CENTEC ENGINEERING, PLLC

CIVIL & ENVIRONMENTAL ENGINEERS

TITLE V RENEWAL

COPPER RIDGE LANDFILL
R30-04700111-2008

PREPARED FOR

COPPER RIDGE LANDFILL, LLC
WELCH, WEST VIRGINIA

NOVEMBER 2017

PROJECT NO. 10-003-102

centec-engineering.com

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COPPER RIDGE LANDFILL
CAPELS LANDFILL, LLC
CAPELS, WEST VIRGINIA

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WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0475
www.dep.wv.gov/daq

INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

1. **Name of Applicant (As registered with the WV Secretary of State's Office):** Copper Ridge Landfill, LLC	**2. Facility Name or Location:** Copper Ridge Landfill Capels, West Virginia
3. DAQ Plant ID No.: ð	**4. Federal Employer ID No. (FEIN):** 33-1098598

5. **Permit Application Type:**

- ☐ Initial Permit — When did operations commence? 10/02/2007
- ☒ Permit Renewal — What is the expiration date of the existing permit? 05/14 /2018
- ☐ Update to Initial/Renewal Permit Application

6. Type of Business Entity:

☐ Corporation ☐ Governmental Agency ☒ LLC
☐ Partnership ☐ Limited Partnership

7. Is the Applicant the:

☐ Owner ☒ Operator ☐ Both

If the Applicant is not both the owner and operator, please provide the name and address of the other party.

_____
_____
_____

8. Number of onsite employees:

4

9. Governmental Code:

- ☒ Privately owned and operated; 0
- ☐ Federally owned and operated; 1
- ☐ State government owned and operated; 2
- ☐ County government owned and operated; 3
- ☐ Municipality government owned and operated; 4
- ☐ District government owned and operated; 5

10. Business Confidentiality Claims

Does this application include confidential information (per 45CSR31)? ☐ Yes ☒ No

If yes, identify each segment of information on each page that is submitted as confidential, and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's *"PRECAUTIONARY NOTICE-CLAIMS OF CONFIDENTIALITY"* guidance.

11. Mailing Address		
Street or P.O. Box: P.O. Box 629		
City: Welch	**State:** WV	**Zip: 24801-**
Telephone Number: (304) 436-6174	**Fax Number:** (304) 436-6178	

12. Facility Location		
Street: 530 Copper Ridge Road	**City:** Welch	**County:** McDowell
UTM Easting: 447.36 km	**UTM Northing:** 4147.73 km	**Zone:** ☒ 17 or ☐ 18
Directions: Approximately 2 miles north of the intersection of US Route 52 and County Route 7. Then, approximately 1.5 miles from the intersection of County Route 7 and County Route 7/2, near the community of Capels.		
Portable Source? ☐ Yes ☒ No		
Is facility located within a nonattainment area? ☐ Yes ☒ No		**If yes, for what air pollutants?**
Is facility located within 50 miles of another state? ☒ Yes ☐ No		**If yes, name the affected state(s).** Virginia Kentucky
Is facility located within 100 km of a Class I Area[1]? ☐ Yes ☒ No **If no, do emissions impact a Class I Area[1]?** ☐ Yes ☒ No		**If yes, name the area(s).**

[1] *Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park and James River Face Wilderness Area in Virginia.*

13. Contact Information		
Responsible Official: Gordon Lusk II		**Title:** Member
Street or P.O. Box: P.O. Box 300		
City: Bluefield	**State:** WV	**Zip: 24701-**
Telephone Number: (304) 425-9338	**Fax Number:** (304) 487-6318	
E-mail address: glusk2@hotmail.com		
Environmental Contact: Gordon Lusk II		**Title:** Member
Street or P.O. Box: P.O. Box 300		
City: Bluefield	**State:** WV	**Zip: 24701-**
Telephone Number: (304) 425-9338	**Fax Number:** (304) 487-6318	
E-mail address: glusk2@hotmail.com		
Application Preparer: Joseph Sulseky, P.E.		**Title:** Senior Project Manager
Company: CENTEC Engineering, PLLC		
Street or P.O. Box: P.O. Box 1152		
City: Beckley	**State:** WV	**Zip: 25802**
Telephone Number: (304) 929-2632	**Fax Number:** (304) 929-2634	
E-mail address: jsulesky@centec-engineering.com		

14. Facility Description

List all processes, products, NAICS and SIC codes for normal operation, in order of priority. Also list any process, products, NAICS and SIC codes associated with any alternative operating scenarios if different from those listed for normal operation.

Process	Products	NAICS	SIC
MSW Landfill	None	562212	4953

Provide a general description of operations.

Copper Ridge Landfill is a 106-acre municipal solid waste (MSW) landfill. The facility accepts solid waste, Construction/demolition debris and other approved wastes as specified in its Solid Waste Facility Permit No. SWF-1033. Waste is transported to the disposal area where it is placed, compacted and covered with daily soil cover. The landfill has a monthly tonnage limit of 50,000.

15. Provide an **Area Map** showing plant location as **ATTACHMENT A**.

16. Provide a **Plot Plan(s)**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as **ATTACHMENT B**. For instructions, refer to ñPlot Plan - Guidelines.ò

17. Provide a detailed **Process Flow Diagram(s)** showing each process or emissions unit as **ATTACHMENT C**. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

Section 2: Applicable Requirements

18. Applicable Requirements Summary	
Instructions: Mark all applicable requirements.	
☐ SIP	☐ FIP
☐ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☐ NESHAP (45CSR34)	☐ Nonattainment NSR (45CSR19)
☒ Section 111 NSPS	☐ Section 112(d) MACT standards
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☒ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ **C**ompliance **A**ssurance **M**onitoring (40CFR64)
☐ CAIR NO_x Annual Trading Program (45CSR39)	☐ CAIR NO_x Ozone Season Trading Program (45CSR40)
☐ CAIR SO_2 Trading Program (45CSR41)	

19. Non Applicability Determinations
List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

☐ Permit Shield

19. Non Applicability Determinations *(Continued)* - *Attach additional pages as necessary.*

List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

☐	Permit Shield

20. Facility-Wide Applicable Requirements

List all facility-wide applicable requirements. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*).

☐ Permit Shield

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Are you in compliance with all facility-wide applicable requirements? ☐ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

20. Facility-Wide Applicable Requirements *(Continued)* - *Attach additional pages as necessary.*

List all facility-wide applicable requirements. For each applicable requirement, include the rule citation and/or permit with the condition number.

☐ Permit Shield

For all facility-wide applicable requirements listed above, provide monitoring/testing/recordkeeping/ reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Are you in compliance with all facility-wide applicable requirements? ☐ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

21. Active Permits/Consent Orders		
Permit or Consent Order Number	Date of Issuance MM/DD/YYYY	List any Permit Determinations that Affect the Permit *(if any)*
	MM/DD/YYYY	
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22. Inactive Permits/Obsolete Permit Conditions		
Permit Number	Date of Issuance	Permit Condition Number
	MM/DD/YYYY	
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Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	38.3
Nitrogen Oxides (NO_X)	0.53
Lead (Pb)	NA
Particulate Matter ($PM_{2.5}$)[1]	11.48
Particulate Matter (PM_{10})[1]	65.68
Total Particulate Matter (TSP)	259.22
Sulfur Dioxide (SO_2)	0.28
Volatile Organic Compounds (VOC)	134
Hazardous Air Pollutants[2]	Potential Emissions
	26
	76.1
Regulated Pollutants other than Criteria and HAP	Potential Emissions
	2286
	8.9
	0.02

[1] $PM_{2.5}$ and PM_{10} are components of TSP.
[2] For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.

Section 4: Insignificant Activities

24. Insignificant Activities (Check all that apply)		
☐	1.	Air compressors and pneumatically operated equipment, including hand tools.
☐	2.	Air contaminant detectors or recorders, combustion controllers or shutoffs.
☐	3.	Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment.
☐	4.	Bathroom/toilet vent emissions.
☐	5.	Batteries and battery charging stations, except at battery manufacturing plants.
☐	6.	Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.
☐	7.	Blacksmith forges.
☐	8.	Boiler water treatment operations, not including cooling towers.
☐	9.	Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
☐	10.	CO_2 lasers, used only on metals and other materials which do not emit HAP in the process.
☐	11.	Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
☐	12.	Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
☐	13.	Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
☐	14.	Demineralized water tanks and demineralizer vents.
☐	15.	Drop hammers or hydraulic presses for forging or metalworking.
☐	16.	Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.
☐	17.	Emergency (backup) electrical generators at residential locations.
☐	18.	Emergency road flares.
☐	19.	Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO_x, SO_2, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units. Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis: _____ _____ _____ _____ _____ _____ _____ _____ _____

24. Insignificant Activities (Check all that apply)		
☐	20.	Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27. Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis: _____ _____ _____ _____ _____
☐	21.	Environmental chambers not using hazardous air pollutant (HAP) gases.
☐	22.	Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.
☐	23.	Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.
☐	24.	Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
☐	25.	Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.
☐	26.	Fire suppression systems.
☐	27.	Firefighting equipment and the equipment used to train firefighters.
☐	28.	Flares used solely to indicate danger to the public.
☐	29.	Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.
☐	30.	Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.
☐	31.	Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
☐	32.	Humidity chambers.
☐	33.	Hydraulic and hydrostatic testing equipment.
☐	34.	Indoor or outdoor kerosene heaters.
☐	35.	Internal combustion engines used for landscaping purposes.
☐	36.	Laser trimmers using dust collection to prevent fugitive emissions.
☐	37.	Laundry activities, except for dry-cleaning and steam boilers.
☐	38.	Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
☐	39.	Oxygen scavenging (de-aeration) of water.
☐	40.	Ozone generators.

24. Insignificant Activities (Check all that apply)		
☐	41.	Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the sourceôs primary business activity, and not otherwise triggering a permit modification. (Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise requested.)
☐	42.	Portable electrical generators that can be moved by hand from one location to another. ñMoved by Handò means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.
☐	43.	Process water filtration systems and demineralizers.
☐	44.	Repair or maintenance shop activities not related to the sourceôs primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.
☐	45.	Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified.
☐	46.	Routing calibration and maintenance of laboratory equipment or other analytical instruments.
☐	47.	Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers.
☐	48.	Shock chambers.
☐	49.	Solar simulators.
☐	50.	Space heaters operating by direct heat transfer.
☐	51.	Steam cleaning operations.
☐	52.	Steam leaks.
☐	53.	Steam sterilizers.
☐	54.	Steam vents and safety relief valves.
☐	55.	Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.
☐	56.	Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP. Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list.
☐	57.	Such other sources or activities as the Director may determine.
☐	58.	Tobacco smoking rooms and areas.
☐	59.	Vents from continuous emissions monitors and other analyzers.

Section 5: Emission Units, Control Devices, and Emission Points

25. Equipment Table
Fill out the **Title V Equipment Table** and provide it as **ATTACHMENT D**.
26. Emission Units
For each emission unit listed in the **Title V Equipment Table**, fill out and provide an **Emission Unit Form** as **ATTACHMENT E**.
For each emission unit not in compliance with an applicable requirement, fill out a **Schedule of Compliance Form** as **ATTACHMENT F**.
27. Control Devices
For each control device listed in the **Title V Equipment Table**, fill out and provide an **Air Pollution Control Device Form** as **ATTACHMENT G**.
For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the **Compliance Assurance Monitoring (CAM) Form(s)** for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as **ATTACHMENT H**.

Section 6: Certification of Information

28. Certification of Truth, Accuracy and Completeness and Certification of Compliance

*Note: This Certification must be signed by a responsible official. The **original**, signed in **blue ink**, must be submitted with the application. Applications without an **original** signed certification will be considered as incomplete.*

a. Certification of Truth, Accuracy and Completeness

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

b. Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

Responsible official (type or print)

Name:	Title:
Gordon M Lusk II	Managing Member

Responsible official's signature:

Signature: _____ Signature Date: 11-7-14

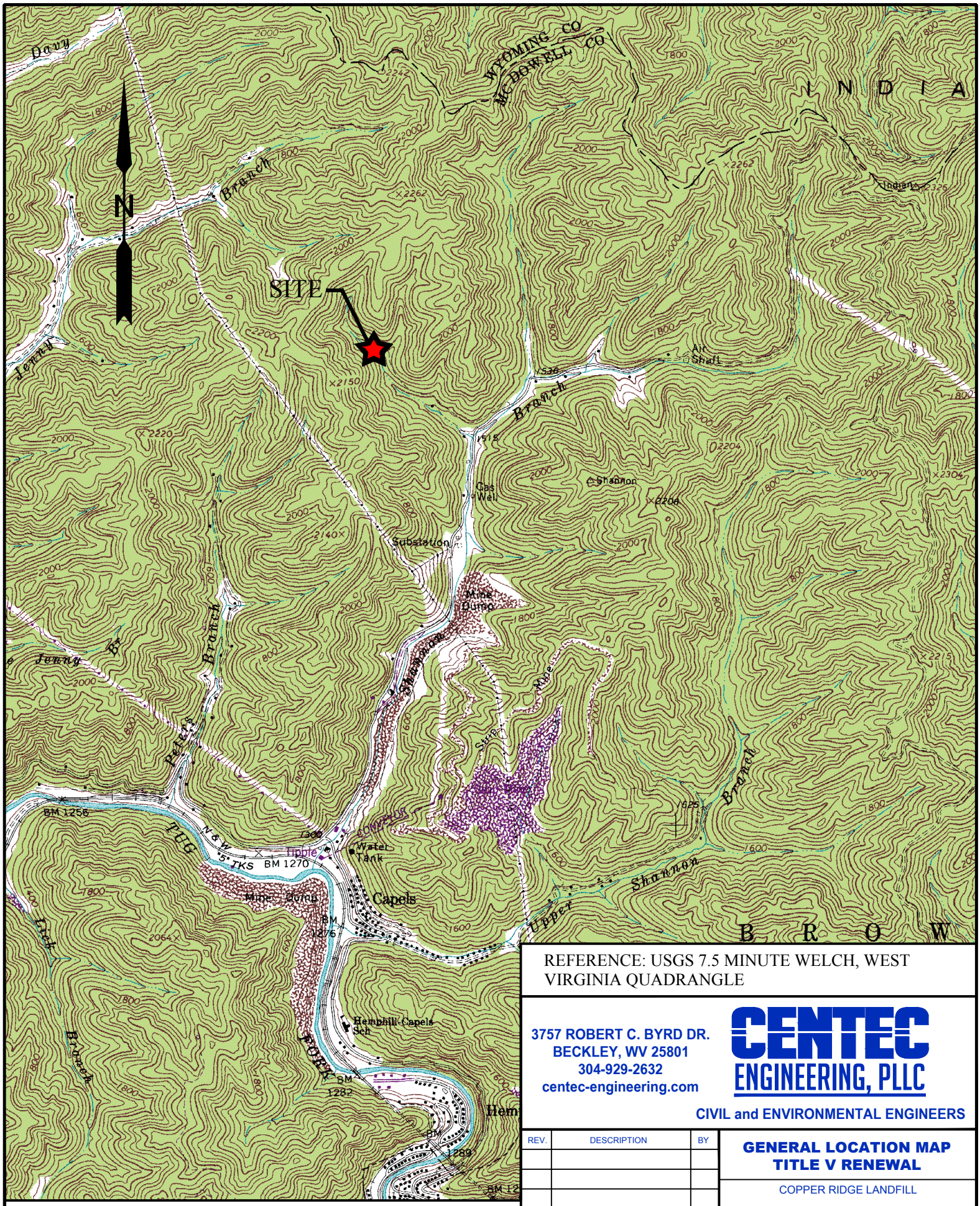
(Must be signed and dated in blue ink)

Note: Please check all applicable attachments included with this permit application:

☒	ATTACHMENT A: Area Map
☒	ATTACHMENT B: Plot Plan(s)
☒	ATTACHMENT C: Process Flow Diagram(s)
☒	ATTACHMENT D: Equipment Table
☒	ATTACHMENT E: Emission Unit Form(s)
☐	ATTACHMENT F: Schedule of Compliance Form(s)
☒	ATTACHMENT G: Air Pollution Control Device Form(s)
☐	ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s)

All of the required forms and additional information can be found and downloaded from, the DEP website at www.dep.wv.gov/daq, requested by phone (304) 926-0475, and/or obtained through the mail.

Attachment “A”



REFERENCE: USGS 7.5 MINUTE WELCH, WEST VIRGINIA QUADRANGLE

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CIVIL and ENVIRONMENTAL ENGINEERS

SCALE

2000 0 2000 4000 FEET

REV.	DESCRIPTION	BY

DRAWN BY:	CTD	08-16-2017
CHECKED BY:		
APPROVED BY:		

GENERAL LOCATION MAP
TITLE V RENEWAL

COPPER RIDGE LANDFILL

COPPER RIDGE LANDFILL, LLC
WELCH, WEST VIRGINIA

PROJECT NUMBER
10-003-102

ATTACHMENT A

DRAWING NO. 10-003-A1

Attachment “B”

PERMITTED WASTE DISPOSAL LIMIT

EXISTING PIPELINE

EMISSION UNIT ID 01-A1

EMISSION UNIT ID 01-F1

PROPERTY LINE

UNPAVED LANDFILL ACCESS ROAD

MAINTENANCE SHOP

SCALE HOUSE AND OFFICE

EXISTING PETROLEUM DEVELOPMENT CORPORATION GAS WELL

LEACHATE TANK

PROPERTY LINE

TO CO. RT. 7

SEDIMENT POND

LANDFILL ACCESS ROAD

UTM ZONE 17
447.36 E
4147.73 N

PAVED COPPER RIDGE ROAD

SHANNON BRANCH

COPPER RIDGE ROAD

EXISTING PETROLEUM DEVELOPMENT CORPORATION GAS WELL

PERMITTED WASTE DISPOSAL LIMIT

PROPERTY LINE

MW1

MW2

MW3

MW4

N

DRAWING SCALE:

0' 200' 400' 600'

0" 1" 2" 3"

NOTE:

GAS FLARE EMISSION UNIT ID IC-F SHALL BE INSTALLED IN THE FUTURE.

REFERENCES:

BASE TOPOGRAPHY TAKEN FROM AN AERIAL MAPPING DATED 4-19-2001, 3-04-2006, AND 3-06-2008. UPDATED WITH TOPOGRAPHY FROM SURVEYS BY GREENTREE CONSULTING DATED 1-12-2012, 10-31-2013, 1-08-2014, 1-02-2015; AND BY CENTEC ENGINEERING DATED 1-13-2016, 9-12-2016, & 1-04-2017.

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CIVIL and ENVIRONMENTAL ENGINEERS

REV.	DESCRIPTION	DATE

DRAWN BY:	CTD	08-16-2017
CHECKED BY:		
APPROVED BY:		

PLOT PLAN
TITLE V RENEWAL

PERMIT RENEWAL
COPPER RIDGE LANDFILL

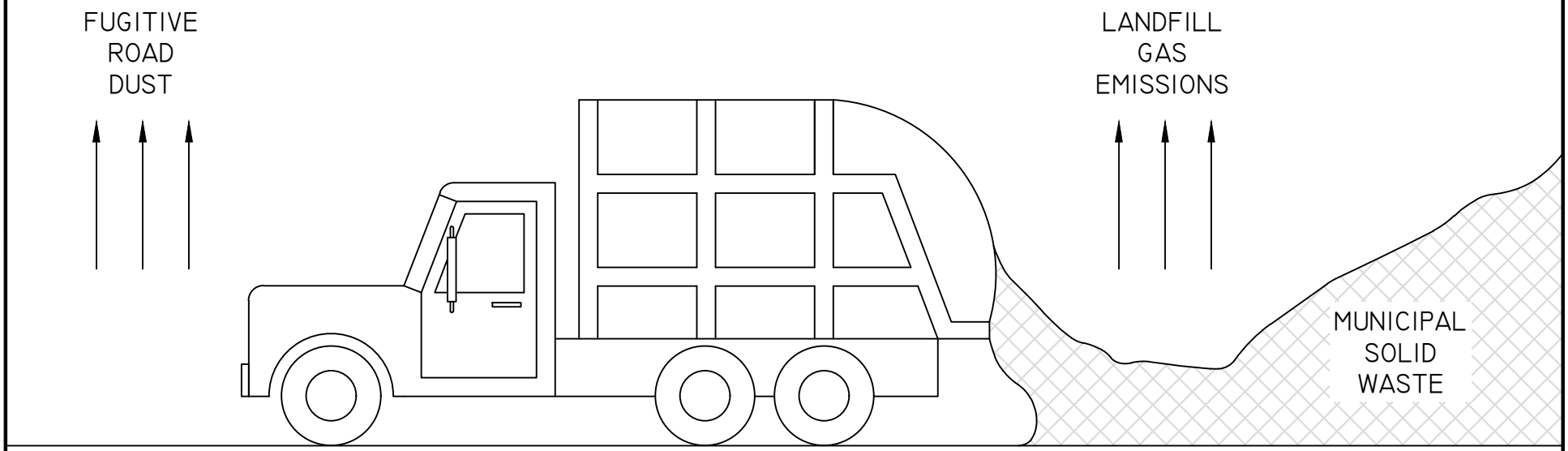
COPPER RIDGE LANDFILL, LLC
WELCH, WEST VIRGINIA

PROJECT NUMBER 10-003-102

ATTACHMENT B

DRAWING NO. 10-003-D36

Attachment “C”



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CIVIL and ENVIRONMENTAL ENGINEERS

REV.	DESCRIPTION	BY

DRAWN BY:	CTD	08-15-2017
CHECKED BY:		
APPROVED BY:		

PROCESS FLOW DIAGRAM
TITLE V RENEWAL

COPPER RIDGE LANDFILL

COPPER RIDGE LANDFILL, LLC
WELCH, WEST VIRGINIA

PROJECT NUMBER
10-003-102

ATTACHMENT C

DRAWING NO. 10-003-A2

Attachment “D”

ATTACHMENT D - Title V Equipment Table

(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Point ID[1]	Control Device[1]	Emission Unit ID[1]	Emission Unit Description	Design Capacity	Year Installed/ Modified
E001	1C-F	01-A1	Phase 1 and 2 (Active)	7,600,000	2006
E001	1C-F	01-F1	Phase 3 through 10 (Future)	15,400,000	N.A.
1C-F	None	1C-F	Flare	10,710 CFM	Future
T-1	None	T-1	Diesel Fuel Tank (Out of service)	8,000 Gallons	2006
T-2	None	T-2	Gasoline Tank (Out of service)	500 Gallons	2006
T-3	None	T-3	Leachate Tank	378,000 Gallons	2006
T-4	None	T-4	Motor Oil Tank (Out of service)	275 Gallons	2006
T-5	None	T-5	Hydraulic Fluid Tank (Out of service)	275 Gallons	2006
T-6	None	T-6	Transmission Fluid Tank (Out of service)	275 Gallons	2006
T-7	None	T-7	Antifreeze Tank (Out of service)	275 Gallons	2006
T-8	None	T-8	Waste Oil Tank	250 Gallons	2012
T-9	None	T-9	Gear Lube Tank (Out of service)	150 Gallons	2006
L-1	None	L-1	Trackmobile	130 HP	Future

[1]For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

Attachment “E”

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
T-1	Diesel Fuel Tank	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
8,000 gallon diesel fuel storage tank for on-site equipment use.

Manufacturer:	**Model number:**	**Serial number:**
NA	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
	2006	MM/DD/YYYY

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8,000 Gallons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _X_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Page _____ of _____

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Naphthalene	0.005	0.02

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

USEPA Tanks 4.0

Applicable Requirements
List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included. None
__X__ Permit Shield
For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.) None
Are you in compliance with all applicable requirements for this emission unit? X Yes ___No If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
T-2, T-4 through T-9	Gasoline, Motor Oil, Hydraulic Fluid, Transmission Fluid, Antifreeze, Waste Oil, Gear Lube	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
500 gallon gasoline storage tank for fuel supply to site equipment and other miscellaneous tanks ranging from 275 to 2,500 gallons (waste oil).

Manufacturer:	**Model number:**	**Serial number:**
NA	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
	2006	MM/DD/YYYY

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 275 to 2,500 gallons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _X_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Hexane	0.48	2.11
Benzene	0.53	2.33
Toluene	0.59	2.57
Xylene	0.16	0.71
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Naphthalene	0	0

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

USEPA Tanks 4.0

Applicable Requirements
List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included. None
__X__ Permit Shield
For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.) None
Are you in compliance with all applicable requirements for this emission unit? X Yes ___No If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
T-3	Leachate Tank	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
500,000 gallon leachate storage tank

Manufacturer:	**Model number:**	**Serial number:**
NA	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
	2007	MM/DD/YYYY

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 500,000 gallons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
		24 hr/day, 365 days/yr

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _X_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Page _____ of _____

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		1.0
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Hexane		
Benzene		
Toluene		
Xylene		
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Naphthalene		

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

As per the original permit application, leachate tank emissions are negligible. However, a value of 1.0 TPY of VOC emissions was conservatively used.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

40 CFR 60.116b(b)
40 CFR 60.116b(d)

__X__ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 CFR 60.116b(b) III.B.2.a.vii. The owner or operator of each storage vessel shall keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel. These records shall be kept for the life of the source.

40 CFR 60.116b(d) III.B.2.viii. The owner or operator of each storage vessel with a design capacity greater than or equal to 151 cubic meters storing a liquid with a maximum true vapor pressure that is normally less than 5.2 kPa shall notify the Administrator and Secretary within 30 days when the maximum true vapor pressure of the liquid exceeds 5.2kPa.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
001	Landfill Operations	1C-F

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Active Landfill area, 35 Acres (Phases 1, 2, 3A)
Future Landfill area, 71 Acres (Phase 3b, 4-10)

Manufacturer:	**Model number:**	**Serial number:**
NA	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
01/01/2007	MM/DD/YYYY	MM/DD/YYYY

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 22,898,400 tons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
		24 hr/day, 365 days/yr

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _X_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Page _____ of _____

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	6.5	28.4
Nitrogen Oxides (NO_X)	0.12	0.53
Lead (Pb)	NA	NA
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)	0.11	0.46
Volatile Organic Compounds (VOC)	30.6	134.1
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
See Attachment I	17.4	76.1
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NMOC	569.4	2,494
Hydrogen Sulfide	2.0	8.9

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

CO, VOC and HAP emissions were estimated from the Landfill Gas Emissions Model (LandGEM) computer program. NMOC emissions were also estimated from LandGEM using default values for L_o and k.

PM-2.5, PM-10 and TSP were estimated using AP-42.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

CSR 45-6-3.1 Open burning prohibited
CSR 45-6-3.2a Open Burning Prohibited
40 CFR 61.145, 61.148, and 61.150 Asbestos ï Facility Inspection
CSR 45-30-4.3.h.1.B Notify and submit compliance schedule
WV Code 22-5-4(a)(15) Conduct testing as required
CSR 45-4-3.1 Objectionable odor prohibited
CSR 45-11-5.2 Submit standby plan if requested
WV Code 22-5-4(a)(14) Submit annual emission inventory
CSR 45-17-3.1 Statutory air pollution limit
CSR 45-23 Incorporate by reference Subparts Cc and WWW
CSR 45-7 Dust Control
CSR 45-30 Operating Permit
40 CFR 60.32C9d) Closure of Landfill
40 CFR 60.33c(e) Recalculation of NMOC emission rate
40 CFR 60.33c(e) If NMOC is <50 Mg/yr, submit annual emission report and recalculate
40 CFR 60.33c(e) If NMOC is >50 Mg/yr, collection and control system
40 CFR 60.35c Recordkeeping and reporting under 40 CFR 60.575 and 60.578
40 CFR 60.36c(b) Reporting for NMOC installation of collection and control system
40 CFR 60.572(b)(2)(iv) Operational Standards, Compliance Provisions, Monitoring of NMOC operations
40 CFR 60.116b(b) Recordkeeping for tank dimensions
40 CFR 60.116b(d) Notification of vapor pressure

__X__ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

CSR 45-6-3.1 Open burning prohibited

CSR 45-6-3.2a Open Burning Prohibited

40 CFR 61.145, 61.148, and 61.150 Asbestos ï Facility Inspection

CSR 45-30-4.3.h.1.B Notify and submit compliance schedule

WV Code 22-5-4(a)(15) Conduct testing as required

CSR 45-4-3.1 Objectionable odor prohibited

CSR 45-11-5.2 Submit standby plan if requested

WV Code 22-5-4(a)(14) Submit annual emission inventory

CSR 45-17-3.1 Statutory air pollution limit

CSR 45-23 Incorporate by reference Subparts Cc and WWW

CSR 45-7 Dust Control

CSR 45-30 Operating Permit

40 CFR 60.32C9d) Closure of Landfill

40 CFR 60.33c(e) Recalculation of NMOC emission rate

40 CFR 60.33c(e) If NMOC is <50 Mg/yr, submit annual emission report and recalculate

40 CFR 60.33c(e) If NMOC is >50 Mg/yr, collection and control system

40 CFR 60.35c Recordkeeping and reporting under 40 CFR 60.575 and 60.578

40 CFR 60.36c(b) Reporting for NMOC installation of collection and control system

40 CFR 60.572(b)(2)(iv) Operational Standards, Compliance Provisions, Monitoring of NMOC operations

40 CFR 60.116b(b) Recordkeeping for tank dimensions

40 CFR 60.116b(d) Notification of vapor pressure

Are you in compliance with all applicable requirements for this emission unit? __X_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Page _____ of _____

Attachment “F” not applicable

Attachment “G”

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: 1C-F	**List all emission units associated with this control device.**	
Manufacturer:	**Model number:**	**Installation date:** MM/DD/YYYY

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter

___ Carbon Bed Adsorber

___ Carbon Drum(s)

___ Catalytic Incinerator

___ Thermal Incinerator

___ Wet Plate Electrostatic Precipitator

___ Venturi Scrubber

___ Multiclone

___ Packed Tower Scrubber

___ Single Cyclone

___ Other Wet Scrubber

___ Cyclone Bank

___ Condenser

___ Settling Chamber

__X_ Flare

___ Other (describe)

_____

___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Landfill gas	NA	NA

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

The landfill gas system consists of gas extraction wells, collection and transmission piping and appurtenances, a blower system, condensate collection and a flare.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes __X_ No

If Yes, **Complete ATTACHMENT H**

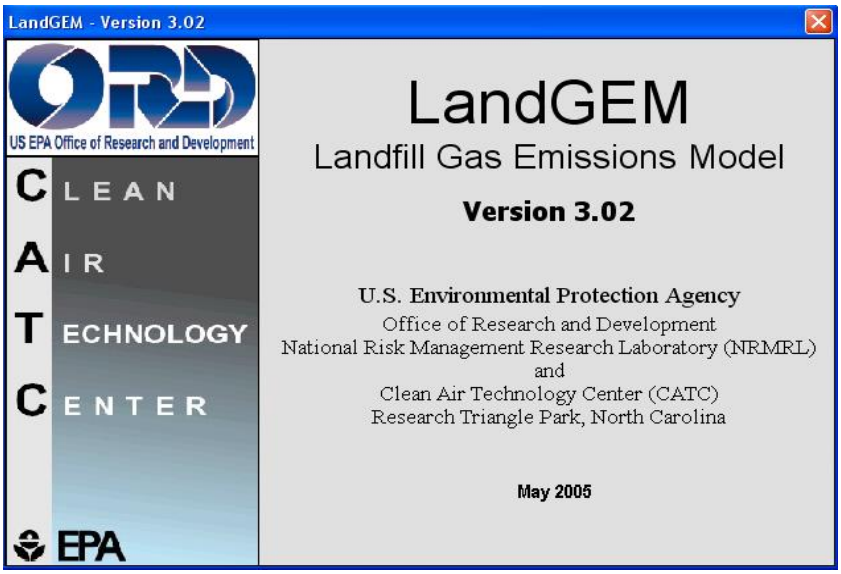
If No**, Provide justification.**

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

Attachment “H” not applicable

Attachment “I”



Summary Report

Landfill Name or Identifier: Copper Ridge Landfill

Date: Monday, November 06, 2017

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

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

Where,

Q_{CH_4} = annual methane generation in the year of the calculation *(m^3/year)*
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate *($year^{-1}$)*
L_o = potential methane generation capacity *(m^3/Mg)*

M_i = mass of waste accepted in the ith year *(Mg)*
t_{ij} = age of the jth section of waste mass M_i accepted in the ith year *(decimal years, e.g., 3.2 years)*

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

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

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**2007**	
Landfill Closure Year (with 80-year limit)	**2045**	
Actual Closure Year (without limit)	***2045***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**18,400,000**	*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.050**	*$year^{-1}$*
Potential Methane Generation Capacity, L_o	**170**	*m^3/Mg*
NMOC Concentration	**4,000**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

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

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2007	545,454	599,999	0	0
2008	545,454	599,999	545,454	599,999
2009	545,454	599,999	1,090,908	1,199,999
2010	545,454	599,999	1,636,362	1,799,998
2011	545,454	599,999	2,181,816	2,399,998
2012	545,454	599,999	2,727,270	2,999,997
2013	545,454	599,999	3,272,724	3,599,996
2014	545,454	599,999	3,818,178	4,199,996
2015	545,454	599,999	4,363,632	4,799,995
2016	545,454	599,999	4,909,086	5,399,995
2017	545,454	599,999	5,454,540	5,999,994
2018	545,454	599,999	5,999,994	6,599,993
2019	545,454	599,999	6,545,448	7,199,993
2020	545,454	599,999	7,090,902	7,799,992
2021	545,454	599,999	7,636,356	8,399,992
2022	545,454	599,999	8,181,810	8,999,991
2023	545,454	599,999	8,727,264	9,599,990
2024	545,454	599,999	9,272,718	10,199,990
2025	545,454	599,999	9,818,172	10,799,989
2026	545,454	599,999	10,363,626	11,399,989
2027	545,454	599,999	10,909,080	11,999,988
2028	545,454	599,999	11,454,534	12,599,987
2029	545,454	599,999	11,999,988	13,199,987
2030	545,454	599,999	12,545,442	13,799,986
2031	545,454	599,999	13,090,896	14,399,986
2032	545,454	599,999	13,636,350	14,999,985
2033	545,454	599,999	14,181,804	15,599,984
2034	545,454	599,999	14,727,258	16,199,984
2035	545,454	599,999	15,272,712	16,799,983
2036	545,454	599,999	15,818,166	17,399,983
2037	545,454	599,999	16,363,620	17,999,982
2038	545,454	599,999	16,909,074	18,599,981
2039	545,454	599,999	17,454,528	19,199,981
2040	545,454	599,999	17,999,982	19,799,980
2041	545,454	599,999	18,545,436	20,399,980
2042	545,454	599,999	19,090,890	20,999,979
2043	545,454	599,999	19,636,344	21,599,978
2044	545,454	599,999	20,181,798	22,199,978
2045	545,454	599,999	20,727,252	22,799,977
2046	0	0	21,272,706	23,399,977

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2047	0	0	21,272,706	23,399,977
2048	0	0	21,272,706	23,399,977
2049	0	0	21,272,706	23,399,977
2050	0	0	21,272,706	23,399,977
2051	0	0	21,272,706	23,399,977
2052	0	0	21,272,706	23,399,977
2053	0	0	21,272,706	23,399,977
2054	0	0	21,272,706	23,399,977
2055	0	0	21,272,706	23,399,977
2056	0	0	21,272,706	23,399,977
2057	0	0	21,272,706	23,399,977
2058	0	0	21,272,706	23,399,977
2059	0	0	21,272,706	23,399,977
2060	0	0	21,272,706	23,399,977
2061	0	0	21,272,706	23,399,977
2062	0	0	21,272,706	23,399,977
2063	0	0	21,272,706	23,399,977
2064	0	0	21,272,706	23,399,977
2065	0	0	21,272,706	23,399,977
2066	0	0	21,272,706	23,399,977
2067	0	0	21,272,706	23,399,977
2068	0	0	21,272,706	23,399,977
2069	0	0	21,272,706	23,399,977
2070	0	0	21,272,706	23,399,977
2071	0	0	21,272,706	23,399,977
2072	0	0	21,272,706	23,399,977
2073	0	0	21,272,706	23,399,977
2074	0	0	21,272,706	23,399,977
2075	0	0	21,272,706	23,399,977
2076	0	0	21,272,706	23,399,977
2077	0	0	21,272,706	23,399,977
2078	0	0	21,272,706	23,399,977
2079	0	0	21,272,706	23,399,977
2080	0	0	21,272,706	23,399,977
2081	0	0	21,272,706	23,399,977
2082	0	0	21,272,706	23,399,977
2083	0	0	21,272,706	23,399,977
2084	0	0	21,272,706	23,399,977
2085	0	0	21,272,706	23,399,977
2086	0	0	21,272,706	23,399,977

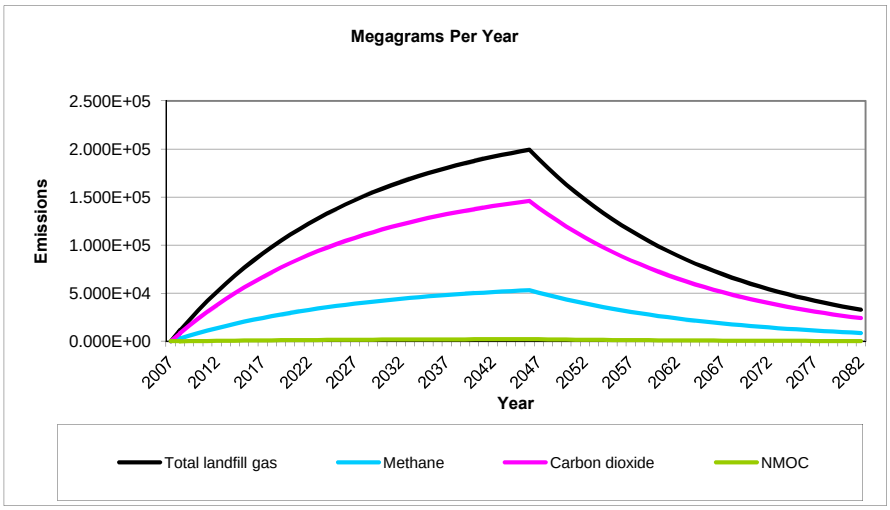
Pollutant Parameters

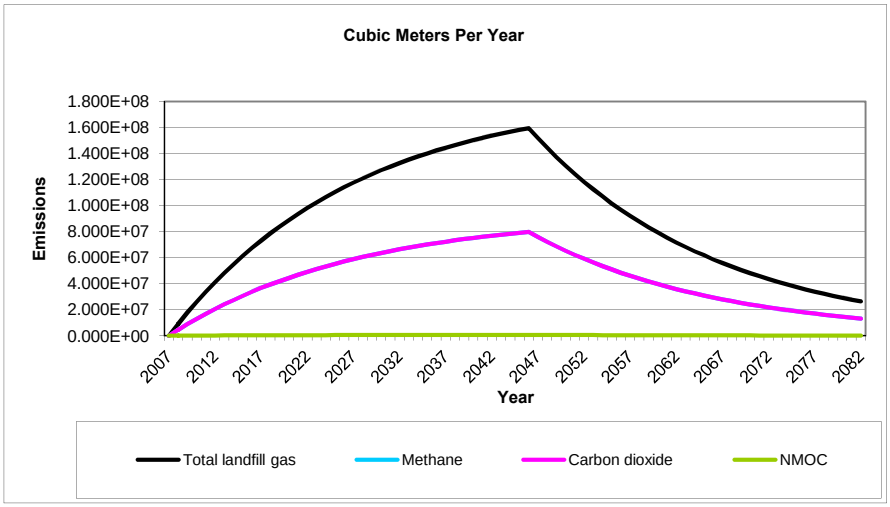
		Gas / Pollutant Default Parameters:		User-specified Pollutant Parameters:	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl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

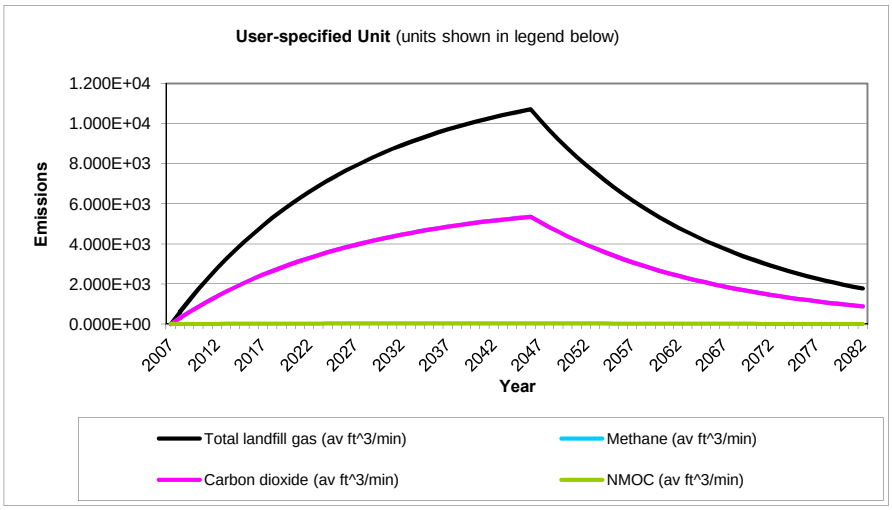
Pollutant Parameters (Continued)

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

Graphs


Megagrams Per Year
Emissions
2.500E+05
2.000E+05
1.500E+05
1.000E+05
5.000E+04
0.000E+00
2007 2012 2017 2022 2027 2032 2037 2042 2047 2052 2057 2062 2067 2072 2077 2082
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
1.800E+08
1.600E+08
1.400E+08
1.200E+08
1.000E+08
8.000E+07
6.000E+07
4.000E+07
2.000E+07
0.000E+00
2007 2012 2017 2022 2027 2032 2037 2042 2047 2052 2057 2062 2067 2072 2077 2082
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
1.200E+04
1.000E+04
8.000E+03
6.000E+03
4.000E+03
2.000E+03
0.000E+00
2007 2012 2017 2022 2027 2032 2037 2042 2047 2052 2057 2062 2067 2072 2077 2082
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2007	0	0	0	0	0	0
2008	1.132E+04	9.067E+06	6.092E+02	3.025E+03	4.534E+06	3.046E+02
2009	2.209E+04	1.769E+07	1.189E+03	5.902E+03	8.846E+06	5.944E+02
2010	3.234E+04	2.590E+07	1.740E+03	8.639E+03	1.295E+07	8.700E+02
2011	4.209E+04	3.370E+07	2.264E+03	1.124E+04	1.685E+07	1.132E+03
2012	5.136E+04	4.113E+07	2.763E+03	1.372E+04	2.056E+07	1.382E+03
2013	6.018E+04	4.819E+07	3.238E+03	1.607E+04	2.409E+07	1.619E+03
2014	6.857E+04	5.490E+07	3.689E+03	1.831E+04	2.745E+07	1.844E+03
2015	7.654E+04	6.129E+07	4.118E+03	2.045E+04	3.065E+07	2.059E+03
2016	8.414E+04	6.737E+07	4.527E+03	2.247E+04	3.369E+07	2.263E+03
2017	9.136E+04	7.315E+07	4.915E+03	2.440E+04	3.658E+07	2.458E+03
2018	9.822E+04	7.865E+07	5.285E+03	2.624E+04	3.933E+07	2.642E+03
2019	1.048E+05	8.388E+07	5.636E+03	2.798E+04	4.194E+07	2.818E+03
2020	1.110E+05	8.886E+07	5.971E+03	2.964E+04	4.443E+07	2.985E+03
2021	1.169E+05	9.359E+07	6.289E+03	3.122E+04	4.680E+07	3.144E+03
2022	1.225E+05	9.810E+07	6.591E+03	3.272E+04	4.905E+07	3.296E+03
2023	1.279E+05	1.024E+08	6.879E+03	3.415E+04	5.119E+07	3.439E+03
2024	1.329E+05	1.065E+08	7.153E+03	3.551E+04	5.323E+07	3.576E+03
2025	1.378E+05	1.103E+08	7.413E+03	3.680E+04	5.516E+07	3.707E+03
2026	1.424E+05	1.140E+08	7.661E+03	3.803E+04	5.701E+07	3.830E+03
2027	1.468E+05	1.175E+08	7.896E+03	3.920E+04	5.876E+07	3.948E+03
2028	1.509E+05	1.209E+08	8.120E+03	4.032E+04	6.043E+07	4.060E+03
2029	1.549E+05	1.240E+08	8.334E+03	4.137E+04	6.202E+07	4.167E+03
2030	1.587E+05	1.270E+08	8.536E+03	4.238E+04	6.352E+07	4.268E+03
2031	1.622E+05	1.299E+08	8.729E+03	4.334E+04	6.496E+07	4.365E+03
2032	1.657E+05	1.327E+08	8.913E+03	4.425E+04	6.633E+07	4.456E+03
2033	1.689E+05	1.352E+08	9.087E+03	4.512E+04	6.762E+07	4.544E+03
2034	1.720E+05	1.377E+08	9.253E+03	4.594E+04	6.886E+07	4.627E+03
2035	1.749E+05	1.401E+08	9.411E+03	4.672E+04	7.004E+07	4.706E+03
2036	1.777E+05	1.423E+08	9.562E+03	4.747E+04	7.115E+07	4.781E+03
2037	1.804E+05	1.444E+08	9.705E+03	4.818E+04	7.222E+07	4.852E+03
2038	1.829E+05	1.465E+08	9.840E+03	4.885E+04	7.323E+07	4.920E+03
2039	1.853E+05	1.484E+08	9.970E+03	4.950E+04	7.419E+07	4.985E+03
2040	1.876E+05	1.502E+08	1.009E+04	5.011E+04	7.511E+07	5.046E+03
2041	1.898E+05	1.520E+08	1.021E+04	5.069E+04	7.598E+07	5.105E+03
2042	1.918E+05	1.536E+08	1.032E+04	5.124E+04	7.681E+07	5.161E+03
2043	1.938E+05	1.552E+08	1.043E+04	5.177E+04	7.759E+07	5.213E+03
2044	1.957E+05	1.567E+08	1.053E+04	5.227E+04	7.834E+07	5.264E+03
2045	1.975E+05	1.581E+08	1.062E+04	5.274E+04	7.906E+07	5.312E+03
2046	1.991E+05	1.595E+08	1.071E+04	5.319E+04	7.973E+07	5.357E+03
2047	1.894E+05	1.517E+08	1.019E+04	5.060E+04	7.584E+07	5.096E+03
2048	1.802E+05	1.443E+08	9.695E+03	4.813E+04	7.215E+07	4.847E+03
2049	1.714E+05	1.373E+08	9.222E+03	4.578E+04	6.863E+07	4.611E+03
2050	1.630E+05	1.306E+08	8.772E+03	4.355E+04	6.528E+07	4.386E+03
2051	1.551E+05	1.242E+08	8.345E+03	4.143E+04	6.210E+07	4.172E+03
2052	1.475E+05	1.181E+08	7.938E+03	3.941E+04	5.907E+07	3.969E+03
2053	1.403E+05	1.124E+08	7.550E+03	3.749E+04	5.619E+07	3.775E+03
2054	1.335E+05	1.069E+08	7.182E+03	3.566E+04	5.345E+07	3.591E+03
2055	1.270E+05	1.017E+08	6.832E+03	3.392E+04	5.084E+07	3.416E+03
2056	1.208E+05	9.672E+07	6.499E+03	3.226E+04	4.836E+07	3.249E+03

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2057	1.149E+05	9.200E+07	6.182E+03	3.069E+04	4.600E+07	3.091E+03
2058	1.093E+05	8.752E+07	5.880E+03	2.919E+04	4.376E+07	2.940E+03
2059	1.040E+05	8.325E+07	5.593E+03	2.777E+04	4.162E+07	2.797E+03
2060	9.889E+04	7.919E+07	5.321E+03	2.642E+04	3.959E+07	2.660E+03
2061	9.407E+04	7.533E+07	5.061E+03	2.513E+04	3.766E+07	2.531E+03
2062	8.948E+04	7.165E+07	4.814E+03	2.390E+04	3.583E+07	2.407E+03
2063	8.512E+04	6.816E+07	4.580E+03	2.274E+04	3.408E+07	2.290E+03
2064	8.097E+04	6.483E+07	4.356E+03	2.163E+04	3.242E+07	2.178E+03
2065	7.702E+04	6.167E+07	4.144E+03	2.057E+04	3.084E+07	2.072E+03
2066	7.326E+04	5.866E+07	3.942E+03	1.957E+04	2.933E+07	1.971E+03
2067	6.969E+04	5.580E+07	3.749E+03	1.861E+04	2.790E+07	1.875E+03
2068	6.629E+04	5.308E+07	3.567E+03	1.771E+04	2.654E+07	1.783E+03
2069	6.306E+04	5.049E+07	3.393E+03	1.684E+04	2.525E+07	1.696E+03
2070	5.998E+04	4.803E+07	3.227E+03	1.602E+04	2.402E+07	1.614E+03
2071	5.706E+04	4.569E+07	3.070E+03	1.524E+04	2.284E+07	1.535E+03
2072	5.427E+04	4.346E+07	2.920E+03	1.450E+04	2.173E+07	1.460E+03
2073	5.163E+04	4.134E+07	2.778E+03	1.379E+04	2.067E+07	1.389E+03
2074	4.911E+04	3.932E+07	2.642E+03	1.312E+04	1.966E+07	1.321E+03
2075	4.671E+04	3.741E+07	2.513E+03	1.248E+04	1.870E+07	1.257E+03
2076	4.444E+04	3.558E+07	2.391E+03	1.187E+04	1.779E+07	1.195E+03
2077	4.227E+04	3.385E+07	2.274E+03	1.129E+04	1.692E+07	1.137E+03
2078	4.021E+04	3.220E+07	2.163E+03	1.074E+04	1.610E+07	1.082E+03
2079	3.825E+04	3.063E+07	2.058E+03	1.022E+04	1.531E+07	1.029E+03
2080	3.638E+04	2.913E+07	1.957E+03	9.718E+03	1.457E+07	9.787E+02
2081	3.461E+04	2.771E+07	1.862E+03	9.244E+03	1.386E+07	9.310E+02
2082	3.292E+04	2.636E+07	1.771E+03	8.793E+03	1.318E+07	8.856E+02
2083	3.131E+04	2.507E+07	1.685E+03	8.364E+03	1.254E+07	8.424E+02
2084	2.979E+04	2.385E+07	1.603E+03	7.956E+03	1.193E+07	8.013E+02
2085	2.833E+04	2.269E+07	1.524E+03	7.568E+03	1.134E+07	7.622E+02
2086	2.695E+04	2.158E+07	1.450E+03	7.199E+03	1.079E+07	7.250E+02
2087	2.564E+04	2.053E+07	1.379E+03	6.848E+03	1.026E+07	6.897E+02
2088	2.439E+04	1.953E+07	1.312E+03	6.514E+03	9.764E+06	6.560E+02
2089	2.320E+04	1.858E+07	1.248E+03	6.196E+03	9.288E+06	6.240E+02
2090	2.207E+04	1.767E+07	1.187E+03	5.894E+03	8.835E+06	5.936E+02
2091	2.099E+04	1.681E+07	1.129E+03	5.607E+03	8.404E+06	5.647E+02
2092	1.997E+04	1.599E+07	1.074E+03	5.333E+03	7.994E+06	5.371E+02
2093	1.899E+04	1.521E+07	1.022E+03	5.073E+03	7.604E+06	5.109E+02
2094	1.807E+04	1.447E+07	9.720E+02	4.826E+03	7.233E+06	4.860E+02
2095	1.719E+04	1.376E+07	9.246E+02	4.590E+03	6.880E+06	4.623E+02
2096	1.635E+04	1.309E+07	8.795E+02	4.366E+03	6.545E+06	4.398E+02
2097	1.555E+04	1.245E+07	8.366E+02	4.153E+03	6.226E+06	4.183E+02
2098	1.479E+04	1.184E+07	7.958E+02	3.951E+03	5.922E+06	3.979E+02
2099	1.407E+04	1.127E+07	7.570E+02	3.758E+03	5.633E+06	3.785E+02
2100	1.338E+04	1.072E+07	7.201E+02	3.575E+03	5.359E+06	3.600E+02
2101	1.273E+04	1.019E+07	6.850E+02	3.401E+03	5.097E+06	3.425E+02
2102	1.211E+04	9.697E+06	6.516E+02	3.235E+03	4.849E+06	3.258E+02
2103	1.152E+04	9.224E+06	6.198E+02	3.077E+03	4.612E+06	3.099E+02
2104	1.096E+04	8.774E+06	5.896E+02	2.927E+03	4.387E+06	2.948E+02
2105	1.042E+04	8.346E+06	5.608E+02	2.784E+03	4.173E+06	2.804E+02
2106	9.915E+03	7.939E+06	5.334E+02	2.648E+03	3.970E+06	2.667E+02
2107	9.431E+03	7.552E+06	5.074E+02	2.519E+03	3.776E+06	2.537E+02

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2108	8.971E+03	7.184E+06	4.827E+02	2.396E+03	3.592E+06	2.413E+02
2109	8.534E+03	6.834E+06	4.591E+02	2.279E+03	3.417E+06	2.296E+02
2110	8.118E+03	6.500E+06	4.367E+02	2.168E+03	3.250E+06	2.184E+02
2111	7.722E+03	6.183E+06	4.154E+02	2.063E+03	3.092E+06	2.077E+02
2112	7.345E+03	5.882E+06	3.952E+02	1.962E+03	2.941E+06	1.976E+02
2113	6.987E+03	5.595E+06	3.759E+02	1.866E+03	2.797E+06	1.880E+02
2114	6.646E+03	5.322E+06	3.576E+02	1.775E+03	2.661E+06	1.788E+02
2115	6.322E+03	5.062E+06	3.401E+02	1.689E+03	2.531E+06	1.701E+02
2116	6.014E+03	4.815E+06	3.236E+02	1.606E+03	2.408E+06	1.618E+02
2117	5.720E+03	4.581E+06	3.078E+02	1.528E+03	2.290E+06	1.539E+02
2118	5.441E+03	4.357E+06	2.928E+02	1.453E+03	2.179E+06	1.464E+02
2119	5.176E+03	4.145E+06	2.785E+02	1.383E+03	2.072E+06	1.392E+02
2120	4.924E+03	3.943E+06	2.649E+02	1.315E+03	1.971E+06	1.325E+02
2121	4.683E+03	3.750E+06	2.520E+02	1.251E+03	1.875E+06	1.260E+02
2122	4.455E+03	3.567E+06	2.397E+02	1.190E+03	1.784E+06	1.198E+02
2123	4.238E+03	3.393E+06	2.280E+02	1.132E+03	1.697E+06	1.140E+02
2124	4.031E+03	3.228E+06	2.169E+02	1.077E+03	1.614E+06	1.084E+02
2125	3.835E+03	3.070E+06	2.063E+02	1.024E+03	1.535E+06	1.032E+02
2126	3.647E+03	2.921E+06	1.962E+02	9.743E+02	1.460E+06	9.812E+01
2127	3.470E+03	2.778E+06	1.867E+02	9.268E+02	1.389E+06	9.334E+01
2128	3.300E+03	2.643E+06	1.776E+02	8.816E+02	1.321E+06	8.878E+01
2129	3.139E+03	2.514E+06	1.689E+02	8.386E+02	1.257E+06	8.445E+01
2130	2.986E+03	2.391E+06	1.607E+02	7.977E+02	1.196E+06	8.034E+01
2131	2.841E+03	2.275E+06	1.528E+02	7.588E+02	1.137E+06	7.642E+01
2132	2.702E+03	2.164E+06	1.454E+02	7.218E+02	1.082E+06	7.269E+01
2133	2.570E+03	2.058E+06	1.383E+02	6.866E+02	1.029E+06	6.915E+01
2134	2.445E+03	1.958E+06	1.315E+02	6.531E+02	9.789E+05	6.577E+01
2135	2.326E+03	1.862E+06	1.251E+02	6.212E+02	9.312E+05	6.257E+01
2136	2.212E+03	1.772E+06	1.190E+02	5.909E+02	8.858E+05	5.951E+01
2137	2.104E+03	1.685E+06	1.132E+02	5.621E+02	8.426E+05	5.661E+01
2138	2.002E+03	1.603E+06	1.077E+02	5.347E+02	8.015E+05	5.385E+01
2139	1.904E+03	1.525E+06	1.024E+02	5.086E+02	7.624E+05	5.122E+01
2140	1.811E+03	1.450E+06	9.745E+01	4.838E+02	7.252E+05	4.873E+01
2141	1.723E+03	1.380E+06	9.270E+01	4.602E+02	6.898E+05	4.635E+01
2142	1.639E+03	1.312E+06	8.818E+01	4.378E+02	6.562E+05	4.409E+01
2143	1.559E+03	1.248E+06	8.388E+01	4.164E+02	6.242E+05	4.194E+01
2144	1.483E+03	1.187E+06	7.979E+01	3.961E+02	5.937E+05	3.989E+01
2145	1.411E+03	1.130E+06	7.590E+01	3.768E+02	5.648E+05	3.795E+01
2146	1.342E+03	1.074E+06	7.219E+01	3.584E+02	5.372E+05	3.610E+01
2147	1.276E+03	1.022E+06	6.867E+01	3.409E+02	5.110E+05	3.434E+01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2007	0	0	0	0	0	0
2008	8.299E+03	4.534E+06	3.046E+02	1.300E+02	3.627E+04	2.437E+00
2009	1.619E+04	8.846E+06	5.944E+02	2.537E+02	7.077E+04	4.755E+00
2010	2.370E+04	1.295E+07	8.700E+02	3.713E+02	1.036E+05	6.960E+00
2011	3.085E+04	1.685E+07	1.132E+03	4.832E+02	1.348E+05	9.058E+00
2012	3.764E+04	2.056E+07	1.382E+03	5.896E+02	1.645E+05	1.105E+01
2013	4.410E+04	2.409E+07	1.619E+03	6.909E+02	1.927E+05	1.295E+01
2014	5.025E+04	2.745E+07	1.844E+03	7.872E+02	2.196E+05	1.476E+01
2015	5.610E+04	3.065E+07	2.059E+03	8.788E+02	2.452E+05	1.647E+01
2016	6.166E+04	3.369E+07	2.263E+03	9.660E+02	2.695E+05	1.811E+01
2017	6.695E+04	3.658E+07	2.458E+03	1.049E+03	2.926E+05	1.966E+01
2018	7.199E+04	3.933E+07	2.642E+03	1.128E+03	3.146E+05	2.114E+01
2019	7.677E+04	4.194E+07	2.818E+03	1.203E+03	3.355E+05	2.254E+01
2020	8.133E+04	4.443E+07	2.985E+03	1.274E+03	3.554E+05	2.388E+01
2021	8.566E+04	4.680E+07	3.144E+03	1.342E+03	3.744E+05	2.515E+01
2022	8.978E+04	4.905E+07	3.296E+03	1.406E+03	3.924E+05	2.636E+01
2023	9.370E+04	5.119E+07	3.439E+03	1.468E+03	4.095E+05	2.752E+01
2024	9.743E+04	5.323E+07	3.576E+03	1.526E+03	4.258E+05	2.861E+01
2025	1.010E+05	5.516E+07	3.707E+03	1.582E+03	4.413E+05	2.965E+01
2026	1.044E+05	5.701E+07	3.830E+03	1.635E+03	4.561E+05	3.064E+01
2027	1.076E+05	5.876E+07	3.948E+03	1.685E+03	4.701E+05	3.159E+01
2028	1.106E+05	6.043E+07	4.060E+03	1.733E+03	4.834E+05	3.248E+01
2029	1.135E+05	6.202E+07	4.167E+03	1.778E+03	4.961E+05	3.333E+01
2030	1.163E+05	6.352E+07	4.268E+03	1.822E+03	5.082E+05	3.415E+01
2031	1.189E+05	6.496E+07	4.365E+03	1.863E+03	5.197E+05	3.492E+01
2032	1.214E+05	6.633E+07	4.456E+03	1.902E+03	5.306E+05	3.565E+01
2033	1.238E+05	6.762E+07	4.544E+03	1.939E+03	5.410E+05	3.635E+01
2034	1.260E+05	6.886E+07	4.627E+03	1.975E+03	5.509E+05	3.701E+01
2035	1.282E+05	7.004E+07	4.706E+03	2.008E+03	5.603E+05	3.765E+01
2036	1.302E+05	7.115E+07	4.781E+03	2.040E+03	5.692E+05	3.825E+01
2037	1.322E+05	7.222E+07	4.852E+03	2.071E+03	5.777E+05	3.882E+01
2038	1.340E+05	7.323E+07	4.920E+03	2.100E+03	5.858E+05	3.936E+01
2039	1.358E+05	7.419E+07	4.985E+03	2.127E+03	5.935E+05	3.988E+01
2040	1.375E+05	7.511E+07	5.046E+03	2.154E+03	6.009E+05	4.037E+01
2041	1.391E+05	7.598E+07	5.105E+03	2.179E+03	6.078E+05	4.084E+01
2042	1.406E+05	7.681E+07	5.161E+03	2.202E+03	6.144E+05	4.128E+01
2043	1.420E+05	7.759E+07	5.213E+03	2.225E+03	6.207E+05	4.171E+01
2044	1.434E+05	7.834E+07	5.264E+03	2.247E+03	6.267E+05	4.211E+01
2045	1.447E+05	7.906E+07	5.312E+03	2.267E+03	6.324E+05	4.249E+01
2046	1.460E+05	7.973E+07	5.357E+03	2.286E+03	6.379E+05	4.286E+01
2047	1.388E+05	7.584E+07	5.096E+03	2.175E+03	6.068E+05	4.077E+01
2048	1.321E+05	7.215E+07	4.847E+03	2.069E+03	5.772E+05	3.878E+01
2049	1.256E+05	6.863E+07	4.611E+03	1.968E+03	5.490E+05	3.689E+01
2050	1.195E+05	6.528E+07	4.386E+03	1.872E+03	5.222E+05	3.509E+01
2051	1.137E+05	6.210E+07	4.172E+03	1.781E+03	4.968E+05	3.338E+01
2052	1.081E+05	5.907E+07	3.969E+03	1.694E+03	4.725E+05	3.175E+01
2053	1.029E+05	5.619E+07	3.775E+03	1.611E+03	4.495E+05	3.020E+01
2054	9.783E+04	5.345E+07	3.591E+03	1.533E+03	4.276E+05	2.873E+01
2055	9.306E+04	5.084E+07	3.416E+03	1.458E+03	4.067E+05	2.733E+01
2056	8.852E+04	4.836E+07	3.249E+03	1.387E+03	3.869E+05	2.599E+01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2057	8.421E+04	4.600E+07	3.091E+03	1.319E+03	3.680E+05	2.473E+01
2058	8.010E+04	4.376E+07	2.940E+03	1.255E+03	3.501E+05	2.352E+01
2059	7.619E+04	4.162E+07	2.797E+03	1.194E+03	3.330E+05	2.237E+01
2060	7.248E+04	3.959E+07	2.660E+03	1.135E+03	3.168E+05	2.128E+01
2061	6.894E+04	3.766E+07	2.531E+03	1.080E+03	3.013E+05	2.024E+01
2062	6.558E+04	3.583E+07	2.407E+03	1.027E+03	2.866E+05	1.926E+01
2063	6.238E+04	3.408E+07	2.290E+03	9.772E+02	2.726E+05	1.832E+01
2064	5.934E+04	3.242E+07	2.178E+03	9.296E+02	2.593E+05	1.742E+01
2065	5.645E+04	3.084E+07	2.072E+03	8.843E+02	2.467E+05	1.658E+01
2066	5.369E+04	2.933E+07	1.971E+03	8.411E+02	2.347E+05	1.577E+01
2067	5.107E+04	2.790E+07	1.875E+03	8.001E+02	2.232E+05	1.500E+01
2068	4.858E+04	2.654E+07	1.783E+03	7.611E+02	2.123E+05	1.427E+01
2069	4.621E+04	2.525E+07	1.696E+03	7.240E+02	2.020E+05	1.357E+01
2070	4.396E+04	2.402E+07	1.614E+03	6.887E+02	1.921E+05	1.291E+01
2071	4.182E+04	2.284E+07	1.535E+03	6.551E+02	1.828E+05	1.228E+01
2072	3.978E+04	2.173E+07	1.460E+03	6.231E+02	1.738E+05	1.168E+01
2073	3.784E+04	2.067E+07	1.389E+03	5.927E+02	1.654E+05	1.111E+01
2074	3.599E+04	1.966E+07	1.321E+03	5.638E+02	1.573E+05	1.057E+01
2075	3.424E+04	1.870E+07	1.257E+03	5.363E+02	1.496E+05	1.005E+01
2076	3.257E+04	1.779E+07	1.195E+03	5.102E+02	1.423E+05	9.563E+00
2077	3.098E+04	1.692E+07	1.137E+03	4.853E+02	1.354E+05	9.097E+00
2078	2.947E+04	1.610E+07	1.082E+03	4.616E+02	1.288E+05	8.653E+00
2079	2.803E+04	1.531E+07	1.029E+03	4.391E+02	1.225E+05	8.231E+00
2080	2.666E+04	1.457E+07	9.787E+02	4.177E+02	1.165E+05	7.830E+00
2081	2.536E+04	1.386E+07	9.310E+02	3.973E+02	1.108E+05	7.448E+00
2082	2.413E+04	1.318E+07	8.856E+02	3.779E+02	1.054E+05	7.084E+00
2083	2.295E+04	1.254E+07	8.424E+02	3.595E+02	1.003E+05	6.739E+00
2084	2.183E+04	1.193E+07	8.013E+02	3.420E+02	9.541E+04	6.410E+00
2085	2.077E+04	1.134E+07	7.622E+02	3.253E+02	9.075E+04	6.098E+00
2086	1.975E+04	1.079E+07	7.250E+02	3.094E+02	8.633E+04	5.800E+00
2087	1.879E+04	1.026E+07	6.897E+02	2.943E+02	8.212E+04	5.517E+00
2088	1.787E+04	9.764E+06	6.560E+02	2.800E+02	7.811E+04	5.248E+00
2089	1.700E+04	9.288E+06	6.240E+02	2.663E+02	7.430E+04	4.992E+00
2090	1.617E+04	8.835E+06	5.936E+02	2.533E+02	7.068E+04	4.749E+00
2091	1.538E+04	8.404E+06	5.647E+02	2.410E+02	6.723E+04	4.517E+00
2092	1.463E+04	7.994E+06	5.371E+02	2.292E+02	6.395E+04	4.297E+00
2093	1.392E+04	7.604E+06	5.109E+02	2.181E+02	6.083E+04	4.087E+00
2094	1.324E+04	7.233E+06	4.860E+02	2.074E+02	5.787E+04	3.888E+00
2095	1.259E+04	6.880E+06	4.623E+02	1.973E+02	5.504E+04	3.698E+00
2096	1.198E+04	6.545E+06	4.398E+02	1.877E+02	5.236E+04	3.518E+00
2097	1.140E+04	6.226E+06	4.183E+02	1.785E+02	4.981E+04	3.346E+00
2098	1.084E+04	5.922E+06	3.979E+02	1.698E+02	4.738E+04	3.183E+00
2099	1.031E+04	5.633E+06	3.785E+02	1.615E+02	4.507E+04	3.028E+00
2100	9.809E+03	5.359E+06	3.600E+02	1.537E+02	4.287E+04	2.880E+00
2101	9.330E+03	5.097E+06	3.425E+02	1.462E+02	4.078E+04	2.740E+00
2102	8.875E+03	4.849E+06	3.258E+02	1.390E+02	3.879E+04	2.606E+00
2103	8.442E+03	4.612E+06	3.099E+02	1.323E+02	3.690E+04	2.479E+00
2104	8.031E+03	4.387E+06	2.948E+02	1.258E+02	3.510E+04	2.358E+00
2105	7.639E+03	4.173E+06	2.804E+02	1.197E+02	3.339E+04	2.243E+00
2106	7.267E+03	3.970E+06	2.667E+02	1.138E+02	3.176E+04	2.134E+00
2107	6.912E+03	3.776E+06	2.537E+02	1.083E+02	3.021E+04	2.030E+00

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2108	6.575E+03	3.592E+06	2.413E+02	1.030E+02	2.874E+04	1.931E+00
2109	6.254E+03	3.417E+06	2.296E+02	9.798E+01	2.733E+04	1.837E+00
2110	5.949E+03	3.250E+06	2.184E+02	9.320E+01	2.600E+04	1.747E+00
2111	5.659E+03	3.092E+06	2.077E+02	8.865E+01	2.473E+04	1.662E+00
2112	5.383E+03	2.941E+06	1.976E+02	8.433E+01	2.353E+04	1.581E+00
2113	5.121E+03	2.797E+06	1.880E+02	8.022E+01	2.238E+04	1.504E+00
2114	4.871E+03	2.661E+06	1.788E+02	7.631E+01	2.129E+04	1.430E+00
2115	4.633E+03	2.531E+06	1.701E+02	7.258E+01	2.025E+04	1.361E+00
2116	4.407E+03	2.408E+06	1.618E+02	6.904E+01	1.926E+04	1.294E+00
2117	4.192E+03	2.290E+06	1.539E+02	6.568E+01	1.832E+04	1.231E+00
2118	3.988E+03	2.179E+06	1.464E+02	6.247E+01	1.743E+04	1.171E+00
2119	3.793E+03	2.072E+06	1.392E+02	5.943E+01	1.658E+04	1.114E+00
2120	3.608E+03	1.971E+06	1.325E+02	5.653E+01	1.577E+04	1.060E+00
2121	3.432E+03	1.875E+06	1.260E+02	5.377E+01	1.500E+04	1.008E+00
2122	3.265E+03	1.784E+06	1.198E+02	5.115E+01	1.427E+04	9.588E-01
2123	3.106E+03	1.697E+06	1.140E+02	4.865E+01	1.357E+04	9.120E-01
2124	2.954E+03	1.614E+06	1.084E+02	4.628E+01	1.291E+04	8.675E-01
2125	2.810E+03	1.535E+06	1.032E+02	4.402E+01	1.228E+04	8.252E-01
2126	2.673E+03	1.460E+06	9.812E+01	4.188E+01	1.168E+04	7.850E-01
2127	2.543E+03	1.389E+06	9.334E+01	3.983E+01	1.111E+04	7.467E-01
2128	2.419E+03	1.321E+06	8.878E+01	3.789E+01	1.057E+04	7.103E-01
2129	2.301E+03	1.257E+06	8.445E+01	3.604E+01	1.006E+04	6.756E-01
2130	2.189E+03	1.196E+06	8.034E+01	3.429E+01	9.565E+03	6.427E-01
2131	2.082E+03	1.137E+06	7.642E+01	3.261E+01	9.099E+03	6.113E-01
2132	1.980E+03	1.082E+06	7.269E+01	3.102E+01	8.655E+03	5.815E-01
2133	1.884E+03	1.029E+06	6.915E+01	2.951E+01	8.233E+03	5.532E-01
2134	1.792E+03	9.789E+05	6.577E+01	2.807E+01	7.831E+03	5.262E-01
2135	1.705E+03	9.312E+05	6.257E+01	2.670E+01	7.449E+03	5.005E-01
2136	1.621E+03	8.858E+05	5.951E+01	2.540E+01	7.086E+03	4.761E-01
2137	1.542E+03	8.426E+05	5.661E+01	2.416E+01	6.740E+03	4.529E-01
2138	1.467E+03	8.015E+05	5.385E+01	2.298E+01	6.412E+03	4.308E-01
2139	1.396E+03	7.624E+05	5.122E+01	2.186E+01	6.099E+03	4.098E-01
2140	1.327E+03	7.252E+05	4.873E+01	2.080E+01	5.802E+03	3.898E-01
2141	1.263E+03	6.898E+05	4.635E+01	1.978E+01	5.519E+03	3.708E-01
2142	1.201E+03	6.562E+05	4.409E+01	1.882E+01	5.249E+03	3.527E-01
2143	1.143E+03	6.242E+05	4.194E+01	1.790E+01	4.993E+03	3.355E-01
2144	1.087E+03	5.937E+05	3.989E+01	1.703E+01	4.750E+03	3.191E-01
2145	1.034E+03	5.648E+05	3.795E+01	1.620E+01	4.518E+03	3.036E-01
2146	9.834E+02	5.372E+05	3.610E+01	1.541E+01	4.298E+03	2.888E-01
2147	9.355E+02	5.110E+05	3.434E+01	1.465E+01	4.088E+03	2.747E-01

Attachment “J”

ATTACHMENT J

VOLATILE ORGANIC COMPOUND SUMMARY

COPPER RIDGE LANDFILL

TITLE V PERMIT RENEWAL

VOLATILE ORGANIC COMPOUND	POTENTIAL TO EMIT Mg/year	POTENTIAL TO EMIT Ton/year
1,1,1 - Trichoroethane	4.21E-01	4.63E-01
1,1,2 - Trichloroethane	0.00E+00	0.00E+00
1,1,2,2-Tetrachloroethane	1.21E+00	1.34E+00
1,1-Dichloroethane	1.56E+00	1.72E+00
1,1-Dichloroethene	1.28E-01	1.40E-01
1,2-Dichloroethane	2.67E-01	2.94E-01
1,2-Dichloropropane	1.34E-01	1.47E-01
Acrylonitrile	2.20E+00	2.42E+00
Benzene - No co-disposal	9.76E-01	1.07E+00
Carbon Disulfide	2.90E-01	3.19E-01
Carbon tetrachloride	4.05E-03	4.45E-03
Carbonyl sulfide	1.94E-01	2.13E-01
Chlorobenzene	1.85E-01	2.04E-01
Chloroethane	5.52E-01	6.07E-01
Chloroform	2.36E-02	2.59E-02
Dichlorobenzene	2.03E-01	2.23E-01
Dichloromethane	7.82E+00	8.60E+00
Ethylbenzene	3.21E+00	3.53E+00
Ethylene dibromide	1.24E-03	1.36E-03
Hexane	3.74E+00	4.12E+00
Mercury (total)	3.83E-04	4.21E-04
Methyl ethyl ketone	3.37E+00	3.70E+00
Methyl isobutyl ketone	1.25E+00	1.38E+00
Perchloroethylene	4.04E+00	4.44E+00
Toulene - No co-disposal	2.36E+01	2.60E+01
Trichloroethylene	2.42E+00	2.66E+00
Vinyl Chloride	3.00E+00	3.30E+00
Xylenes	8.38E+00	9.22E+00

TOTALS	6.92E+01	7.61E+01

Attachment “K”

ATTACHMENT K
VOLATILE ORGANIC COMPOUND SUMMARY
COPPER RIDGE LANDFILL
TITLE V PERMIT RENEWAL

VOLATILE ORGANIC COMPOUND	POTENTIAL TO EMIT Mg/year	POTENTIAL TO EMIT Ton/year
1,1,2,2-Tetrachloroethane	1.21E+00	1.34E+00
1,1-Dichloroethane	1.56E+00	1.72E+00
1,1-Dichloroethene	1.28E-01	1.40E-01
1,2-Dichloroethane	2.67E-01	2.94E-01
1,2-Dichloropropane	1.34E-01	1.47E-01
2-Propanol	1.98E+01	2.17E+01
Acrylonitrile	2.20E+00	2.42E+00
Benzene - No co-disposal	9.76E-01	1.07E+00
Bromodichloromethane	3.34E+00	3.67E+00
Butane	1.91E+00	2.10E+00
Carbon Disulfide	2.90E-01	3.19E-01
Carbon tetrachloride	4.05E-03	4.45E-03
Carbonyl sulfide	1.94E-01	2.13E-01
Chlorobenzene	1.85E-01	2.04E-01
Chlorodifluoromethane	7.39E-01	8.13E-01
Chloroethane	5.52E-01	6.07E-01
Chloroform	2.36E-02	2.59E-02
Chloromethane	3.98E-01	4.38E-01
Dichlorobenzene	2.03E-01	2.23E-01
Dichlorodifluoromethane	1.27E+01	1.40E+01
Dichlorofluoromethane	1.76E+00	1.94E+00
Dimethyl Sulfide	3.19E+00	3.51E+00
Ethanol	8.18E+00	9.00E+00
Ethyl mercaptan	9.40E-01	1.03E+00
Ethylbenzene	3.21E+00	3.53E+00
Ethylene dibromide	1.24E-03	1.36E-03
Fluorotrichloromethane	6.87E-01	7.55E-01
Hexane	3.74E+00	4.12E+00
Methyl ethyl ketone	3.37E+00	3.70E+00
Methyl isobutyl ketone	1.25E+00	1.38E+00
Methyl mercaptan	7.91E-01	8.70E-01
Pentane	1.57E+00	1.72E+00
Perchloroethylene	4.04E+00	4.44E+00
Propane	3.19E+00	3.51E+00
t-1,2-Dichloroethene	1.79E+00	1.96E+00
Toulene - No co-disposal	2.36E+01	2.60E+01
Trichloroethylene	2.42E+00	2.66E+00
Vinyl Chloride	3.00E+00	3.30E+00
Xylenes	8.38E+00	9.22E+00

TOTALS	1.22E+02	1.34E+02

Attachment “L”

ATTACHMENT L

COPPER RIDGE LANDFILL

FUGITIVE PARTICULATE EMISSIONS SUMMARY

ORIGIN	TSP (tons/yr)	PM-10 (tons/yr)	PM-2.5 (tons/yr)
Solid Waste Hauling ï Unpaved Roads	183.09	45.51	6.65
Daily Cover Hauling ï Unpaved Roads	7.32	1.82	0.27
Daily Cover Loading/Unloading	0.035	0.016	0.005
Equipment and Blasting	44.19	12.01	3.65
Construction Excavation Haul to Stockpile	6.89	1.71	0.25
Construction Excavation Haul to Fill	15.79	3.92	0.57
Construction Excavation Load/Unload	0.18	0.09	0.03
Soil Liner Haul to Cell	0.61	0.15	0.02
Soil Liner Load/Unload	0.003	0.001	0.0004
Protective Cover Haul to Cell	0.88	0.22	0.03
Protective Cover Load/Unload	0.004	0.002	0.001
TOTALS	**258.99**	**65.45**	**11.48**

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS
DAILY COVER HAULING
UNPAVED ROADS

Emission Factor, E = k(s/12)^a(W/3)^b/(M0.2)^c*((365-p)/365)

			TSP	PM10	PM2.5
Where,	k = Particle Size Multiplier	k =	10	2.6	0.38
	s = Silt Content of Road Surface (%)	s =	14.3	14.3	14.3
	a = 0.8	a =	0.8	0.8	0.8
	W = Average Vehicluar Weight (tons)	W =	40	40	40
	b = 0.4	b =	0.5	0.4	0.4
	M = Moisture Content of Road Surface	M =	1.7	1.7	1.7
	c = 0.3	c =	0.4	0.3	0.3
	p = Days With 0.10 Inches or Greater Precipitation	p =	157	157	157
	Emissions Factor (lbs/vehicle-mile)		**10.17**	**2.53**	**0.37**

Daily Cover Tonnage =	60,000
(10% of Waste Disposal)	
Tons per Trip	25.00
Trips per Year	2400
Miles per Trip	1
Miles per year	2400

UNCONTROLLED	TSP	PM10	PM2.5
Pounds per Year	**24412.22**	**6067.76**	**886.83**
Pounds per Ton	**0.41**	**0.10**	**0.01**
Tons per Year	**12.21**	**3.03**	**0.44**

CONTROLLED EMISSIONS

CONTROLLED	TSP	PM10	PM2.5
Tons per year	7.32	1.82	0.27

Control Efficiency 0.7

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS CALCULATIONS
DAILY COVER LOADING/UNLOADING

Emission Factor, E = k(0.0032)[(u/5)^1.3/(M/2^1.4]

Where, k = Particle Size Multiplier
u = mean wind speed (mph)
M = moisture content (%)

	TSP	PM10	PM2.5
k =	0.74	0.35	0.11
u =	6.2	6.2	6.2
M =	6.7	6.7	6.7

Emissions Factor (lbs/ton)	**0.0006**	**0.0003**	**0.0001**

Daily Cover Tonnage = 60,000
(10% of Waste Disposal)

UNCONTROLLED	TSP	PM10	PM2.5
Pounds per Year	**34.59**	**16.36**	**5.14**
Tons per Year	**0.0173**	**0.0082**	**0.0026**

CONTROLLED	TSP	PM10	PM2.5
Tons per year	0.0346	0.0164	0.0051

Control Efficiency 0

ATTACHMENT L
FUGITIVE EQUIPMENT EMISSIONS
COPPER RIDGE LANDFILL

Equipment	TSP Emissions Factor	PM-10 Emissions Factor	PM-2.5 Emissions Factor	Number of Units	Hours of Operation Per Day	Days of Operation Per Year	Annual TSP Emissions (tons)	Annual PM-10 Emissions (tons)	Annual PM-2.5 Emissions (tons)
Compactor	0.00143 tons/hr	0.00024 tons/hr	0.00015 tons/hr	1	12	312	5.36690	0.89330	0.56353
Landfill Dozer	0.00143 tons/hr	0.00024 tons/hr	0.00015 tons/hr	2	12	312	10.73381	1.78659	1.12705
Excavator	0.00143 tons/hr	0.00024 tons/hr	0.00015 tons/hr	1	10	312	4.47242	0.74441	0.46960
Loader	0.00143 tons/hr	0.00024 tons/hr	0.00015 tons/hr	1	5	312	2.23621	0.37221	0.23480
Construction Dozer	0.00143 tons/hr	0.00024 tons/hr	0.00015 tons/hr	3	5	312	6.70863	1.11662	0.70441
Road Grader	0.00143 tons/hr	0.00024 tons/hr	0.00015 tons/hr	1	4	260	1.49081	0.24814	0.15653
Blasting	13.177 tons/blast	6.852 tons/blast	0.395 tons/blast	1	1	1	13.17747	6.85228	0.39532
						Total:	**44.186**	**12.014**	**3.651**

Emissions Factor Equations	Cover Material/Compaction/Roadwork	
M=Material Moisture Content %	6.10	
S=Material Silt Content %	4.00	
TSP	PM-10	PM-2.5
5.7(S)^1.2/(M)^1.3	(1.0(S)^1.5/(M)^1.4).75	(5.7(S)^1.2/(M)^1.3)0.105
0.001433468	0.000238594	0.000150514
tons/hr	tons/hr	tons/hr

Blasting	A = Blast Area, sf	
Emission Factor TSP	0.000014(A^1.5)/2000	tons/blast
Emission Factor PM10	0.000014(A^1.5)*0.52/2000	tons/blast
Emission Factor PM2.5	0.000014(A^1.5)*0.03/2000	tons/blast
A = 35 Ac =	1,524,600 sf	

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS
CONSTRUCTION EXCAVATION HAULING TO STOCKPILE
UNPAVED ROADS

Emission Factor, E = k(s/12)^a(W/3)^b/(M0.2)^c*((365-p)/365)

			TSP	PM10	PM2.5
Where,	k = Particle Size Multiplier	k =	10	2.6	0.38
	s = Silt Content of Road Surface (%)	s =	14.3	14.3	14.3
	a = 0.8	a =	0.8	0.8	0.8
	W = Average Vehicluar Weight (tons)	W =	40	40	40
	b = 0.4	b =	0.5	0.4	0.4
	M = Moisture Content of Road Surface	M =	1.7	1.7	1.7
	c = 0.3	c =	0.4	0.3	0.3
	p = Days With 0.10 Inches or Greater Precipitation	p =	157	157	157
	Emissions Factor (lbs/vehicle-mile)		**10.17**	**2.53**	**0.37**

Excavation Tonnage =	56,421
Tons per Trip	25.00
Trips per Year	2256.84
Miles per Trip	1
Miles per year	2256.84

UNCONTROLLED	**TSP**	**PM10**	**PM2.5**
Pounds per Year	**22956.03**	**5705.82**	**833.93**
Pounds per Ton	**0.41**	**0.10**	**0.01**
Tons per Year	**11.48**	**2.85**	**0.42**

CONTROLLED EMISSIONS

Control Efficiency	0.7

CONTROLLED	**TSP**	**PM10**	**PM2.5**
Tons per year	6.89	1.71	0.25

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS
CONSTRUCTION EXCAVATION HAULING TO FILL
UNPAVED ROADS

Emission Factor, E = k(s/12)^a(W/3)^b/(M0.2)^c*((365-p)/365)

			TSP	PM10	PM2.5
Where,	k = Particle Size Multiplier	k =	10	2.6	0.38
	s = Silt Content of Road Surface (%)	s =	14.3	14.3	14.3
	a = 0.8	a =	0.8	0.8	0.8
	W = Average Vehicluar Weight (tons)	W =	40	40	40
	b = 0.4	b =	0.5	0.4	0.4
	M = Moisture Content of Road Surface	M =	1.7	1.7	1.7
	c = 0.3	c =	0.4	0.3	0.3
	p = Days With 0.10 Inches or Greater Precipitation	p =	157	157	157
	Emissions Factor (lbs/vehicle-mile)		**10.17**	**2.53**	**0.37**

Excavation Tonnage =	129,347
Tons per Trip	25.00
Trips per Year	5173.88
Miles per Trip	1
Miles per year	5173.88

UNCONTROLLED	TSP	PM10	PM2.5
Pounds per Year	**52627.47**	**13080.79**	**1911.81**
Pounds per Ton	**0.41**	**0.10**	**0.01**
Tons per Year	**26.31**	**6.54**	**0.96**

CONTROLLED EMISSIONS

Control Efficiency	0.7

CONTROLLED	TSP	PM10	PM2.5
Tons per year	15.79	3.92	0.57

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS CALCULATIONS
CONSTRUCTION EXCAVATION LOADING/UNLOADING

Emission Factor, E = k(0.0032)[(u/5)^1.3/(M/2^1.4]

Where, k = Particle Size Multiplier
u = mean wind speed (mph)
M = moisture content (%)

	TSP	PM10	PM2.5
k =	0.74	0.35	0.11
u =	6.2	6.2	6.2
M =	6.7	6.7	6.7

Emissions Factor (lbs/ton)	**0.0006**	**0.0003**	**0.0001**

Excavation Tonnage = 320,000

UNCONTROLLED	**TSP**	**PM10**	**PM2.5**
Pounds per Year	**184.47**	**87.25**	**27.42**
Tons per Year	**0.0922**	**0.0436**	**0.0137**

CONTROLLED	**TSP**	**PM10**	**PM2.5**
Tons per year	0.1845	0.0872	0.0274

Control Efficiency 0

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS
PROTECTIVE COVER HAULING TO CELL
UNPAVED ROADS

Emission Factor, E = k(s/12)^a(W/3)^b/(M0.2)^c*((365-p)/365)

			TSP	PM10	PM2.5
Where,	k = Particle Size Multiplier	k =	10	2.6	0.38
	s = Silt Content of Road Surface (%)	s =	14.3	14.3	14.3
	a = 0.8	a =	0.8	0.8	0.8
	W = Average Vehicluar Weight (tons)	W =	40	40	40
	b = 0.4	b =	0.5	0.4	0.4
	M = Moisture Content of Road Surface	M =	1.7	1.7	1.7
	c = 0.3	c =	0.4	0.3	0.3
	p = Days With 0.10 Inches or Greater Precipitation	p =	157	157	157
	Emissions Factor (lbs/vehicle-mile)		**10.17**	**2.53**	**0.37**

Hauled Tonnage =	7,250
Tons per Trip	25.00
Trips per Year	290
Miles per Trip	1
Miles per year	290

UNCONTROLLED	TSP	PM10	PM2.5
Pounds per Year	**2949.81**	**733.19**	**107.16**
Pounds per Ton	**0.41**	**0.10**	**0.01**
Tons per Year	**1.47**	**0.37**	**0.05**

CONTROLLED EMISSIONS

Control Efficiency	0.7

CONTROLLED	TSP	PM10	PM2.5
Tons per year	0.88	0.22	0.03

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS CALCULATIONS
PROTECTIVE COVER LOADING/UNLOADING

Emission Factor, E = k(0.0032)[(u/5)^1.3/(M/2^1.4]

Where, k = Particle Size Multiplier
u = mean wind speed (mph)
M = moisture content (%)

	TSP	PM10	PM2.5
k =	0.74	0.35	0.11
u =	6.2	6.2	6.2
M =	6.7	6.7	6.7

Emissions Factor (lbs/ton)	**0.0006**	**0.0003**	**0.0001**

Tonnage = 7,250

UNCONTROLLED	TSP	PM10	PM2.5
Pounds per Year	**4.18**	**1.98**	**0.62**
Tons per Year	**0.0021**	**0.0010**	**0.0003**

CONTROLLED	TSP	PM10	PM2.5
Tons per year	0.0042	0.0020	0.0006

Control Efficiency 0

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS
SOIL LINER HAULED TO CELL
UNPAVED ROADS

Emission Factor, E = k(s/12)^a(W/3)^b/(M0.2)^c*((365-p)/365)

			TSP	PM10	PM2.5
Where,	k = Particle Size Multiplier	k =	10	2.6	0.38
	s = Silt Content of Road Surface (%)	s =	14.3	14.3	14.3
	a = 0.8	a =	0.8	0.8	0.8
	W = Average Vehicluar Weight (tons)	W =	40	40	40
	b = 0.4	b =	0.5	0.4	0.4
	M = Moisture Content of Road Surface	M =	1.7	1.7	1.7
	c = 0.3	c =	0.4	0.3	0.3
	p = Days With 0.10 Inches or Greater Precipitation	p =	157	157	157
	Emissions Factor (lbs/vehicle-mile)		**10.17**	**2.53**	**0.37**

Hauled Tonnage =	5,000
Tons per Trip	25.00
Trips per Year	200
Miles per Trip	1
Miles per year	200

UNCONTROLLED	TSP	PM10	PM2.5
Pounds per Year	**2034.35**	**505.65**	**73.90**
Pounds per Ton	**0.41**	**0.10**	**0.01**
Tons per Year	**1.02**	**0.25**	**0.04**

CONTROLLED EMISSIONS

Control Efficiency	0.7

CONTROLLED	TSP	PM10	PM2.5
Tons per year	0.61	0.15	0.02

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS CALCULATIONS
SOIL LINER EXCAVATION LOADING/UNLOADING

Emission Factor, E = k(0.0032)[(u/5)^1.3/(M/2^1.4]

Where, k = Particle Size Multiplier
u = mean wind speed (mph)
M = moisture content (%)

	TSP	PM10	PM2.5
k =	0.74	0.35	0.11
u =	6.2	6.2	6.2
M =	6.7	6.7	6.7

Emissions Factor (lbs/ton)	**0.0006**	**0.0003**	**0.0001**

Excavation Tonnage = 5,000

UNCONTROLLED	**TSP**	**PM10**	**PM2.5**
Pounds per Year	**2.88**	**1.36**	**0.43**
Tons per Year	**0.0014**	**0.0007**	**0.0002**

CONTROLLED	**TSP**	**PM10**	**PM2.5**
Tons per year	0.0029	0.0014	0.0004

Control Efficiency 0

ATTACHMENT L

COPPER RIDGE LANDFILL
FUGITIVE EMISSIONS
SOLID WASTE HAULING
UNPAVED ROADS

Emission Factor, E = k(s/12)^a(W/3)^b/(M0.2)^c*((365-p)/365)

			TSP	PM10	PM2.5
Where,	k = Particle Size Multiplier	k =	10	2.6	0.38
	s = Silt Content of Road Surface (%)	s =	14.3	14.3	14.3
	a = 0.8	a =	0.8	0.8	0.8
	W = Average Vehicluar Weight (tons)	W =	40	40	40
	b = 0.4	b =	0.5	0.4	0.4
	M = Moisture Content of Road Surface	M =	1.7	1.7	1.7
	c = 0.3	c =	0.4	0.3	0.3
	p = Days With 0.10 Inches or Greater Precipitation	p =	157	157	157
	Emissions Factor (lbs/vehicle-mile)		**10.17**	**2.53**	**0.37**

Landfill Disposal Tonnage =	600,000
Tons per Trip	25.00
Trips per Year	24000
Miles per Trip	2.5
Miles per year	60000

UNCONTROLLED	**TSP**	**PM10**	**PM2.5**
Pounds per Year	**610305.60**	**151694.11**	**22170.68**
Pounds per Ton	**1.02**	**0.25**	**0.04**
Tons per Year	**305.15**	**75.85**	**11.09**

CONTROLLED EMISSIONS

Control Efficiency	0.7

CONTROLLED	**TSP**	**PM10**	**PM2.5**
Tons per year	183.09	45.51	6.65

Attachment “M”

COPPER RIDGE. LANDFILL

TITLE V PERMIT RENEWAL

ATTACHMENT M
EMISSIONS SUMMARY

	Potential to Emit Mg/year	Potential to Emit Ton/year	Secondary Emissions from Flare Ton/year	**Total Emission Potential Ton/year**
Acetone	2.67E+00	2.95E+00	n/a	**2.9475**
Carbon Dioxide	1.45E+05	1.60E+05	1517.92	**161019.7**
Carbon Monoxide	2.58E+01	2.84E+01	9.96	**38.388**
Ethane	1.76E+02	1.94E+02	n/a	**194.00**
Hydrogen Sulfide	8.07E+00	8.89E+00	n/a	**8.8933**
Methane	5.27E+04	5.81E+04	n/a	**58134.9**
NOx	n/a	n/a	0.53	**0.53**
SO_2	n/a	n/a	0.28	**0.28**
HCl	n/a	n/a	0.46	**0.46**
PM	59.38	65.45	1.05	**66.5**
TSP	234.96	258.99	1.05	**260.04**

CENTEC ENGINEERING, PLLC
CIVIL and ENVIRONMENTAL ENGINEERS

SUBJECT Copper Ridge Landfill Title V Renewal
JOB NUMBER 10-003-102
FACILITY Copper Ridge Landfill
DATE 10/27/2017

SHEET 1 OF 4
CLIENT Copper Ridge Landfill, LLC
BY JWS
CHECKED

Purpose: Calculate the potential to emit secondary compounds for the combustion of Landfill Gas (LFG) from the proposed gas flare at Copper Ridge Landfill in accordance with AP-42 emission factors.

There are 54 proposed vertical gas extraction wells planned for the facility. There is a proposed LFG Header and Lateral LFG collection and transmission system and a blower/flares station.

The total permitted MSW disposal area is 106 acres. The single flare will serve all 106 acres.

Peak Methane (CH_4) production in 2046 = 53,190Mg/yr (58,509 tons/yr) or 5,357 cfm. (Ref. LandGem).

Peak Landfill Gas (LFG) production in 2046 = 199,100 Mg/yr (219,100 tons/yr) or 10,710 cfm (Ref. LandGem).

Ratio (R_1) of the molecular weight of Carbon Dioxide (CO_2) to the molecular weight of CH_4 = 2.75 (Ref. AP-42)

Ratio (R_2) of the molecular weight of Sulfur Dioxide (SO_2) to the molecular weight of CH_4 = 2.0 (Ref. AP-42)

Ratio (R_3) of the molecular weight of Hydrochloric Acid (HCL) to the molecular weight of CH_4 = 1.03 (Ref. AP-42)

Sum (M_S) of all Sulfur compounds = 14.82 tons (Ref. LandGem)

Sum (M_C) of all Chlorinated compounds = 47.74 tons (Ref. LandGem)

Flares typically produce 750 lbs of Carbon Monoxide (CO) per 1,000,000 cubic foot of CH_4 combusted (Ref. AP-42).

Flares typically produce 40 lbs of Nitrogen Dioxide (NO_X) per 1,000,000 cubic foot of CH_4 combusted (Ref. AP-42).

Flares typically produce 17 lbs of Particulate Matter (PM) per 1,000,000 cubic foot of CH_4 combusted (Ref. AP-42).

Volume of LFG Combusted by Each Flare

Flare Gas Flow = (Area of Influence x LFG)/Permitted Area

Flare Gas Flow = (106 x 10,710)/106

Flare Gas Flow = 10,710 cfm

Mass of CO_2 (M_{CO2}) Secondary Emissions from Flares

M_{CO2} = ((M_{CH4} x R_1) / Permitted Area) x Proposed Flares

M_{CO2} = ((58,509 x 2.75) / 106) x 1

M_{CO2} = 1,517.92 tons/yr

CENTEC ENGINEERING, PLLC
CIVIL and ENVIRONMENTAL ENGINEERS

SUBJECT Copper Ridge Landfill Title V Renewal
JOB NUMBER 10-003-102
FACILITY Copper Ridge Landfill
DATE 10/27/2017

SHEET 3 OF 4
CLIENT Copper Ridge Landfill, LLC
BY JWS
CHECKED

Mass of CO (M_{CO}) Secondary Emissions from Flares

M_{CO} = ((750 lbs/1,000,000 cf x M_{CH4})/Permitted Area) x number of flares

M_{CO} = ((750 lbs/1,000,000 cf x 5,357)/106) x 1

M_{CO} = 0.038 lbs/min

M_{CO} = 9.96 tons/yr

Mass of NO_X (M_{NOX}) Secondary Emissions from Flares

M_{NOX} = ((40 lbs/1,000,000 cf x M_{CH4})/Permitted Area) x number of flares

M_{NOX} = ((40 lbs/1,000,000 cf x 5,357)/106) x 1

M_{NOX} = 0.002 lbs/min

M_{NOX} = 0.53 tons/yr

Mass of SO_2 (M_{SO2}) Secondary Emissions from Flares

M_{SO2} = ((M_S x R_2)/Permitted Acres) x Number of Flares

M_{SO2} = ((14.82 x 2.0)/106) x 1

M_{SO2} = 0.28 tons/yr

CENTEC ENGINEERING, PLLC
CIVIL and ENVIRONMENTAL ENGINEERS

SUBJECT Copper Ridge Landfill Title V Renewal
JOB NUMBER 10-003-102
FACILITY Copper Ridge Landfill
DATE 10/27/2017

SHEET 4 OF 4
CLIENT Copper Ridge Landfill, LLC
BY JWS
CHECKED

Mass of HCL (M_{HCL}) Secondary Emissions from Flares

M_{HCL} = ((M_C x R_3)/Permitted Acres) x Number of Flares

M_{HCL} = ((47.74 x 1.03)/106) x 1

M_{HCL} = 0.46 tons/yr

Mass of Particulate Matter (M_{PM}) Secondary Emissions from Flares

M_{PM} = ((17 lbs/1,000,000 cf x M_{CH4})/Permitted Area) x number of flares

M_{PM} = ((17 lbs/1,000,000 cf x 5,357)/106) x 1

M_{PM} = 0.00086 lbs/min

M_{PM} = 0.23 tons/yr