uses an organic vapor analyzer (OVA) to measure VOC emissions from daily cover soil. The OVA screen is performed at the receiving area when trucks arrive at the facility containing soils that potentially qualify for daily cover. If the OVA screen is greater than 50 ppmw VOC, then the load is disposed as waste and not used for daily cover material.

Active Face

To calculate potential emissions from the active face, a maximum surface area must be assumed. The landfilling activities are limited in the SEIR to 400 trucks per day. Therefore on any given day, the facility can receive approximately 7,200 cubic yards of waste. Landfilled waste is typically placed in lifts seven feet deep before it is covered. Given this waste bed depth, the daily maximum surface area of disposed waste soils is assumed to be approximately 3,086 square yards. Though it is required that applied waste is covered each day, the potential emissions are calculated assuming 3,086 square yards are continually exposed through the year.

Inactive Area

The waste will be exposed for a maximum of 24 hours before it is covered with several inches of daily cover soil. As the active face moves throughout the surface plane of the landfill, lifts are added by placing seven feet of waste and daily cover on top of the waste layer below it. Throughout the life of the landfill, the elevation of the landfill increases to its maximum permitted height and the surface plane of the landfill decreases as the landfill slopes inward for stability. Therefore, each seven foot lift layer with daily cover acts as an impenetrable barrier preventing any further diffusion of VOC emissions from the underlying layers of waste. Further, as the landfill grows in size throughout its life, the area of the surface plane gets smaller as the elevation increases.

Current PTO C-283-11-2 can be found in Attachment A.

V. Equipment Listing

Pre-project

Permit	Equipment Listing
PTO C-283-11-2	HAZARDOUS WASTE LANDFILL (B-18), 9.7 MILLION CUBIC YARD CAPACITY, USED FOR DISPOSAL OF BULK SOLIDS OF EMPTY CONTAINERS, SOLIDS, AND CONTAMINATED SOIL, (55.2 ACRE)

Modification

Permit	Equipment Listing
ATC C-283-11-6	MODIFICATION OF HAZARDOUS WASTE LANDFILL (B-18), 9.7 MILLION CUBIC YARD CAPACITY, USED FOR DISPOSAL OF BULK SOLIDS OF EMPTY CONTAINERS, SOLIDS, AND CONTAMINATED SOIL, (55.2 ACRE): EXPAND LANDFILL VERTICALLY BY APPROXIMATELY 53 FEET AND LATERALLY BY 14 ACRES WHICH INCREASES THE CAPACITY APPROXIMATELY 4.9 MILLION CUBIC YARDS

Post-project

Permit	Equipment Listing
PTO C-283-11-6	HAZARDOUS WASTE LANDFILL (B-18), 15.6 MILLION CUBIC YARD CAPACITY, USED FOR DISPOSAL OF BULK SOLIDS OF EMPTY CONTAINERS, SOLIDS, AND CONTAMINATED SOIL, (67 ACRE)

VI. Emission Control Technology Evaluation

Chemical Waste Management places a minimum of one inch of daily cover soil over the B-18 active face daily.

The facility also uses Class II soils as alternate daily cover for both the active and inactive area. Load testing is performed using an OVA to determine if the load headspace VOC concentration is greater than 50 ppmw. If greater than 50 ppmw, then the load does not qualify for use as daily cover.

VII. General Calculations

A. Assumptions

- Facility operates 24 hours per day (worst-case)
- Molecular weight of Hexane = 86.18 lb/lb-mole (AP-42 (11/98), Section 2.4.4.2)
- The landfill is a horizontal plane with no hills or valleys (worst-case)

The assumptions associated with modeling the open active face and inactive area of the B-18 landfill at the facility can be broken down into two categories:

- Assumptions inherent to the model
- Site-specific assumptions made in selecting the input variable for the model

Model Assumptions

The following general assumptions are associated with applying the RTI Land Treatment Model to open landfills and waste piles:

- The waste liquid is mixed uniformly with the carrier matrix (either fixative, soil, or some other granular solid material) before placement in an active landfill
- The liquid waste containing the constituent of interest is assumed to be bound in the waste after fixation and placement in the active landfill
- The waste liquid does not flow within the carrier matrix
- The adsorption isotherm of the constituent of interest is linear within the depth of the waste and does not change with time
- No bulk flow of gas is induced within the waste matrix
- The diffusion coefficient does not vary with either concentration or time
- The concentration of the constituent of interest in the gas phase at the surface of the open landfill is much lower than the concentration of the constituent of interest in the gas phase within the waste matrix
- No diffusion of the waste liquid into depths below the waste layer is assumed
- Liquid-vapor equilibrium is established at all times within the waste matrix
- For the case of fixed waste in the landfill, the fixed waste mixture behaves as a soil with regard to diffusion of the constituent of interest
- No biodegradation of the constituent of interest occurs in open landfills
- The model assumes there is an unlimited quantity of chemical constituents (VOCs) in the waste material, thereby holding the emission rate constant

The sensitivity of the RTI Land Treatment Model to some parameters differs in its application to open landfills and waste piles from that in land treatment operations because of the difference in the expected range of the parameters. In general, for application to open landfills and waste piles, the model is sensitive to the air porosity of the sold waste, the liquid loading in the solid waste, the waste depth, the concentration of the constituent in the waste, and the volatility of the constituent under consideration. In contrast, the model exhibits a relatively low sensitivity to the diffusion coefficient of the constituent in air.

A limitation of the model is that it does not account for depletion of VOCs in the waste through "other" mechanisms such as leaching or photolysis, thereby adding another layer of conservatism through use of the model.

Site-Specific Input Assumptions

The input values used in modeling the emissions from the active working face of the B-18 landfill are listed in Attachment B. These are summarized as follows:

- The maximum number of trucks that could bring direct landfilled waste the facility for disposal in the B-18 landfill is 400 trucks/24 hours. The average truck carries 18 cubic yards of waste making the facility capable of receiving 7,200 cubic yards of

waste per day. Landfilled waste is typically placed in seven foot lifts before it is covered. Therefore, for the purpose of modeling VOC emissions from waste soils, the maximum daily area of exposed waste soils is assumed to be 3,086 square yards (0.64 acres). Further, the seven foot life size may be less when waste is placed along the side slopes of the landfill. However, the assumed life size and maximum exposed area are conservative and appropriate for the purpose of modeling potential VOC emissions from the active working face.

- The average temperature is assumed to be 25 °C or 77 °F. This is a model recommended default value. Based on over 30 years of data collected by the US Department of Commerce National Climatic Data Center, the Normal Daily mean Temperature for nearby Fresno, California is 62.5 °F. The Normal Daily Maximum Temperature is 76.1 °F. Therefore, the default value of 25 °C was assumed to be conservative and sufficient for modeling purposes.
- Compound-specific data includes molecular weight, density, Henry's Law constants, and liquid and gas diffusion coefficients. These were generated for 25 °C using the US EPA's CHEMDAT8 database.
- The model input assumes that there is no significant oil-phase present in the waste that is being landfilled. This is consistent with the facility's operational practices in that any oil-laden waste would need to be organically stabilized or treated to levels below regulated levels. If oil-laden waste cannot be treated, it would be sent off-site for incineration.
- The composition of the waste, were based on maximum concentrations of VOCs contained in landfilled waste, as regulated under Title 40 of the Federal Code of Regulations (40 CFR) Part 268.40 "Universal Treatment Standards". The composition assumes that the maximum concentration of each compound is contained in every load of waste being landfilled at the site. Based on historical acceptance data of bulk waste directly landfilled, the incoming waste stream consists of the following composition:

  - 10-20% 40 CFR Part 268.40 RCRA waste
  - 80-90% Non-RCRA/Non-hazardous

  Therefore, the universal treatment standards (UTS) accurately represent the ceiling concentrations of VOCs that could be present in waste soils placed in the B-18 landfill
- The air and total porosities in the fixed waste were assumed to equal 0.25 and 0.50 cm^3/cm^3, respectively. These values were model defaults that are assumed to be typical for hazardous wastes.
- This use of the RTI Land Treatment Model assumed there is no biological activity occurring in the landfill.
- RCRA permit conditions require all waste that is landfilled at the facility to be covered within a 24 hour period.
- The assumed average wind speed of 2.86 meters per second (m/s), or 6.4 miles per hour (mph), was based on 37 years data collected by the US Department of Commerce National Climatic Data Center at Fresno, California.

Active Face

- 7 ft lifts
- 400 trucks/day
- 18 yd^3/truck
- 7200 yd^3/day (0.64 acres)
- Weighted VOC concentration = 10,000 ppmw (daily average)
- Weighted VOC concentration = 1,834 ppmw (annual average)

Inactive Area

- Pre-project = 53.04 acres – 0.64 acres (active face) = 52.36 acres
- Post-project = 66.84 acres – 0.64 acres (active face) = 66.2 acres
- Weighted VOC concentration = 1,834 ppmw (daily average combined active face plus inactive area)
- Weighted VOC concentration = 1,834 ppmw (annual average)

Daily Cover VOC Emissions

Per District Rule 4651, soils are considered uncontaminated with VOCs, and qualify as daily cover, if they contain less than 50 ppmw VOC content or register less than 50 ppmv VOC when measured with an organic vapor analyzer (OVA) three inches above the surface of the soil. The OVA screen is performed by the facility at the receiving area when trucks arrive at the facility containing soils that potential qualify for daily cover. If the OVA screen is greater than 50 ppmv, then the load is disposed as waste and not considered for use as daily cover material.

Daily Cover PM10 Emissions

- Daily Cover requirements are 25% by volume of the waste received
- Waste density for bulk material handling = 1.4 ton/yd^3

B. Emission Factors

EPA Research Triangle Institute (RTI) Land Treatment Model

The Research Triangle Institute (RTI) Land Treatment Model is used to estimate the air emission rate of constituents of interest from open (active) landfills. This model is based on the theory of diffusion out of an infinite flat slab and was intended originally for use in estimating emissions from land treatment operations. However, the US EPA suggests using the RTI Land Treatment Model for open landfills still receiving waste.

There are similarities in physical characteristics among open landfills, waste piles, and land treatment operations for the purpose of estimating emissions based on diffusion theory. In all three, the waste liquid is ultimately mixed homogeneously with a "carrier" matrix (soil in the case of land treatment; dry fixative in the case of active landfills; and soil, fixative, or

some other solid matrix in the case of waste piles). In all cases, the matrix is porous and permeable, allowing the diffusion of the constituent of interest through the matrix and into the air. Therefore, in all cases, diffusion theory can be used to model the VOC emission rate.

The notable difference between land treatment operations and open landfills is the presence of an additional land treatment mechanism affecting emissions. Emissions from land treatment are affected by biological decay of the constituent. There is no evidence that there is significant biomass (necessary for biological decay) in any chemical waste landfill. It is assumed that the toxic property of the waste will inhibit biological processes. Therefore, biological decay is conservatively not considered when modeling VOC emissions from chemical waste landfills.

The RTI Land Treatment Model, which was selected for estimating emissions from open landfills and waste piles, has the following characteristics:

- Sound basis in scientific theory
- Limited validation against measured emissions from land treatment operations
- Reasonably available input data

The model considers effects such as evaporation of the constituent of interest from interstitial surfaces of the carrier matrix and diffusion of material through air-filled pore spaces.

The equations necessary to apply the land treatment model to open landfills and waste piles are summarized in the examples calculations in Attachment B. These equations, explained in US EPA document Air Emissions for Waste and Wastewater, can be used to estimate the fraction of the constituent emissions (Ft) and the instantaneous emission rate (E). It should be noted that the absence of biodegradation represents a special case that allows some simplification of several of the Chapter 7.0 equations, e.g., Equations (7-4) and (7-5). In both equations the biodegradation term ($e^{-t/tb}$) goes to unity.

Because the land treatment model was derived originally for land treatment operations, model input parameters are not necessarily in the most convenient units and terminology for open landfills and waste piles. Therefore, several points require clarification:

- For modeling purposes, fixed waste is analogous to the waste-laden soil in land treatment.
- M_o, the area-loading of the constituent in grams per square centimeter (g/cm^2), is geared toward land treatment operations. For open landfills and waste piles, the landfill equivalent is computed as the mass concentration per the active surface of the landfill.
- No "tilling" is performed in open active chemical waste landfills.
- Waste liquid as described in Chapter 7.0 is "applied" or mixed with fixative only once. Therefore, waste "reapplication" does not occur in open active chemical waste landfills.

- The waste bed depth in open landfills is analogous to the "depth to which waste is mixed" in land treatment (represented by "l"), as discussed in Chapter 7.0.

Daily Cover PM10 Emissions

$EF = k(0.0032) \times (U/5)^{1.3} \div (M/2)^{1.4}$ (AP-42 Section 13.2.4 11/06)

where:

k = 0.35 (particle size multiplier for PM_{10})
U = 6.4 mph (mean wind speed for Fresno, CA)
M = 4.8% (assumed AP-42 moisture content based on Fugitive Dust Control Plan)

$EF = 0.35 \times (0.0032) \times (6.4/5)^{1.3} \div (4.8/2)^{1.4} = 0.000453$ lb-PM10/ton

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Based on equations used in the land treatment model, the approach required to estimate emissions from the B-18 landfill is as follows:

- Compute the loading (M_o) of VOCs in the waste
- Compute the effective diffusions coefficient (D_e)
- Compute the partition coefficient (K_{eq})
- Use the appropriate emission equation to compute the instantaneous VOC emission rate (E)

Active Face

Attachment B contains example calculations for the land treatment model used to estimate emissions from the active working face of the B-18 landfill.

To perform a worst case emission calculation, the maximum daily waste acceptance rate of 7200 yd^3/day is assumed to be the active face.

Daily Waste Acceptance = 400 trucks/day x 18 yd^3/truck = 7200 yd^3/day

Daily Landfill Surface Area = 7200 yd^3/day x 1/7 ft lifts x 3 ft/yd = 3085.7 yd^2 = 0.64 acres

See Attachment B for detailed calculations.

Daily PE1 = 160.0 lb/day
Annual PE1 = 58,400 lb/year

Inactive Area

Pre-project acres = 52.36 acres

To calculate worst case emissions, it will be assumed the first parcel (0.64 acres) of active face is placed into the landfill and covered with one-inch compacted daily cover soil at the end of the day (i.e. 24 hour exposure period) achieving a 92% VOC control per Best Available Control Technology Guideline 2.2.2. The next day another parcel of active face waste is placed into the landfill next to the existing parcel and covered with daily cover at the end of the day (i.e. 48 hour exposure period). This is repeated until the landfill is at capacity horizontally and a new lift commences on top of this layer.

See Attachment B for detailed calculations.

Daily PE1 = 221.6 lb-VOC/day
Annual PE1 = 40.44 tons-VOC/year = 80,880 lb-VOC/year

Daily Cover PM10 Emissions

Daily PE1 = 0.000453 lb-PM10/ton x (7,200 yd^3/day + 7,200 yd^3/day x 0.25) x 1.4 ton/yd^3
= 5.7 lb-PM10/day

Annual PE1 = 5.7 lb-PM10/day x 365 days/year
= 2,081 lb-PM10/year

Pre-Project Potential to Emit (PE1)	
Daily VOC (Active Face)	160.0 lb/day
Daily VOC (Inactive Area)	221.6 lb/day
Total Daily VOC	381.6 lb/day
Annual VOC (Active Face)	58,400 lb/yr
Annual VOC (Inactive Area)	80,880 lb/yr
Total Annual VOC	139,280 lb/yr
Daily PM_{10} (Daily Cover)	5.7 lb/day
Annual PM_{10} (Daily Cover)	2,081 lb/yr

2. Post Project Potential to Emit (PE2)

Active Face (no change PE2 = PE1)

Daily Waste Acceptance = 400 trucks/day x 18 yd^3/truck = 7200 yd^3/day

Daily Landfill Surface Area = 7200 yd^3/day x 1/7 ft lifts x 3 ft/yd = 3085.7 yd^2 = 0.64 acres

See Attachment B for detailed calculations.

Daily PE2 = 160.0 lb/day
Annual PE2 = 58,400 lb/year

Inactive Area

Post-project acres = 66.2 acres

See Attachment B for detailed calculations.

Daily PE2 = 230.4 lb-VOC/day
Annual PE2 = 42.06 tons-VOC/year = 84,120 lb-VOC/year

Daily Cover PM10 Emissions (no change PE2 = PE1)

Daily PE2 = 0.000453 lb-PM10/ton x (7,200 yd^3/day + 7,200 yd^3/day x 0.25) x 1.4 ton/yd^3
= 5.7 lb-PM10/day

Annual PE2 = 5.7 lb-PM10/day x 365 days/year
= 2,081 lb-PM10/year

Post-Project Potential to Emit (PE2)	
Daily VOC (Active Face)	160.0 lb/day
Daily VOC (Inactive Area)	230.4 lb/day
Total Daily VOC	390.4 lb/day
Annual VOC (Active Face)	58,400 lb/yr
Annual VOC (Inactive Area)	84,120 lb/yr
Total Annual VOC	142,520 lb/yr
Daily PM_{10} (Daily Cover)	5.7 lb/day
Annual PM_{10} (Daily Cover)	2,081 lb/yr

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to Section 4.9 of District Rule 2201, the Pre-project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Pre Project Stationary Source Potential to Emit [SSPE1] (lb/year)					
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC
C-283-8-5	140	0	13	41	15
C-283-11-2	0	0	2,081	0	139,280
C-283-14-2	0	0	0	0	3,723
C-283-15-2	0	0	0	0	2,336
C-283-17-2	0	0	0	0	4,052
C-283-19-1	0	0	8,614	0	5,950
C-283-20-7	0	0	0	0	569
C-283-22-15 C-283-25-0	23,993	13,155	3,190	87,646	123,904
C-283-24-1	0	0	256	0	0
Pre Project SSPE (SSPE1)	24,133	13,155	14,154	87,687	279,829

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201 Section 4.10, the post project Stationary Source Potential to Emit (SSPE2) is the sum of the Potential to Emit of the post-project Authority to Construct for new or modified units, provided that the ATC will include new conditions canceling the existing ATC or PTO for those units, otherwise the ATC or PTO with the highest potential emissions is used plus all existing units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) with the highest potential emissions at the Stationary Source, added to the quantity of emission reduction credits (ERC's) that have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Post Project Stationary Source Potential to Emit [SSPE2] (lb/year)					
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC
C-283-8-5	140	0	13	41	15
C-283-11-6	0	0	2,081	0	142,520
C-283-14-2	0	0	0	0	3,723
C-283-15-2	0	0	0	0	2,336
C-283-17-2	0	0	0	0	4,052
C-283-19-1	0	0	8,614	0	5,950
C-283-20-7	0	0	0	0	569
C-283-22-15 C-283-25-0	23,993	13,155	3,190	87,646	123,904
C-283-24-1	0	0	256	0	0
Post Project SSPE (SSPE2)	24,133	13,155	14,154	87,687	283,069

5. Major Source Determination

Rule 2201 Major Source Determination

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

Pollutant	SSPE1 (lb/yr)	SSPE2 (lb/yr)	Major Source Threshold	Existing Major Source	New Major Source
NO_x	24,133	24,133	50,000 lb/year	No	No
SO_x	13,155	13,155	140,000 lb/year	No	No
PM_{10}	14,154	14,154	140,000 lb/year	No	No
CO	87,687	87,687	200,000 lb/year	No	No
VOC	279,829	283,069	50,000 lb/year	Yes	No

This source is an existing Major Source for VOC emissions and will remain a Major Source for VOC.

Rule 2410 Major Source Determination

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). Therefore the following PSD Major Source thresholds are applicable.

PSD Major Source Determination (tons/year)							
	NO2	VOC	SO2	CO	PM	PM10	CO2e
Estimated Facility PE before Project Increase	12.1	139.9	6.6	43.8	7.1	7.1	24,190
PSD Major Source Thresholds	250	250	250	250	250	250	100,000
PSD Major Source ? (Y/N)	N	N	N	N	N	N	N

GHG Calculations

The following table summarizes the combustion equipment at the facility.

Permit	Equipment	Rating
C-283-22	Flare	398,333 MMBtu/year
C-283-25		
C-283-8	Engine	306 bhp

Basis and Assumptions

- BHP to Btu/hr conversion: 2,542.5 Btu/bhp-hr
- Thermal efficiency of engine: commonly ≈ 35%
- Emission factors and global warming potentials (GWP) are taken from EPA 40 CFR Part 98, Subpart A, Tables C-1 and C-2:

Biogas
CO2 52.07 kg/MMBtu (114.79 lb/MMBtu)
CH4 3.2×10^{-3} kg/MMBtu (0.00705 lb/MMBtu)
N2O 6.3×10^{-4} kg/MMBtu (0.00139 lb/MMBtu)

Distillate Fuel Oil #2
CO2 73.96 kg/MMBtu (163.05 lb/MMBtu)
CH4 3.0×10^{-3} kg/MMBtu (0.0066 lb/MMBtu)
N2O 6.0×10^{-4} kg/MMBtu (0.0013 lb/MMBtu)

GWP for CH4 = 21 lb-CO2(eq) per lb-CH4
GWP for N2O = 310 lb-CO2(eq) per lb-N2O

Calculations

Annual Emissions (Entire Facility)

Assuming worst case all VOC emissions from the facility are methane,

CH4 Emissions = 279,829 lb/year x 21 lb-CO2(eq) per lb-CH4
= 5,876,409 lb-CO2(eq)/year
= 2,938 short tons-CO2(eq)/year

Annual Emissions (External Combustion)

The flare listed on permits C-283-22 and '25 is limited to a heat input limit of 398,333 MMBtu/year.

CO2 Emissions = 398,333 MMBtu/year x 114.79 lb/MMBtu
= 45,724,645 lb-CO2(eq)/year
CH4 Emissions = 398,333 MMBtu/year x 0.0022 lb/MMBtu x
21 lb-CO2(eq) per lb-CH4
= 18,403 lb-CO2(eq)/year
N2O Emissions = 398,333 MMBtu/year x 0.00022 lb/MMBtu x
310 lb-CO2(eq) per lb-N2O
= 27,166 lb-CO2(eq)/year

Total = 45,724,645 + 18,403 + 27,166 = 45,770,214 lb-CO2(eq)/year
Total = 45,770,214 lb-CO2(eq)/year÷ 2,000 lb/ton = **22,885 short tons-CO2(eq)/year**

Annual Emissions (Engine)

The engine listed on permits C-283-8 is rated at 306 bhp and 20 hours per year of maintenance and testing operation.

CO2 Emissions = 306 bhp_{out} x 2,542.5 Btu_{in}/bhp_{in}-hr x 163.05 lb/$MMBtu_{in}$
x 1 $bhp_{in}/0.35$ bhp_{out} x 20 hours/year
= 7,248.78 lb-CO2e/year
CH4 Emissions = 306 bhp_{out} x 2,542.5 Btu_{in}/bhp_{in}-hr x 0.0066 lb/$MMBtu_{in}$
x 1 $bhp_{in}/0.35$ bhp_{out} x 21 lb-CO2e per lb-CH4 x 20 hours/year
= 6.16 lb-CO2e/year
N2O Emissions = 306 bhp_{out} x 2,542.5 Btu_{in}/bhp_{in}-hr x 0.0013 lb/$MMBtu_{in}$
x 1 $bhp_{in}/0.35$ bhp_{out} x 310 lb-CO2e per lb-N2O x 20 hours/year
= 17.92 lb-CO2e/year

Total = (7,248.78 + 6.16 + 17.92) lb-CO2e/year = 7,272.86 lb-CO2e/year
Total = 7,272.86 lb-CO2e/year ÷ 2,000 lb/ton = **3.6 short tons-CO2(eq)/year**

Total Annual Emissions (Municipal Waste Landfill + External Combustion)

Total = (1,301 + 22,885 + 3.6) short tons-CO2(eq)/year = **24,190 short tons-CO2(eq)/year**

6. Baseline Emissions (BE)

The BE calculation (in lbs/year) is performed pollutant-by-pollutant for each unit within the project, to calculate the QNEC and if applicable, to determine the amount of offsets required.

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historical Actual Emissions (HAE), calculated pursuant to Section 3.22

a. BE NOx

Unit Located at a Non-Major Source
As shown in Section VII.C.5 above, the facility is not a major source for NO_X emissions.

Therefore, Baseline Emissions (BE) are equal to the Pre-project Potential to Emit (PE1).

BE = PE1 = 0 lb NO_X/year

b. BE SOx

Unit Located at a Non-Major Source
As shown in Section VII.C.5 above, the facility is not a major source for SO_X emissions.

Therefore, Baseline Emissions (BE) are equal to the Pre-project Potential to Emit (PE1).

BE = PE1 = 0 lb SO_X/year

c. BE PM_{10}

Unit Located at a Non-Major Source
As shown in Section VII.C.5 above, the facility is not a major source for PM_{10} emissions.

Therefore, Baseline Emissions (BE) are equal to the Pre-project Potential to Emit (PE1).

BE = PE1 = 2,081 lb PM_{10}/year

d. BE CO

Unit Located at a Non-Major Source
As shown in Section VII.C.5 above, the facility is not a major source for CO emissions.

Therefore, Baseline Emissions (BE) are equal to the Pre-project Potential to Emit (PE1).

BE = PE1 = 0 lb CO/year

e. BE VOC

Clean Emissions Unit, Located at a Major Source
Pursuant to Rule 2201, a Clean Emissions Unit is defined as an emissions unit that is "equipped with an emissions control technology with a minimum control efficiency of at least 95% or is equipped with emission control technology that meets the requirements for achieved-in-practice BACT as accepted by the APCO during the five years immediately prior to the submission of the complete application.

The landfill utilizes daily clean-fill cover (minimum one inch of compacted, District approved soil) onto the exposed VOC contaminated soil, which meets the current requirements for achieved-in-practice BACT. Therefore, Baseline Emissions (BE) are equal to the Pre-project Potential to Emit (PE1).

7. Major Modification

Major Modification is defined in 40 CFR Part 51.165 as "*any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act.*"

As discussed in Section VII.C.5 above, the facility is not a Major Source for NO, SOx, or PM10; therefore, the project does not constitute a Major Modification for these pollutants.

As discussed in Section VII.C.5 above, the facility is an existing Major Source for VOC; however, the project by itself would need to be a significant increase in order to trigger a Major Modification.

Fugitive emissions are not included in SB 288 Major Modification calculations except for those sources enumerated in 40 CFR 51.165(a)(4). The proposed operation is not a source enumerated in 40 CFR 51.165(a)(4). Therefore, the emissions from permit C-283-11 will not be included in the SB288 Major Modification determination for this project.

Therefore, the project does not constitute a Major Modification.

8. Federal Major Modification

As shown above, this project does not constitute a Major Modification. Therefore, in accordance with District Rule 2201, Section 3.17, this project does not constitute a Federal Major Modification and no further discussion is required.

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to pollutants for which the District is in attainment or for unclasssified, pollutants. The pollutants addressed in the PSD applicability determination are listed as follows:

- NO2 (as a primary pollutant)
- SO2 (as a primary pollutant)
- CO
- PM
- PM10
- Greenhouse gases (GHG): CO2, N2O, CH4, HFCs, PFCs, and SF6

The first step of this PSD evaluation consists of determining whether the facility is an existing PSD Major Source or not (See Section VII.C.5 of this document).

In the case the facility is an existing PSD Major Source, the second step of the PSD evaluation is to determine if the project results in a PSD significant increase.

In the case the facility is NOT an existing PSD Major Source but is an existing source, the second step of the PSD evaluation is to determine if the project, by itself, would be a PSD major source.

In the case the facility is new source, the second step of the PSD evaluation is to determine if this new facility will become a new PSD major Source as a result of the project and if so, to determine which pollutant will result in a PSD significant increase.

I. Potential to Emit for New or Modified Emission Units vs PSD Major Source Thresholds

As a screening tool, the project potential to emit from all new and modified units is compared to the PSD major source threshold, and if total project potential to emit from all new and modified units is below this threshold, no further analysis will be needed.

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). Therefore the following PSD Major Source thresholds are applicable.

PSD Major Source Determination: Potential to Emit (tons/year)						
	NO2	SO2	CO	PM	PM10	CO2e
Total PE from New and Modified Units	0	0	0	0	0	1,496
PSD Major Source Thresholds	250	250	250	250	250	75,000
New PSD Major Source?	N	N	N	N	N	N

Basis and Assumptions

- Emission factors and global warming potentials (GWP) are taken from EPA 40 CFR Part 98, Subpart A, Tables C-1 and C-2:

  Biogas
  CO2 52.07 kg/MMBtu (114.79 lb/MMBtu)
  CH4 3.2×10^{-3} kg/MMBtu (0.00705 lb/MMBtu)
  N2O 6.3×10^{-4} kg/MMBtu (0.00139 lb/MMBtu)

  GWP for CH4 = 21 lb-CO2(eq) per lb-CH4
  GWP for N2O = 310 lb-CO2(eq) per lb-N2O

Calculations

Annual Emissions (C-283-11-6)

Assuming worst case all VOC emissions from the landfill are methane,

CH4 Emissions = 142,520 lb/year x 21 lb-CO2(eq) per lb-CH4
= 2,992,920 lb-CO2(eq)/year
= 1,496 short tons-CO2(eq)/year

As shown in the table above, the project potential to emit, by itself, does not exceed any of the PSD major source thresholds. Therefore Rule 2410 is not applicable and no further discussion is required.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is entered into PAS database and subsequently reported to EPA. For seasonal sources, or where the emissions differ quarter to quarter, then evaluate each pollutant for each quarter separately. The QNEC is calculated for each pollutant, for each unit, as the difference between the post-project quarterly potential to emit (PE2) and the quarterly baseline emissions (BE).

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - BE, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.
PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.
BE = Baseline Emissions (per Rule 2201) for each emissions unit, lb/qtr.

Using the values in Sections VII.C.2 and VII.C.6 in the evaluation above, quarterly PE2 and quarterly BE can be calculated as follows:

$PE2_{quarterly}$ = $PE2_{annual}$ ÷ 4 quarters/year
= 142,520 lb/year ÷ 4 qtr/year
= 35,630 lb VOC/qtr

$BE_{quarterly}$ = BE_{annual} ÷ 4 quarters/year
= 139,280 lb/year ÷ 4 qtr/year
= 34,820 lb VOC/qtr

Quarterly NEC [QNEC]			
	PE2 (lb/qtr)	BE (lb/qtr)	NEC (lb/qtr)
PM_{10}	520	520	0
VOC	35,630	34,820	810

VIII. Compliance

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis for the following*:

a. Any new emissions unit with a potential to emit exceeding two pounds per day,
b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
d. Any new or modified emissions unit, in a stationary source project, which results in a Major Modification.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

As discussed in Section I above, there are no new emissions units associated with this project; therefore BACT for new units with PE > 2 lb/day purposes is not triggered.

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore BACT is not triggered.

c. Modification of emissions units – AIPE > 2 lb/day

AIPE = PE2 – HAPE

Where,
AIPE = Adjusted Increase in Permitted Emissions, (lb/day)
PE2 = Post-Project Potential to Emit, (lb/day)
HAPE = Historically Adjusted Potential to Emit, (lb/day)

HAPE = PE1 x (EF2/EF1)

Where,
PE1 = The emissions unit's Potential to Emit prior to modification or relocation, (lb/day)
EF2 = The emissions unit's permitted emission factor for the pollutant after modification or relocation. If EF2 is greater than EF1 then EF2/EF1 shall be set to 1
EF1 = The emissions unit's permitted emission factor for the pollutant before the modification or relocation

AIPE = PE2 – (PE1 x (EF2 / EF1))

There are no emission factor changes; therefore EF2 / EF1 = 1

C-283-11-6:

B-18 Landfill VOC Emissions (Active Face):
AIPE = 160.0 – (160.0 x (1))
= 160.0 – 160.0 x 1
= 0.0 lb-VOC/day

B-18 Landfill VOC Emissions (Inactive Area):
AIPE = 230.4 – (221.6 x (1)]
= 230.4 – 221.6 x 1
= 8.8 lb-VOC/day

B-18 Landfill PM10 Emissions:
AIPE = 5.7 – (5.7 x (1))
= 5.7 – 5.7 x 1
= 0.0 lb-PM10/day

As demonstrated above, the AIPE is greater than 2.0 lb/day the inactive area emissions. Therefore, BACT is triggered for VOC since the AIPE is greater than 2 lbs/day.

d. Major Modification

As discussed in Section VII.C.7 and VII.C.8 above, this project does not constitute a Major Modification; therefore BACT is not triggered.

2. BACT Guideline

BACT Guideline 2.2.2, applies to the hazardous landfill in this project. [Landfill – VOC Contaminated Soil] (See Attachment C)

3. Top Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analysis (see Attachment C), BACT has been satisfied with the following:

VOC: Daily clean-fill cover (minimum one inch of compacted, District approved soil) onto the exposed VOC contaminated soil

B. Offsets

1. Offset Applicability

Pursuant to Section 4.5.3, offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the Post Project Stationary Source Potential to Emit (SSPE2) equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The following table compares the post-project facility-wide annual emissions in order to determine if offsets will be required for this project.

Offset Determination (lb/year)					
	NO_X	SO_X	PM_{10}	CO	VOC
Post Project SSPE (SSPE2)	24,133	13,155	14,154	87,687	283,069
Offset Threshold	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	Yes	No	No	No	Yes

2. Quantity of Offsets Required

NO_X

As seen above, the SSPE2 is greater than the offset thresholds for NOx; therefore offset calculations will be required for this project.

Per Sections 4.7.1 and 4.7.3, the quantity of offsets in pounds per year for VOC is calculated as follows for sources with an SSPE1 greater than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) = (Σ[PE2 – BE] + ICCE) x DOR, for all new or modified emissions units in the project,

Where,
PE2 = Post Project Potential to Emit, (lb/year)
BE = Baseline Emissions, (lb/year)
ICCE = Increase in Cargo Carrier Emissions, (lb/year)
DOR = Distance Offset Ratio, determined pursuant to Section 4.8

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, Located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE)

There are no NO_X emissions from this permit unit. Therefore, PE2 = BE = 0 and no NO_X offsets are required.

VOC

As seen above, the SSPE2 is greater than the offset thresholds for VOC; therefore offset calculations will be required for this project.

Per Sections 4.7.1 and 4.7.3, the quantity of offsets in pounds per year for VOC is calculated as follows for sources with an SSPE1 greater than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) = (Σ[PE2 – BE] + ICCE) x DOR, for all new or modified emissions units in the project,

Where,
PE2 = Post Project Potential to Emit, (lb/year)
BE = Baseline Emissions, (lb/year)
ICCE = Increase in Cargo Carrier Emissions, (lb/year)
DOR = Distance Offset Ratio, determined pursuant to Section 4.8

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, Located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE)

As shown in Section VII.C.6, BE = PE1 for VOC. Also, there is only one emissions unit associated with this project and there are no increases in cargo carrier emissions; therefore offsets can be determined as follows:

Offsets Required (lb/year) = ($[PE2 - BE]_{active\ face}$ + $[PE2 - BE]_{inactive\ area}$ + ICCE) x DOR

$PE2\ (VOC)_{active\ face}$ = 58,400 lb/year
$BE\ (VOC)_{active\ face}$ = 58,400 lb/year
$PE2\ (VOC)_{inactive\ area}$ = 84,120 lb/year
$BE\ (VOC)_{inactive\ area}$ = 80,880 lb/year
ICCE = 0 lb/year

Offsets Required (lb/year) = ([58,400 – 58,400] + [84,120 – 80,880] + 0) x DOR
= 3,240 x DOR
= 3,240 lb VOC/year

Calculating the appropriate quarterly emissions to be offset is as follows:

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
810	810	810	810

Assuming an offset ratio of 1.5:1, the amount of VOC ERCs that need to be withdrawn is:

Offsets Required (lb/year) = 3,240 x 1.5
= 4,860 lb VOC/year

Calculating the appropriate quarterly emissions to be offset is as follows:

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1,215	1,215	1,215	1,215

The applicant has stated that the facility plans to use ERC certificate S-2645-1 and N-663-1 to offset the increases in VOC emissions associated with this project. The above certificate has available quarterly VOC credits as follows:

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
ERC #S-2645-1	1,513	2,602	2,033	2,038
ERC #N-663-1	7,000	0	0	14,000
Total	8,513	2,602	2,033	16,038

As seen above, the facility has sufficient credits to fully offset the quarterly VOC emissions increases associated with this project.

Proposed Rule 2201 (offset) Conditions:

- Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 810 lb, 2nd quarter - 810 lb, 3rd quarter - 810 lb, and fourth quarter - 810 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]
- ERC Certificate Numbers S-2645-1 and/or N-663-1 (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

C. Public Notification

1. Applicability

Public noticing is required for:
a. Any new Major Source, which is a new facility that is also a Major Source,
b. Major Modifications,
c. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,

d. Any project which results in the offset thresholds being surpassed, and/or
e. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a. New Major Source

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

b. Major Modification

As demonstrated in VII.C.7 and VII.C.8, this project does not constitute a Major Modification; therefore, public noticing for Major Modification purposes is not required.

c. PE > 100 lb/day

Applications which include a new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. There are no new emissions units associated with this project; therefore public noticing is not required for this project for Potential to Emit Purposes.

d. Offset Threshold

The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Threshold				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO_X	24,133	24,133	20,000 lb/year	No
SO_X	13,155	13,155	54,750 lb/year	No
PM_{10}	14,154	14,154	29,200 lb/year	No
CO	87,687	87,687	200,000 lb/year	No
VOC	279,829	283,069	20,000 lb/year	No

As detailed above, there were no thresholds surpassed with this project; therefore public noticing is not required for offset purposes.

e. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a Stationary Source Increase in Permitted Emissions (SSIPE) of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE is calculated as the Post

Project Stationary Source Potential to Emit (SSPE2) minus the Pre-Project Stationary Source Potential to Emit (SSPE1), i.e. SSIPE = SSPE2 – SSPE1. The values for SSPE2 and SSPE1 are calculated according to Rule 2201, Sections 4.9 and 4.10, respectively. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO_x	24,133	24,133	0	20,000 lb/year	No
SO_x	13,155	13,155	0	20,000 lb/year	No
PM_{10}	14,154	14,154	0	20,000 lb/year	No
CO	87,687	87,687	0	20,000 lb/year	No
VOC	283,069	279,829	3,240	20,000 lb/year	No

As demonstrated above, the SSIPEs for all pollutants were less than 20,000 lb/year; therefore public noticing for SSIPE purposes is not required.

2. Public Notice Action

As discussed above, this project will not result in emissions, for any pollutant, which would subject the project to any of the noticing requirements listed above. Therefore, public notice will not be required for this project.

D. Daily Emission Limits (DELs)

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Section 3.15 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.15.1 and 3.15.2, the DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

- The open face area, defined as the area where exposed waste is being worked, shall not exceed 0.64 acres in size. [District Rule 2201]
- No more than 7,200 cubic yards per day of solid waste shall be received for placement into landfill B-18. [District Rule 2201]
- No more than 1,800 cubic yards per day of daily cover shall be received for placement onto landfill B-18. [District Rule 2201]
- Total PM10 emissions from handling of solid waste and daily cover shall not exceed 0.000453 pounds per ton material handled. [District Rule 2201]
- Daily weighted average VOC content of non-containerized landfilled waste shall not exceed any of the following: 10,000 ppmw for the active face or 1,834 ppmw for the landfill (combined active face plus inactive area). [District Rule 2201]

E. Compliance Assurance

1. Source Testing

The following new conditions will be placed on the Authority to Construct permit:

- Contaminated wastes containing organic constituents, with the potential to be used for daily cover, shall be analyzed for VOC content using District approved Organic Vapor Analyzer (OVA) at a distance 3 inches above the surface. These waste materials shall be analyzed at the facility receiving area prior to being transported to the landfill for direct waste disposal or stockpiled and/or used as alternative daily cover. [District Rule 2201]
- An OVA reading shall be taken for a minimum of 10 seconds and the highest reading in this 10 second period shall be recorded. [District Rule 2201]

2. Monitoring

No monitoring is required to demonstrate compliance with Rule 2201.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following new conditions will be placed on the Authority to Construct permit:

- Permittee shall maintain daily records of the volume of wastes received for placement into landfill B-18 and daily records of the volume of daily cover used for placement onto landfill B-18. [District Rule 1070]
- Permittee shall maintain records of all OVA readings for waste materials that were considered for use as daily cover. [District Rule 1070]
- Permittee shall maintain daily records of size of active open face area. [District Rules 1070 and 2201]
- All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rule 1070]

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

Therefore, compliance with the requirements of this rule is expected.

Rule 2410 Prevention of Significant Deterioration

The prevention of significant deterioration (PSD) program is a construction permitting program for new major stationary sources and major modifications to existing major stationary sources located in areas classified as attainment or in areas that are unclassifiable for any criteria air pollutant.

As demonstrated above, this project is not subject to the requirements of Rule 2410 due to a significant emission increase and no further discussion is required.

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this Rule, and has received their Title V Operating Permit. The proposed modification is a Minor Modification to the Title V Permit pursuant to Section 3.20 of this rule:

In accordance with Rule 2520, 3.20, these modifications:

1. Do not violate requirements of any applicable federally enforceable local or federal requirement;
2. Do not relax monitoring, reporting, or recordkeeping requirements in the permit and are not significant changes in existing monitoring permit terms or conditions;
3. Do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis;
4. Do not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include:
    a. A federally enforceable emission cap assumed to avoid classification as a modification under any provisions of Title I of the Federal Clean Air Act; and
    b. An alternative emissions limit approved pursuant to regulations promulgated under section 112(i)(5) of the Federal Clean Air Act; and
5. Are not Title I modifications as defined in District Rule 2520 or modifications as defined in section 111 or 112 of the Federal Clean Air Act; and
6. Do not seek to consolidate overlapping applicable requirements.

Under Section 111 of the Clean Air Act, any physical or operational change that results in an increase in emission rate to the atmosphere of any pollutant *to which a standard applies* shall be considered a Title V significant modification (40CFR60.14).

This facility is subject to National Emission Standards for Hazardous Air Pollutants Subpart M – National Emission Standard for Asbestos and Subpart FF – National Emission Standard for Benzene Waste Operations. Subpart M – National Emission Standard for Asbestos does not have an applicable emission standard. The facility is currently subject to Subpart FF –

National Emission Standard for Benzene Waste Operations with a permit limit of benzene waste of 10 Mg/year as listed on the facility-wide permit. The facility is not proposing to revise this limit in this project and this project does not result in an increase in emission rate for any pollutant to which a standard applies. Therefore, this project is not a modification as defined in section 111 or 112 of the Federal Clean Air Act.

As discussed above, the facility has not applied for a Certificate of Conformity (COC); therefore, the facility must apply to modify their Title V permit with a minor modification, prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility may construct/operate under the ATC upon submittal of the Title V minor modification application.

Rule 4001 New Source Performance Standards

There are no applicable subparts for hazardous waste landfills. Therefore, the requirements of this rule are not applicable to this project.

Rule 4002 National Emission Standards for Hazardous Air Pollutants

Subpart M - National Emission Standard for Asbestos

This landfill is subject to the requirements of 40 CFR 61 Subpart M for National Emission Standard for Asbestos.

Section 61.151

Each owner or operator of any inactive waste disposal site that was operated by sources covered under §61.142, 61.144, or 61.147 and received deposits of asbestos-containing waste material generated by the sources, shall comply with the requirements of Section 61.151. This facility does not accept waste from sources covered under §61.142, 61.144, or 61.147. Therefore, this section is not applicable.

Section 61.153

This section states (a) Any new source to which this subpart applies (with the exception of sources subject to §§61.143, 61.145, 61.146, and 61.148), which has an initial startup date preceding the effective date of this revision, shall provide the following information to the Administrator postmarked or delivered within 90 days of the effective date. In the case of a new source that does not have an initial startup date preceding the effective date, the information shall be provided, postmarked or delivered, within 90 days of the initial startup date. Any owner or operator of an existing source shall provide the following information to the Administrator within 90 days of the effective date of this subpart unless the owner or operator of the existing source has previously provided this information to the Administrator. Any changes in the information provided by any existing source shall be provided to the Administrator, postmarked or delivered, within 30 days after the change.

(5) For sources subject to §§61.151 and 61.154:
(i) A brief description of the site; and
(ii) The method or methods used to comply with the standard, or alternative procedures to be used.

(b) The information required by paragraph (a) of this section must accompany the information required by §61.10. Active waste disposal sites subject to §61.154 shall also comply with this provision. Roadways, demolition and renovation, spraying, and insulating materials are exempted from the requirements of §61.10(a). The information described in this section must be reported using the format of appendix A of this part as a guide.

The following condition will be listed on the permit to ensure compliance:

- Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.153. [40 CFR 61.153]

Section 61.154

This section states each owner or operator of an active waste disposal site that receives asbestos-containing waste material shall meet the requirements of this section:

(a) Either there must be no visible emissions to the outside air from any active waste disposal site where asbestos-containing waste material has been deposited, or the requirements of paragraph (c) or (d) of this section must be met.

(b) Unless a natural barrier adequately deters access by the general public, either warning signs and fencing must be installed and maintained as follows, or the requirements of paragraph (c)(1) of this section must be met.
(1) Warning signs must be displayed at all entrances and at intervals of 100 m (330 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material is deposited. The warning signs must:
(i) Be posted in such a manner and location that a person can easily read the legend; and
(ii) Conform to the requirements of 51 cm x 36 cm (20 inch x 14 inch) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and
(iii) Display the legend in this section in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph. Spacing between any tow lines must be at least equal to the height of the upper of the two lines.
(2) The perimeter of the disposal site must be fenced in a manner adequate to deter access by the general public.
(3) Upon request and supply of appropriate information, the Administrator will determine whether a fence or natural barrier adequately deters access by the general public.

(c) Rather than meet the no visible emission requirement of paragraph (a) of this section, at the end of each operating day, or at least once every 24 hour period while the site is

in continuous operation, the asbestos containing waste material that has been deposited at the site during the operating day or previous 24 hour period shall:

(1) Be covered with at least 15 centimeters (6 inches) of compacted nonasbestos containing material, or

(2) Be covered with a resinous or petroleum based dust suppression agent that effectively binds dust and controls wind erosion. Such an agent shall be used in the manner and frequency recommended for the particular dust by the dust suppression agent manufacturer to achieve and maintain dust control. Other equally effective dust suppression agents may be used upon prior approval by the Administrator. For purposes of this paragraph, any used, spent, or other waste oil is not considered a dust suppression agent.

(d) Rather than meet the no visible emission requirement of paragraph (a) of this section, use an alternative emissions control method that has received prior written approval by the Administrator according to the procedures described in Section 61.149(c)(2).

(e) For all asbestos containing waste material received, the owner or operator of the active waste disposal site shall:

(1) Maintain waste shipment records, using a form similar to that shown in Figure 4, and include the following information:

(i) The name, address, and telephone number of the waste generator.

(ii) The name, address, and telephone number of the transporter(s).

(iii) The quantity of the asbestos containing waste material in cubic meters (cubic yards).

(iv) The presence of improperly enclosed or uncovered waste, or any asbestos containing waste material not sealed in leak tight containers. Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site, by the following working day, the presence of a significant amount of improperly enclosed or uncovered waste. Submit a copy proof the waste shipment record along with the report.

(v) The date of the receipt.

(2) As soon as possible and no longer than 30 days after receipt of the waste, send a copy of the signed waste shipment record to the waste generator.

(3) Upon discovering a discrepancy between the quantity of waste designated on the waste shipment records and the quantity actually received, attempt to reconcile the discrepancy with the waste generator. If the discrepancy is not resolved within 15 days after receiving the waste, immediately report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site. Describe the discrepancy and attempts to reconcile it, and submit a copy of the waste shipment record along with the report.

(4) Retain a copy of all records and reports required by this paragraph for at least 2 years.

(f) Maintain, until closure, records of the location, depth and area, and quantity in cubic meters (cubic yards) of asbestos containing waste material within the disposal site on a map or diagram of the disposal area.
(g) Upon closure, comply with all the provisions of Section 61.151.
(h) Submit to the Administrator, upon closure of the facility, a copy of records of asbestos waste disposal locations and quantities.
(i) Furnish upon request, and make available during normal business hours for inspection by the Administrator, all records required under this section.
(j) Notify the Administrator in writing at least 45 days prior to excavating or otherwise disturbing any asbestos containing waste material that has been deposited at a waste disposal site and is covered. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice:
    (1) Scheduled starting and completion dates.
    (2) Reason for disturbing the waste.
    (3) Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos containing waste material. If deemed necessary, the Administrator may require changes in the emission control procedures to the used.
    (4) Location of any temporary storage site and the final disposal site.

The following condition will be listed on the permit to ensure compliance:

- Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.154. [40 CFR 61.154]

Therefore, continued compliance with the requirements of this subpart is expected.

Subpart FF - National Emission Standard for Benzene Waste Operations

The provisions of 40 CFR 61 Subpart FF applies to owners and operators of hazardous waste treatment, storage, and disposal facilities that treat, store, or dispose of hazardous waste generated by chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries. The waste streams at hazardous waste treatment, storage, and disposal facilities subject to the provisions of this subpart are the benzene-containing hazardous waste from any facility listed in paragraph (a) of this section. A hazardous waste treatment, storage, and disposal facility is a facility that must obtain a hazardous waste management permit under subtitle C of the Solid Waste Disposal Act.

Section 61.340

This section states (a) The provisions of this subpart apply to owners and operators of chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries.

(b) The provisions of this subpart apply to owners and operators of hazardous waste treatment, storage, and disposal facilities that treat, store, or dispose of hazardous waste generated by any facility listed in paragraph (a) of this section. The waste streams at hazardous waste treatment, storage, and disposal facilities subject to the provisions of this subpart are the benzene-containing hazardous waste from any facility listed in paragraph (a) of this section. A hazardous waste treatment, storage, and disposal facility is a facility that must obtain a hazardous waste management permit under subtitle C of the Solid Waste Disposal Act.
(c) At each facility identified in paragraph (a) or (b) of this section, the following waste is exempt from the requirements of this subpart:
(1) Waste in the form of gases or vapors that is emitted from process fluids:
(2) Waste that is contained in a segregated stormwater sewer system.
(d) At each facility identified in paragraph (a) or (b) of this section, any gaseous stream from a waste management unit, treatment process, or wastewater treatment system routed to a fuel gas system, as defined in §61.341, is exempt from this subpart. No testing, monitoring, recordkeeping, or reporting is required under this subpart for any gaseous stream from a waste management unit, treatment process, or wastewater treatment unit routed to a fuel gas system.

The facility is subject to the requirements of Subpart FF Section 61.340. The facility shall comply with all applicable paragraphs of the section.

Section 61.341

This section provides the definitions for the subpart.

Benzene concentration means the fraction by weight of benzene in a waste as determined in accordance with the procedures specified in §61.355 of this subpart.
Car-seal means a seal that is placed on a device that is used to change the position of a valve (e.g., from opened to closed) in such a way that the position of the valve cannot be changed without breaking the seal.
Chemical manufacturing plant means any facility engaged in the production of chemicals by chemical, thermal, physical, or biological processes for use as a product, co-product, by-product, or intermediate including but not limited to industrial organic chemicals, organic pesticide products, pharmaceutical preparations, paint and allied products, fertilizers, and agricultural chemicals. Examples of chemical manufacturing plants include facilities at which process units are operated to produce one or more of the following chemicals: benzenesulfonic acid, benzene, chlorobenzene, cumene, cyclohexane, ethylene, ethylbenzene, hydroquinone, linear alklylbenzene, nitrobenzene, resorcinol, sulfolane, or styrene.
Closed-vent system means a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow inducing devices that transport gas or vapor from an emission source to a control device.
Coke by-product recovery plant means any facility designed and operated for the separation and recovery of coal tar derivatives (by-products) evolved from coal during the coking process of a coke oven battery.

Container means any portable waste management unit in which a material is stored, transported, treated, or otherwise handled. Examples of containers are drums, barrels, tank trucks, barges, dumpsters, tank cars, dump trucks, and ships.
Control device means an enclosed combustion device, vapor recovery system, or flare.
Cover means a device or system which is placed on or over a waste placed in a waste management unit so that the entire waste surface area is enclosed and sealed to minimize air emissions. A cover may have openings necessary for operation, inspection, and maintenance of the waste management unit such as access hatches, sampling ports, and gauge wells provided that each opening is closed and sealed when not in use. Example of covers include a fixed roof installed on a tank, a lid installed on a container, and an air-supported enclosure installed over a waste management unit.
External floating roof means a pontoon-type or double-deck type cover with certain rim sealing mechanisms that rests on the liquid surface in a waste management unit with no fixed roof.
Facility means all process units and product tanks that generate waste within a stationary source, and all waste management units that are used for waste treatment, storage, or disposal within a stationary source.
Fixed roof means a cover that is mounted on a waste management unit in a stationary manner and that does not move with fluctuations in liquid level.
Floating roof means a cover with certain rim sealing mechanisms consisting of a double deck, pontoon single deck, internal floating cover or covered floating roof, which rests upon and is supported by the liquid being contained, and is equipped with a closure seal or seals to close the space between the roof edge and unit wall.
Flow indicator means a device which indicates whether gas flow is present in a line or vent system.
Fuel gas system means the offsite and onsite piping and control system that gathers gaseous streams generated by facility operations, may blend them with sources of gas, if available, and transports the blended gaseous fuel at suitable pressures for use as fuel in heaters, furnaces, boilers, incinerators, gas turbines, and other combustion devices located within or outside the facility. The fuel is piped directly to each individual combustion device, and the system typically operates at pressures over atmospheric.
Individual drain system means the system used to convey waste from a process unit, product storage tank, or waste management unit to a waste management unit. The term includes all process drains and common junction boxes, together with their associated sewer lines and other junction boxes, down to the receiving waste management unit.
Internal floating roof means a cover that rests or floats on the liquid surface inside a waste management unit that has a fixed roof.
Liquid-mounted seal means a foam or liquid-filled primary seal mounted in contact with the liquid between the waste management unit wall and the floating roof continuously around the circumference.
Loading means the introduction of waste into a waste management unit but not necessarily to complete capacity (also referred to as filling).
Maximum organic vapor pressure means the equilibrium partial pressure exerted by the waste at the temperature equal to the highest calendar-month average of the waste storage temperature for waste stored above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for waste stored at the ambient temperature, as determined:

(1) In accordance with §60.17(c); or
(2) As obtained from standard reference texts; or
(3) In accordance with §60.17(a)(37); or
(4) Any other method approved by the Administrator.
No detectable emissions means less than 500 parts per million by volume (ppmv) above background levels, as measured by a detection instrument reading in accordance with the procedures specified in §61.355(h) of this subpart.
Oil-water separator means a waste management unit, generally a tank or surface impoundment, used to separate oil from water. An oil-water separator consists of not only the separation unit but also the forebay and other separator basins, skimmers, weirs, grit chambers, sludge hoppers, and bar screens that are located directly after the individual drain system and prior to additional treatment units such as an air flotation unit, clarifier, or biological treatment unit. Examples of an oil-water separator include an API separator, parallel-plate interceptor, and corrugated-plate interceptor with the associated ancillary equipment.
Petroleum refinery means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through the distillation of petroleum, or through the redistillation, cracking, or reforming of unfinished petroleum derivatives.
Petroleum means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.
Point of waste generation means the location where the waste stream exits the process unit component or storage tank prior to handling or treatment in an operation that is not an integral part of the production process, or in the case of waste management units that generate new wastes after treatment, the location where the waste stream exits the waste management unit component.
Process unit means equipment assembled and connected by pipes or ducts to produce intermediate or final products. A process unit can be operated independently if supplied with sufficient fuel or raw materials and sufficient product storage facilities.
Process unit turnaround means the shutting down of the operations of a process unit, the purging of the contents of the process unit, the maintenance or repair work, followed by restarting of the process.
Process unit turnaround waste means a waste that is generated as a result of a process unit turnaround.
Process wastewater means water which comes in contact with benzene during manufacturing or processing operations conducted within a process unit. Process wastewater is not organic wastes, process fluids, product tank drawdown, cooling tower blowdown, steam trap condensate, or landfill leachate.
Process wastewater stream means a waste stream that contains only process wastewater.
Product tank means a stationary unit that is designed to contain an accumulation of materials that are fed to or produced by a process unit, and is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support.
Product tank drawdown means any material or mixture of materials discharged from a product tank for the purpose of removing water or other contaminants from the product tank.
Safety device means a closure device such as a pressure relief valve, frangible disc, fusible plug, or any other type of device which functions exclusively to prevent physical damage or permanent deformation to a unit or its air emission control equipment by venting gases or vapors directly to the atmosphere during unsafe conditions resulting from an unplanned,

accidental, or emergency event. For the purpose of this subpart, a safety device is not used for routine venting of gases or vapors from the vapor headspace underneath a cover such as during filling of the unit or to adjust the pressure in this vapor headspace in response to normal daily diurnal ambient temperature fluctuations. A safety device is designed to remain in a closed position during normal operations and open only when the internal pressure, or another relevant parameter, exceeds the device threshold setting applicable to the air emission control equipment as determined by the owner or operator based on manufacturer recommendations, applicable regulations, fire protection and prevention codes, standard engineering codes and practices, or other requirements for the safe handling of flammable, ignitable, explosive, reactive, or hazardous materials.

Segregated stormwater sewer system means a drain and collection system designed and operated for the sole purpose of collecting rainfall runoff at a facility, and which is segregated from all other individual drain systems.

Sewer line means a lateral, trunk line, branch line, or other enclosed conduit used to convey waste to a downstream waste management unit.

Slop oil means the floating oil and solids that accumulate on the surface of an oil-water separator.

Sour water stream means a stream that:

(1) Contains ammonia or sulfur compounds (usually hydrogen sulfide) at concentrations of 10 ppm by weight or more;

(2) Is generated from separation of water from a feed stock, intermediate, or product that contained ammonia or sulfur compounds; and

(3) Requires treatment to remove the ammonia or sulfur compounds.

Sour water stripper means a unit that:

(1) Is designed and operated to remove ammonia or sulfur compounds (usually hydrogen sulfide) from sour water streams;

(2) Has the sour water streams transferred to the stripper through hard piping or other enclosed system; and

(3) Is operated in such a manner that the offgases are sent to a sulfur recovery unit, processing unit, incinerator, flare, or other combustion device.

Surface impoundment means a waste management unit which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or waste containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling, and aeration pits, ponds, and lagoons.

Tank means a stationary waste management unit that is designed to contain an accumulation of waste and is constructed primarily of nonearthen materials (e.g., wood, concrete, steel, plastic) which provide structural support.

Treatment process means a stream stripping unit, thin-film evaporation unit, waste incinerator, or any other process used to comply with §61.348 of this subpart.

Vapor-mounted seal means a foam-filled primary seal mounted continuously around the perimeter of a waste management unit so there is an annular vapor space underneath the seal. The annular vapor space is bounded by the bottom of the primary seal, the unit wall, the liquid surface, and the floating roof.

Waste means any material resulting from industrial, commercial, mining or agricultural operations, or from community activities that is discarded or is being accumulated, stored, or physically, chemically, thermally, or biologically treated prior to being discarded, recycled, or discharged.
Waste management unit means a piece of equipment, structure, or transport mechanism used in handling, storage, treatment, or disposal of waste. Examples of a waste management unit include a tank, surface impoundment, container, oil-water separator, individual drain system, steam stripping unit, thin-film evaporation unit, waste incinerator, and landfill.
Waste stream means the waste generated by a particular process unit, product tank, or waste management unit. The characteristics of the waste stream (e.g., flow rate, benzene concentration, water content) are determined at the point of waste generation. Examples of a waste stream include process wastewater, product tank drawdown, sludge and slop oil removed from waste management units, and landfill leachate.
Wastewater treatment system means any component, piece of equipment, or installation that receives, manages, or treats process wastewater, product tank drawdown, or landfill leachate prior to direct or indirect discharge in accordance with the National Pollutant Discharge Elimination System permit regulations under 40 CFR part 122. These systems typically include individual drain systems, oil-water separators, air flotation units, equalization tanks, and biological treatment units.
Water seal controls means a seal pot, p-leg trap, or other type of trap filled with water (e.g., flooded sewers that maintain water levels adequate to prevent air flow through the system) that creates a water barrier between the sewer line and the atmosphere. The water level of the seal must be maintained in the vertical leg of a drain in order to be considered a water seal.

Section 61.342

This section states (a) An owner or operator of a facility at which the total annual benzene quantity from facility waste is less than 10 megagrams per year shall be exempt from the requirements of paragraphs (b) and (c) of this section. The total annual benzene quantity from facility waste is the sum of the annual benzene quantity for each waste stream at the facility that has a flow weighted annual average water content greater than 10 percent or that is mixed with water, or other wastes, at any time and the mixture has an annual average water content greater than 10 percent. The benzene quantity in a waste stream is to be counted only once without multiple counting if other waste streams are mixed with or generated from the original waste stream. Other specific requirements for calculating the total annual benzene waste quantity are as follows:

(1) Wastes that are exempted from control under Section 61.342(c)(2) and 61.342(c)(3) are included in the calculation of the total annual benzene quantity if they have an annual average water content greater than 10 percent, or if they are mixed with water or other wastes at any time and the mixture has an annual average water content greater than 10 percent.
(2) The benzene in a material subject to this subpart that is sold is included in the calculation of the total annual benzene quantity if the material has an annual average water content greater than 10 percent.
(3) Benzene in wastes generated by remediation activities conducted at the facility, such as the excavation of contaminated soil, pumping and treatment of

groundwater, and the recovery of product from soil or groundwater, are not included in the calculation of total annual benzene quantity for that facility. If the facility's total annual benzene quantity is 10 Mg/yr or more, wastes generated by remediation activities are subject to the requirements of paragraphs (c) through (h) of this section. If the facility is managing remediation waste generated offsite, the benzene in this waste shall be included in the calculation of total annual benzene quantity in facility waste, if the waste streams have an annual average water content greater than 10 percent, or if they are mixed with water or other wastes at any time and the mixture has an annual average waste content greater than 10 percent.

(4) The total annual benzene quantity is determined based upon the quantity of benzene in the waste before any waste treatment occurs to remove the benzene except as specified in Section 61.355(c)(1)(i) (A) through (C).

(f) Rather than treating the waste onsite, an owner or operator may elect to comply with paragraph (c)(1)(i) of this section by transferring the waste offsite to another facility where the waste is treated in accordance with the requirements of paragraph (c)(1)(i) of this section. The owner or operator transferring the waste shall:

(1) Comply with the standards specified in §§61.343 through 61.347 of this subpart for each waste management unit that receives or manages the waste prior to shipment of the waste offsite.

(2) Include with each offsite waste shipment a notice stating that the waste contains benzene which is required to be managed and treated in accordance with the provisions of this subpart.

(g) Compliance with this subpart will be determined by review of facility records and results from tests and inspections using methods and procedures specified in §61.355 of this subpart.

The following condition will be listed on the permit to ensure compliance:

- Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.342 (a), (f), and (g). Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable requirements of 40 CFR 61.342 (b) through (e) and (h). [40 CFR 61.342]

<u>Sections 61.343, 61.344, 61.345, 61.346, 61.347, 61.348, 61.349, 61.350, 61.351, 61.352, 61.353, 61.354</u>

The facility is not subject to these sections as the facility total annual benzene quantity is less than 10 Mg/yr calculated per Section 61.342.

The following condition will be listed on the permit to ensure compliance:

- Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable sections of 40 CFR 61.343 through 61.354. [40 CFR 61.343 through 61.354]

Section 61.355

This section states (a) An owner or operator shall determine the total annual benzene quantity from facility waste by the following procedure:

(1) For each waste stream subject to this subpart having a flow-weighted annual average water content greater than 10 percent water, on a volume basis as total water, or is mixed with water or other wastes at any time and the resulting mixture has an annual average water content greater than 10 percent as specified in §61.342(a), the owner or operator shall:
   (i) Determine the annual waste quantity for each waste stream using the procedures specified in paragraph (b) of this section.
   (ii) Determine the flow-weighted annual average benzene concentration for each waste stream using the procedures specified in paragraph (c) of this section.
   (iii) Calculate the annual benzene quantity for each waste stream by multiplying the annual waste quantity of the waste stream times the flow-weighted annual average benzene concentration.

(2) Total annual benzene quantity from facility waste is calculated by adding together the annual benzene quantity for each waste stream generated during the year and the annual benzene quantity for each process unit turnaround waste annualized according to paragraph (b)(4) of this section.

(3) If the total annual benzene quantity from facility waste is equal to or greater than 10 Mg/yr (11 ton/yr), then the owner or operator shall comply with the requirements of §61.342 (c), (d), or (e).

(4) If the total annual benzene quantity from facility waste is less than 10 Mg/yr (11 ton/yr) but is equal to or greater than 1 Mg/yr (1.1 ton/yr), then the owner or operator shall:
   (i) Comply with the recordkeeping requirements of §61.356 and reporting requirements of §61.357 of this subpart; and
   (ii) Repeat the determination of total annual benzene quantity from facility waste at least once per year and whenever there is a change in the process generating the waste that could cause the total annual benzene quantity from facility waste to increase to 10 Mg/yr (11 ton/yr) or more.

(5) If the total annual benzene quantity from facility waste is less than 1 Mg/yr (1.1 ton/yr), then the owner or operator shall:
   (i) Comply with the recordkeeping requirements of §61.356 and reporting requirements of §61.357 of this subpart; and
   (ii) Repeat the determination of total annual benzene quantity from facility waste whenever there is a change in the process generating the waste that could cause the total annual benzene quantity from facility waste to increase to 1 Mg/yr (1.1 ton/yr) or more.

(6) The benzene quantity in a waste stream that is generated less than one time per year, except as provided for process unit turnaround waste in paragraph (b)(4) of this section, shall be included in the determination of total annual benzene quantity from facility waste for the year in which the waste is generated unless the waste stream is otherwise excluded from the determination of total annual benzene

quantity from facility waste in accordance with paragraphs (a) through (c) of this section. The benzene quantity in this waste stream shall not be annualized or averaged over the time interval between the activities that resulted in generation of the waste, for purposes of determining the total annual benzene quantity from facility waste.

(b) For purposes of the calculation required by paragraph (a) of this section, an owner or operator shall determine the annual waste quantity at the point of waste generation, unless otherwise provided in paragraphs (b) (1), (2), (3), and (4) of this section, by one of the methods given in paragraphs (b) (5) through (7) of this section.

(1) The determination of annual waste quantity for sour water streams that are processed in sour water strippers shall be made at the point that the water exits the sour water stripper.

(2) The determination of annual waste quantity for wastes at coke by-product plants subject to and complying with the control requirements of §61.132, 61.133, 61.134, or 61.139 of subpart L of this part shall be made at the location that the waste stream exits the process unit component or waste management unit controlled by that subpart or at the exit of the ammonia still, provided that the following conditions are met:

(i) The transfer of wastes between units complying with the control requirements of subpart L of this part, process units, and the ammonia still is made through hard piping or other enclosed system.

(ii) The ammonia still meets the definition of a sour water stripper in §61.341.

(3) The determination of annual waste quantity for wastes that are received at hazardous waste treatment, storage, or disposal facilities from offsite shall be made at the point where the waste enters the hazardous waste treatment, storage, or disposal facility.

(4) The determination of annual waste quantity for each process unit turnaround waste generated only at 2 year or greater intervals, may be made by dividing the total quantity of waste generated during the most recent process unit turnaround by the time period (in the nearest tenth of a year) between the turnaround resulting in generation of the waste and the most recent preceding process turnaround for the unit. The resulting annual waste quantity shall be included in the calculation of the annual benzene quantity as provided in paragraph (a)(1)(iii) of this section for the year in which the turnaround occurs and for each subsequent year until the unit undergoes the next process turnaround. For estimates of total annual benzene quantity as specified in the 90-day report, required under §61.357(a)(1), the owner or operator shall estimate the waste quantity generated during the most recent turnaround, and the time period between turnarounds in accordance with good engineering practices. If the owner or operator chooses not to annualize process unit turnaround waste, as specified in this paragraph, then the process unit turnaround waste quantity shall be included in the calculation of the annual benzene quantity for the year in which the turnaround occurs.

(5) Select the highest annual quantity of waste managed from historical records representing the most recent 5 years of operation or, if the facility has been in service for less than 5 years but at least 1 year, from historical records representing the total operating life of the facility;

(6) Use the maximum design capacity of the waste management unit; or
(7) Use measurements that are representative of maximum waste generation rates.

(c) For the purposes of the calculation required by §§61.355(a) of this subpart, an owner or operator shall determine the flow-weighted annual average benzene concentration in a manner that meets the requirements given in paragraph (c)(1) of this section using either of the methods given in paragraphs (c)(2) and (c)(3) of this section.

(1) The determination of flow-weighted annual average benzene concentration shall meet all of the following criteria:

(i) The determination shall be made at the point of waste generation except for the specific cases given in paragraphs (c)(1)(i)(A) through (D) of this section.

(A) The determination for sour water streams that are processed in sour water strippers shall be made at the point that the water exits the sour water stripper.

(B) The determination for wastes at coke by-product plants subject to and complying with the control requirements of §61.132, 61.133, 61.134, or 61.139 of subpart L of this part shall be made at the location that the waste stream exits the process unit component or waste management unit controlled by that subpart or at the exit of the ammonia still, provided that the following conditions are met:

(1) The transfer of wastes between units complying with the control requirements of subpart L of this part, process units, and the ammonia still is made through hard piping or other enclosed system.

(2) The ammonia still meets the definition of a sour water stripper in §61.341.

(C) The determination for wastes that are received from offsite shall be made at the point where the waste enters the hazardous waste treatment, storage, or disposal facility.

(D) The determination of flow-weighted annual average benzene concentration for process unit turnaround waste shall be made using either of the methods given in paragraph (c)(2) or (c)(3) of this section. The resulting flow-weighted annual average benzene concentration shall be included in the calculation of annual benzene quantity as provided in paragraph (a)(1)(iii) of this section for the year in which the turnaround occurs and for each subsequent year until the unit undergoes the next process unit turnaround.

(ii) Volatilization of the benzene by exposure to air shall not be used in the determination to reduce the benzene concentration.

(iii) Mixing or diluting the waste stream with other wastes or other materials shall not be used in the determination—to reduce the benzene concentration.

(iv) The determination shall be made prior to any treatment of the waste that removes benzene, except as specified in paragraphs (c)(1)(i)(A) through (D) of this section.

(v) For wastes with multiple phases, the determination shall provide the weighted-average benzene concentration based on the benzene concentration in each phase of the waste and the relative proportion of the phases.

(2) Knowledge of the waste. The owner or operator shall provide sufficient information to document the flow-weighted annual average benzene concentration of each waste stream. Examples of information that could constitute knowledge include

material balances, records of chemicals purchases, or previous test results provided the results are still relevant to the current waste stream conditions. If test data are used, then the owner or operator shall provide documentation describing the testing protocol and the means by which sampling variability and analytical variability were accounted for in the determination of the flow-weighted annual average benzene concentration for the waste stream. When an owner or operator and the Administrator do not agree on determinations of the flow-weighted annual average benzene concentration based on knowledge of the waste, the procedures under paragraph (c)(3) of this section shall be used to resolve the disagreement.

(3) Measurements of the benzene concentration in the waste stream in accordance with the following procedures:

(i) Collect a minimum of three representative samples from each waste stream. Where feasible, samples shall be taken from an enclosed pipe prior to the waste being exposed to the atmosphere.

(ii) For waste in enclosed pipes, the following procedures shall be used:

(A) Samples shall be collected prior to the waste being exposed to the atmosphere in order to minimize the loss of benzene prior to sampling.

(B) A static mixer shall be installed in the process line or in a by-pass line unless the owner or operator demonstrates that installation of a static mixer in the line is not necessary to accurately determine the benzene concentration of the waste stream.

(C) The sampling tap shall be located within two pipe diameters of the static mixer outlet.

(D) Prior to the initiation of sampling, sample lines and cooling coil shall be purged with at least four volumes of waste.

(E) After purging, the sample flow shall be directed to a sample container and the tip of the sampling tube shall be kept below the surface of the waste during sampling to minimize contact with the atmosphere.

(F) Samples shall be collected at a flow rate such that the cooling coil is able to maintain a waste temperature less than 10 °C (50 °F).

(G) After filling, the sample container shall be capped immediately (within 5 seconds) to leave a minimum headspace in the container.

(H) The sample containers shall immediately be cooled and maintained at a temperature below 10 °C (50 °F) for transfer to the laboratory.

(iii) When sampling from an enclosed pipe is not feasible, a minimum of three representative samples shall be collected in a manner to minimize exposure of the sample to the atmosphere and loss of benzene prior to sampling.

(iv) Each waste sample shall be analyzed using one of the following test methods for determining the benzene concentration in a waste stream:

(A) Method 8020, Aromatic Volatile Organics, in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW–846 (incorporation by reference as specified in §61.18 of this part);

(B) Method 8021, Volatile Organic Compounds in Water by Purge and Trap Capillary Column Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series in "Test Methods for Evaluating Solid Waste,

Physical/Chemical Methods," EPA Publication No. SW–846 (incorporation by reference as specified in §61.18 of this part);

(C) Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW–846 (incorporation by reference as specified in §61.18 of this part);

(D) Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics: Capillary Column Technique in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW–846 (incorporation by reference as specified in §61.18 of this part);

(E) Method 602, Purgeable Aromatics, as described in 40 CFR part 136, appendix A, Test Procedures for Analysis of Organic Pollutants, for wastewaters for which this is an approved EPA methods; or

(F) Method 624, Purgeables, as described in 40 CFR part 136, appendix A, Test Procedures for Analysis of Organic Pollutants, for wastewaters for which this is an approved EPA method.

(v) The flow-weighted annual average benzene concentration shall be calculated by averaging the results of the sample analyses as follows:

$$\bar{C} = \frac{1}{Q_t} \times \sum_{i=1}^{n} (Q_i)(C_i)$$

The following condition will be listed on the permit to ensure compliance:

- Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.355 (a), (b), and (c). Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable requirements of 40 CFR 61.355 (d) through (k). [40 CFR 61.355]

Section 61.356

This section states (a) each owner or operator of a facility subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section. Each record shall be maintained in a readily accessible location at the facility site for a period not less than two years from the date the information is recorded unless otherwise specified.

(b) Each owner or operator shall maintain records that identify each waste stream at the facility subject to this subpart, and indicate whether or not the waste stream is controlled for benzene emissions in accordance with this subpart. In addition, the owner or operator shall maintain the following records:

(1) For each waste stream not controlled for benzene emissions in accordance with this subpart, the records shall include all test results, measurements, calculations, and other documentation used to determine the following information for the waste stream, waste stream identification, water content, whether or not the waste stream is a process wastewater stream, annual waste quantity, range of benzene concentrations, annual average flow-weighted benzene concentration, and annual benzene quantity.

(2) For each waste stream exempt from Section 61.34(c)(1) in accordance with Section 61.342(c)(3), the records shall include:
  (i) All measurements, calculations, and other documentation used to determine that the continuous flow of process wastewater is less than 0.2 liters (0.005 gallons) per minute or the annual waste quantity of process wastewater is less than 10 Mg/yr in accordance with 61.342(c)(3)(i), or
  (ii) All measurements, calculations, and other documentation used to determine that the sum of the total annual benzene quantity in all exempt waste streams does not exceed 2.0 Mg/yr in accordance with Section 61.342(c)(3)(ii).

(c) An owner or operator transferring waste off-site to another facility for treatment in accordance with §61.342(f) shall maintain documentation for each offsite waste shipment that includes the following information: Date waste is shipped offsite, quantity of waste shipped offsite, name and address of the facility receiving the waste, and a copy of the notice sent with the waste shipment.

The following condition will be listed on the permit to ensure compliance:

- Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.356 (a), (b) and (c). Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable requirements of 40 CFR 61.356 (d) through (n). [40 CFR 61.356]

Section 61.357

This section states (a) each owner or operator of a chemical plant, petroleum refinery, coke by-product recovery plant, and any facility managing wastes from these industries shall submit to the Administrator within 90 days after January 7, 1993, or by initial startup for a new source with an initial startup after the effective date, a report that summarizes the regulatory status of each waste stream subject to Section 61.342 and is determined by the procedures specified in Section 61.355(c) to contain benzene. Each owner or operator subject to this subject to this subpart who has no benzene onsite in wastes, products, by-products, or intermediates shall submit an initial report that is a statement to this effect. For all other owners or operators subject to this subpart, the report shall include the following information:

(2) A table identifying each waste stream and whether or not the waste stream will be controlled for benzene emissions in accordance with the requirements of this subpart.

(3) For each waste stream identified as not being controlled for benzene emissions in accordance with the requirements of this subpart the following information shall be added to the table:
  (i) Whether or not the water content of the waste stream is greater than 10 percent;
  (ii) Whether or not the waste stream is a process waste waster stream, product tank drawdown, or landfill leachate;
  (iii) Annual waste quantity for the waste stream;
  (iv) Range of benzene concentrations for the waste stream;
  (v) Annual average flow-weighted benzene concentration for the waste stream; and
  (vi) Annual benzene quantity for the waste stream.

(4) The information required in paragraphs (a) (1), (2), and (3) of this section should represent the waste stream characteristics based on current configuration and operating conditions. An owner or operator only needs to list in the report those waste streams that contact materials containing benzene. The report does not need to include a description of the controls to be installed to comply with the standard or other information required in Section 61.10(a).

(b) If the total annual benzene quantity from facility waste is less than 1 Mg/yr, then the owner or operator shall submit to the Administrator a report that updates the information listed in paragraphs (a)(1) through (a)(3) of this section whenever there is a change in the process generating the waste stream that could cause the total annual benzene quantity from facility waste to increase to 1 Mg/yr or more.

(c) If the total annual benzene quantity from facility waste is less than 10 Mg/yr but is equal to or greater than 1 Mg/yr, then the owner or operator shall submit to the Administrator a report that updates the information listed paragraphs (a)(1) through (a)(3) of this section. The report shall be submitted annually and whenever there is a change in the process generating the waste stream that could cause the total annual benzene quantity from facility waste to increase to 10 Mg/yr or more. If the information in the annual report required by paragraphs (a)(1) through (a)(3) of this section is not changed in the following year, the owner or operator may submit a statement to that effect.

The following condition will be listed on the permit to ensure compliance:

- Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.357 (a), (b), and (c). Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable requirements of 40 CFR 61.357 (d) through (g). [40 CFR 61.357]

Therefore, continued compliance with the requirements of this subpart is expected.

Rule 4101 Visible Emissions

Rule 4101 states that no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity.

Trucks will travel in the facility to the active working area on paved roads. The active working area will be watered to minimize fugitive dust. Air contaminants released into the atmosphere, which are greater than these visible emission limits, are not expected.

Therefore, compliance with the requirements of this rule is expected.

Rule 4102 Nuisance

Rule 4102 states that no air contaminant shall be released into the atmosphere which causes a public nuisance.

Air contaminants released into the atmosphere, which cause a public nuisance, are not expected.

The following existing condition will be carried over to the new permit to ensure compliance with the requirements of this rule.

- The District shall be notified in writing 10 days prior to the acceptance of new types of waste streams, or waste streams with significant malodorous qualities. [District Rules 2201 and 4102]

The following new condition will be added to the permit to ensure compliance with the requirements of this rule.

- Any malodorous material received at the facility which exhibits odors detectable at or beyond the facility property boundary shall be covered at the end of the working day with acceptable cover material. [District Rule 4102]

Therefore, compliance with the requirements of this rule is expected.

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than or equal to one. According to the Technical Services Memo for this project (Attachment E), the total facility prioritization score including this project was less than or equal to one. Therefore, no future analysis is required to determine the impact from this project and compliance with the District's Risk Management Policy is expected.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification not have acute or chronic indices, or a cancer risk greater than the District's significance levels (i.e. acute and/or chronic indices greater than 1 and a cancer risk greater than 10 in a million). As outlined by the HRA Summary in Attachment E of this report, the emissions increases for this project was determined to be less than significant.

Rule 4105 Commercial Offsite Multiuser Hazardous & Nonhazardous Waste Disposal Facilities

This rule is applicable to any commercial offsite multiuser hazardous or nonhazardous waste disposal facility licensed under the provisions of Division 20, Chapter 6.5 of the California Health and Safety Code.

Section 3.3 requires a plan containing the following:

- Methods used to monitor odors.
- Precautions to be taken to prevent creation of nuisance odors.
- Procedures to deal with public complaints.
- The names, titles, responsibilities, and telephone numbers of responsible persons who, or one of whom, may be contacted at all times while the facility is in use.
- If applicable, the information required by Section 25155.10 of the California Health and Safety Code relating to ambient air monitoring plans.
- Precautions to be taken to prevent the mixing of incompatible wastes.

Attachment D contains a summary of the facility Rule 4105 plan. The applicant has also submitted a copy of their Final Ambient Air Monitoring Plan to the California Department of Toxic Substance Control to comply with the requirements of California Code of Regulations, Title 22, Section 66264.700 et seq. (Article 17).

Therefore, compliance with the requirements of this rule is expected.

Rule 4202 Particulate Matter Emission Rate

Rule 4202 establishes PM emission limits as a function of process weight rate in tons/hr.

Per Section 4.1, particulate matter (PM) emissions from any source operation shall not exceed the allowable hourly emission rate (E) as calculated using the following formula:

$E = 3.59\ P^{0.62}$ (when, P = process weight rate $\leq$ 30 tons/hr)
$E = 17.31\ P^{0.16}$ (when, P = process weight rate $>$ 30 tons/hr)

P = (12,600 ton/day) ÷ (24 hr/day) = 525 ton/hr

The allowable hourly emission rate for this operation is:

$E = 17.31 \times 525^{0.16} = 47.15$ lb-PM_{10}/hr

PE2 = 5.7 lb-PM_{10}/day ÷ (24 hr/day) = 0.24 lb-PM_{10}/hr

Since 0.24 lb PM_{10}/hr $<$ 47.15 lb PM_{10}/hr, compliance is expected.

Rule 4642 Solid Waste Disposal Sites

Pursuant to Section 2.0, this rule is applicable to solid waste disposal sites which has a gas collection system and/or control device in operation, or undergoing maintenance or repair.

Pursuant to Section 4.1.3, the requirements of this rule shall not apply to hazardous waste disposal sites.

Therefore, the requirements of this rule do not apply to this project.

California Health & Safety Code 42301.6 (School Notice)

This site is not located within 1,000 feet of a K-12 school.

Therefore, pursuant to California Health & Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

DISTRICT RESPONSIBLE AGENCY – ENVIRONMENTAL IMPACT REPORT WITH STATEMENT OF OVERRIDING CONSIDERATION

The California Environmental Quality Act (CEQA) requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The County of Kings (County) is the public agency having principal responsibility for approving the Project. As such, the County served as the Lead Agency for the project. On December 22, 2009, the County certified the Final Subsequent Environmental Impact Report (FSEIR), finding that after implementing all feasible mitigation measures certain project (B18/B20) specific emissions of criteria pollutants and toxic air contaminants (TAC) would have a significant, unavoidable impact on air quality. The County approved the project and adopted a Statement of Overriding Consideration (SOC).

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381). As a Responsible Agency the District complies with CEQA by considering the EIR prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project involved (CEQA Guidelines §15096). The District has considered the Final Subsequent EIR certified by the County.

The District's engineering evaluation of the project (this document) demonstrates that the District would impose permit conditions requiring the applicant to meet BACT and the District would impose permit conditions requiring the applicant to surrender emission reduction credits (ERC). Thus, the District concludes that through a combination of project design elements and permit conditions, project specific stationary source emissions will be reduced and mitigated to less than significant levels.

The County concluded that emissions from mobile sources and operational greenhouse gases would have a significant impact on air quality. The District finds that impacts from mobile source emissions and greenhouse gases are within the jurisdiction of the California Air Resources Board. The District has no statutory authority over mobile source emissions and cannot impose additional mitigation measures to reduce emissions from those sources.

As a Responsible Agency the District is required to issue findings for significant air quality impacts detailed in the Lead Agency's EIR and adopt an SOC. The District has required all feasible mitigation measures to lessen stationary source emissions impacts to air quality from this project. As a single purpose agency, the District lacks the Lead Agency's broader scope of authority over the project and does not believe that it should overrule the decisions made by the Lead Agency. Accordingly, after considering the Lead Agency's FSEIR, the SOC, and the substantial evidence the Lead Agency relied on in adopting the SOC, the District finds that it had no basis on which to disagree with the SOC and evidence relied on therein. The District therefore adopts the Lead Agency's SOC by reference as its own.

IX. Recommendation

Issue Authority to Construct (ATC) C-283-11-6 subject to the permit conditions listed on the attached draft Authority to Construct in Attachment F.

X. Billing Information

The facility will be billed under Rule 3020 Permit Fee Schedules, Schedule 12 Commercial Offsite Multiuser Hazardous And Nonhazardous Waste Disposal Facilities Schedule.

Permit Number	Fee Schedule	Fee Description	Annual Fee
C-283-11-6	999-99	499 total acres (see C-283-22)	$0

Attachments

A Current PTO
B Active Face and Inactive Area Emission Calculations
C BACT Guideline 2.2.2 and Top Down BACT Analysis
D Rule 4105 Plan Summary
E Health Risk Assessment Analysis
F Draft Authority to Construct
G Emission Profile
H B-18 Landfill Fill Plan

ATTACHMENT A

Current PTO

San Joaquin Valley
Air Pollution Control District

PERMIT UNIT: C-283-11-2 **EXPIRATION DATE:** 08/31/2007

EQUIPMENT DESCRIPTION:
HAZARDOUS WASTE LANDFILL (B-18), 9.7 MILLION CUBIC YARD CAPACITY, USED FOR DISPOSAL OF BULK SOLIDS OF EMPTY CONTAINERS, SOLIDS, AND CONTAMINATED SOIL, (55.2 ACRE)

PERMIT UNIT REQUIREMENTS

1. The District shall be notified in writing 10 days prior to the acceptance of any new waste stream causing, or having the potential to cause, emissions of pollutants designated under the National Emissions Standards for Hazardous Air Pollutants which are not already addressed in this permit. [District NSR Rule] Federally Enforceable Through Title V Permit
2. The District shall be notified in writing 10 days prior to the acceptance of new types of waste streams, or waste streams with significant malodorous qualities. [District Rules 4102 and NSR] Federally Enforceable Through Title V Permit
3. A District approved anemometer shall be continuously operated on site with permanent data available to the District. [District NSR Rule] Federally Enforceable Through Title V Permit
4. Wastes with the potential to release hazardous gases, mists, or vapors in excess of existing air quality standards shall not be exposed to the atmosphere, and combustion of flammable wastes in the landfill shall be prevented. [District NSR Rule] Federally Enforceable Through Title V Permit
5. Vehicle speeds on all roads shall be limited to fifteen miles per hour. [District NSR Rule] Federally Enforceable Through Title V Permit
6. Materials handling operations associated with landfill construction and operation shall be curtailed when wind and moisture conditions make it likely that any resulting visible emissions will exceed 40% opacity at an elevation of 25 feet. [District NSR Rule] Federally Enforceable Through Title V Permit

ATTACHMENT B

Active Face and Inactive Area Emission Calculations

Active Face

Daily and Annual PE

Table B-1
B-18 Landfill Modeling Input Parameters

Input Parameters

OPEN LANDFILL- Working Face for B18

Parameter		Unit	Value	Comment
Area	A	cm^2	2.58E+07	Maximum assumed working face if all 7200 yds^3/day of waste were soils (0.64 acres)
Waste depth	I	cm	2.13E+02	Typical 7 ft lifts
Volume	V	cm^3	5.50E+09	A x I
Temperature	T	Degrees C	25	Assumed
Waste liquid (before fixation)			Single Phase	No significant oil-phase in waste.
Liquid composition	Sum Ci	ppm	1834	See Attached Waste Composition
Liquid/ fixative			1	Model assumes that the liquid in the waste does not increase the waste volume. *
Liquid in fixed waste	W	g/cm^3	1	Model Assumption
Air porosity fixed waste	ea	cm^3/cm^3	0.25	Default value. Typical for hazardous landfill waste
Total porosity fixed waste	et	cm^3/cm^3	0.50	Default value. Typical for hazardous landfill waste
Biomass concentration		g/cm^3	0	No biological activity in waste.
Average time waste is exposed to atmosphere.	t	hours	24	disposed of in the landfill.

Constants

Gas constant	R	cm^3-atm/K-g mole	82.05	Universal Gas Constant
Windspeed	U	m/s	2.86	Based on NCDC wind data for Fresno, CA.
Viscocity of air	ua	g-cm/s	1.81E-04	
Density of air	ra	g/cm^3	1.20E-03	
Density of waste liquid	rl	g/cm^3	1	Model Assumption

Table B-2
B-18 Landfill Waste Composition

Cas No.	VOC/ HAP CONSTITUENT	40 CFR Part 268.48 UTS (mg/kg)
75-05-8	ACETONITRILE	38
107-13-1	ACRYLONITRILE	84
71-43-2	BENZENE	10
75-27-4	BROMODICHLOROMETHANE	15
75-25-2	BROMOFORM	15
75-15-0	CARBON DISULFIDE	4.8
56-23-5	CARBON TETRACHLORIDE	6
108-90-70	CHLOROBENZENE	6
75-00-3	CHLOROETHANE	6
67-66-3	CHLOROFORM	6
126-99-8	CHLOROPRENE	0.28
10061-01-5	CIS-1,3-DICHLOROPROPYLENE	18
96-12-8	DIBROMO-3-CHLOROPROPANE, 1,2-	15
74-95-3	DIBROMOMETHANE	15
106-46-7	DICHLOROBENZENE,1,4-	6
75-34-3	DICHLOROETHANE,1,1-	6
156-60-5	DICHLOROETHYLENE (1,2) TRANS	30
75-35-4	DICHLOROETHYLENE,1,1-	6
78-87-5	DICHLOROPROPANE,1,2-	18
107-06-2	DICLOROETHANE,1,2-	6
123-91-1	DIOXANE,1,4-	170
100-41-4	ETHYL BENZENE	10
97-63-2	ETHYL METHACRYLATE (3)	160
106-93-4	ETHYLENE DIBROMIDE	15
87-68-3	HEXACHLORO-1,3-BUTADIENE	5.6
67-72-1	HEXACHLOROETHANE	30
74-88-4	IODOMETHANE	65
78-83-1	ISOBUTYL ALCOHOL	170
126-98-7	METHACRYLONITRILE	84
67-56-1	METHANOL	0.75
74-83-9	METHYL BROMIDE	15
74-87-3	METHYL CHLORIDE	30
78-93-3	METHYL ETHYL KETONE	36
108-10-1	METHYL ISOBUTYL KETONE	33
80-62-6	METHYL METHACRYLATE	160
75-09-2	METHYLENE CHLORIDE	30
107-12-0	PROPANENITRILE	360
630-20-6	TETRACHLORETHANE (1,1,1,2)	6
79-34-5	TETRACHLOROETHANE,1,1,2,2-	6
127-18-4	TETRACHLOROETHYLENE	6
108-88-3	TOLUENE	10
10061-02-6	TRANS-1,3-DICHLOROPROPYLENE	18
120-82-1	TRICHLOROBENZENE,1,2,4-	19
71-55-6	TRICHLOROETHANE,1,1,1-	6
79-00-5	TRICHLOROETHANE,1,1,2-	6
79-01-6	TRICHLOROETHYLENE	6
96-18-4	TRICHLOROPROPANE (1,2,3)	30
75-01-4	VINYL CHLORIDE	6
1330-20-7	XYLENE	30

Table B-3
B-18 Landfill Compound Specific Data

VOC Compounds in Waste	CAS No.	Max. Conc. NWW, ppm (1)	M Wt g/mole (2)	Density g/cm^3 (2)	Henry's Law Constant $atm\text{-}m^3/mol$ (2)	Liquid Diffusion Coefficient, cm^2/s (2)	Gas Diffusion Da, Coefficient, cm^2/s (2)
ACETONITRILE	75-05-8	38	41.03	0 78	2.873E-05	1.400E-05	3.140E-01
ACRYLONITRILE	107-13-1	84	53.1	0.81	8.312E-05	1.230E-05	2.110E-01
BENZENE	71-43-2	10	78 1	0.87	5.433E-03	1.020E-05	1.173E-01
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.97	1.423E-03	1.060E-05	2.980E-02
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	1.41	2.063E-03	1.210E-05	7.280E-02
CARBON DISULFIDE	75-15-0	4.8	76.1	1.26	3.113E-02	1.290E-05	1.044E-01
CARBON TETRACHLORIDE	56-23-5	6	153.8	1.59	2.975E-02	9.770E-06	3.560E-02
CHLOROBENZENE	108-90-7	6	112.6	1.11	2.430E-03	9.490E-06	6.350E-02
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	1.41	2.940E-03	1.530E-05	1.269E-01
CHLOROFORM	67-66-3	6	119.4	1.49	3.964E-03	1.090E-05	5.170E-02
CHLOROMETHANE	74-87-3	30	50.49	0.95	3.885E-03	1.390E-05	2.128E-01
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	0.958	1.272E-02	1.000E-05	9.440E-01
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.41	1.247E-04	7.020E-06	2.120E-02
DIBROMOETHANE-1,2	106-93-4	15	187.88	1.41	3.356E-04	8.060E-06	2.870E-02
DIBROMOMETHANE	74-95-3	15	173.85	1.41	3.280E-04	8.440E-06	3.180E-02
DICHLOROBENZENE (1,4-)	106-46-7	6	147	1.29	7.164E-03	8.850E-06	4.140E-02
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	1.17	3.060E-03	1.050E-05	7.420E-02
DICHLOROETHANE(1,2)	107-06-2	6	99	1.26	1.250E-03	1.100E-05	7.190E-02
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.28	1.490E-02	1.090E-05	7.520E-02
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	1.41	8.960E-03	1.190E-05	7.070E-02
DICHLOROPROPANE 1,2	78-87-5	18	112.99	1.156	5.963E-04	9.710E-06	6.210E-02
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	1.41	8.984E-03	1.100E-05	5.860E-02
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.41	1.101E-02	1.100E-05	5.860E-02
DIOXANE(1,4)	123-91-1	170	88.2	1.03	2.385E-05	1.050E-05	9.200E-02
ETHYL BENZENE	100-41-4	10	106.2	0.87	7.876E-03	8.490E-06	7.650E-02
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	0.95	3.982E-04	9.280E-06	7.990E-02
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.67	1.584E-02	7.330E-06	1.730E-02
HEXACHLOROETHANE	67-72-1	30	237	2.09	9.491E-05	8.880E-06	1.770E-02
IDOMETHANE	74-88-4	65	141.94	1.65	6.476E-04	1.040E-05	3.900E-02
ISOBUTYL ALCOHOL	78-83-1	170	74.12	0.79	1.336E-05	9.960E-06	1.319E-01
METHANOL	67-56-1	0.75	32	0.79	6.644E-06	1.640E-05	4.578E-01
METHACRYLONITRILE	126-98-7	84	67.09	1.15	8.312E-05	1.320E-05	1.299E-01
METHYL ETHYL KETONE	78-93-3	36	72.1	0 82	7.247E-05	1.030E-05	1.347E-01
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	0.8	1.184E-04	8.360E-06	8.590E-02
METHYL METHACRYLATE	80-62-6	160	100.1	0.95	3.982E-04	9.280E-06	8.000E-02
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	1.34	2.621E-03	1.250E-05	8.690E-02
PROPANENITRILE	107-12-0	360	55.08	1.15	5.870E-05	1.480E-05	1.735E-01
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.6	1.265E-03	9.300E-06	3.150E-02
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.59	1.265E-03	9.260E-06	3.160E-02
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.624	1.133E-02	9.450E-06	3.180E-02
TOLUENE	108-88-3	10	92.4	0.87	8.003E-03	9.230E-06	9.270E-02
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.89	2.125E-04	1.030E-05	1.410E-02
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.41	1.564E-02	8.230E-06	3.000E-02
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	1.33	6.874E-03	9.560E-06	4.660E-02
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.435	1.510E-03	1.000E-05	4.510E-02
TRICHLOROETHYLENE	79-01-6	6	131.4	1.4	2.113E-03	9.940E-06	4.650E-02
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.41	1.440E+00	9.320E-06	3.970E-02
VINYL CHLORIDE	75-01-4	6	62.5	0.91	1.800E-02	1.190E-05	1.584E-01
XYLENE	1330-20-7	30	106.2	1.02	1.108E-02	9.340E-06	7.140E-02

NOTES:
(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)
(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.
(3) Chemical-specific parameters for ethyl methacrylate were taken from methyl methacrylate.

Table B-4
INTERMEDIATE CALCULATIONS

Compound	CAS No.	C_i, ppm (1)	De_i cm^2/s	Keq,	Kvt, s^{-1}	Mo, g	Scg	kg cm/s
ACETONITRILE	75-05-8	38	1.24E-02	5.88E-04	1.38E-05	2.09E+05	4.80E-01	1.15E-02
ACRYLONITRILE	107-13-1	84	8.35E-03	1.70E-03	2.69E-05	4.62E+05	7.15E-01	8.79E-03
BENZENE	71-43-2	10	4.64E-03	1.11E-01	9.78E-04	5.50E+04	1.29E+00	5.93E-03
BROMODICHLOROMETHANE	75-27-4	15	1.18E-03	2.91E-02	6.51E-05	8.26E+04	5.06E+00	2.37E-03
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	2.88E-03	4.22E-02	2.31E-04	8.26E+04	2.07E+00	4.31E-03
CARBON DISULFIDE	75-15-0	4.8	4.13E-03	6.37E-01	4.99E-03	2.64E+04	1.44E+00	5.49E-03
CARBON TETRACHLORIDE	56-23-5	6	1.41E-03	6.08E-01	1.63E-03	3.30E+04	4.24E+00	2.67E-03
CHLOROBENZENE	108-90-7	6	2.51E-03	4.97E-02	2.37E-04	3.30E+04	2.38E+00	3.93E-03
CHLOROETHANE (ethyl chloride)	75-00-3	6	5.02E-03	6.01E-02	5.73E-04	3.30E+04	1.19E+00	6.26E-03
CHLOROFORM	67-66-3	6	2.04E-03	8.11E-02	3.15E-04	3.30E+04	2.92E+00	3.43E-03
CHLOROMETHANE	74-87-3	30	8.42E-03	7.94E-02	1.27E-03	1.65E+05	7.09E-01	8.84E-03
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	3.73E-02	2.60E-01	1.84E-02	1.54E+03	1.60E-01	2.40E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	8.39E-04	2.55E-03	4.06E-06	8.26E+04	7.11E+00	1.89E-03
DIBROMOETHANE-1,2	106-93-4	15	1.14E-03	6.86E-03	1.48E-05	8.26E+04	5.26E+00	2.31E-03
DIBROMOMETHANE	74-95-3	15	1.26E-03	6.71E-03	1.60E-05	8.26E+04	4.74E+00	2.47E-03
DICHLOROBENZENE (1,4-)	106-46-7	6	1.64E-03	1.46E-01	4.55E-04	3.30E+04	3.64E+00	2.95E-03
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	2.93E-03	6.26E-02	3.49E-04	3.30E+04	2.03E+00	4.37E-03
DICHLOROETHANE(1,2)	107-06-2	6	2.84E-03	2.56E-02	1.38E-04	3.30E+04	2.10E+00	4.27E-03
DICHLOROETHYLENE(1,1)	75-35-4	6	2.97E-03	3.05E-01	1.72E-03	3.30E+04	2.01E+00	4.41E-03
DICHLOROETHYLENE(1,2)trans	156-60-5	30	2.80E-03	1.83E-01	9.73E-04	1.65E+05	2.13E+00	4.23E-03
DICHLOROPROPANE 1,2	78-87-5	18	2.46E-03	1.22E-02	5.68E-05	9.91E+04	2.43E+00	3.88E-03
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	2.32E-03	1.84E-01	8.08E-04	9.91E+04	2.57E+00	3.73E-03
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	2.32E-03	2.25E-01	9.90E-04	9.91E+04	2.57E+00	3.73E-03
DIOXANE(1,4)	123-91-1	170	3.64E-03	4.88E-04	3.37E-06	9.36E+05	1.64E+00	5.04E-03
ETHYL BENZENE	100-41-4	10	3.03E-03	1.61E-01	9.25E-04	5.50E+04	1.97E+00	4.46E-03
ETHYL METHACRYLATE (3)	97-63-2	160	3.16E-03	8.14E-03	4.88E-05	8.81E+05	1.89E+00	4.59E-03
HEXACHLOROBUTADIENE	87-68-3	5.6	6.84E-04	3.24E-01	4.21E-04	3.08E+04	8.72E+00	1.65E-03
HEXACHLOROETHANE	67-72-1	30	7.00E-04	1.94E-03	2.58E-06	1.65E+05	8.52E+00	1.67E-03
IDOMETHANE	74-88-4	65	1.54E-03	1.32E-02	3.88E-05	3.58E+05	3.87E+00	2.84E-03
ISOBUTYL ALCOHOL	78-83-1	170	5.22E-03	2.73E-04	2.71E-06	9.36E+05	1.14E+00	6.42E-03
METHANOL	67-56-1	0.75	1.81E-02	1.36E-04	4.67E-06	4.13E+03	3.29E-01	1.48E-02
METHACRYLONITRILE	126-98-7	84	5.14E-03	1.70E-03	1.66E-05	4.62E+05	1.16E+00	6.35E-03
METHYL ETHYL KETONE	78-93-3	36	5.33E-03	1.48E-03	1.50E-05	1.98E+05	1.12E+00	6.51E-03
METHYL ISOBUTYL KETONE	108-10-1	33	3.40E-03	2.42E-03	1.56E-05	1.82E+05	1.76E+00	4.82E-03
METHYL METHACRYLATE	80-62-6	160	3.16E-03	8.14E-03	4.89E-05	8.81E+05	1.89E+00	4.59E-03
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	3.44E-03	5.36E-02	3.50E-04	1.65E+05	1.74E+00	4.85E-03
PROPANENITRILE	107-12-0	360	6.86E-03	1.20E-03	1.56E-05	1.98E+06	8.69E-01	7.71E-03
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	1.25E-03	2.59E-02	6.12E-05	3.30E+04	4.79E+00	2.46E-03
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	1.25E-03	2.59E-02	6.14E-05	3.30E+04	4.77E+00	2.46E-03
TETRACHLOROETHYLENE	127-18-4	6	1.26E-03	2.32E-01	5.53E-04	3.30E+04	4.74E+00	2.47E-03
TOLUENE	108-88-3	10	3.67E-03	1.64E-01	1.14E-03	5.50E+04	1.63E+00	5.07E-03
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	5.58E-04	4.35E-03	4.60E-06	8.26E+04	1.07E+01	1.44E-03
TRICHLOROBENZENE 1,2,4	120-82-1	19	1.19E-03	3.20E-01	7.20E-04	1.05E+05	5.03E+00	2.38E-03
TRICHLOROETHANE 1,1,1	71-55-6	6	1.84E-03	1.41E-01	4.92E-04	3.30E+04	3.24E+00	3.20E-03
TRICHLOROETHANE 1,1,2	79-00-5	6	1.78E-03	3.09E-02	1.05E-04	3.30E+04	3.34E+00	3.13E-03
TRICHLOROETHYLENE	79-01-6	6	1.84E-03	4.32E-02	1.51E-04	3.30E+04	3.24E+00	3.19E-03
TRICHLOROPROPANE(1,2,3)	96-18-4	30	1.57E-03	2.94E+01	8.78E-02	1.65E+05	3.80E+00	2.87E-03
VINYL CHLORIDE	75-01-4	6	6.27E-03	3.68E-01	4.38E-03	3.30E+04	9.52E-01	7.26E-03
XYLENE	1330-20-7	30	2.82E-03	2.27E-01	1.21E-03	1.65E+05	2.11E+00	4.25E-03
TOTAL		1834.43				1.01E+07		

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)

Table B-5
B-18 Potential Landfill Emissions Compositions

Compound	CAS No.	Cl, ppm	M Wt g/mole (2)	Henry's Law Constant atm-m^3/mol (2)	E (VOCs) g/s	E (VOCs) tpy
ACETONITRILE	75-05-8	38	41.03	2.87E-05	4.26E-03	1.48E-01
ACRYLONITRILE	107-13-1	84	53.1	8.31E-05	1.40E-02	4.86E-01
BENZENE	71-43-2	10	78.1	5.43E-03	1.11E-02	3.85E-01
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.42E-03	4.18E-03	1.45E-01
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	2.06E-03	7.96E-03	2.77E-01
CARBON DISULFIDE	75-15-0	4.8	76.1	3.11E-02	1.21E-02	4.21E-01
CARBON TETRACHLORIDE	56-23-5	6	153.8	2.98E-02	8.62E-03	3.00E-01
CHLOROBENZENE	108-90-7	6	112.6	2.43E-03	3.23E-03	1.12E-01
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	2.94E-03	5.05E-03	1.76E-01
CHLOROFORM	67-66-3	6	119.4	3.96E-03	3.74E-03	1.30E-01
CHLOROMETHANE	74-87-3	30	50.49	3.89E-03	3.78E-02	1.31E+00
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	1.27E-02	1.36E-03	4.72E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.25E-04	9.48E-04	3.30E-02
DIBROMOETHANE-1,2	106-93-4	15	187.88	3.36E-04	1.91E-03	6.65E-02
DIBROMOMETHANE	74-95-3	15	173.85	3.28E-04	1.99E-03	6.92E-02
DICHLOROBENZENE (1,4-)	106-46-7	6	147	7.16E-03	4.52E-03	1.57E-01
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	3.06E-03	3.93E-03	1.37E-01
DICHLOROETHANE(1,2)	107-06-2	6	99	1.25E-03	2.44E-03	8.49E-02
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.49E-02	8.85E-03	3.08E-01
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	8.96E-03	3.32E-02	1.15E+00
DICHLOROPROPANE 1,2	78-87-5	18	112.99	5.96E-04	4.62E-03	1.61E-01
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	8.98E-03	1.81E-02	6.30E-01
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.10E-02	2.01E-02	6.99E-01
DIOXANE(1,4)	123-91-1	170	88.2	2.39E-05	8.90E-03	3.10E-01
ETHYL BENZENE	100-41-4	10	106.2	7.88E-03	1.08E-02	3.75E-01
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	3.98E-04	3.77E-02	1.31E+00
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.58E-02	4.07E-03	1.42E-01
HEXACHLOROETHANE	67-72-1	30	237	9.49E-05	1.48E-03	5.14E-02
IDOMETHANE	74-88-4	65	141.94	6 48E-04	1.38E-02	4.78E-01
ISOBUTYL ALCOHOL	78-83-1	170	74.12	1.34E-05	7.58E-03	2.63E-01
METHANOL	67-56-1	0.75	32	6.64E-06	4.24E-05	1.47E-03
METHACRYLONITRILE	126-98-7	84	67.09	8.31E-05	1.09E-02	3.78E-01
METHYL ETHYL KETONE	78-93-3	36	72.1	7.25E-05	4.40E-03	1.53E-01
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	1.18E-04	4.19E-03	1.46E-01
METHYL METHACRYLATE	80-62-6	160	100.1	3.98E-04	3.78E-02	1.31E+00
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	2.62E-03	1.97E-02	6.84E-01
PROPANENITRILE	107-12-0	360	55.08	5.87E-05	4.45E-02	1.55E+00
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.27E-03	1.62E-03	5.62E-02
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.27E-03	1.62E-03	5.63E-02
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.13E-02	5.00E-03	1.74E-01
TOLUENE	108-88-3	10	92.4	8.00E-03	1.20E-02	4.16E-01
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.13E-04	1.03E-03	3.59E-02
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.56E-02	1.81E-02	6.30E-01
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	6.87E-03	4.70E-03	1.63E-01
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.51E-03	2.13E-03	7.39E-02
TRICHLOROETHYLENE	79-01-6	6	131.4	2.11E-03	2.57E-03	8.93E-02
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.44E+00	3.19E-01	1.11E+01
VINYL CHLORIDE	75-01-4	6	62.5	1.80E-02	1.41E-02	4.92E-01
XYLENE	1330-20-7	30	106.2	1.11E-02	3.71E-02	1.29E+00
TOTAL		1834.43			8.39E-01	29.1633

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)
(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.

Table B-6
B-18 Total Potential Landfill Emissions

SUMMARY OF POTENTIAL EMISSIONS
FROM WORKING FACE OF B-18 LANDFILL

TOTAL VOCs =	**29.2 TONS PER YEAR**

Inactive Area PEI Daily and Annual

Table B-1
B-18 Landfill Modeling Input Parameters

Input Parameters

Pre-Project Emissions (52.4 acres, 81.88 parcels)

Parameter		Unit	Value	Comment
Area	A	cm^2	2.58E+07	Maximum assumed working face if all 7200 yds^3/day of waste were soils (0.64 acres)
Waste depth	l	cm	2.13E+02	Typical 7 ft lifts
Volume	V	cm^3	5.50E+09	A x l
Temperature	T	Degrees C	25	Assumed
Waste liquid (before fixation)			Single Phase	No significant oil-phase in waste.
Liquid composition	Sum Ci	ppm	1834	See Attached Waste Composition
Liquid/ fixative			1	Model assumes that the liquid in the waste does not increase the waste volume.
Liquid in fixed waste	W	g/cm^3	1	Model Assumption
Air porosity fixed waste	ea	cm^3/cm^3	0.25	Default value. Typical for hazardous landfill waste
Total porosity fixed waste	et	cm^3/cm^3	0.50	Default value. Typical for hazardous landfill waste
Biomass concentration		g/cm^3	0	No biological activity in waste.
Average time waste is exposed to atmosphere.	t	hours	1965.12	disposed of in the landfill.

Constants

Gas constant	R	cm^3-atm/K-g mole	82.05	Universal Gas Constant
Windspeed	U	m/s	2.86	Based on NCDC wind data for Fresno, CA.
Viscocity of air	ua	g-cm/s	1.81E-04	
Density of air	ra	g/cm^3	1.20E-03	
Density of waste liquid	rl	g/cm^3	1	Model Assumption

Table B-2
B-18 Landfill Waste Composition

Cas No.	VOC/ HAP CONSTITUENT	40 CFR Part 268.48 UTS (mg/kg)
75-05-8	ACETONITRILE	38
107-13-1	ACRYLONITRILE	84
71-43-2	BENZENE	10
75-27-4	BROMODICHLOROMETHANE	15
75-25-2	BROMOFORM	15
75-15-0	CARBON DISULFIDE	4.8
56-23-5	CARBON TETRACHLORIDE	6
108-90-70	CHLOROBENZENE	6
75-00-3	CHLOROETHANE	6
67-66-3	CHLOROFORM	6
126-99-8	CHLOROPRENE	0.28
10061-01-5	CIS-1,3-DICHLOROPROPYLENE	18
96-12-8	DIBROMO-3-CHLOROPROPANE, 1,2-	15
74-95-3	DIBROMOMETHANE	15
106-46-7	DICHLOROBENZENE,1,4-	6
75-34-3	DICHLOROETHANE,1,1-	6
156-60-5	DICHLOROETHYLENE (1,2) TRANS	30
75-35-4	DICHLOROETHYLENE,1,1-	6
78-87-5	DICHLOROPROPANE,1,2-	18
107-06-2	DICLOROETHANE,1,2-	6
123-91-1	DIOXANE,1,4-	170
100-41-4	ETHYL BENZENE	10
97-63-2	ETHYL METHACRYLATE (3)	160
106-93-4	ETHYLENE DIBROMIDE	15
87-68-3	HEXACHLORO-1,3-BUTADIENE	5.6
67-72-1	HEXACHLOROETHANE	30
74-88-4	IODOMETHANE	65
78-83-1	ISOBUTYL ALCOHOL	170
126-98-7	METHACRYLONITRILE	84
67-56-1	METHANOL	0.75
74-83-9	METHYL BROMIDE	15
74-87-3	METHYL CHLORIDE	30
78-93-3	METHYL ETHYL KETONE	36
108-10-1	METHYL ISOBUTYL KETONE	33
80-62-6	METHYL METHACRYLATE	160
75-09-2	METHYLENE CHLORIDE	30
107-12-0	PROPANENITRILE	360
630-20-6	TETRACHLORETHANE (1,1,1,2)	6
79-34-5	TETRACHLOROETHANE,1,1,2,2-	6
127-18-4	TETRACHLOROETHYLENE	6
108-88-3	TOLUENE	10
10061-02-6	TRANS-1,3-DICHLOROPROPYLENE	18
120-82-1	TRICHLOROBENZENE,1,2,4-	19
71-55-6	TRICHLOROETHANE,1,1,1-	6
79-00-5	TRICHLOROETHANE,1,1,2-	6
79-01-6	TRICHLOROETHYLENE	6
96-18-4	TRICHLOROPROPANE (1,2,3)	30
75-01-4	VINYL CHLORIDE	6
1330-20-7	XYLENE	30

Table B-3
B-18 Landfill Compound Specific Data

VOC Compounds in Waste	CAS No.	Max. Conc. NWW, ppm (1)	M Wt g/mole (2)	Density g/cm^3 (2)	Henry's Law Constant atm-m^3/mol (2)	Liquid Diffusion Coefficient, cm^2/s (2)	Gas Diffusion D_a, Coefficient, cm^2/s (2)
ACETONITRILE	75-05-8	38	41.03	0.78	2.873E-05	1.400E-05	3.140E-01
ACRYLONITRILE	107-13-1	84	53.1	0.81	8.312E-05	1.230E-05	2.110E-01
BENZENE	71-43-2	10	78.1	0.87	5.433E-03	1.020E-05	1.173E-01
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.97	1.423E-03	1.060E-05	2.980E-02
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	1.41	2.063E-03	1.210E-05	7.280E-02
CARBON DISULFIDE	75-15-0	4.8	76.1	1.26	3.113E-02	1.290E-05	1.044E-01
CARBON TETRACHLORIDE	56-23-5	6	153.8	1.59	2.975E-02	9.770E-06	3.560E-02
CHLOROBENZENE	108-90-7	6	112.6	1.11	2.430E-03	9.490E-06	6.350E-02
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	1.41	2.940E-03	1.530E-05	1.269E-01
CHLOROFORM	67-66-3	6	119.4	1.49	3.964E-03	1.090E-05	5.170E-02
CHLOROMETHANE	74-87-3	30	50.49	0.95	3.885E-03	1.390E-05	2.128E-01
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	0.958	1.272E-02	1.000E-05	9.440E-01
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.41	1.247E-04	7.020E-06	2.120E-02
DIBROMOETHANE-1,2	106-93-4	15	187.88	1.41	3.356E-04	8.060E-06	2.870E-02
DIBROMOMETHANE	74-95-3	15	173.85	1.41	3.280E-04	8.440E-06	3.180E-02
DICHLOROBENZENE (1,4-)	106-46-7	6	147	1.29	7.164E-03	8.850E-06	4.140E-02
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	1.17	3.060E-03	1.050E-05	7.420E-02
DICHLOROETHANE(1,2)	107-06-2	6	99	1.26	1.250E-03	1.100E-05	7.190E-02
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.28	1.490E-02	1.090E-05	7.520E-02
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	1.41	8.960E-03	1.190E-05	7.070E-02
DICHLOROPROPANE 1,2	78-87-5	18	112.99	1.156	5.963E-04	9.710E-06	6.210E-02
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	1.41	8.984E-03	1.100E-05	5.860E-02
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.41	1.101E-02	1.100E-05	5.860E-02
DIOXANE(1,4)	123-91-1	170	88.2	1.03	2.385E-05	1.050E-05	9.200E-02
ETHYL BENZENE	100-41-4	10	106.2	0.87	7.876E-03	8.490E-06	7.650E-02
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	0.95	3.982E-04	9.280E-06	7.990E-02
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.67	1.584E-02	7.330E-06	1.730E-02
HEXACHLOROETHANE	67-72-1	30	237	2.09	9.491E-05	8.880E-06	1.770E-02
IDOMETHANE	74-88-4	65	141.94	1.65	6.476E-04	1.040E-05	3.900E-02
ISOBUTYL ALCOHOL	78-83-1	170	74.12	0.79	1.336E-05	9.960E-06	1.319E-01
METHANOL	67-56-1	0.75	32	0.79	6.644E-06	1.640E-05	4.578E-01
METHACRYLONITRILE	126-98-7	84	67.09	1.15	8.312E-05	1.320E-05	1.299E-01
METHYL ETHYL KETONE	78-93-3	36	72.1	0.82	7.247E-05	1.030E-05	1.347E-01
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	0.8	1.184E-04	8.360E-06	8.590E-02
METHYL METHACRYLATE	80-62-6	160	100.1	0.95	3.982E-04	9.280E-06	8.000E-02
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	1.34	2.621E-03	1.250E-05	8.690E-02
PROPANENITRILE	107-12-0	360	55.08	1.15	5.870E-05	1.480E-05	1.735E-01
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.6	1.265E-03	9.300E-06	3.150E-02
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.59	1.265E-03	9.260E-06	3.160E-02
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.624	1.133E-02	9.450E-06	3.180E-02
TOLUENE	108-88-3	10	92.4	0.87	8.003E-03	9.230E-06	9.270E-02
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.89	2.125E-04	1.030E-05	1.410E-02
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.41	1.564E-02	8.230E-06	3.000E-02
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	1.33	6.874E-03	9.560E-06	4.660E-02
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.435	1.510E-03	1.000E-05	4.510E-02
TRICHLOROETHYLENE	79-01-6	6	131.4	1.4	2.113E-03	9.940E-06	4.650E-02
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.41	1.440E+00	9.320E-06	3.970E-02
VINYL CHLORIDE	75-01-4	6	62.5	0.91	1.800E-02	1.190E-05	1.584E-01
XYLENE	1330-20-7	30	106.2	1.02	1.108E-02	9.340E-06	7.140E-02

NOTES:
(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)
(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.
(3) Chemical-specific parameters for ethyl methacrylate were taken from methyl methacrylate.

Table B-4
INTERMEDIATE CALCULATIONS

Compound	CAS No.	C_i, ppm (1)	De_i cm^2/s	Keq_i	Kvt_i s^{-1}	Mo_i g	Scg	kg cm/s
ACETONITRILE	75-05-8	38	1.24E-02	5.88E-04	1.13E-03	2.09E+05	4.80E-01	1.15E-02
ACRYLONITRILE	107-13-1	84	8.35E-03	1.70E-03	2.20E-03	4.62E+05	7.15E-01	8.79E-03
BENZENE	71-43-2	10	4.64E-03	1.11E-01	8.01E-02	5.50E+04	1.29E+00	5.93E-03
BROMODICHLOROMETHANE	75-27-4	15	1.18E-03	2.91E-02	5.33E-03	8.26E+04	5.06E+00	2.37E-03
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	2.88E-03	4.22E-02	1.89E-02	8.26E+04	2.07E+00	4.31E-03
CARBON DISULFIDE	75-15-0	4.8	4.13E-03	6.37E-01	4.09E-01	2.64E+04	1.44E+00	5.49E-03
CARBON TETRACHLORIDE	56-23-5	6	1.41E-03	6.08E-01	1.33E-01	3.30E+04	4.24E+00	2.67E-03
CHLOROBENZENE	108-90-7	6	2.51E-03	4.97E-02	1.94E-02	3.30E+04	2.38E+00	3.93E-03
CHLOROETHANE (ethyl chloride)	75-00-3	6	5.02E-03	6.01E-02	4.69E-02	3.30E+04	1.19E+00	6.26E-03
CHLOROFORM	67-66-3	6	2.04E-03	8.11E-02	2.58E-02	3.30E+04	2.92E+00	3.43E-03
CHLOROMETHANE	74-87-3	30	8.42E-03	7.94E-02	1.04E-01	1.65E+05	7.09E-01	8.84E-03
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	3.73E-02	2.60E-01	1.51E+00	1.54E+03	1.60E-01	2.40E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	8.39E-04	2.55E-03	3.32E-04	8.26E+04	7.11E+00	1.89E-03
DIBROMOETHANE-1,2	106-93-4	15	1.14E-03	6.86E-03	1.21E-03	8.26E+04	5.26E+00	2.31E-03
DIBROMOMETHANE	74-95-3	15	1.26E-03	6.71E-03	1.31E-03	8.26E+04	4.74E+00	2.47E-03
DICHLOROBENZENE (1,4-)	106-46-7	6	1.64E-03	1.46E-01	3.73E-02	3.30E+04	3.64E+00	2.95E-03
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	2.93E-03	6.26E-02	2.85E-02	3.30E+04	2.03E+00	4.37E-03
DICHLOROETHANE(1,2)	107-06-2	6	2.84E-03	2.56E-02	1.13E-02	3.30E+04	2.10E+00	4.27E-03
DICHLOROETHYLENE(1,1)	75-35-4	6	2.97E-03	3.05E-01	1.41E-01	3.30E+04	2.01E+00	4.41E-03
DICHLOROETHYLENE(1,2)trans	156-60-5	30	2.80E-03	1.83E-01	7.96E-02	1.65E+05	2.13E+00	4.23E-03
DICHLOROPROPANE 1,2	78-87-5	18	2.46E-03	1.22E-02	4.65E-03	9.91E+04	2.43E+00	3.88E-03
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	2.32E-03	1.84E-01	6.62E-02	9.91E+04	2.57E+00	3.73E-03
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	2.32E-03	2.25E-01	8.11E-02	9.91E+04	2.57E+00	3.73E-03
DIOXANE(1,4)	123-91-1	170	3.64E-03	4.88E-04	2.76E-04	9.36E+05	1.64E+00	5.04E-03
ETHYL BENZENE	100-41-4	10	3.03E-03	1.61E-01	7.57E-02	5.50E+04	1.97E+00	4.46E-03
ETHYL METHACRYLATE (3)	97-63-2	160	3.16E-03	8.14E-03	4.00E-03	8.81E+05	1.89E+00	4.59E-03
HEXACHLOROBUTADIENE	87-68-3	5.6	6.84E-04	3.24E-01	3.44E-02	3.08E+04	8.72E+00	1.65E-03
HEXACHLOROETHANE	67-72-1	30	7.00E-04	1.94E-03	2.11E-04	1.65E+05	8.52E+00	1.67E-03
IDOMETHANE	74-88-4	65	1.54E-03	1.32E-02	3.17E-03	3.58E+05	3.87E+00	2.84E-03
ISOBUTYL ALCOHOL	78-83-1	170	5.22E-03	2.73E-04	2.22E-04	9.36E+05	1.14E+00	6.42E-03
METHANOL	67-56-1	0.75	1.81E-02	1.36E-04	3.82E-04	4.13E+03	3.29E-01	1.48E-02
METHACRYLONITRILE	126-98-7	84	5.14E-03	1.70E-03	1.36E-03	4.62E+05	1.16E+00	6.35E-03
METHYL ETHYL KETONE	78-93-3	36	5.33E-03	1.48E-03	1.23E-03	1.98E+05	1.12E+00	6.51E-03
METHYL ISOBUTYL KETONE	108-10-1	33	3.40E-03	2.42E-03	1.28E-03	1.82E+05	1.76E+00	4.82E-03
METHYL METHACRYLATE	80-62-6	160	3.16E-03	8.14E-03	4.00E-03	8.81E+05	1.89E+00	4.59E-03
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	3.44E-03	5.36E-02	2.86E-02	1.65E+05	1.74E+00	4.85E-03
PROPANENITRILE	107-12-0	360	6.86E-03	1.20E-03	1.28E-03	1.98E+06	8.69E-01	7.71E-03
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	1.25E-03	2.59E-02	5.01E-03	3.30E+04	4.79E+00	2.46E-03
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	1.25E-03	2.59E-02	5.02E-03	3.30E+04	4.77E+00	2.46E-03
TETRACHLOROETHYLENE	127-18-4	6	1.26E-03	2.32E-01	4.53E-02	3.30E+04	4.74E+00	2.47E-03
TOLUENE	108-88-3	10	3.67E-03	1.64E-01	9.33E-02	5.50E+04	1.63E+00	5.07E-03
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	5.58E-04	4.35E-03	3.77E-04	8.26E+04	1.07E+01	1.44E-03
TRICHLOROBENZENE 1,2,4	120-82-1	19	1.19E-03	3.20E-01	5.90E-02	1.05E+05	5.03E+00	2.38E-03
TRICHLOROETHANE 1,1,1	71-55-6	6	1.84E-03	1.41E-01	4.03E-02	3.30E+04	3.24E+00	3.20E-03
TRICHLOROETHANE 1,1,2	79-00-5	6	1.78E-03	3.09E-02	8.56E-03	3.30E+04	3.34E+00	3.13E-03
TRICHLOROETHYLENE	79-01-6	6	1.84E-03	4.32E-02	1.24E-02	3.30E+04	3.24E+00	3.19E-03
TRICHLOROPROPANE(1,2,3)	96-18-4	30	1.57E-03	2.94E+01	7.19E+00	1.65E+05	3.80E+00	2.87E-03
VINYL CHLORIDE	75-01-4	6	6.27E-03	3.68E-01	3.58E-01	3.30E+04	9.52E-01	7.26E-03
XYLENE	1330-20-7	30	2.82E-03	2.27E-01	9.94E-02	1.65E+05	2.11E+00	4.25E-03
TOTAL		1834.43				1.01E+07		

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)

Table B-5
B-18 Potential Landfill Emissions Compositions

Compound	CAS No.	Cl, ppm	M Wt g/mole (2)	Henry's Law Constant atm-m^3/mol (2)	E (VOCs) g/s	E (VOCs) tpy
ACETONITRILE	75-05-8	38	41.03	2.87E-05	5.50E-04	1.57E+00
ACRYLONITRILE	107-13-1	84	53.1	8.31E-05	1.71E-03	4.86E+00
BENZENE	71-43-2	10	78.1	5.43E-03	1.24E-03	3.53E+00
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.42E-03	4.79E-04	1.36E+00
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	2.06E-03	9.02E-04	2.57E+00
CARBON DISULFIDE	75-15-0	4.8	76.1	3.11E-02	1.11E-03	3.17E+00
CARBON TETRACHLORIDE	56-23-5	6	153.8	2.98E-02	9.60E-04	2.73E+00
CHLOROBENZENE	108-90-7	6	112.6	2.43E-03	3.66E-04	1.04E+00
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	2.94E-03	5.69E-04	1.62E+00
CHLOROFORM	67-66-3	6	119.4	3.96E-03	4.22E-04	1.20E+00
CHLOROMETHANE	74-87-3	30	50.49	3.89E-03	4.24E-03	1.21E+01
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	1.27E-02	1.59E-05	4.52E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.25E-04	1.18E-04	3.36E-01
DIBROMOETHANE-1,2	106-93-4	15	187.88	3.36E-04	2.27E-04	6.46E-01
DIBROMOMETHANE	74-95-3	15	173.85	3.28E-04	2.36E-04	6.73E-01
DICHLOROBENZENE (1,4-)	106-46-7	6	147	7.16E-03	5.08E-04	1.45E+00
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	3.06E-03	4.44E-04	1.26E+00
DICHLOROETHANE(1,2)	107-06-2	6	99	1.25E-03	2.79E-04	7.94E-01
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.49E-02	9.87E-04	2.81E+00
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	8.96E-03	3.71E-03	1.06E+01
DICHLOROPROPANE 1,2	78-87-5	18	112.99	5.96E-04	5.36E-04	1.53E+00
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	8.98E-03	2.03E-03	5.78E+00
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.10E-02	2.25E-03	6.40E+00
DIOXANE(1,4)	123-91-1	170	88.2	2.39E-05	1.20E-03	3.43E+00
ETHYL BENZENE	100-41-4	10	106.2	7.88E-03	1.21E-03	3.43E+00
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	3.98E-04	4.41E-03	1.26E+01
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.58E-02	4.56E-04	1.30E+00
HEXACHLOROETHANE	67-72-1	30	237	9.49E-05	1.88E-04	5.35E-01
IDOMETHANE	74-88-4	65	141.94	6.48E-04	1.60E-03	4.55E+00
ISOBUTYL ALCOHOL	78-83-1	170	74.12	1.34E-05	1.07E-03	3.05E+00
METHANOL	67-56-1	0.75	32	6.64E-06	6.18E-06	1.76E-02
METHACRYLONITRILE	126-98-7	84	67.09	8.31E-05	1.34E-03	3.81E+00
METHYL ETHYL KETONE	78-93-3	36	72.1	7.25E-05	5.45E-04	1.55E+00
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	1.18E-04	5.11E-04	1.46E+00
METHYL METHACRYLATE	80-62-6	160	100.1	3.98E-04	4.41E-03	1.26E+01
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	2.62E-03	2.22E-03	6.33E+00
PROPANENITRILE	107-12-0	360	55.08	5.87E-05	5.56E-03	1.58E+01
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.27E-03	1.86E-04	5.28E-01
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.27E-03	1.86E-04	5.29E-01
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.13E-02	5.60E-04	1.59E+00
TOLUENE	108-88-3	10	92.4	8.00E-03	1.34E-03	3.81E+00
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.13E-04	1.26E-04	3.59E-01
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.56E-02	2.02E-03	5.76E+00
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	6.87E-03	5.28E-04	1.50E+00
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.51E-03	2.43E-04	6.91E-01
TRICHLOROETHYLENE	79-01-6	6	131.4	2.11E-03	2.92E-04	8.31E-01
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.44E+00	6.69E-09	1.90E-05
VINYL CHLORIDE	75-01-4	6	62.5	1.80E-02	1.38E-03	3.93E+00
XYLENE	1330-20-7	30	106.2	1.11E-02	4.15E-03	1.18E+01
TOTAL		1834.43			5.96E-02	169.7655

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)
(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.

Table B-6
B-18 Total Potential Landfill Emissions

SUMMARY OF POTENTIAL EMISSIONS
Pre-Project (52.4 acres, 81.88 parcels)

MODELED VOCs WITH NO CONTROL=	**169.8 TONS PER YEAR**	**930.22 lb/day**
TOTAL UNCONTROLLED VOCS EXPOSED ON DAY 1:	**29.2 TONS PER YEAR**	**160.0 lb/day**
TOTAL CONTROLLED VOCS : (169.8-29.2) * (1-0.92)	**11.245 TONS PER YEAR**	**61.62 lb/day**
TOTAL VOCs EMITTED	**40.445 TONS PER YEAR**	**221.62 lb/day**

T:\0742\824 2011 Capital\B-18 ATC\[B-18 Pre-project PTE.xls]Summary_Table B-6

Inactive Area PE 2 Daily and Annual

Table B-1
B-18 Landfill Modeling Input Parameters

Input Parameters

Post-Project Emissions (66.2 acres, 103.44 parcels)

Parameter		Unit	Value	Comment
Area	A	cm^2	2.58E+07	Maximum assumed working face if all 7200 yds^3/day of waste were soils (0.64 acres)
Waste depth	l	cm	2.13E+02	Typical 7 ft lifts
Volume	V	cm^3	5.50E+09	A x l
Temperature	T	Degrees C	25	Assumed
Waste liquid (before fixation)			Single Phase	No significant oil-phase in waste.
Liquid composition	Sum Ci	ppm	1834	See Attached Waste Composition
Liquid/ fixative			1	Model assumes that the liquid in the waste does not increase the waste volume.
Liquid in fixed waste	W	g/cm^3	1	Model Assumption
Air porosity fixed waste	ea	cm^3/cm^3	0.25	Default value. Typical for hazardous landfill waste
Total porosity fixed waste	et	cm^3/cm^3	0.50	Default value. Typical for hazardous landfill waste
Biomass concentration		g/cm^3	0	No biological activity in waste.
Average time waste is exposed to atmosphere.	t	hours	2482.56	disposed of in the landfill.

Constants

Gas constant	R	cm^3-atm/K-g mole	82.05	Universal Gas Constant
Windspeed	U	m/s	2.86	Based on NCDC wind data for Fresno, CA.
Viscocity of air	ua	g-cm/s	1.81E-04	
Density of air	ra	g/cm^3	1.20E-03	
Density of waste liquid	rl	g/cm^3	1	Model Assumption

Table B-2
B-18 Landfill Waste Composition

Cas No.	VOC/ HAP CONSTITUENT	40 CFR Part 268.48 UTS (mg/kg)
75-05-8	ACETONITRILE	38
107-13-1	ACRYLONITRILE	84
71-43-2	BENZENE	10
75-27-4	BROMODICHLOROMETHANE	15
75-25-2	BROMOFORM	15
75-15-0	CARBON DISULFIDE	4.8
56-23-5	CARBON TETRACHLORIDE	6
108-90-70	CHLOROBENZENE	6
75-00-3	CHLOROETHANE	6
67-66-3	CHLOROFORM	6
126-99-8	CHLOROPRENE	0.28
10061-01-5	CIS-1,3-DICHLOROPROPYLENE	18
96-12-8	DIBROMO-3-CHLOROPROPANE, 1,2-	15
74-95-3	DIBROMOMETHANE	15
106-46-7	DICHLOROBENZENE,1,4-	6
75-34-3	DICHLOROETHANE,1,1-	6
156-60-5	DICHLOROETHYLENE (1,2) TRANS	30
75-35-4	DICHLOROETHYLENE,1,1-	6
78-87-5	DICHLOROPROPANE,1,2-	18
107-06-2	DICLOROETHANE,1,2-	6
123-91-1	DIOXANE,1,4-	170
100-41-4	ETHYL BENZENE	10
97-63-2	ETHYL METHACRYLATE (3)	160
106-93-4	ETHYLENE DIBROMIDE	15
87-68-3	HEXACHLORO-1,3-BUTADIENE	5.6
67-72-1	HEXACHLOROETHANE	30
74-88-4	IODOMETHANE	65
78-83-1	ISOBUTYL ALCOHOL	170
126-98-7	METHACRYLONITRILE	84
67-56-1	METHANOL	0.75
74-83-9	METHYL BROMIDE	15
74-87-3	METHYL CHLORIDE	30
78-93-3	METHYL ETHYL KETONE	36
108-10-1	METHYL ISOBUTYL KETONE	33
80-62-6	METHYL METHACRYLATE	160
75-09-2	METHYLENE CHLORIDE	30
107-12-0	PROPANENITRILE	360
630-20-6	TETRACHLORETHANE (1,1,1,2)	6
79-34-5	TETRACHLOROETHANE,1,1,2,2-	6
127-18-4	TETRACHLOROETHYLENE	6
108-88-3	TOLUENE	10
10061-02-6	TRANS-1,3-DICHLOROPROPYLENE	18
120-82-1	TRICHLOROBENZENE,1,2,4-	19
71-55-6	TRICHLOROETHANE,1,1,1-	6
79-00-5	TRICHLOROETHANE,1,1,2-	6
79-01-6	TRICHLOROETHYLENE	6
96-18-4	TRICHLOROPROPANE (1,2,3)	30
75-01-4	VINYL CHLORIDE	6
1330-20-7	XYLENE	30

Table B-3
B-18 Landfill Compound Specific Data

VOC Compounds in Waste	CAS No.	Max. Conc. NWW, ppm (1)	M Wt g/mole (2)	Density g/cm^3 (2)	Henry's Law Constant atm-m^3/mol (2)	Liquid Diffusion Coefficient, cm^2/s (2)	Gas Diffusion Da_i Coefficient, cm^2/s (2)
ACETONITRILE	75-05-8	38	41.03	0.78	2.873E-05	1.400E-05	3.140E-01
ACRYLONITRILE	107-13-1	84	53.1	0.81	8.312E-05	1.230E-05	2.110E-01
BENZENE	71-43-2	10	78.1	0.87	5.433E-03	1.020E-05	1.173E-01
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.97	1.423E-03	1.060E-05	2.980E-02
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	1.41	2.063E-03	1.210E-05	7.280E-02
CARBON DISULFIDE	75-15-0	4.8	76.1	1.26	3.113E-02	1.290E-05	1.044E-01
CARBON TETRACHLORIDE	56-23-5	6	153.8	1.59	2.975E-02	9.770E-06	3.560E-02
CHLOROBENZENE	108-90-7	6	112.6	1.11	2.430E-03	9.490E-06	6.350E-02
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	1.41	2.940E-03	1.530E-05	1.269E-01
CHLOROFORM	67-66-3	6	119.4	1.49	3.964E-03	1.090E-05	5.170E-02
CHLOROMETHANE	74-87-3	30	50.49	0.95	3.885E-03	1.390E-05	2.128E-01
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	0.958	1.272E-02	1.000E-05	9.440E-01
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.41	1.247E-04	7.020E-06	2.120E-02
DIBROMOETHANE-1,2	106-93-4	15	187.88	1.41	3.356E-04	8.060E-06	2.870E-02
DIBROMOMETHANE	74-95-3	15	173.85	1.41	3.280E-04	8.440E-06	3.180E-02
DICHLOROBENZENE (1,4-)	106-46-7	6	147	1.29	7.164E-03	8.850E-06	4.140E-02
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	1.17	3.060E-03	1.050E-05	7.420E-02
DICHLOROETHANE(1,2)	107-06-2	6	99	1.26	1.250E-03	1.100E-05	7.190E-02
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.28	1.490E-02	1.090E-05	7.520E-02
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	1.41	8.960E-03	1.190E-05	7.070E-02
DICHLOROPROPANE 1,2	78-87-5	18	112.99	1.156	5.963E-04	9.710E-06	6.210E-02
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	1.41	8.984E-03	1.100E-05	5.860E-02
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.41	1.101E-02	1.100E-05	5.860E-02
DIOXANE(1,4)	123-91-1	170	88.2	1.03	2.385E-05	1.050E-05	9.200E-02
ETHYL BENZENE	100-41-4	10	106.2	0.87	7.876E-03	8.490E-06	7.650E-02
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	0.95	3.982E-04	9.280E-06	7.990E-02
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.67	1.584E-02	7.330E-06	1.730E-02
HEXACHLOROETHANE	67-72-1	30	237	2.09	9.491E-05	8.880E-06	1.770E-02
IDOMETHANE	74-88-4	65	141.94	1.65	6.476E-04	1.040E-05	3.900E-02
ISOBUTYL ALCOHOL	78-83-1	170	74.12	0.79	1.336E-05	9.960E-06	1.319E-01
METHANOL	67-56-1	0.75	32	0.79	6.644E-06	1.640E-05	4.578E-01
METHACRYLONITRILE	126-98-7	84	67.09	1.15	8.312E-05	1.320E-05	1.299E-01
METHYL ETHYL KETONE	78-93-3	36	72.1	0.82	7.247E-05	1.030E-05	1.347E-01
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	0.8	1.184E-04	8.360E-06	8.590E-02
METHYL METHACRYLATE	80-62-6	160	100.1	0.95	3.982E-04	9.280E-06	8.000E-02
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	1.34	2.621E-03	1.250E-05	8.690E-02
PROPANENITRILE	107-12-0	360	55.08	1.15	5.870E-05	1.480E-05	1.735E-01
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.6	1.265E-03	9.300E-06	3.150E-02
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.59	1.265E-03	9.260E-06	3.160E-02
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.624	1.133E-02	9.450E-06	3.180E-02
TOLUENE	108-88-3	10	92.4	0.87	8.003E-03	9.230E-06	9.270E-02
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.89	2.125E-04	1.030E-05	1.410E-02
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.41	1.564E-02	8.230E-06	3.000E-02
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	1.33	6.874E-03	9.560E-06	4.660E-02
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.435	1.510E-03	1.000E-05	4.510E-02
TRICHLOROETHYLENE	79-01-6	6	131.4	1.4	2.113E-03	9.940E-06	4.650E-02
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.41	1.440E+00	9.320E-06	3.970E-02
VINYL CHLORIDE	75-01-4	6	62.5	0.91	1.800E-02	1.190E-05	1.584E-01
XYLENE	1330-20-7	30	106.2	1.02	1.108E-02	9.340E-06	7.140E-02

NOTES:

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)

(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.

(3) Chemical-specific parameters for ethyl methacrylate were taken from methyl methacrylate.

Table B-4
INTERMEDIATE CALCULATIONS

Compound	CAS No.	C_i, ppm (1)	De_i cm^2/s	Keq_i	Kvt_i s^{-1}	Mo_i g	Scg	kg cm/s
ACETONITRILE	75-05-8	38	1.24E-02	5.88E-04	1.43E-03	2.09E+05	4.80E-01	1.15E-02
ACRYLONITRILE	107-13-1	84	8.35E-03	1.70E-03	2.79E-03	4.62E+05	7.15E-01	8.79E-03
BENZENE	71-43-2	10	4.64E-03	1.11E-01	1.01E-01	5.50E+04	1.29E+00	5.93E-03
BROMODICHLOROMETHANE	75-27-4	15	1.18E-03	2.91E-02	6.73E-03	8.26E+04	5.06E+00	2.37E-03
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	2.88E-03	4.22E-02	2.38E-02	8.26E+04	2.07E+00	4.31E-03
CARBON DISULFIDE	75-15-0	4.8	4.13E-03	6.37E-01	5.16E-01	2.64E+04	1.44E+00	5.49E-03
CARBON TETRACHLORIDE	56-23-5	6	1.41E-03	6.08E-01	1.68E-01	3.30E+04	4.24E+00	2.67E-03
CHLOROBENZENE	108-90-7	6	2.51E-03	4.97E-02	2.45E-02	3.30E+04	2.38E+00	3.93E-03
CHLOROETHANE (ethyl chloride)	75-00-3	6	5.02E-03	6.01E-02	5.92E-02	3.30E+04	1.19E+00	6.26E-03
CHLOROFORM	67-66-3	6	2.04E-03	8.11E-02	3.25E-02	3.30E+04	2.92E+00	3.43E-03
CHLOROMETHANE	74-87-3	30	8.42E-03	7.94E-02	1.31E-01	1.65E+05	7.09E-01	8.84E-03
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	3.73E-02	2.60E-01	1.91E+00	1.54E+03	1.60E-01	2.40E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	8.39E-04	2.55E-03	4.20E-04	8.26E+04	7.11E+00	1.89E-03
DIBROMOETHANE-1,2	106-93-4	15	1.14E-03	6.86E-03	1.53E-03	8.26E+04	5.26E+00	2.31E-03
DIBROMOMETHANE	74-95-3	15	1.26E-03	6.71E-03	1.66E-03	8.26E+04	4.74E+00	2.47E-03
DICHLOROBENZENE (1,4-)	106-46-7	6	1.64E-03	1.46E-01	4.71E-02	3.30E+04	3.64E+00	2.95E-03
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	2.93E-03	6.26E-02	3.61E-02	3.30E+04	2.03E+00	4.37E-03
DICHLOROETHANE(1,2)	107-06-2	6	2.84E-03	2.56E-02	1.43E-02	3.30E+04	2.10E+00	4.27E-03
DICHLOROETHYLENE(1,1)	75-35-4	6	2.97E-03	3.05E-01	1.78E-01	3.30E+04	2.01E+00	4.41E-03
DICHLOROETHYLENE(1,2)trans	156-60-5	30	2.80E-03	1.83E-01	1.01E-01	1.65E+05	2.13E+00	4.23E-03
DICHLOROPROPANE 1,2	78-87-5	18	2.46E-03	1.22E-02	5.88E-03	9.91E+04	2.43E+00	3.88E-03
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	2.32E-03	1.84E-01	8.36E-02	9.91E+04	2.57E+00	3.73E-03
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	2.32E-03	2.25E-01	1.02E-01	9.91E+04	2.57E+00	3.73E-03
DIOXANE(1,4)	123-91-1	170	3.64E-03	4.88E-04	3.48E-04	9.36E+05	1.64E+00	5.04E-03
ETHYL BENZENE	100-41-4	10	3.03E-03	1.61E-01	9.57E-02	5.50E+04	1.97E+00	4.46E-03
ETHYL METHACRYLATE (3)	97-63-2	160	3.16E-03	8.14E-03	5.05E-03	8.81E+05	1.89E+00	4.59E-03
HEXACHLOROBUTADIENE	87-68-3	5.6	6.84E-04	3.24E-01	4.35E-02	3.08E+04	8.72E+00	1.65E-03
HEXACHLOROETHANE	67-72-1	30	7.00E-04	1.94E-03	2.67E-04	1.65E+05	8.52E+00	1.67E-03
IDOMETHANE	74-88-4	65	1.54E-03	1.32E-02	4.01E-03	3.58E+05	3.87E+00	2.84E-03
ISOBUTYL ALCOHOL	78-83-1	170	5.22E-03	2.73E-04	2.80E-04	9.36E+05	1.14E+00	6.42E-03
METHANOL	67-56-1	0.75	1.81E-02	1.36E-04	4.83E-04	4.13E+03	3.29E-01	1.48E-02
METHACRYLONITRILE	126-98-7	84	5.14E-03	1.70E-03	1.71E-03	4.62E+05	1.16E+00	6.35E-03
METHYL ETHYL KETONE	78-93-3	36	5.33E-03	1.48E-03	1.55E-03	1.98E+05	1.12E+00	6.51E-03
METHYL ISOBUTYL KETONE	108-10-1	33	3.40E-03	2.42E-03	1.62E-03	1.82E+05	1.76E+00	4.82E-03
METHYL METHACRYLATE	80-62-6	160	3.16E-03	8.14E-03	5.06E-03	8.81E+05	1.89E+00	4.59E-03
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	3.44E-03	5.36E-02	3.62E-02	1.65E+05	1.74E+00	4.85E-03
PROPANENITRILE	107-12-0	360	6.86E-03	1.20E-03	1.62E-03	1.98E+06	8.69E-01	7.71E-03
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	1.25E-03	2.59E-02	6.33E-03	3.30E+04	4.79E+00	2.46E-03
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	1.25E-03	2.59E-02	6.35E-03	3.30E+04	4.77E+00	2.46E-03
TETRACHLOROETHYLENE	127-18-4	6	1.26E-03	2.32E-01	5.72E-02	3.30E+04	4.74E+00	2.47E-03
TOLUENE	108-88-3	10	3.67E-03	1.64E-01	1.18E-01	5.50E+04	1.63E+00	5.07E-03
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	5.58E-04	4.35E-03	4.76E-04	8.26E+04	1.07E+01	1.44E-03
TRICHLOROBENZENE 1,2,4	120-82-1	19	1.19E-03	3.20E-01	7.45E-02	1.05E+05	5.03E+00	2.38E-03
TRICHLOROETHANE 1,1,1	71-55-6	6	1.84E-03	1.41E-01	5.09E-02	3.30E+04	3.24E+00	3.20E-03
TRICHLOROETHANE 1,1,2	79-00-5	6	1.78E-03	3.09E-02	1.08E-02	3.30E+04	3.34E+00	3.13E-03
TRICHLOROETHYLENE	79-01-6	6	1.84E-03	4.32E-02	1.56E-02	3.30E+04	3.24E+00	3.19E-03
TRICHLOROPROPANE(1,2,3)	96-18-4	30	1.57E-03	2.94E+01	9.08E+00	1.65E+05	3.80E+00	2.87E-03
VINYL CHLORIDE	75-01-4	6	6.27E-03	3.68E-01	4.53E-01	3.30E+04	9.52E-01	7.26E-03
XYLENE	1330-20-7	30	2.82E-03	2.27E-01	1.26E-01	1.65E+05	2.11E+00	4.25E-03
TOTAL		1834.43				1.01E+07		

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)

Table B-5
B-18 Potential Landfill Emissions Compositions

Compound	CAS No.	Cl, ppm	M Wt g/mole (2)	Henry's Law Constant atm-m^3/mol (2)	E (VOCs) g/s	E (VOCs) tpy
ACETONITRILE	75-05-8	38	41.03	2.87E-05	4.91E-04	1.76E+00
ACRYLONITRILE	107-13-1	84	53.1	8.31E-05	1.52E-03	5.48E+00
BENZENE	71-43-2	10	78.1	5.43E-03	1.10E-03	3.97E+00
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.42E-03	4.26E-04	1.53E+00
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	2.06E-03	8.03E-04	2.89E+00
CARBON DISULFIDE	75-15-0	4.8	76.1	3.11E-02	8.54E-04	3.07E+00
CARBON TETRACHLORIDE	56-23-5	6	153.8	2.98E-02	8.54E-04	3.07E+00
CHLOROBENZENE	108-90-7	6	112.6	2.43E-03	3.26E-04	1.17E+00
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	2.94E-03	5.06E-04	1.82E+00
CHLOROFORM	67-66-3	6	119.4	3.96E-03	3.75E-04	1.35E+00
CHLOROMETHANE	74-87-3	30	50.49	3.89E-03	3.77E-03	1.36E+01
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	1.27E-02	5.95E-06	2.14E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.25E-04	1.05E-04	3.79E-01
DIBROMOETHANE-1,2	106-93-4	15	187.88	3.36E-04	2.02E-04	7.27E-01
DIBROMOMETHANE	74-95-3	15	173.85	3.28E-04	2.10E-04	7.57E-01
DICHLOROBENZENE (1,4-)	106-46-7	6	147	7.16E-03	4.52E-04	1.62E+00
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	3.06E-03	3.95E-04	1.42E+00
DICHLOROETHANE(1,2)	107-06-2	6	99	1.25E-03	2.48E-04	8.93E-01
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.49E-02	8.79E-04	3.16E+00
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	8.96E-03	3.30E-03	1.19E+01
DICHLOROPROPANE 1,2	78-87-5	18	112.99	5.96E-04	4.77E-04	1.72E+00
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	8.98E-03	1.81E-03	6.50E+00
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.10E-02	2.00E-03	7.19E+00
DIOXANE(1,4)	123-91-1	170	88.2	2.39E-05	1.08E-03	3.87E+00
ETHYL BENZENE	100-41-4	10	106.2	7.88E-03	1.07E-03	3.86E+00
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	3.98E-04	3.93E-03	1.41E+01
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.58E-02	4.05E-04	1.46E+00
HEXACHLOROETHANE	67-72-1	30	237	9.49E-05	1.67E-04	6.02E-01
IDOMETHANE	74-88-4	65	141.94	6.48E-04	1.42E-03	5.12E+00
ISOBUTYL ALCOHOL	78-83-1	170	74.12	1.34E-05	9.57E-04	3.44E+00
METHANOL	67-56-1	0.75	32	6.64E-06	5.52E-06	1.99E-02
METHACRYLONITRILE	126-98-7	84	67.09	8.31E-05	1.19E-03	4.29E+00
METHYL ETHYL KETONE	78-93-3	36	72.1	7.25E-05	4.86E-04	1.75E+00
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	1.18E-04	4.56E-04	1.64E+00
METHYL METHACRYLATE	80-62-6	160	100.1	3.98E-04	3.93E-03	1.41E+01
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	2.62E-03	1.98E-03	7.11E+00
PROPANENITRILE	107-12-0	360	55.08	5.87E-05	4.96E-03	1.78E+01
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.27E-03	1.65E-04	5.94E-01
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.27E-03	1.65E-04	5.95E-01
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.13E-02	4.98E-04	1.79E+00
TOLUENE	108-88-3	10	92.4	8.00E-03	1.19E-03	4.28E+00
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.13E-04	1.12E-04	4.04E-01
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.56E-02	1.80E-03	6.47E+00
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	6.87E-03	4.69E-04	1.69E+00
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.51E-03	2.16E-04	7.77E-01
TRICHLOROETHYLENE	79-01-6	6	131.4	2.11E-03	2.60E-04	9.34E-01
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.44E+00	6.27E-11	2.26E-07
VINYL CHLORIDE	75-01-4	6	62.5	1.80E-02	1.10E-03	3.94E+00
XYLENE	1330-20-7	30	106.2	1.11E-02	3.69E-03	1.33E+01
TOTAL		1834.43			5.28E-02	189.9398

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)
(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.

Table B-6
B-18 Total Potential Landfill Emissions

SUMMARY OF POTENTIAL EMISSIONS
Post-Project (66.2 acres, 103.44 parcels)

MODELED VOCs WITH NO CONTROL=	**189.9 TONS PER YEAR**	**1040.8 lb/day**
TOTAL UNCONTROLLED VOCS EXPOSED ON DAY 1:	**29.2 TONS PER YEAR**	**160.0 lb/day**
TOTAL CONTROLLED VOCS : (189.9-29.2) * (1-0.92)	**12.859 TONS PER YEAR**	**70.46 lb/day**
TOTAL VOCs EMITTED	**42.059 TONS PER YEAR**	**230.46 lb/day**

T:\0742\824 2011 Capital\B-18 ATC\[B-18 Post-project PTE.xls]Summary_Table B-6

Pre-Project Emissions
(52.4 acres, 81.88 parcels)

Daily and Annual

Day or Parcel #	Hours	Total Model Output	Daily Emissions (lb/day)	After Control (lb/day)	After Control (tpy)
1	24	160	160	160.0	29.20
2	48	227.9	67.9	5.4	0.99
3	72	275.1	47.2	3.8	0.69
4	96	310.7	35.6	2.8	0.52
5	120	335.9	25.2	2.0	0.37
6	144	354.5	18.6	1.5	0.27
7	168	368.8	14.3	1.1	0.21
8	192	379.7	10.9	0.9	0.16
9	216	389.6	9.9	0.8	0.14
10	240	397.8	8.2	0.7	0.12
11	264	405.5	7.7	0.6	0.11
12	288	413.2	7.7	0.6	0.11
13	312	420.3	7.1	0.6	0.10
14	336	427.9	7.6	0.6	0.11
15	360	435.6	7.7	0.6	0.11
16	384	443.8	8.2	0.7	0.12
17	408	452.1	8.3	0.7	0.12
18	432	460.3	8.2	0.7	0.12
19	456	469	8.7	0.7	0.13
20	480	477.8	8.8	0.7	0.13
21	504	486.6	8.8	0.7	0.13
22	528	495.9	9.3	0.7	0.14
23	552	504.7	8.8	0.7	0.13
24	576	514	9.3	0.7	0.14
25	600	523.3	9.3	0.7	0.14
26	624	532.1	8.8	0.7	0.13
27	648	541.4	9.3	0.7	0.14
28	672	550.1	8.7	0.7	0.13
29	696	559.5	9.4	0.8	0.14
30	720	568.2	8.7	0.7	0.13
31	744	577.5	9.3	0.7	0.14
32	768	586.3	8.8	0.7	0.13
33	792	595.1	8.8	0.7	0.13
34	816	603.8	8.7	0.7	0.13
35	840	612.6	8.8	0.7	0.13
36	864	620.8	8.2	0.7	0.12
37	888	629.6	8.8	0.7	0.13
38	912	637.8	8.2	0.7	0.12
39	936	646	8.2	0.7	0.12
40	960	654.2	8.2	0.7	0.12
41	984	662.5	8.3	0.7	0.12
42	1008	670.1	7.6	0.6	0.11
43	1032	678.4	8.3	0.7	0.12
44	1056	686	7.6	0.6	0.11
45	1080	693.2	7.2	0.6	0.11
46	1104	700.8	7.6	0.6	0.11
47	1128	708.5	7.7	0.6	0.11
48	1152	715.6	7.1	0.6	0.10
49	1176	723.3	7.7	0.6	0.11
50	1200	730.4	7.1	0.6	0.10
51	1224	737	6.6	0.5	0.10
52	1248	744.7	7.7	0.6	0.11

Pre-Project Emissions
(52.4 acres, 81.88 parcels)

Day or Parcel #	Hours	Total Model Output	Daily Emissions (lb/day)	After Control (lb/day)	After Control (tpy)
53	1272	751.2	6.5	0.5	0.09
54	1296	758.4	7.2	0.6	0.11
55	1320	765.5	7.1	0.6	0.10
56	1344	772.1	6.6	0.5	0.10
57	1368	779.2	7.1	0.6	0.10
58	1392	785.8	6.6	0.5	0.10
59	1416	792.3	6.5	0.5	0.09
60	1440	798.9	6.6	0.5	0.10
61	1464	805.5	6.6	0.5	0.10
62	1488	812.1	6.6	0.5	0.10
63	1512	818.6	6.5	0.5	0.09
64	1536	824.7	6.1	0.5	0.09
65	1560	831.2	6.5	0.5	0.09
66	1584	837.3	6.1	0.5	0.09
67	1608	843.8	6.5	0.5	0.09
68	1632	849.9	6.1	0.5	0.09
69	1656	855.9	6	0.5	0.09
70	1680	861.9	6	0.5	0.09
71	1704	867.9	6	0.5	0.09
72	1728	874	6.1	0.5	0.09
73	1752	880	6	0.5	0.09
74	1776	885.5	5.5	0.4	0.08
75	1800	891.5	6	0.5	0.09
76	1824	897	5.5	0.4	0.08
77	1848	903	6	0.5	0.09
78	1872	908.5	5.5	0.4	0.08
79	1896	914	5.5	0.4	0.08
80	1920	920	6	0.5	0.09
81	1944	925.5	5.5	0.4	0.08
81.88	1965.12	929.9	4.4	0.4	0.06
Total Emissions (lb/day)				**221.6**	**40.44**

Post-Project Emissions
(66.2 acres, 103.44 parcels)

Daily and Annual

Day or Parcel #	Hours	Total Model Output	Daily Emissions (lb/day)	After Control (lb/day)	After Control (tpy)
1	24	160.0	160.0	160.0	29.20
2	48	227.9	67.9	5.4	0.99
3	72	275.1	47.2	3.8	0.69
4	96	310.7	35.6	2.8	0.52
5	120	335.9	25.2	2.0	0.37
6	144	354.5	18.6	1.5	0.27
7	168	368.8	14.3	1.1	0.21
8	192	379.7	10.9	0.9	0.16
9	216	389.6	9.9	0.8	0.14
10	240	397.8	8.2	0.7	0.12
11	264	405.5	7.7	0.6	0.11
12	288	413.2	7.7	0.6	0.11
13	312	420.3	7.1	0.6	0.10
14	336	427.9	7.6	0.6	0.11
15	360	435.6	7.7	0.6	0.11
16	384	443.8	8.2	0.7	0.12
17	408	452.1	8.3	0.7	0.12
18	432	460.3	8.2	0.7	0.12
19	456	469	8.7	0.7	0.13
20	480	477.8	8.8	0.7	0.13
21	504	486.6	8.8	0.7	0.13
22	528	495.9	9.3	0.7	0.14
23	552	504.7	8.8	0.7	0.13
24	576	514	9.3	0.7	0.14
25	600	523.3	9.3	0.7	0.14
26	624	532.1	8.8	0.7	0.13
27	648	541.4	9.3	0.7	0.14
28	672	550.1	8.7	0.7	0.13
29	696	559.5	9.4	0.8	0.14
30	720	568.2	8.7	0.7	0.13
31	744	577.5	9.3	0.7	0.14
32	768	586.3	8.8	0.7	0.13
33	792	595.1	8.8	0.7	0.13
34	816	603.8	8.7	0.7	0.13
35	840	612.6	8.8	0.7	0.13
36	864	620.8	8.2	0.7	0.12
37	888	629.6	8.8	0.7	0.13
38	912	637.8	8.2	0.7	0.12
39	936	646	8.2	0.7	0.12
40	960	654.2	8.2	0.7	0.12
41	984	662.5	8.3	0.7	0.12
42	1008	670.1	7.6	0.6	0.11
43	1032	678.4	8.3	0.7	0.12
44	1056	686	7.6	0.6	0.11
45	1080	693.2	7.2	0.6	0.11
46	1104	700.8	7.6	0.6	0.11
47	1128	708.5	7.7	0.6	0.11
48	1152	715.6	7.1	0.6	0.10
49	1176	723.3	7.7	0.6	0.11
50	1200	730.4	7.1	0.6	0.10
51	1224	737	6.6	0.5	0.10
52	1248	744.7	7.7	0.6	0.11
53	1272	751.2	6.5	0.5	0.09

Post-Project Emissions
(66.2 acres, 103.44 parcels)

Day or Parcel #	Hours	Total Model Output	Daily Emissions (lb/day)	After Control (lb/day)	After Control (tpy)
54	1296	758.4	7.2	0.6	0.11
55	1320	765.5	7.1	0.6	0.10
56	1344	772.1	6.6	0.5	0.10
57	1368	779.2	7.1	0.6	0.10
58	1392	785.8	6.6	0.5	0.10
59	1416	792.3	6.5	0.5	0.09
60	1440	798.9	6.6	0.5	0.10
61	1464	805.5	6.6	0.5	0.10
62	1488	812.1	6.6	0.5	0.10
63	1512	818.6	6.5	0.5	0.09
64	1536	824.7	6.1	0.5	0.09
65	1560	831.2	6.5	0.5	0.09
66	1584	837.3	6.1	0.5	0.09
67	1608	843.8	6.5	0.5	0.09
68	1632	849.9	6.1	0.5	0.09
69	1656	855.9	6	0.5	0.09
70	1680	861.9	6	0.5	0.09
71	1704	867.9	6	0.5	0.09
72	1728	874	6.1	0.5	0.09
73	1752	880	6	0.5	0.09
74	1776	885.5	5.5	0.4	0.08
75	1800	891.5	6	0.5	0.09
76	1824	897	5.5	0.4	0.08
77	1848	903	6	0.5	0.09
78	1872	908.5	5.5	0.4	0.08
79	1896	914	5.5	0.4	0.08
80	1920	920	6	0.5	0.09
81	1944	925.5	5.5	0.4	0.08
82	1968	931	5.5	0.4	0.08
83	1992	936.4	5.4	0.4	0.08
84	2016	941.9	5.5	0.4	0.08
85	2040	947.4	5.5	0.4	0.08
86	2064	952.3	4.9	0.4	0.07
87	2088	957.8	5.5	0.4	0.08
88	2112	963.3	5.5	0.4	0.08
89	2136	968.2	4.9	0.4	0.07
90	2160	973.7	5.5	0.4	0.08
91	2184	978.6	4.9	0.4	0.07
92	2208	984.1	5.5	0.4	0.08
93	2232	989	4.9	0.4	0.07
94	2256	994	5	0.4	0.07
95	2280	999.5	5.5	0.4	0.08
96	2304	1004.4	4.9	0.4	0.07
97	2328	1009.3	4.9	0.4	0.07
98	2352	1014.2	4.9	0.4	0.07
99	2376	1019.2	5	0.4	0.07
100	2400	1024.1	4.9	0.4	0.07
101	2424	1029	4.9	0.4	0.07
102	2448	1034	5	0.4	0.07
103	2472	1038.9	4.9	0.4	0.07
103.44	2482.56	1040.5	1.6	0.1	0.02
Total Emissions				**230.4**	**42.06**

Inactive Area 24 hr exposure

Table B-1
B-18 Landfill Modeling Input Parameters

Input Parameters

Parameter		Unit	Value	Comment
Area	A	cm^2	2.58E+07	Maximum assumed working face if all 7200 yds^3/day of waste were soils (0.64 acres)
Waste depth	l	cm	2.13E+02	Typical 7 ft lifts
Volume	V	cm^3	5.50E+09	A x l
Temperature	T	Degrees C	25	Assumed
Waste liquid (before fixation)			Single Phase	No significant oil-phase in waste.
Liquid composition	Sum Ci	ppm	1834	See Attached Waste Composition
Liquid/ fixative			1	Model assumes that the liquid in the waste does not increase the waste volume.
Liquid in fixed waste	W	g/cm^3	1	Model Assumption
Air porosity fixed waste	ea	cm^3/cm^3	0.25	Default value. Typical for hazardous landfill waste
Total porosity fixed waste	et	cm^3/cm^3	0.50	Default value. Typical for hazardous landfill waste
Biomass concentration		g/cm^3	0	No biological activity in waste.
Average time waste is exposed to atmosphere.	t	hours	24	disposed of in the landfill.

Constants

Gas constant	R	cm^3-atm/K-g mole	82.05	Universal Gas Constant
Windspeed	U	m/s	2.86	Based on NCDC wind data for Fresno, CA.
Viscocity of air	ua	g-cm/s	1.81E-04	
Density of air	ra	g/cm^3	1.20E-03	
Density of waste liquid	rl	g/cm^3	1	Model Assumption

Table B-2
B-18 Landfill Waste Composition

Cas No.	VOC/ HAP CONSTITUENT	40 CFR Part 268.48 UTS (mg/kg)
75-05-8	ACETONITRILE	38
107-13-1	ACRYLONITRILE	84
71-43-2	BENZENE	10
75-27-4	BROMODICHLOROMETHANE	15
75-25-2	BROMOFORM	15
75-15-0	CARBON DISULFIDE	4.8
56-23-5	CARBON TETRACHLORIDE	6
108-90-70	CHLOROBENZENE	6
75-00-3	CHLOROETHANE	6
67-66-3	CHLOROFORM	6
126-99-8	CHLOROPRENE	0.28
10061-01-5	CIS-1,3-DICHLOROPROPYLENE	18
96-12-8	DIBROMO-3-CHLOROPROPANE, 1,2-	15
74-95-3	DIBROMOMETHANE	15
106-46-7	DICHLOROBENZENE,1,4-	6
75-34-3	DICHLOROETHANE,1,1-	6
156-60-5	DICHLOROETHYLENE (1,2) TRANS	30
75-35-4	DICHLOROETHYLENE,1,1-	6
78-87-5	DICHLOROPROPANE,1,2-	18
107-06-2	DICLOROETHANE,1,2-	6
123-91-1	DIOXANE,1,4-	170
100-41-4	ETHYL BENZENE	10
97-63-2	ETHYL METHACRYLATE (3)	160
106-93-4	ETHYLENE DIBROMIDE	15
87-68-3	HEXACHLORO-1,3-BUTADIENE	5.6
67-72-1	HEXACHLOROETHANE	30
74-88-4	IODOMETHANE	65
78-83-1	ISOBUTYL ALCOHOL	170
126-98-7	METHACRYLONITRILE	84
67-56-1	METHANOL	0.75
74-83-9	METHYL BROMIDE	15
74-87-3	METHYL CHLORIDE	30
78-93-3	METHYL ETHYL KETONE	36
108-10-1	METHYL ISOBUTYL KETONE	33
80-62-6	METHYL METHACRYLATE	160
75-09-2	METHYLENE CHLORIDE	30
107-12-0	PROPANENITRILE	360
630-20-6	TETRACHLORETHANE (1,1,1,2)	6
79-34-5	TETRACHLOROETHANE,1,1,2,2-	6
127-18-4	TETRACHLOROETHYLENE	6
108-88-3	TOLUENE	10
10061-02-6	TRANS-1,3-DICHLOROPROPYLENE	18
120-82-1	TRICHLOROBENZENE,1,2,4-	19
71-55-6	TRICHLOROETHANE,1,1,1-	6
79-00-5	TRICHLOROETHANE,1,1,2-	6
79-01-6	TRICHLOROETHYLENE	6
96-18-4	TRICHLOROPROPANE (1,2,3)	30
75-01-4	VINYL CHLORIDE	6
1330-20-7	XYLENE	30

Table B-3
B-18 Landfill Compound Specific Data

VOC Compounds in Waste	CAS No.	Max. Conc. NWW, ppm (1)	M Wt g/mole (2)	Density g/cm^3 (2)	Henry's Law Constant $atm\text{-}m^3/mol$ (2)	Liquid Diffusion Coefficient, cm^2/s (2)	Gas Diffusion Da_i Coefficient, cm^2/s (2)
ACETONITRILE	75-05-8	38	41.03	0.78	2.873E-05	1.400E-05	3.140E-01
ACRYLONITRILE	107-13-1	84	53.1	0.81	8.312E-05	1.230E-05	2.110E-01
BENZENE	71-43-2	10	78.1	0.87	5.433E-03	1..020E-05	1.173E-01
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.97	1.423E-03	1.060E-05	2.980E-02
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	1.41	2.063E-03	1.210E-05	7.280E-02
CARBON DISULFIDE	75-15-0	4.8	76.1	1.26	3.113E-02	1.290E-05	1.044E-01
CARBON TETRACHLORIDE	56-23-5	6	153.8	1.59	2.975E-02	9.770E-06	3.560E-02
CHLOROBENZENE	108-90-7	6	112.6	1.11	2.430E-03	9.490E-06	6.350E-02
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	1.41	2.940E-03	1.530E-05	1.269E-01
CHLOROFORM	67-66-3	6	119.4	1.49	3.964E-03	1.090E-05	5.170E-02
CHLOROMETHANE	74-87-3	30	50.49	0.95	3.885E-03	1.390E-05	2.128E-01
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	0.958	1.272E-02	1.000E-05	9.440E-01
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.41	1.247E-04	7.020E-06	2.120E-02
DIBROMOETHANE-1,2	106-93-4	15	187.88	1.41	3.356E-04	8.060E-06	2.870E-02
DIBROMOMETHANE	74-95-3	15	173.85	1.41	3.280E-04	8.440E-06	3.180E-02
DICHLOROBENZENE (1,4-)	106-46-7	6	147	1.29	7.164E-03	8.850E-06	4.140E-02
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	1.17	3.060E-03	1.050E-05	7.420E-02
DICHLOROETHANE(1,2)	107-06-2	6	99	1.26	1.250E-03	1.100E-05	7.190E-02
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.28	1.490E-02	1.090E-05	7.520E-02
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	1.41	8.960E-03	1.190E-05	7.070E-02
DICHLOROPROPANE 1,2	78-87-5	18	112.99	1.156	5.963E-04	9.710E-06	6.210E-02
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	1.41	8.984E-03	1.100E-05	5.860E-02
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.41	1.101E-02	1.100E-05	5.860E-02
DIOXANE(1,4)	123-91-1	170	88.2	1.03	2.385E-05	1.050E-05	9.200E-02
ETHYL BENZENE	100-41-4	10	106.2	0.87	7.876E-03	8.490E-06	7.650E-02
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	0.95	3.982E-04	9.280E-06	7.990E-02
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.67	1.584E-02	7.330E-06	1.730E-02
HEXACHLOROETHANE	67-72-1	30	237	2.09	9.491E-05	8.880E-06	1.770E-02
IDOMETHANE	74-88-4	65	141.94	1.65	6.476E-04	1.040E-05	3.900E-02
ISOBUTYL ALCOHOL	78-83-1	170	74.12	0.79	1.336E-05	9.960E-06	1.319E-01
METHANOL	67-56-1	0.75	32	0.79	6.644E-06	1.640E-05	4.578E-01
METHACRYLONITRILE	126-98-7	84	67.09	1.15	8.312E-05	1.320E-05	1.299E-01
METHYL ETHYL KETONE	78-93-3	36	72.1	0.82	7.247E-05	1.030E-05	1.347E-01
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	0.8	1.184E-04	8.360E-06	8.590E-02
METHYL METHACRYLATE	80-62-6	160	100.1	0.95	3.982E-04	9.280E-06	8.000E-02
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	1.34	2.621E-03	1.250E-05	8.690E-02
PROPANENITRILE	107-12-0	360	55.08	1.15	5.870E-05	1.480E-05	1.735E-01
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.6	1.265E-03	9.300E-06	3.150E-02
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.59	1.265E-03	9.260E-06	3.160E-02
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.624	1.133E-02	9.450E-06	3.180E-02
TOLUENE	108-88-3	10	92.4	0.87	8.003E-03	9.230E-06	9.270E-02
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.89	2.125E-04	1.030E-05	1.410E-02
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.41	1.564E-02	8.230E-06	3.000E-02
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	1.33	6.874E-03	9.560E-06	4.660E-02
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.435	1.510E-03	1.000E-05	4.510E-02
TRICHLOROETHYLENE	79-01-6	6	131.4	1.4	2.113E-03	9.940E-06	4.650E-02
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.41	1.440E+00	9.320E-06	3.970E-02
VINYL CHLORIDE	75-01-4	6	62.5	0.91	1.800E-02	1.190E-05	1.584E-01
XYLENE	1330-20-7	30	106.2	1.02	1.108E-02	9.340E-06	7.140E-02

NOTES:

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)

(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.

(3) Chemical-specific parameters for ethyl methacrylate were taken from methyl methacrylate.

Table B-4
INTERMEDIATE CALCULATIONS

Compound	CAS No.	C_n, ppm (1)	De_i cm^2/s	Keq_i	Kvt_i s^{-1}	Mo_i g	Scg	kg cm/s
ACETONITRILE	75-05-8	38	1.24E-02	5.88E-04	1.38E-05	2.09E+05	4.80E-01	1.15E-02
ACRYLONITRILE	107-13-1	84	8.35E-03	1.70E-03	2.69E-05	4.62E+05	7.15E-01	8.79E-03
BENZENE	71-43-2	10	4.64E-03	1.11E-01	9.78E-04	5.50E+04	1.29E+00	5.93E-03
BROMODICHLOROMETHANE	75-27-4	15	1.18E-03	2.91E-02	6.51E-05	8.26E+04	5.06E+00	2.37E-03
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	2.88E-03	4.22E-02	2.31E-04	8.26E+04	2.07E+00	4.31E-03
CARBON DISULFIDE	75-15-0	4.8	4.13E-03	6.37E-01	4.99E-03	2.64E+04	1.44E+00	5.49E-03
CARBON TETRACHLORIDE	56-23-5	6	1.41E-03	6.08E-01	1.63E-03	3.30E+04	4.24E+00	2.67E-03
CHLOROBENZENE	108-90-7	6	2.51E-03	4.97E-02	2.37E-04	3.30E+04	2.38E+00	3.93E-03
CHLOROETHANE (ethyl chloride)	75-00-3	6	5.02E-03	6.01E-02	5.73E-04	3.30E+04	1.19E+00	6.26E-03
CHLOROFORM	67-66-3	6	2.04E-03	8.11E-02	3.15E-04	3.30E+04	2.92E+00	3.43E-03
CHLOROMETHANE	74-87-3	30	8.42E-03	7.94E-02	1.27E-03	1.65E+05	7.09E-01	8.84E-03
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	3.73E-02	2.60E-01	1.84E-02	1.54E+03	1.60E-01	2.40E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	8.39E-04	2.55E-03	4.06E-06	8.26E+04	7.11E+00	1.89E-03
DIBROMOETHANE-1,2	106-93-4	15	1.14E-03	6.86E-03	1.48E-05	8.26E+04	5.26E+00	2.31E-03
DIBROMOMETHANE	74-95-3	15	1.26E-03	6.71E-03	1.60E-05	8.26E+04	4.74E+00	2.47E-03
DICHLOROBENZENE (1,4-)	106-46-7	6	1.64E-03	1.46E-01	4.55E-04	3.30E+04	3.64E+00	2.95E-03
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	2.93E-03	6.26E-02	3.49E-04	3.30E+04	2.03E+00	4.37E-03
DICHLOROETHANE(1,2)	107-06-2	6	2.84E-03	2.56E-02	1.38E-04	3.30E+04	2.10E+00	4.27E-03
DICHLOROETHYLENE(1,1)	75-35-4	6	2.97E-03	3.05E-01	1.72E-03	3.30E+04	2.01E+00	4.41E-03
DICHLOROETHYLENE(1,2)trans	156-60-5	30	2.80E-03	1.83E-01	9.73E-04	1.65E+05	2.13E+00	4.23E-03
DICHLOROPROPANE 1,2	78-87-5	18	2.46E-03	1.22E-02	5.68E-05	9.91E+04	2.43E+00	3.88E-03
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	2.32E-03	1.84E-01	8.08E-04	9.91E+04	2.57E+00	3.73E-03
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	2.32E-03	2.25E-01	9.90E-04	9.91E+04	2.57E+00	3.73E-03
DIOXANE(1,4)	123-91-1	170	3.64E-03	4.88E-04	3.37E-06	9.36E+05	1.64E+00	5.04E-03
ETHYL BENZENE	100-41-4	10	3.03E-03	1.61E-01	9.25E-04	5.50E+04	1.97E+00	4.46E-03
ETHYL METHACRYLATE (3)	97-63-2	160	3.16E-03	8.14E-03	4.88E-05	8.81E+05	1.89E+00	4.59E-03
HEXACHLOROBUTADIENE	87-68-3	5.6	6.84E-04	3.24E-01	4.21E-04	3.08E+04	8.72E+00	1.65E-03
HEXACHLOROETHANE	67-72-1	30	7.00E-04	1.94E-03	2.58E-06	1.65E+05	8.52E+00	1.67E-03
IDOMETHANE	74-88-4	65	1.54E-03	1.32E-02	3.88E-05	3.58E+05	3.87E+00	2.84E-03
ISOBUTYL ALCOHOL	78-83-1	170	5.22E-03	2.73E-04	2.71E-06	9.36E+05	1.14E+00	6.42E-03
METHANOL	67-56-1	0.75	1.81E-02	1.36E-04	4.67E-06	4.13E+03	3.29E-01	1.48E-02
METHACRYLONITRILE	126-98-7	84	5.14E-03	1.70E-03	1.66E-05	4.62E+05	1.16E+00	6.35E-03
METHYL ETHYL KETONE	78-93-3	36	5.33E-03	1.48E-03	1.50E-05	1.98E+05	1.12E+00	6.51E-03
METHYL ISOBUTYL KETONE	108-10-1	33	3.40E-03	2.42E-03	1.56E-05	1.82E+05	1.76E+00	4.82E-03
METHYL METHACRYLATE	80-62-6	160	3.16E-03	8.14E-03	4.89E-05	8.81E+05	1.89E+00	4.59E-03
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	3.44E-03	5.36E-02	3.50E-04	1.65E+05	1.74E+00	4.85E-03
PROPANENITRILE	107-12-0	360	6.86E-03	1.20E-03	1.56E-05	1.98E+06	8.69E-01	7.71E-03
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	1.25E-03	2.59E-02	6.12E-05	3.30E+04	4.79E+00	2.46E-03
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	1.25E-03	2.59E-02	6.14E-05	3.30E+04	4.77E+00	2.46E-03
TETRACHLOROETHYLENE	127-18-4	6	1.26E-03	2.32E-01	5.53E-04	3.30E+04	4.74E+00	2.47E-03
TOLUENE	108-88-3	10	3.67E-03	1.64E-01	1.14E-03	5.50E+04	1.63E+00	5.07E-03
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	5.58E-04	4.35E-03	4.60E-06	8.26E+04	1.07E+01	1.44E-03
TRICHLOROBENZENE 1,2,4	120-82-1	19	1.19E-03	3.20E-01	7.20E-04	1.05E+05	5.03E+00	2.38E-03
TRICHLOROETHANE 1,1,1	71-55-6	6	1.84E-03	1.41E-01	4.92E-04	3.30E+04	3.24E+00	3.20E-03
TRICHLOROETHANE 1,1,2	79-00-5	6	1.78E-03	3.09E-02	1.05E-04	3.30E+04	3.34E+00	3.13E-03
TRICHLOROETHYLENE	79-01-6	6	1.84E-03	4.32E-02	1.51E-04	3.30E+04	3.24E+00	3.19E-03
TRICHLOROPROPANE(1,2,3)	96-18-4	30	1.57E-03	2.94E+01	8.78E-02	1.65E+05	3.80E+00	2.87E-03
VINYL CHLORIDE	75-01-4	6	6.27E-03	3.68E-01	4.38E-03	3.30E+04	9.52E-01	7.26E-03
XYLENE	1330-20-7	30	2.82E-03	2.27E-01	1.21E-03	1.65E+05	2.11E+00	4.25E-03
TOTAL		1834.43				1.01E+07		

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)

Table B-5
B-18 Potential Landfill Emissions Compositions

Compound	CAS No.	Cl, ppm	M Wt g/mole (2)	Henry's Law Constant atm-m^3/mol (2)	E (VOCs) g/s	E (VOCs) tpy
ACETONITRILE	75-05-8	38	41.03	2.87E-05	4.26E-03	1.48E-01
ACRYLONITRILE	107-13-1	84	53.1	8.31E-05	1.40E-02	4.86E-01
BENZENE	71-43-2	10	78.1	5.43E-03	1.11E-02	3.85E-01
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.42E-03	4.18E-03	1.45E-01
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	2.06E-03	7.96E-03	2.77E-01
CARBON DISULFIDE	75-15-0	4.8	76.1	3.11E-02	1.21E-02	4.21E-01
CARBON TETRACHLORIDE	56-23-5	6	153.8	2.98E-02	8.62E-03	3.00E-01
CHLOROBENZENE	108-90-7	6	112.6	2.43E-03	3.23E-03	1.12E-01
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	2.94E-03	5.05E-03	1.76E-01
CHLOROFORM	67-66-3	6	119.4	3.96E-03	3.74E-03	1.30E-01
CHLOROMETHANE	74-87-3	30	50.49	3.89E-03	3.78E-02	1.31E+00
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	1.27E-02	1.36E-03	4.72E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.25E-04	9.48E-04	3.30E-02
DIBROMOETHANE-1,2	106-93-4	15	187.88	3.36E-04	1.91E-03	6.65E-02
DIBROMOMETHANE	74-95-3	15	173.85	3.28E-04	1.99E-03	6.92E-02
DICHLOROBENZENE (1,4-)	106-46-7	6	147	7.16E-03	4.52E-03	1.57E-01
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	3.06E-03	3.93E-03	1.37E-01
DICHLOROETHANE(1,2)	107-06-2	6	99	1.25E-03	2.44E-03	8.49E-02
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.49E-02	8.85E-03	3.08E-01
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	8.96E-03	3.32E-02	1.15E+00
DICHLOROPROPANE 1,2	78-87-5	18	112.99	5.96E-04	4.62E-03	1.61E-01
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	8.98E-03	1.81E-02	6.30E-01
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.10E-02	2.01E-02	6.99E-01
DIOXANE(1,4)	123-91-1	170	88.2	2.39E-05	8.90E-03	3.10E-01
ETHYL BENZENE	100-41-4	10	106.2	7.88E-03	1.08E-02	3.75E-01
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	3.98E-04	3.77E-02	1.31E+00
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.58E-02	4.07E-03	1.42E-01
HEXACHLOROETHANE	67-72-1	30	237	9.49E-05	1.48E-03	5.14E-02
IDOMETHANE	74-88-4	65	141.94	6.48E-04	1.38E-02	4.78E-01
ISOBUTYL ALCOHOL	78-83-1	170	74.12	1.34E-05	7.58E-03	2.63E-01
METHANOL	67-56-1	0.75	32	6.64E-06	4.24E-05	1.47E-03
METHACRYLONITRILE	126-98-7	84	67.09	8.31E-05	1.09E-02	3.78E-01
METHYL ETHYL KETONE	78-93-3	36	72.1	7.25E-05	4.40E-03	1.53E-01
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	1.18E-04	4.19E-03	1.46E-01
METHYL METHACRYLATE	80-62-6	160	100.1	3.98E-04	3.78E-02	1.31E+00
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	2.62E-03	1.97E-02	6.84E-01
PROPANENITRILE	107-12-0	360	55.08	5.87E-05	4.45E-02	1.55E+00
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.27E-03	1.62E-03	5.62E-02
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.27E-03	1.62E-03	5.63E-02
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.13E-02	5.00E-03	1.74E-01
TOLUENE	108-88-3	10	92.4	8.00E-03	1.20E-02	4.16E-01
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.13E-04	1.03E-03	3.59E-02
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.56E-02	1.81E-02	6.30E-01
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	6.87E-03	4.70E-03	1.63E-01
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.51E-03	2.13E-03	7.39E-02
TRICHLOROETHYLENE	79-01-6	6	131.4	2.11E-03	2.57E-03	8.93E-02
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.44E+00	3.19E-01	1.11E+01
VINYL CHLORIDE	75-01-4	6	62.5	1.80E-02	1.41E-02	4.92E-01
XYLENE	1330-20-7	30	106.2	1.11E-02	3.71E-02	1.29E+00
TOTAL		1834.43			8.39E-01	29.1633

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)
(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.

Table B-6
B-18 Total Potential Landfill Emissions

SUMMARY OF POTENTIAL EMISSIONS

MODELED VOCs WITH NO CONTROL=	29.2 TONS PER YEAR	159.8 lb/day

T:\0742\824 2011 Capital\B-18 ATC\[B-18 Pre-project PTE.xls]Summary_Table B-6

Inactive Area 48 hr exposure

Table B-1
B-18 Landfill Modeling Input Parameters

Input Parameters

Parameter		Unit	Value	Comment
Area	A	cm^2	2.58E+07	Maximum assumed working face if all 7200 yds^3/day of waste were soils (0.64 acres)
Waste depth	l	cm	2.13E+02	Typical 7 ft lifts
Volume	V	cm^3	5.50E+09	A x l
Temperature	T	Degrees C	25	Assumed
Waste liquid (before fixation)			Single Phase	No significant oil-phase in waste.
Liquid composition	Sum Ci	ppm	1834	See Attached Waste Composition
Liquid/ fixative			1	Model assumes that the liquid in the waste does not increase the waste volume.
Liquid in fixed waste	W	g/cm^3	1	Model Assumption
Air porosity fixed waste	ea	cm^3/cm^3	0.25	Default value. Typical for hazardous landfill waste
Total porosity fixed waste	et	cm^3/cm^3	0.50	Default value. Typical for hazardous landfill waste
Biomass concentration		g/cm^3	0	No biological activity in waste.
Average time waste is exposed to atmosphere.	t	hours	48	disposed of in the landfill.

Constants

Gas constant	R	cm^3-atm/K-g mole	82.05	Universal Gas Constant
Windspeed	U	m/s	2.86	Based on NCDC wind data for Fresno, CA.
Viscocity of air	ua	g-cm/s	1.81E-04	
Density of air	ra	g/cm^3	1.20E-03	
Density of waste liquid	rl	g/cm^3	1	Model Assumption

Table B-2
B-18 Landfill Waste Composition

Cas No.	VOC/ HAP CONSTITUENT	40 CFR Part 268.48 UTS (mg/kg)
75-05-8	ACETONITRILE	38
107-13-1	ACRYLONITRILE	84
71-43-2	BENZENE	10
75-27-4	BROMODICHLOROMETHANE	15
75-25-2	BROMOFORM	15
75-15-0	CARBON DISULFIDE	4.8
56-23-5	CARBON TETRACHLORIDE	6
108-90-70	CHLOROBENZENE	6
75-00-3	CHLOROETHANE	6
67-66-3	CHLOROFORM	6
126-99-8	CHLOROPRENE	0.28
10061-01-5	CIS-1,3-DICHLOROPROPYLENE	18
96-12-8	DIBROMO-3-CHLOROPROPANE, 1,2-	15
74-95-3	DIBROMOMETHANE	15
106-46-7	DICHLOROBENZENE,1,4-	6
75-34-3	DICHLOROETHANE,1,1-	6
156-60-5	DICHLOROETHYLENE (1,2) TRANS	30
75-35-4	DICHLOROETHYLENE,1,1-	6
78-87-5	DICHLOROPROPANE,1,2-	18
107-06-2	DICLOROETHANE,1,2-	6
123-91-1	DIOXANE,1,4-	170
100-41-4	ETHYL BENZENE	10
97-63-2	ETHYL METHACRYLATE (3)	160
106-93-4	ETHYLENE DIBROMIDE	15
87-68-3	HEXACHLORO-1,3-BUTADIENE	5.6
67-72-1	HEXACHLOROETHANE	30
74-88-4	IODOMETHANE	65
78-83-1	ISOBUTYL ALCOHOL	170
126-98-7	METHACRYLONITRILE	84
67-56-1	METHANOL	0.75
74-83-9	METHYL BROMIDE	15
74-87-3	METHYL CHLORIDE	30
78-93-3	METHYL ETHYL KETONE	36
108-10-1	METHYL ISOBUTYL KETONE	33
80-62-6	METHYL METHACRYLATE	160
75-09-2	METHYLENE CHLORIDE	30
107-12-0	PROPANENITRILE	360
630-20-6	TETRACHLORETHANE (1,1,1,2)	6
79-34-5	TETRACHLOROETHANE,1,1,2,2-	6
127-18-4	TETRACHLOROETHYLENE	6
108-88-3	TOLUENE	10
10061-02-6	TRANS-1,3-DICHLOROPROPYLENE	18
120-82-1	TRICHLOROBENZENE,1,2,4-	19
71-55-6	TRICHLOROETHANE,1,1,1-	6
79-00-5	TRICHLOROETHANE,1,1,2-	6
79-01-6	TRICHLOROETHYLENE	6
96-18-4	TRICHLOROPROPANE (1,2,3)	30
75-01-4	VINYL CHLORIDE	6
1330-20-7	XYLENE	30

Table B-3
B-18 Landfill Compound Specific Data

VOC Compounds in Waste	CAS No.	Max. Conc. NWW, ppm (1)	M Wt g/mole (2)	Density g/cm^3 (2)	Henry's Law Constant $atm\text{-}m^3/mol$ (2)	Liquid Diffusion Coefficient, cm^2/s (2)	Gas Diffusion Da_i Coefficient, cm^2/s (2)
ACETONITRILE	75-05-8	38	41.03	0.78	2.873E-05	1.400E-05	3.140E-01
ACRYLONITRILE	107-13-1	84	53.1	0.81	8.312E-05	1.230E-05	2.110E-01
BENZENE	71-43-2	10	78.1	0.87	5.433E-03	1.020E-05	1.173E-01
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.97	1.423E-03	1.060E-05	2.980E-02
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	1.41	2.063E-03	1.210E-05	7.280E-02
CARBON DISULFIDE	75-15-0	4.8	76.1	1.26	3.113E-02	1.290E-05	1.044E-01
CARBON TETRACHLORIDE	56-23-5	6	153.8	1.59	2.975E-02	9.770E-06	3.560E-02
CHLOROBENZENE	108-90-7	6	112.6	1.11	2.430E-03	9.490E-06	6.350E-02
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	1.41	2.940E-03	1.530E-05	1.269E-01
CHLOROFORM	67-66-3	6	119.4	1.49	3.964E-03	1.090E-05	5.170E-02
CHLOROMETHANE	74-87-3	30	50.49	0.95	3.885E-03	1.390E-05	2.128E-01
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	0.958	1.272E-02	1.000E-05	9.440E-01
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.41	1.247E-04	7.020E-06	2.120E-02
DIBROMOETHANE-1,2	106-93-4	15	187.88	1.41	3.356E-04	8.060E-06	2.870E-02
DIBROMOMETHANE	74-95-3	15	173.85	1.41	3.280E-04	8.440E-06	3.180E-02
DICHLOROBENZENE (1,4-)	106-46-7	6	147	1.29	7.164E-03	8.850E-06	4.140E-02
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	1.17	3.060E-03	1.050E-05	7.420E-02
DICHLOROETHANE(1,2)	107-06-2	6	99	1.26	1.250E-03	1.100E-05	7.190E-02
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.28	1.490E-02	1.090E-05	7.520E-02
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	1.41	8.960E-03	1.190E-05	7.070E-02
DICHLOROPROPANE 1,2	78-87-5	18	112.99	1.156	5.963E-04	9.710E-06	6.210E-02
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	1.41	8.984E-03	1.100E-05	5.860E-02
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.41	1.101E-02	1.100E-05	5.860E-02
DIOXANE(1,4)	123-91-1	170	88.2	1.03	2.385E-05	1.050E-05	9.200E-02
ETHYL BENZENE	100-41-4	10	106.2	0.87	7.876E-03	8.490E-06	7.650E-02
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	0.95	3.982E-04	9.280E-06	7.990E-02
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.67	1.584E-02	7.330E-06	1.730E-02
HEXACHLOROETHANE	67-72-1	30	237	2.09	9.491E-05	8.880E-06	1.770E-02
IDOMETHANE	74-88-4	65	141.94	1.65	6.476E-04	1.040E-05	3.900E-02
ISOBUTYL ALCOHOL	78-83-1	170	74.12	0.79	1.336E-05	9.960E-06	1.319E-01
METHANOL	67-56-1	0.75	32	0.79	6.644E-06	1.640E-05	4.578E-01
METHACRYLONITRILE	126-98-7	84	67.09	1.15	8.312E-05	1.320E-05	1.299E-01
METHYL ETHYL KETONE	78-93-3	36	72.1	0.82	7.247E-05	1.030E-05	1.347E-01
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	0.8	1.184E-04	8.360E-06	8.590E-02
METHYL METHACRYLATE	80-62-6	160	100.1	0.95	3.982E-04	9.280E-06	8.000E-02
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	1.34	2.621E-03	1.250E-05	8.690E-02
PROPANENITRILE	107-12-0	360	55.08	1.15	5.870E-05	1.480E-05	1.735E-01
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.6	1.265E-03	9.300E-06	3.150E-02
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.59	1.265E-03	9.260E-06	3.160E-02
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.624	1.133E-02	9.450E-06	3.180E-02
TOLUENE	108-88-3	10	92.4	0.87	8.003E-03	9.230E-06	9.270E-02
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.89	2.125E-04	1.030E-05	1.410E-02
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.41	1.564E-02	8.230E-06	3.000E-02
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	1.33	6.874E-03	9.560E-06	4.660E-02
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.435	1.510E-03	1.000E-05	4.510E-02
TRICHLOROETHYLENE	79-01-6	6	131.4	1.4	2.113E-03	9.940E-06	4.650E-02
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.41	1.440E+00	9.320E-06	3.970E-02
VINYL CHLORIDE	75-01-4	6	62.5	0.91	1.800E-02	1.190E-05	1.584E-01
XYLENE	1330-20-7	30	106.2	1.02	1.108E-02	9.340E-06	7.140E-02

NOTES:
(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)
(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.
(3) Chemical-specific parameters for ethyl methacrylate were taken from methyl methacrylate.

Table B-4
INTERMEDIATE CALCULATIONS

Compound	CAS No.	C_i, ppm (1)	De_i cm^2/s	Keq_i	Kvt_i s^{-1}	Mo_i g	Scg	kg cm/s
ACETONITRILE	75-05-8	38	1.24E-02	5.88E-04	2.77E-05	2.09E+05	4.80E-01	1.15E-02
ACRYLONITRILE	107-13-1	84	8.35E-03	1.70E-03	5.38E-05	4.62E+05	7.15E-01	8.79E-03
BENZENE	71-43-2	10	4.64E-03	1.11E-01	1.96E-03	5.50E+04	1.29E+00	5.93E-03
BROMODICHLOROMETHANE	75-27-4	15	1.18E-03	2.91E-02	1.30E-04	8.26E+04	5.06E+00	2.37E-03
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	2.88E-03	4.22E-02	4.61E-04	8.26E+04	2.07E+00	4.31E-03
CARBON DISULFIDE	75-15-0	4.8	4.13E-03	6.37E-01	9.98E-03	2.64E+04	1.44E+00	5.49E-03
CARBON TETRACHLORIDE	56-23-5	6	1.41E-03	6.08E-01	3.25E-03	3.30E+04	4.24E+00	2.67E-03
CHLOROBENZENE	108-90-7	6	2.51E-03	4.97E-02	4.74E-04	3.30E+04	2.38E+00	3.93E-03
CHLOROETHANE (ethyl chloride)	75-00-3	6	5.02E-03	6.01E-02	1.15E-03	3.30E+04	1.19E+00	6.26E-03
CHLOROFORM	67-66-3	6	2.04E-03	8.11E-02	6.29E-04	3.30E+04	2.92E+00	3.43E-03
CHLOROMETHANE	74-87-3	30	8.42E-03	7.94E-02	2.54E-03	1.65E+05	7.09E-01	8.84E-03
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	3.73E-02	2.60E-01	3.69E-02	1.54E+03	1.60E-01	2.40E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	8.39E-04	2.55E-03	8.12E-06	8.26E+04	7.11E+00	1.89E-03
DIBROMOETHANE-1,2	106-93-4	15	1.14E-03	6.86E-03	2.96E-05	8.26E+04	5.26E+00	2.31E-03
DIBROMOMETHANE	74-95-3	15	1.26E-03	6.71E-03	3.20E-05	8.26E+04	4.74E+00	2.47E-03
DICHLOROBENZENE (1,4-)	106-46-7	6	1.64E-03	1.46E-01	9.11E-04	3.30E+04	3.64E+00	2.95E-03
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	2.93E-03	6.26E-02	6.97E-04	3.30E+04	2.03E+00	4.37E-03
DICHLOROETHANE(1,2)	107-06-2	6	2.84E-03	2.56E-02	2.76E-04	3.30E+04	2.10E+00	4.27E-03
DICHLOROETHYLENE(1,1)	75-35-4	6	2.97E-03	3.05E-01	3.44E-03	3.30E+04	2.01E+00	4.41E-03
DICHLOROETHYLENE(1,2)trans	156-60-5	30	2.80E-03	1.83E-01	1.95E-03	1.65E+05	2.13E+00	4.23E-03
DICHLOROPROPANE 1,2	78-87-5	18	2.46E-03	1.22E-02	1.14E-04	9.91E+04	2.43E+00	3.88E-03
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	2.32E-03	1.84E-01	1.62E-03	9.91E+04	2.57E+00	3.73E-03
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	2.32E-03	2.25E-01	1.98E-03	9.91E+04	2.57E+00	3.73E-03
DIOXANE(1,4)	123-91-1	170	3.64E-03	4.88E-04	6.74E-06	9.36E+05	1.64E+00	5.04E-03
ETHYL BENZENE	100-41-4	10	3.03E-03	1.61E-01	1.85E-03	5.50E+04	1.97E+00	4.46E-03
ETHYL METHACRYLATE (3)	97-63-2	160	3.16E-03	8.14E-03	9.77E-05	8.81E+05	1.89E+00	4.59E-03
HEXACHLOROBUTADIENE	87-68-3	5.6	6.84E-04	3.24E-01	8.41E-04	3.08E+04	8.72E+00	1.65E-03
HEXACHLOROETHANE	67-72-1	30	7.00E-04	1.94E-03	5.16E-06	1.65E+05	8.52E+00	1.67E-03
IDOMETHANE	74-88-4	65	1.54E-03	1.32E-02	7.75E-05	3.58E+05	3.87E+00	2.84E-03
ISOBUTYL ALCOHOL	78-83-1	170	5.22E-03	2.73E-04	5.41E-06	9.36E+05	1.14E+00	6.42E-03
METHANOL	67-56-1	0.75	1.81E-02	1.36E-04	9.34E-06	4.13E+03	3.29E-01	1.48E-02
METHACRYLONITRILE	126-98-7	84	5.14E-03	1.70E-03	3.32E-05	4.62E+05	1.16E+00	6.35E-03
METHYL ETHYL KETONE	78-93-3	36	5.33E-03	1.48E-03	3.00E-05	1.98E+05	1.12E+00	6.51E-03
METHYL ISOBUTYL KETONE	108-10-1	33	3.40E-03	2.42E-03	3.12E-05	1.82E+05	1.76E+00	4.82E-03
METHYL METHACRYLATE	80-62-6	160	3.16E-03	8.14E-03	9.78E-05	8.81E+05	1.89E+00	4.59E-03
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	3.44E-03	5.36E-02	6.99E-04	1.65E+05	1.74E+00	4.85E-03
PROPANENITRILE	107-12-0	360	6.86E-03	1.20E-03	3.13E-05	1.98E+06	8.69E-01	7.71E-03
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	1.25E-03	2.59E-02	1.22E-04	3.30E+04	4.79E+00	2.46E-03
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	1.25E-03	2.59E-02	1.23E-04	3.30E+04	4.77E+00	2.46E-03
TETRACHLOROETHYLENE	127-18-4	6	1.26E-03	2.32E-01	1.11E-03	3.30E+04	4.74E+00	2.47E-03
TOLUENE	108-88-3	10	3.67E-03	1.64E-01	2.28E-03	5.50E+04	1.63E+00	5.07E-03
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	5.58E-04	4.35E-03	9.20E-06	8.26E+04	1.07E+01	1.44E-03
TRICHLOROBENZENE 1,2,4	120-82-1	19	1.19E-03	3.20E-01	1.44E-03	1.05E+05	5.03E+00	2.38E-03
TRICHLOROETHANE 1,1,1	71-55-6	6	1.84E-03	1.41E-01	9.84E-04	3.30E+04	3.24E+00	3.20E-03
TRICHLOROETHANE 1,1,2	79-00-5	6	1.78E-03	3.09E-02	2.09E-04	3.30E+04	3.34E+00	3.13E-03
TRICHLOROETHYLENE	79-01-6	6	1.84E-03	4.32E-02	3.02E-04	3.30E+04	3.24E+00	3.19E-03
TRICHLOROPROPANE(1,2,3)	96-18-4	30	1.57E-03	2.94E+01	1.76E-01	1.65E+05	3.80E+00	2.87E-03
VINYL CHLORIDE	75-01-4	6	6.27E-03	3.68E-01	8.75E-03	3.30E+04	9.52E-01	7.26E-03
XYLENE	1330-20-7	30	2.82E-03	2.27E-01	2.43E-03	1.65E+05	2.11E+00	4.25E-03
TOTAL		1834.43				1.01E+07		

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)

Table B-5
B-18 Potential Landfill Emissions Compositions

Compound	CAS No.	Cl, ppm	M Wt g/mole (2)	Henry's Law Constant atm-m^3/mol (2)	E (VOCs) g/s	E (VOCs) tpy
ACETONITRILE	75-05-8	38	41.03	2.87E-05	3.16E-03	2.20E-01
ACRYLONITRILE	107-13-1	84	53.1	8.31E-05	1.02E-02	7.10E-01
BENZENE	71-43-2	10	78.1	5.43E-03	7.86E-03	5.46E-01
BROMODICHLOROMETHANE	75-27-4	15	163.8	1.42E-03	2.99E-03	2.08E-01
BROMOMETHANE (METHYL BROMIDE)	74-83-9	15	94.95	2.06E-03	5.67E-03	3.94E-01
CARBON DISULFIDE	75-15-0	4.8	76.1	3.11E-02	8.58E-03	5.96E-01
CARBON TETRACHLORIDE	56-23-5	6	153.8	2.98E-02	6.11E-03	4.25E-01
CHLOROBENZENE	108-90-7	6	112.6	2.43E-03	2.30E-03	1.60E-01
CHLOROETHANE (ethyl chloride)	75-00-3	6	64.51	2.94E-03	3.59E-03	2.50E-01
CHLOROFORM	67-66-3	6	119.4	3.96E-03	2.66E-03	1.85E-01
CHLOROMETHANE	74-87-3	30	50.49	3.89E-03	2.68E-02	1.87E+00
CHLOROPRENE (2-CHLORO-1,3 BUTADEINE)	126-99-8	0.28	88.5	1.27E-02	9.61E-04	6.68E-02
DIBROMO-3-CHLOROPROPANE, 1,2-	96-12-8	15	236.36	1.25E-04	6.96E-04	4.84E-02
DIBROMOETHANE-1,2	106-93-4	15	187.88	3.36E-04	1.38E-03	9.62E-02
DIBROMOMETHANE	74-95-3	15	173.85	3.28E-04	1.44E-03	1.00E-01
DICHLOROBENZENE (1,4-)	106-46-7	6	147	7.16E-03	3.22E-03	2.24E-01
DICHLOROETHANE(1,1) ethylidenedichloride	75-34-3	6	98.96	3.06E-03	2.80E-03	1.95E-01
DICHLOROETHANE(1,2)	107-06-2	6	99	1.25E-03	1.75E-03	1.21E-01
DICHLOROETHYLENE(1,1)	75-35-4	6	96.95	1.49E-02	6.28E-03	4.37E-01
DICHLOROETHYLENE(1,2)trans	156-60-5	30	96.94	8.96E-03	2.35E-02	1.64E+00
DICHLOROPROPANE 1,2	78-87-5	18	112.99	5.96E-04	3.32E-03	2.31E-01
CIS-1,3-DICHLOROPROPYLENE	10061-01-5	18	110.97	8.98E-03	1.29E-02	8.95E-01
TRANS-1,3-DICHLOROPROPYLENE	10061-02-6	18	110.97	1.10E-02	1.43E-02	9.92E-01
DIOXANE(1,4)	123-91-1	170	88.2	2.39E-05	6.70E-03	4.66E-01
ETHYL BENZENE	100-41-4	10	106.2	7.88E-03	7.65E-03	5.32E-01
ETHYL METHACRYLATE (3)	97-63-2	160	100.1	3.98E-04	2.72E-02	1.89E+00
HEXACHLOROBUTADIENE	87-68-3	5.6	260.8	1.58E-02	2.89E-03	2.01E-01
HEXACHLOROETHANE	67-72-1	30	237	9.49E-05	1.09E-03	7.59E-02
IDOMETHANE	74-88-4	65	141.94	6.48E-04	9.88E-03	6.87E-01
ISOBUTYL ALCOHOL	78-83-1	170	74.12	1.34E-05	5.77E-03	4.01E-01
METHANOL	67-56-1	0.75	32	6.64E-06	3.26E-05	2.26E-03
METHACRYLONITRILE	126-98-7	84	67.09	8.31E-05	7.95E-03	5.53E-01
METHYL ETHYL KETONE	78-93-3	36	72.1	7.25E-05	3.22E-03	2.24E-01
METHYL ISOBUTYL KETONE	108-10-1	33	100.2	1.18E-04	3.06E-03	2.13E-01
METHYL METHACRYLATE	80-62-6	160	100.1	3.98E-04	2.72E-02	1.89E+00
METHYLENE CHLORIDE, dichloromethane	75-09-2	30	85	2.62E-03	1.40E-02	9.74E-01
PROPANENITRILE	107-12-0	360	55.08	5.87E-05	3.27E-02	2.28E+00
TETRACHLOROETHANE(1,1,1,2)	630-20-6	6	168	1.27E-03	1.16E-03	8.05E-02
TETRACHLOROETHANE(1,1,2,2)	79-34-6	6	168	1.27E-03	1.16E-03	8.06E-02
TETRACHLOROETHYLENE	127-18-4	6	165.83	1.13E-02	3.55E-03	2.47E-01
TOLUENE	108-88-3	10	92.4	8.00E-03	8.49E-03	5.91E-01
TRIBROMOMETHANE (BROMOFORM)	75-25-2	15	252.77	2.13E-04	7.54E-04	5.24E-02
TRICHLOROBENZENE 1,2,4	120-82-1	19	181.5	1.56E-02	1.28E-02	8.94E-01
TRICHLOROETHANE 1,1,1	71-55-6	6	133.4	6.87E-03	3.34E-03	2.32E-01
TRICHLOROETHANE 1,1,2	79-00-5	6	133.4	1.51E-03	1.52E-03	1.06E-01
TRICHLOROETHYLENE	79-01-6	6	131.4	2.11E-03	1.83E-03	1.27E-01
TRICHLOROPROPANE(1,2,3)	96-18-4	30	147.4	1.44E+00	2.26E-01	1.57E+01
VINYL CHLORIDE	75-01-4	6	62.5	1.80E-02	1.00E-02	6.97E-01
XYLENE	1330-20-7	30	106.2	1.11E-02	2.63E-02	1.83E+00
TOTAL		1834.43			5.99E-01	41.6259

(1) Waste composition was based on Non-wastewater Universal Treatment Standards (40 CFR Part 268.48)
(2) Compound-specific parameters were taken from USEPA's Chemdat8 database at 25 Degrees C.

Table B-6
B-18 Total Potential Landfill Emissions

SUMMARY OF POTENTIAL EMISSIONS

MODELED VOCs WITH NO CONTROL=	**41.6 TONS PER YEAR**	**228.09 lb/day**
TOTAL UNCONTROLLED VOCS EXPOSED ON DAY 1:	**29.2 TONS PER YEAR**	**160.0 lb/day**
TOTAL CONTROLLED VOCS : (41.6-29.2) * (1-0.92)	**0.99 TONS PER YEAR**	**5.45 lb/day**
TOTAL VOCs EMITTED	**30.19 TONS PER YEAR**	**165.45 lb/day**

T:\0742\824 2011 Capital\B-18 ATC\[B-18 Pre-project PTE.xls]Summary_Table B-6

ATTACHMENT C

BACT Guideline 2.2.2 and Top Down BACT Analysis

Best Available Control Technology (BACT) Guideline 2.2.2
Last Update: 6/30/1999
Landfill - VOC-Contaminated Soil

Pollutant	Achieved in Practice or in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Daily clean-fill cover (minimum one inch of compacted, District approved soil) onto the exposed VOC contaminated soil.	1. Enclosing landfill and venting vapors to a control device. 2. Use of vapor suppressant foam.	
PM10	Water the unpaved truck unloading and maneuvering area		

TOP DOWN BACT ANALYSIS

I. BACT Analysis for landfill in permit C-283-11-6:

For hazardous waste landfill in permit C-283-11-6, BACT is required for VOC.

BACT Guideline 2.2.2 was established for the hazardous waste landfill Laidlaw Environmental Services (now known as Clean Harbors Buttonwillow) Facility S-1259. Chemical Waste Management Facility C-283 operates a hazardous waste landfill which belongs to the same class and category source as the hazardous waste landfill at facility S-1259.

a. Step 1 - Identify All Possible Control Technologies

BACT guideline 2.2.2 identifies the following control technologies:

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Daily clean-fill cover (minimum one inch of compacted, District approved soil) onto the exposed VOC contaminated soil.	1. Enclosing landfill and venting vapors to a control device. 2. Use of vapor suppressant foam.	
PM10	Water the unpaved truck unloading and maneuvering area.		

b. Step 2 - Eliminate Technologically Infeasible Options

There are no technologically infeasible options for VOC.

c. Step 3 - Rank Remaining Control Technologies by Control Effectiveness

VOC

Rank	Control Technology	Achieved in Practice
1	Enclosing landfill and venting vapors to a control device.	N
2	Use of vapor suppressant foam.	N
3	Daily clean-fill cover (minimum one inch of compacted, District approved soil) onto the exposed VOC contaminated soil.	Y

There are no remaining control technologies for VOC.

d. Step 4 - Cost Effectiveness Analysis

VOC

The applicant has supplied comparative costs to project S-970415 for Facility S-1259 hazardous waste landfill operation in Buttonwillow, CA. Since these costs are 12 years old, the values will be considered extremely conservative as costs are much higher today.

Size of Facility S-1259 landfill (WMU #35) = 90 acres
Size of Chemical Waste Management landfill (B-18) = 67 acres
Scaling factor = 67 acres/90 acres = 0.74

Enclosing landfill and venting to control device

WMU #35 calculated total annual cost (TAC) = $6,888,770
B-18 scaled total annual cost = $6,888,770 x 0.74 = $5,097,690

Assumed control efficiency = 98%

Emission reductions = 84,120 lb/yr x 0.98 x ton/2000 lb = 41.22 tons/yr

Cost/ton VOC = $5,097,690/yr ÷ 41.22 ton/yr = $123,674/ton VOC

Since the cost per ton of VOC is greater than the cost effectiveness threshold of $17,500/ton VOC, enclosing the landfill and venting to a control device is not cost effective.

Use of vapor suppressant foam

WMU #35 calculated total annual cost (TAC) = $1,010,276
B-18 scaled total annual cost = $1,010,276 x 0.74 = $747,604

Assumed control efficiency = 99%

Emission reductions = 84,120 lb/yr x 0.99 x ton/2000 lb = 41.64 tons/yr

Cost/ton VOC = $747,604/yr ÷ 41.64 ton/yr = $17,954/ton VOC

Since the cost per ton of VOC is greater than the cost effectiveness threshold of $17,500/ton VOC, use of vapor suppressant foam is not cost effective.

Daily clean-fill cover (minimum one inch of compacted, District approved soil) onto the exposed VOC contaminated soil

At facility S-1259, the operator uses clean, virgin soil as alternate daily cover as the facility has a sufficient supply at the location. However, Chemical Waste Management does not have clean, virgin soil at the location and proposes to utilize soil that registers less than 50 ppmv of VOC concentration when measured three inches above the surface as alternate daily cover. If clean, virgin soil was required, the soil would have to be loaded and transported to the location by mobile equipment.

The following environmental benefit analysis compares the amount of VOC reduction achieved by requiring the use of clean, virgin soil versus the amount of NO_X, SO_X, PM_{10}, and VOC emissions from the mobile equipment to transport the clean, virgin soil to the location.

Operating Data

Cover soil required = 657,000 cu yd/year = 1,800 cu yd/day
Truck capacity = 20 yd/truck/day
Trips per day = 90
Operation schedule = 365 days/year

Mobile Equipment Emission Factors

Equipment (Year 2011)	NOx (lb/hr)	SOx (lb/hr)	PM10 (lb/hr)	CO (lb/hr)	ROG (lb/hr)	CH4 (lb/hr)
Tractors/Loaders/Backhoe Composite	0.6276	0.0008	0.0482	0.3874	0.0938	0.0085
Off-Highway Trucks Composite	2.1941	0.0027	0.0792	0.6994	0.2355	0.0212
Rubber Tired Dozers Composite	2.8346	0.0025	0.1212	1.3284	0.3244	0.0293

(http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html)

Annual Operating Hours Utilizing Clean Soil

Segment time

Loading = 5 min to load a 20 cu yd haul truck
Hauling = 20 min round trip from borrow area to B-18
Spreading = 5 min to spread 20 cu yd clean soil

Total time

Loading = 5 min x hr/60 min x 90 trips/day x 365 days/yr = 2,737.5 hr/year
Hauling = 20 min x hr/60 min x 90 trips/day x 365 days/yr = 10,950 hr/year
Spreading = 5 min x hr/60 min x 90 trips/day x 365 days/yr = 2,737.5 hr/year

Emissions from Diesel Mobile Equipment

Emissions	NOx (ton/yr)	SOx (ton/yr)	PM10 (ton/yr)	CO (ton/yr)	ROG (ton/yr)	CH4 (ton/yr)
Tractors/Loaders/Backhoe Composite	0.8590	0.0011	0.0660	0.5302	0.1285	0.0116
Off-Highway Trucks Composite	12.0125	0.0146	0.4339	3.8294	1.2893	0.1163
Rubber Tired Dozers Composite	3.8799	0.0034	0.1659	1.8182	0.4440	0.0401
Total	16.75	0.019	0.67	6.18	1.8618	0.168
					2.03	

VOC Emission Reductions

VOC emissions using clean, virgin soil as alternate daily cover = 84,120 lb/year = 42.06 ton/year (assumes 92% clean soil cover control)

Worst case VOC emissions are for soils containing less than 50 ppmw of VOC concentration. VOC emissions using soil that contains less than 50 ppmw of VOC concentration as alternate daily cover = 42.06 ton/year + 45.99 ton/year = 88.05 ton/year (assumes 92% clean soil cover control in addition to the soil that contains less than 50 ppmw of VOC concentration as alternate daily cover)

$$\left(\frac{7200\ yd^3}{day}\right)(0.25)\left(\frac{1.4\ ton}{yd^3}\right)\left(\frac{50\ lb-VOC}{10^6\ lb-soil}\right)\left(\frac{365\ days}{year}\right)=45.99\frac{ton-VOC}{year}$$

VOC emission reduction from use of clean, virgin soil = 88.05 – 42.06 ton/year = 45.99 ton/year

Environmental Benefit Index Ranking Method

A higher Environmental Benefit Index (EBI) ranking indicates a more environmentally beneficial control option.

EBI = ∑(Target Pollutant Reduction)(Pollutant Significance Factor) + ∑(Non-Target Pollutant Reduction)(Pollutant Significance Factor) – ∑(Collateral Pollutant Increase)(Pollutant Significance Factor)

Significance factors for NO_X, VOC, SO_X, and $PM_{10/2.5}$ based on information contained in the 2007 eight hour attainment plan and the 2008 $PM_{2.5}$ attainment plans, are as follows:

NO_X: 7
VOC: 1
$PM_{10/2.5}$: 1
SO_X: 1

These significance factors take into account the relationship between ozone precursors NO_X and VOC and between $PM_{2.5}$ precursors NO_X and SO_X and the relative emission reductions needed of each pollutant needed to attain the ozone and $PM_{2.5}$ ambient air quality standards.

EBI = (45.99 ton-VOC/year)(1) – [(16.75 ton-NOx/year)(7) + (0.019 ton-SOx/year)(1) + 0.67 ton-PM10/year)(1) + 2.03 ton-VOC/year)(1)]
EBI = -74.0 ton/year

Since the EBI is negative, the option of using clean, virgin soil as alternate daily cover is not as environmentally beneficial as using soil that contains less than 50 ppmw of VOC concentration or soil that registers less than 50 ppmv of VOC concentration when measured three inches above the surface as alternate daily cover.

e. Step 5 - Select BACT

VOC: Daily clean-fill cover (minimum one inch of compacted, District approved soil) onto the exposed VOC contaminated soil is selected as BACT.

Per District Rule 4651, the definition of uncontaminated soil is soil which registers less than fifty (50) ppmv of VOC concentration before suppression materials have been applied when measured as hexane at a distance of three (3) inches above the surface with an organic vapor analyzer or soil containing less than fifty (50) ppmw of VOC content. Chemical Waste Management proposes to use an organic vapor analyzer to determine if incoming soil registers 50 ppmv or greater of VOC concentration at a distance of three (3) inches above the surface. Soils which register greater than 50 ppmv or greater of VOC concentration at a distance of three (3) inches above the surface or contain 50 ppmw or greater of VOC content will be buried with the other hazardous materials. Soils which register less than 50 ppmv of VOC concentration at a distance of three (3) inches above the surface or contain less than 50 ppmw of VOC content will be a candidate to be utilized as alternate daily cover to satisfy the above BACT requirement.

ATTACHMENT D

Rule 4105 Plan Summary

SJVUAPCD Rule 4105 Section 3.3 Plan

The Chemical Waste Management, Inc. – Kettleman Hills Facility (KHF) submitted an Authority to Construct (ATC) permit application to the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) to authorize construction to expand the B-18 Landfill. SJVUAPCD Rule 4105.3.3 requires the applicant to prepare a plan which addresses the following:

- Methods used to monitor odors (4105.3.3.1);
- Precautions to be taken to prevent creation of nuisance odors (4105.3.3.2);
- Procedures to deal with public complaints (4105.3.3.3);
- The names, titles, responsibilities, and telephone numbers of all responsible persons who, or one of whom, may be contacted at all times while the facility is in use (4105.3.3.4);
- If applicable, the information required by Section 25155.10 of the California Health and Safety Code relating to ambient air monitoring plans (4105.3.3.5);
- Precautions to be taken to prevent the mixing of incompatible wastes (4105.3.3.6).

The following was prepared to address these specific requirements:

Methods Used to Monitor Odors

Odors have the potential to originate from various waste treatment and disposal units at KHF, including the B-18 landfill. KHF staff working throughout the facility will monitor odors using their sense of smell.

Cautions to Prevent Nuisance Odors

All wastes entering the KHF for treatment and disposal are evaluated and approved according to KHF's Waste Analysis Plan (WAP), which is part of the KHF Hazardous Waste Facility Permit Operation Plan. During this process KHF staff gain knowledge of any odiferous nature of the waste. This knowledge is used to prevent or control any nuisance odor conditions.

To prevent odors while the facility (B-18 landfill) is not operating, the landfill is covered with a layer of soil at the end of each operating day. This application of cover soil will control odors from most waste streams. If KHF is disposing of highly odiferous waste in the B-18 landfill during operating hours that is creating a nuisance, soil cover will be applied to the waste immediately following compaction.

Procedures to Deal with Public Complaints

Any complaints received from the public regarding odors will be investigated by KHF staff. If the facility receives a complaint, KHF staff will ask the following information from the person making the complaint:

- Name;
- Time;
- Date;
- Nature of Complaint;
- Action Taken to Identify and Correct;
- Result of Corrective Action

This information, along with the weather conditions (wind speed, wind direction, and temperature), will be evaluated and compared to the conditions and activities that were being performed at KHF at the time the odor was noticed. If necessary, a member of KHF staff will visit the location where the odor was detected to help determine if the source of the odor originated from KHF. If KHF is the source of the odor, operations may be modified and mitigation measures taken to reduce the nuisance odors. Once any required investigation is complete, the individual who made the odor complaint may be contacted by KHF and apprised of the findings and any mitigation measures taken.

KHF Emergency Response Coordinators and other Contacts

KHF operates under the Incident Command System, as detailed in the KHF Contingency Plan, which is part of the KHF Hazardous Waste Facility Permit Operation Plan. The following table lists the Emergency Coordinator, and Alternates, who are on call 24 hours a day, 364 days per year in case of an emergency. These individuals are familiar with KHF's operations and have the authority to take any required emergency response or corrective action. In addition, KHF has 24-hour manned security who can contact the KHF Emergency Coordinator, KHF Alternate Emergency Coordinators, KHF First Responders, outside agencies, etc., as required by the emergency. The main telephone number at KHF is (559) 386-9711.

Type of Contact	Name	Title	Responsibility	Telephone Number
Emergency Coordinator	Bob Henry	Senior District Manager	All facility operations	(559) 386-6195
Alternate	Sam Cerveny	District Manager	Facility operations	(559) 386-6119
Alternate	Paul Turek	Environmental Manager	Environmental Compliance, and Health & Safety	(559) 386-6151

Ambient Air Monitoring Plans

Section 25155.10 of the California Health and Safety Code requires commercial off-site hazardous waste facilities to develop a proposed ambient air monitoring plan for the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). The plan must identify the hazardous constituents to be monitored, sampling locations, sample duration and frequency, and method for data reduction. An Ambient Air Monitoring Plan (AAMP) was prepared and submitted to DTSC in 2005, approved on March 29, 2006, and monitoring initiated in October 2006. Ambient air monitoring for volatile organic compounds (VOCs), carbonyls, metals, and particulate matter less than 10 microns in diameter (PM_{10}) is still being conducted in accordance with the AAMP.

Precautions to Prevent Mixing Incompatible Wastes

As mentioned above, KHF has developed and implemented a comprehensive Waste Analysis Plan (WAP). This WAP was developed in accordance with Title 40 of the Code of Federal Regulations, Section 264.13 (40 CFR 264.13) and Title 22 of the California Code of Regulations, Section 66264 (22 CCR 66264.13). In addition, the WAP has been approved by the United States Environmental Protection Agency (US EPA) and DTSC. This plan was designed to ensure proper treatment, storage, and disposal of hazardous wastes handled at KHF.

The WAP includes procedures developed by KHF to identify waste characteristics through a combination of generator knowledge and analytical data. Operations personnel are educated on the hazardous nature of wastes being accepted at KHF through Hazardous Waste Operations (HAZWOPER) training.

ATTACHMENT E

Health Risk Assessment Analysis

San Joaquin Valley Air Pollution Control District
Risk Management Review

To:	Stanley Tom, AQE – Permit Services
From:	Joe Agauyo, AQS – Technical Services
Date:	February 26, 2012
Facility Name:	Chemical Waste Management
Location:	35251 Old Skyline Rd Kettleman City, CA 93239
Application #(s):	C-283-11-6
Project #:	C-1083923

A. RMR SUMMARY

RMR Summary			
Categories	**Waste Landfill (Unit 11-6)**	**Project Totals**	**Facility Totals**
Prioritization Score	0.0	0.0[1]	0.15
Acute Hazard Index	N/A	N/A	0.0
Chronic Hazard Index	N/A	N/A	0.0
Maximum Individual Cancer Risk (10^{-6})	N/A	N/A	0.06
T-BACT Required?	**No**		
Special Permit Conditions?	**No**		

1 The prioritization score for this project was less than 0.0; therefore, no further analysis is required.

Proposed Permit Conditions

To ensure that human health risks will not exceed District allowable levels; the following permit conditions must be included for:

Unit # 11-6

No special conditions are required.

B. RMR REPORT

I. Project Description

Technical Services received a request on August 17, 2009, to perform a Risk Management Review for a proposed modification to a hazardous waste landfill. The modification consisted of expanding landfill B-18. This expansion will create an additional 4.9 million cubic yards of gross airspace to create a total of 15.6 million cubic yards of gross airspace.

II. Analysis

Toxic emissions for this proposed unit were calculated using the District's landfill VOC speciation profile 1401. In accordance with the District's *Risk Management Policy for Permitting New and Modified Sources* (APR 1905, March 2, 2001), risks from the proposed unit's toxic emissions were prioritized using the procedure in the 1990 CAPCOA Facility Prioritization Guidelines and incorporated in the District's HEARTs database. The prioritization score for this proposed unit was less than 1.0 (see RMR Summary Table). Therefore, no further analysis was necessary.

The following parameters were used for the review:

Analysis Parameters Unit 11-6			
VOC Emissions (lb/yr)	3,240	VOC Emissions (lb/hr)	8.8
Closest Receptor (m)	4,023		

III. Conclusion

The prioritization score is less than 1.0. **In accordance with the District's Risk Management Policy, the project is approved without Toxic Best Available Control Technology (T-BACT).**

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

Attachments:

A. RMR request from the project engineer
B. Toxic emissions summary
C. Prioritization score
D. Facility Summary

ATTACHMENT F

Draft Authority to Construct

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-283-11-6 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: CHEMICAL WASTE MANAGEMENT, INC
MAILING ADDRESS: PO BOX 471
KETTLEMAN CITY, CA 93239-0471

LOCATION: 35251 OLD SKYLINE ROAD
KETTLEMAN CITY, CA 93239

EQUIPMENT DESCRIPTION:
MODIFICATION OF HAZARDOUS WASTE LANDFILL (B-18), 10.7 (GROSS) MILLION CUBIC YARD CAPACITY, USED FOR DISPOSAL OF BULK SOLIDS OF EMPTY CONTAINERS, SOLIDS, AND CONTAMINATED SOIL, (APPROXIMATELY 53 ACRES): EXPAND LANDFILL VERTICALLY BY APPROXIMATELY 53 FEET AND LATERALLY BY 14 ACRES WHICH INCREASES THE CAPACITY APPROXIMATELY 4.9 MILLION CUBIC YARDS

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantities of emissions: 1st quarter - 810 lb, 2nd quarter - 810 lb, 3rd quarter - 810 lb, and fourth quarter - 810 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 09/21/06). [District Rule 2201]
3. ERC Certificate Numbers S-2645-1 and/or N-663-1 (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct [District Rule 2201]
4. The District shall be notified in writing 10 days prior to the acceptance of any new waste stream causing, or having the potential to cause, emissions of pollutants designated under the National Emissions Standards for Hazardous Air Pollutants which are not already addressed in this permit. [District Rule 2201] Federally Enforceable Through Title V Permit
5. The District shall be notified in writing 10 days prior to the acceptance of new types of waste streams, or waste streams with significant malodorous qualities. [District Rules 2201 and 4102] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services
C-283-11-6 : Jul 2 2013 9:17AM -- TOMS : Joint Inspection NOT Required

6. A District approved anemometer shall be continuously operated on site with permanent data available to the District. [District Rule 2201] Federally Enforceable Through Title V Permit
7. Wastes with the potential to release hazardous gases, mists, or vapors in excess of existing air quality standards shall not be exposed to the atmosphere, and combustion of flammable wastes in the landfill shall be prevented. [District Rule 2201] Federally Enforceable Through Title V Permit
8. Vehicle speeds on all roads shall be limited to fifteen miles per hour. [District Rule 2201] Federally Enforceable Through Title V Permit
9. Materials handling operations associated with landfill construction and operation shall be curtailed when wind and moisture conditions make it likely that any resulting visible emissions will exceed 40% opacity at an elevation of 25 feet. [District Rule 2201] Federally Enforceable Through Title V Permit
10. Any malodorous material received at the B-18 Landfill which exhibits odors detectable at or beyond the facility property boundary shall be covered at the end of the working day with acceptable cover material. [District Rule 4102]
11. Truck operating areas, including roadways within the boundaries of landfill B-18, shall be watered to maintain moisture content such that the generation of dust is controlled. [District Rule 2201]
12. Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.154. [40 CFR 61.154]
13. For purposes of complying with conditions 14 through 18, below, applicable definitions are found from section 40 CFR 61.341. [40 CFR 61.341]
14. Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.342 (a), (f), and (g). Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable requirements of 40 CFR 61.342 (b) through (e) and (h). [40 CFR 61.342]
15. Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable sections of 40 CFR 61.343 through 61.354. [40 CFR 61.343 through 61.354]
16. Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.355 (a), (b), and (c). Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable requirements of 40 CFR 61.355 (d) through (k). [40 CFR 61.355]
17. Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.356 (a), (b) and (c). Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable requirements of 40 CFR 61.356 (d) through (n). [40 CFR 61.356]
18. Each owner or operator shall comply with applicable paragraphs of section 40 CFR 61.357 (a), (b), and (c). Prior to accepting benzene waste in excess of 10 Mg/yr, facility shall apply for modification of this operating permit to satisfy the applicable requirements of 40 CFR 61.357 (d) through (g). [40 CFR 61.357]
19. With the exception of non-exposed waste (such as containers, drums, macrovaults, transformers, other large objects, etc.), the open face area shall be covered with a minimum of one inch of clean soil, or other alternative daily cover material, or soils permitted for use as daily cover, before the end of each working day. [District Rule 2201]
20. Records of the type of daily cover material used, along with testing results for alternative daily cover materials, such as Class II soils, shall be maintained onsite. [District Rules 1070 and 2201]
21. No more than 7,200 cubic yards per day of waste shall be received for placement into landfill B-18. [District Rule 2201]
22. No more than 1,800 cubic yards per day of daily cover shall be received for placement onto landfill B-18. [District Rule 2201]
23. Daily weighted average VOC content of non-containerized landfilled waste shall not exceed any of the following: 10,000 ppmw for the active face or 1,834 ppmw for the landfill (combined active face plus inactive area). [District Rule 2201]
24. Annual weighted average VOC content of non-containerized landfilled waste shall not exceed 1,834 ppmw for the active face or inactive area. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

25. VOC content of non-containerized landfilled waste shall be determined according to the procedures described in the document entitled "Determination of VOC Content for Bulk Direct Landfilled Waste Destined for Landfill B-18, SDP Number ET-400". [District Rule 2201]

26. Permittee shall maintain daily records of the weight of wastes, the corresponding ppmw VOC in waste, lab and method used to analyze the sample(s). The VOC content of the waste shall be determined using a combination of generator knowledge and the procedures described in the document entitled "Determination of VOC Content for Bulk Direct Landfilled Waste Destined for Landfill B-18, SDP Number ET-400". Permittee shall also compute and record the daily and annual weighted-average VOC content of non-containerized wastes. [District Rules 1070 and 2201]

27. Before the end of each day, the daily weighted-average VOC content for wastes landfilled shall be determined by dividing the sum of all the individual loads VOC's (summation of ppmw x tons) placed in the landfill by the tons of waste placed into the landfill. The VOC content may be determined using the generator analysis and the amount of the materials added to the landfill. [District Rule 2201]

28. Total PM10 emissions from handling of solid waste and daily cover shall not exceed 0.000453 pounds per ton material handled. [District Rule 2201]

29. The active open face area, defined as the area where exposed waste is being worked, shall not exceed 0.64 acres in size. [District Rule 2201]

30. Soil with VOC content of 50 ppm by weight or greater shall not be used as daily cover. [District Rule 4651]

31. Soil or other alternative daily cover material that registers 50 ppm by volume or greater when measured as hexane at a distance of three (3) inches above the surface of the soil shall not be used as daily cover. [District Rule 4651]

32. Contaminated wastes containing organic constituents, with the potential to be used for daily cover, shall be analyzed for VOC content using District approved Organic Vapor Analyzer (OVA) at a distance 3 inches above the surface. These waste materials shall be analyzed at the facility receiving area prior to being transported to the landfill for direct waste disposal or stockpiled and/or used as alternative daily cover. [District Rule 2201]

33. An OVA reading shall be taken for a minimum of 10 seconds and the highest reading in this 10 second period shall be recorded. [District Rule 2201]

34. Permittee shall maintain daily records of the volume of wastes received for placement into landfill B-18 and daily records of the volume of daily cover used for placement onto landfill B-18. [District Rule 1070]

35. Permittee shall maintain records of all OVA readings for waste materials that were considered for use as daily cover. [District Rule 1070]

36. Permittee shall maintain daily records of size of active open face area. [District Rules 1070 and 2201]

37. {3246} All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rule 1070]

ATTACHMENT G

Emission Profile

Application Emissions

Permit #: C-283-11-6 **Last Updated**
Facility: CHEMICAL WASTE MANAGEMENT, INC 08/02/2011 TOMS

Equipment Pre-Baselined: NO

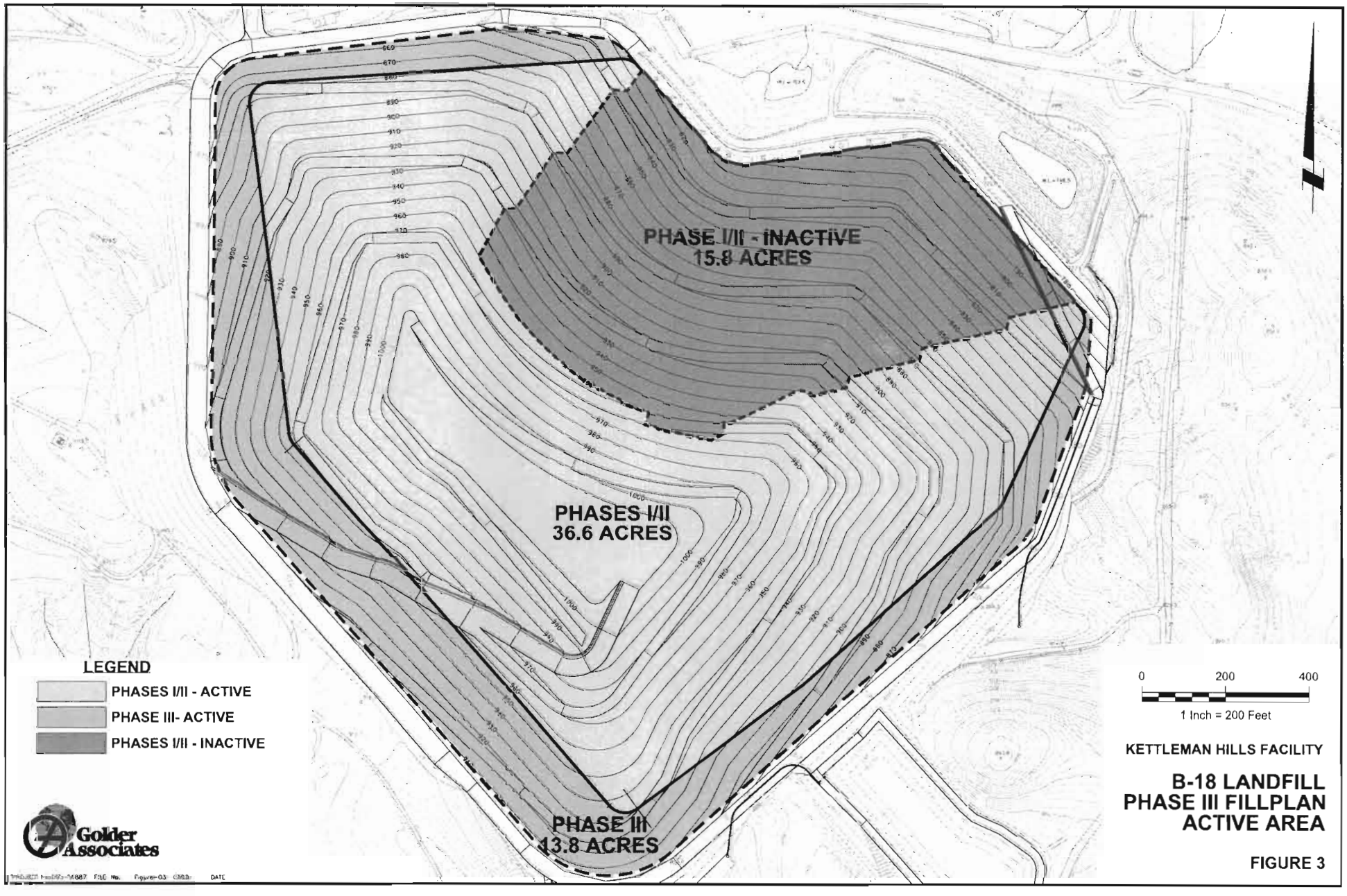
	NOX	SOX	PM10	CO	VOC
Potential to Emit (lb/Yr):	0.0	0.0	2081.0	0.0	142520.0
Daily Emis. Limit (lb/Day)	0.0	0.0	5.7	0.0	390.4
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	0.0	0.0	0.0	0.0	810.0
Q2:	0.0	0.0	0.0	0.0	810.0
Q3:	0.0	0.0	0.0	0.0	810.0
Q4:	0.0	0.0	0.0	0.0	810.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					1.5
Quarterly Offset Amounts (lb/Qtr)					
Q1:					1215.0
Q2:					1215.0
Q3:					1215.0
Q4:					1215.0

ATTACHMENT H

District's CEQA Findings

ATTACHMENT H

B-18 Landfill Fill Plan


PHASE I/II - INACTIVE
15.8 ACRES
PHASES I/II
36.6 ACRES
PHASE III
13.8 ACRES
LEGEND
PHASES I/II - ACTIVE
PHASE III- ACTIVE
PHASES I/II - INACTIVE
0
200
400
1 Inch = 200 Feet
KETTLEMAN HILLS FACILITY
B-18 LANDFILL
PHASE III FILLPLAN
ACTIVE AREA
FIGURE 3
Golder Associates