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Supplemental Landfill Gas Investigation Report

Marshall Landfill Cleanup and Closure, CSID 1022
Marshall, Washington

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Engineer's Stamp

This report has been prepared under the supervision of a professional engineer registered in the State of Washington.

5/8/25

Michael Spillane	May 8, 2025
Name	Date

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Introduction

The Washington State Department of Ecology (Ecology) executed a contract with Herrera Environmental Consultants (Herrera) to provide Architectural/Engineering Services for the Marshall Landfill Cleanup Site, CSID #1022 (Project), located in Marshall, Spokane County, Washington. The Project consists of engineering services for a traditional design-bid-build public works project in conformance with the Revised Code of Washington (RCW) 39.04, along with other services necessary to achieve the requirements of remedial action for the Marshall Landfill (Site).

In 2023 and 2024, Herrera conducted exploratory investigations of the Site. Through these investigations, Herrera assessed LFG production, both within and near the Site, and informed closure design for the Project.

This Supplemental Landfill Gas Investigation Summary Report (LFG Report) summarizes the field activities conducted and provides recommendations on closure design for LFG mitigation strategies at the Site.

Site Description and Background

The Site is located northwest of Cheney-Spokane Road, about 1 mile southwest of the town of Marshall, Washington, and 7 miles southwest of Spokane, Washington. The Site is bounded to the north by a gravel pit and privately-owned vacant land; to the east by South Cheney-Spokane Road; to the south by a landfill property owned by Spokane County; and to the west by forested land owned by Spokane County. The Site layout and the locations of groundwater monitoring wells are presented in the Site Plan, (Appendix A). The Site consists of two primary historic land use areas: the Main Landfill and the Five-Acre Landfill.

Main Landfill

This approximate 25-acre waste disposal area is located within the south-central portion of the Site. Sand and gravel removed from the Main Landfill were replaced with waste during the period from 1970 through 1990. The landfilled waste thickness was estimated at 100 feet in the Main Landfill (Fetrow 1991). The Main Landfill does not have a bottom liner. The cover consists of fine to coarse sand with silt and gravel, or fine to coarse gravel with silt and sand. The cover ranges from 0 to 5.5 feet in most locations (see Appendix A).

Five-Acre Landfill

This approximately 5-acre waste disposal area is located within the northwest portion of the Site. Waste was disposed within the Five-Acre Landfill during the period from 1980 through 1984. The landfilled waste thickness was estimated at 45 feet in the Five-Acre Landfill (Fetrow 1991). The Five-Acre Landfill does not have a bottom liner. The cover consists of fine to coarse sand with varying amounts of silt, underlain by a fine-grained soil cover layer (stiff lean clay with varying amounts of sand). Soil cover thickness ranges from 0 to 9.5 feet throughout the Five-Acre Landfill.

Neighboring Properties

The Marshall Landfill is located adjacent to a mix of public- and private-owned properties:

- The former Spokane County Landfill (Parcel No. 24282.9002) is located adjacent to the southern boundary of the Main Landfill. The landfill was operated by Spokane County as a daily-burn landfill from the 1950s until 1970. It has no bottom liner.
- Spokane County Engineers own three parcels to the west of the Marshall Landfill. These parcels are primarily undeveloped. They are heavily forested.
- An access road connects to an active gravel pit and associated offices, a laydown area, and parking facilities. The access road borders the Five-Acre Landfill to the north. The access road separates the Five-Acre Landfill from an undeveloped private property to the north.
- Parcels owned by Randall Gillingham and Castle Materials are located to the north of the Marshall Landfill. Action Materials uses the Castle Materials property for ongoing excavation operations at an active gravel pit (Gillingham Gravel Pit). Administrative offices, parking, and ongoing operations to support excavation of an active gravel pit are also provided on the property. The Gillingham Property includes additional support facilities for Action Materials (a portion of their administrative offices, parking, and haul road).
- The east side of the Main Landfill is bordered by South Cheney Spokane Road.

Historic Landfill Gas Monitoring Activities

GeoEngineers conducted a Remedial Investigation (RI) and Feasibility Study (FS) for Ecology at the Site. As part of the RI effort, GeoEngineers installed 10 LFG monitoring wells and conducted sampling events in September 2015, August 2016, November 2016, and February 2017. A total of 12 volatile organic compounds (VOCs) were detected at concentrations greater than the Model Toxics Control Act (MTCA) Method B shallow soil gas screening levels (SLs) in at least one sample. Exceedances were observed in 8 of the 10 LFG monitoring wells. Observed methane concentrations were greater than the lower explosive limit (LEL) of 5 percent in one of four LFG monitoring wells at the Five-Acre Landfill (LFB-11) and four of six LFG monitoring wells at the Main Landfill (LFB-4, LFB-3, LFB-5, and LFB-17) during at least one monitoring event. Monitoring well locations are shown in Appendix A, with historic LFG monitoring data included in Appendix B. The lateral extent of LFG contamination was not defined.

Static pressure within landfill gas monitoring wells was measured during the December 2017 monitoring event. Results indicate that, during the December 2017 monitoring event, pressure in each landfill gas monitoring well was minimal. The maximum pressure was 0.21 inches of water, observed in landfill gas monitoring well LFB-4.

During sampling events conducted between November 2020 and November 2021, methane greater than 5 percent was observed in 4 of the 10 LFG monitoring wells, with a maximum observed value of 31.9 percent in LFB-11 during the November 2021 sampling event.

During the historic monitoring activities, the following trends were identified:

- VOC exceedances appear to attenuate before the south boundary of the Main Landfill.
- Methane exceedances appear to attenuate before the south and southeast boundaries of the Main Landfill.

Regulatory Requirements for Landfill Gas

Since filling operations at the Marshall Landfill ceased in 1990 (before 1992), landfill closure is dictated by the requirements described in Washington Administrative Code, WAC 173-304. Key considerations described for LFG in WAC 173-304 include requirements for air quality and toxic air emissions, and LFG control.

Air Quality and Toxic Air Emissions

WAC 173-304-460(2)(b) provides requirements for air quality and toxic air emissions:

> *(i) An owner or operator of a landfill shall not allow explosive gases generated by the facility whose concentration exceeds:*
>
> > *(A) Twenty-five percent of the lower explosive limit for the gases in facility structures (excluding gas control or recovery system components);*
> >
> > *(B) The lower explosive limit for the gases at the property boundary or beyond; and*
> >
> > *(C) One hundred parts per million by volume of hydrocarbons (expressed as methane) in offsite structures.*
>
> *(ii) An owner or operator of a landfill shall not cause a violation of any ambient air quality standard at the property boundary or emission standard from any emission of landfill gases, combustion or any other emission associated with a landfill.*

Ambient air quality standards are set forth in WAC 173-400. WAC 173-400-110(6) indicates that landfills constructed, reconstructed, or modified before May 30, 1991, are required to meet, at a minimum, the requirements provided in WAC 173-400. WAC 173-400-111 indicates that the requirements of WAC 173-460 must be satisfied for the approval of a notice of construction application.
WAC 173-460-150 provides the table of acceptable source impact level (ASIL), small quantity emission rate (SQER), and de minimis emission values for toxic air pollutants (TAPs). A summary of response for TAP threshold levels is included in Table 1.

Table 1. Toxic Air Pollutant Threshold Levels and Responses.		
TAP Threshold	**Definition**	**Response**
ASIL [microgram/ cubic meter]	Screening concentration of a TAP in ambient air.	If above ASIL, the TAP is regulated in Washington, and requires a loading analysis (i.e., how much of the TAP will be produced over a defined period of time).
De minimis [pound per averaging period]	Loading level of emissions that do not pose a threat to human health or the environment.	If below de minimis, not identified in the WAC as a threat to human health or the environment. If above de minimis but below SQER, dispersion modeling is not required, but TAP is still regulated.
SQER [pound per averaging period]	Loading level of emissions below which dispersion modeling is not required to demonstrate compliance with acceptable source impact levels.	If below SQER, refer to de minimis. If above SQER, dispersion modeling is required. AERSCREEN model is used to determine highest concentration at closest point of public access (typically identified as the property boundary).

For loading, LFG production rate developed is multiplied by the TAP ASIL concentration to compare anticipated TAP generation to the de minimis and SQER values. The modeled application of LFG generation to TAP ASIL concentrations is described in the ensuing sections.

Landfill Gas Control

WAC 173-304-460(3)(f) provides requirements for gas control:

> *(i) All owners and operators shall design landfills, having a permitted capacity of greater than ten thousand cubic yards per year, so that methane and other gases are continuously collected, and*
>
> > *(A) Purified for sale;*
> >
> > *(B) Flared; or*
> >
> > *(C) Utilized for its energy value.*
>
> *(ii) Collection and handling of landfill gases shall not be required if it can be shown that little or no landfill gases will be produced or that landfill gases will not support combustion; in such cases installation of vents shall be required.*

Since the Landfill is not actively receiving waste, WAC 173-304-460(3)(f)(i) is not applicable. The Marshall Landfill has 3 LFG vents installed in the Five-Acre Landfill. These vents are anticipated to remain operational through final closure. WAC 173-304-460(3)(f)(ii) considers if the quantity and quality of LFG produced at the landfill can be captured to support combustion. This requirement is further considered in the ensuing sections.

Landfill Gas Generation Rates and Calculated Emission Loading

Herrera reviewed the theoretical generation of LFG and default and sampled concentrations of LFG constituents at the Site. Methodology and findings are described below.

Landfill Gas Generation

LFG generation rates were determined using the U.S. Environmental Protection Agency (EPA) LandGEM – Landfill Gas Emissions Model, Version 3.02. The LandGEM model is a first-order decomposition rate equation for quantifying emission from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating LFG emissions. Model LFG concentration default values are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Input data provided by Ecology, including landfill operation dates, waste volume, and annual waste acceptance rates (averaged), were entered into the model. Table 2 includes the model parameters selected for the model run.

Table 2. LandGEM Model.

Landfill Open Year	1970
Landfill Closure Year	1990
Tons per Year Disposed	87,406
Methane Generation Rate K ($year^{-1}$)	Clean Air Act (CAA) Arid Area – 0.02
Potential Methane Generation Capacity, L_o (cubic meters per megagram [m^3/Mg])	CAA Conventional – 170
Non methane organic compound (NMOC) Concentration (parts per million volume [ppmv] as hexane)	CAA – 4,000
Methane Content (percent by volume)	CAA – 50 percent by volume

Inputting the above values into LandGEM produced estimated annual emission rates for total LFG, methane, carbon dioxide, and NMOCs, and 48 default air pollutants commonly found in LFG. The Herrera team used 2022 as a base year to assess potential LFG generation, with a summary of key constituents included below:

- **Total LFG:** 335.2 standard cubic feet per minute (scfm)
- **Methane:** 168 scfm
- **Carbon Dioxide:** 168 scfm
- **NMMOCs:** 1.34 scfm

The theoretical emission loading rates from LandGEM were input into a spreadsheet to compare loading rates to de minimis and SQER regulatory threshold. 15 TAPs were observed exceeding de minimis

emissions and SQER regulatory thresholds. The list below indicates the TAPs that exceeded their corresponding de minimis values. TAPs shown in italics exceeded both SQER and de minimis emissions.

- *1,1,2,2-Tetrachloroethane*
- *1,1-Dichloroethane*
- *1,2-Dichloroethane*
- 1,2-Dichloropropane
- *Acrylonitrile*
- *Benzene*
- *Bromodichloromethane*
- Chloroform
- Dichloromethane
- *Ethylbenzene*
- *Hydrogen Sulfide*
- *Isopropyl Alcohol*
- *Tetrachloroethylene*
- *Trichloroethylene*
- *Vinyl Chloride*

Following desktop assessment, Herrera assessed LFG generation from site-specific information provided from Ecology.

Site-Specific Modeled LFG Emission Loading

Ecology collected LFG samples during quarterly monitoring events from November 2020 to November 2021. This included field and laboratory LFG quality samples from 10 LFG monitoring wells (LFB-3 through LFB-5, LFB-8 through LFB-11, and LFB-15 through LFB-17). Ecology field personnel used a handheld Landtec GEM5000+ meter to measure concentrations of methane, carbon dioxide, oxygen, hydrogen sulfide, carbon monoxide, and gas pressure at the 10 LFG monitoring wells. LFG samples were collected in 1-liter Summa canisters at a flow rate of approximately 200 milliliters per minute for about 5 minutes. LFG samples were submitted to Fremont Analytical for analysis of volatile organic compounds (VOCs) using EPA Method Toxic Organics-15 (TO-15). Analytical data is included in the Appendix B.

Sampled results from the quarterly monitoring events were compiled into a composite theoretical LFG sample containing the maximum concentrations for every analyte. Given that there are three vents on site, it was assumed that the maximum flow rate out of each individual vent stack would be 1/3 of the calculated 335.2-scfm total LFG flow from the LandGEM model. The composite sample concentrations of LFG analytes were multiplied by 111.73 scfm LFG flow and converted to pounds per averaging period. The pounds per averaging period (loading rates) were compared to SQER and de minimis emissions values. The calculated emission loading rates indicated nine exceedances of de minimis and no exceedances of SQER values. Although three of the nine analytes indicated as exceeding de minimis values were not detected at concentrations greater than the laboratory reporting limit, the de minimis value is equal to or below the laboratory reporting limit. In these instances, the laboratory reporting limit was used in the

assessment. Analytes exceeding de minimis values are shown below. Analytes that exceeded de minimis values and were non-detect are italicized.

- *1,1,2,2-Tetrachloroethane*
- *Ethylene dibromide (EDB)*
- 1,4-Dichlorobenzene
- Benzene
- Benzyl chloride
- Ethyl benzene
- *Hexachlorobutadiene*
- Naphthalene
- Vinyl Chloride

Air Dispersion Modeling

While no analyte exceeded SQER threshold values, air dispersion modeling was performed to assess potential existing vent emissions. Although contaminant concentrations from LFG wells are indicative of conditions within the waste mass, Herrera took a conservative approach of modeling LFG to determine the theoretical impact of vented LFG at the property boundary.

Similar to the methodology described above, composite LFG sample methane concentrations were multiplied by 111.73 scfm LFG flow. The resulting loading rate was modeled for the closest vent to the property boundary (i.e., 90 feet from the property boundary for Vent 1) using EPA's AERSCREEN.

AERSCREEN is the EPA's recommended screening-level air quality model. AERSCREEN produces estimates for the "worst-case" 1-hour concentration of contaminants and takes into account site-specific meteorological and terrain data to produce a contaminant concentration at a user-defined distance from the source.

Vent 1 was modeled in AERSCREEN, assuming composite sample values for methane (31.9 percent) and TAPs concentrations. The vent was modeled using its existing physical properties (approximately 10-foot-tall, 6-inch-diameter polyvinyl chloride [PVC]). Well modeling applied the total LFG generation rate from to the chemical concentrations provided by Ecology.

AERSCREEN results indicate that, if Vent 1 was discharging LFG at the estimated flow rate, methane concentrations would not exceed 5 percent at the property boundary, and that ASILs would not be exceeded at the property boundary. Since Vents 2 and 3 are located further from the property boundary than is Vent 1, the impact at the property boundary is assumed to be less than the impact from Vent 1.

Recommendations from Assessment

Based on output from the AERSCREEN model and measured methane concentrations from LFG wells at the site, LFG treatment is not required by the WAC.

Based on modeling, even if the entire modeled landfill LFG generation rate is discharged through the three existing vents (proportioned equally between the vents), there would not be exceedances at the property boundary. Although historical monitoring of the vents has not been performed, monitoring of the vents was performed as part of this analysis. Herrera monitored vent emissions during initial perimeter compliance probe monitoring and did not detect measurable methane concentrations (see Compliance Probe Monitoring Section). Herrera recommends that vent monitoring be included with ongoing perimeter compliance probe monitoring to verify methane levels remain below 5 percent by volume. If methane emissions from the vents are measured or are anticipated to exceed 5 percent, treatment of the vent emissions is recommended.

Lateral Extents of Waste Investigation

Following desktop analysis, Herrera visited the Site to identify locations to test LFG in the field. The Site includes three passive vents in the Five-Acre Landfill. To assess potential LFG migration, the Herrera team performed investigatory excavations to the west, north, and east of known landfilled waste to approximate the edge of waste. Findings from investigatory excavation work are described in the *Cover System and Buttress Alternatives Evaluation* (Herrera and Geoengineers, 2023), with waste extents summarized for the Main Landfill and Five-Acre Landfill in this section, and test pit locations and waste extents shown in Appendix A.

Main Landfill Approximate Waste Extents

Perimeter test pits excavated at the Main Landfill provided insight to the approximate lateral extent and depth of waste buried beyond the Marshall Properties' parcel lines, summarized below.

Waste extends approximately 25 to 45 feet onto parcel 24213.9076. Interpolated perimeter boundaries show waste extents up to approximately 160 feet onto the north adjacent parcel (24213.9076). Waste was observed in test pits TP-M-1A and TP-SC-16, located approximately 125 and 50 feet beyond the north boundary of parcel 24213.9018, respectively. Approximately 1.09 acres of parcel 24213.9076 is assumed to contain Main Landfill waste. Approximate bottom of waste depths of 6 and 7 feet bgs were observed on the north adjacent parcel. Waste depths of 1.5 and 7.5 feet bgs were observed on the north adjacent property, in test pits TP-6 and TP-7, respectively.

Waste extends approximately 25 feet onto parcel 24214.9044. Interpolated perimeter boundaries show waste extents up to approximately 50 feet onto the north adjacent parcel (24214.9044). Approximately 0.40 acres of parcel 24214.9044 is assumed to contain Main Landfill waste. An approximate bottom of waste depth of at least 10 feet bgs was observed on the north adjacent parcel. Waste depths of 4.5 and 6 feet bgs were observed on the north adjacent property, in test pits TP-15A and TP-SC-18, respectively.

Along the western boundary of the Main Landfill, waste extends approximately 15 and 30 feet beyond the west parcel boundary of 24213.9018 and onto the west adjacent parcel (24213.9017). Near the northwest corner of the Main Landfill, waste extents appear to generally follow the west parcel boundary up until approximately at the test pit locations TP-11A and TP-11B. Here, waste begins to generally extend beyond the west perimeter boundary onto the west adjacent parcel. Main Landfill waste was observed

approximately 50, 70, 160, and 75 feet beyond the west perimeter boundary in test pits TP-3W, TP-SC-4A, TP-SC-2B, and TP-1, respectively. Approximately 1.32 acres of parcel 24213.9017 is assumed to contain Main Landfill waste. An approximate bottom of waste depth of at least 7 feet bgs was observed on the west adjacent parcel. Waste depths of 4, 9, and at least 5 feet bgs were observed on the west adjacent property, in test pits TP-SC-4, TP-SC-2B and TP-1, respectively.

Five-Acre Landfill Approximate Waste Extents

Based upon current exploratory data, the Five-Acre Landfill currently occupies five parcels:

- Two centrally located parcels (24213.9009 and 24213.9011) containing majority of the Five-Acre Landfill are owned by MARSHALL PROP
- Two east adjacent parcels (24213.9075 and 24213.9076) are privately owned by Randall J Gillingham
- One west adjacent parcel (24213.9010) is owned by Spokane County Engineers.

Along the eastern boundary of the Five-Acre Landfill, waste extends onto the southwest corner of parcel 24213.9075 and onto the northwest corner and western portion of parcel 24213.9076.

Landfilled municipal solid waste terminates near the east boundary of parcel 24213.9009, but accumulation of construction and demolition waste continues approximately 215 feet beyond the east boundary of parcel 24213.9009 onto the northeast adjacent parcel 24213.9075. Approximately 0.74 acres of parcel 24213.9075 is assumed to contain Five-Acre Landfill construction and demolition waste. An approximate bottom of waste depth of at least 7.5 feet bgs was observed on the northeast adjacent property (parcel 24213.9075). The following construction and demolition waste depths were observed on the northeast adjacent property (parcel 24213.9075):

- 6 feet in TP-FE-1
- At least 7.5 feet in TP-FE-3
- 5 feet in TP-SC-20
- At least 4 feet in TP-SC-22
- 1.75 feet in TP-SC-22A

Landfilled waste continues approximately 60 feet beyond the east boundary of parcel 24213.9009 onto the southeast adjacent parcel (24213.9076). Interpolated perimeter boundaries show waste extents up to approximately 230 feet onto the southeast adjacent parcel (24213.9076). Waste was observed in test pit exploration TP-FE-2, located approximately 95 feet beyond the east boundary of parcel 24213.9009. Approximately 1.16 acres of parcel 24213.9076 is assumed to contain Five-Acre Landfill waste. An approximate bottom of waste depth of at least 7.5 feet bgs was observed on the southeast adjacent parcel (24213.9076). The following waste depths were observed on the southeast adjacent property (Parcel 24213.9076):

- 8 feet in TP-FE-2
- 6 feet in TP-M-4A

- At least 6 feet in TP-F-11A
- At least 3.5 feet in TP-11B
- 4.5 feet in TP-11C
- At least 11 feet in TP-M-1B

Along the western boundary of the Five-Acre Landfill, waste extends onto the west adjacent parcel (24213.9010). Waste appears to extend approximately 75, 65, and 25 feet beyond the west boundary of parcel 24213.9009, at boundary B, C, and D, respectively. Test pits TP-SC-33 and TP-F-12B, show that waste extends approximately 50 and 60 feet beyond the west boundary of parcel 24213.9009. Approximately 1.17 acres of parcel is assumed to contain Five-Acre Landfill waste. Approximate bottom of waste depths of at least 3, 6, and 7 feet bgs were observed on the west adjacent parcel 24213.9010, at boundary B, C, and D, respectively. The following waste depths were observed on the west adjacent property (Parcel 24213.9010):

- At least 7 feet in TP-F-16B
- At least 10 feet in TP-SC-33
- At least 6.5 feet in TP-F-15B
- At least 6 feet in TP-F-14B
- At least 3 feet in TP-SC-32
- At least 7 feet in TP-F-12B

Landfill Gas Compliance Monitoring Probe Installation

The lateral extents of waste, along with location of potential receptors, were used as a baseline for LFG compliance monitoring probe locations. LFG has the potential to migrate from where it has been landfilled when it is not properly contained. Chemical compounds in LFG carry the potential for vapor intrusion into overlying or nearby buildings. Buildings are not present on the Landfill and are not anticipated for the future. Action Materials' buildings to the north may be subject to vapor intrusion. To assess LFG migration, eight LFG compliance monitoring probes were installed beyond the approximate extents of landfilled waste:

- Four probes west of the Marshall Landfill
- One probe at the north end of the Five-Acre Landfill
- Two probes adjacent to Castle Materials – one to west, one to east
- One probe along the east edge of the Main Landfill

Probes consisted of the following components, from bottom to top:

- 1-inch Schedule 40 PVC cap
- 1-inch Schedule 40 PVC casing

- 1-inch pre-fabricated Schedule 40 PVC screen with 0.010-inch continuous slots (CSS) to a minimum of 10 feet below ground surface
- 1-inch Schedule 40 PVC casing, extended to a minimum of 2 feet above ground surface
- 1-inch by 1/4-inch Schedule 40 PVC reducing bushing, female by female, NPT
- 1/4-inch labcock
- Protective monument.
- Installation requirements and LFG compliance monitoring probe design is described in the *Landfill Gas Monitoring Probe Work Plan* (Herrera, 2024).
- LFG compliance monitoring probes were installed between March 25 and 28, 2024. LFG compliance monitoring probe well logs and installation completion reports are included in Appendix D.
- Each probe was assigned a unique identification number during design and the well installation contractor added an Ecology well tag to each probe. A map showing locations for the various LFG compliance monitoring probes is included in Appendix A.

Landfill Gas Compliance Monitoring Probe Monitoring

Herrera conducted two rounds of LFG compliance monitoring probe sampling, following installation on April 24, 2024, and July 1, 2024. Each LFG compliance monitoring probe was sampled by connecting a handheld Landtec GEM5000+ directly to the 1/4-inch labcock to measure flow of LFG at each location. During the April sampling event, the three existing LFG vents were sampled by dropping the end of the GEM5000+ tube into the vent.

The GEM5000+ measures methane (CH_4), carbon dioxide (CO_2), oxygen (O_2), hydrogen sulfide (H_2S), carbon monoxide (CO), static pressure, and differential pressure. The GEM5000+ calculates balance gas, flow (in scfm), and energy. Pine Environmental calibrated the GEM5000+ prior to use. Herrera staff calibrated the GEM5000+ again, with calibration gas, in the field. Each LFG compliance monitoring probe was sampled until measurements stabilized, with readings documented every 30 to 60 seconds. Weather conditions were documented before sampling each LFG compliance monitoring probe.

Summary of Results

Readings following stabilization for each LFG compliance monitoring probe and/or vent during the two sampling events are included in Table 3.

Table 3. Readings from Landfill Gas Compliance Monitoring Probe Sampling Events.						
May 24, 2024.						
Monitoring Probe	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**H2S**	**CO (ppm)**	**Bal (ppm)**
LFB-24-01	0.1	3.6	18.7	0	0	77.6
LFB-24-02	0.0	1.9	18.9	0	0	79.2
LFB-24-03	0.0	0.9	20.3	0	0	78.8
LFB-24-04	0.0	3.7	17.2	0	0	78.9
LFB-24-05	0.1	2.4	18.3	0	0	79.2
LFB-24-06	0.1	2.8	18.3	0	0	78.9
LFB-24-07	0.1	1.6	19.2	0	0	79.1
LFB-24-08	0.1	0.3	18.1	1	1	81.4
Vent 1 (west of trusses)	0.0	0.0	21.9	0	0	78.1
Vent 2 (south of Vent 1)	0.0	0.0	22.0	0	0	77.9
Vent 3 (south of Vents 1 and 2)	0.0	0.1	21.8	0	0	78.1
July 1, 2024.						
Monitoring Probe	**CH4 (%)**	**CO2 (%)**	**O2 (%)**	**H2S**	**CO (ppm)**	**Bal (ppm)**
LFB-24-01	0.0	3.0	18.5	0	0	78.5
LFB-24-02	0.0	1.3	16.1	0	0	82.6
LFB-24-03	0.0	0.4	20.1	0	0	79.5
LFB-24-04	0.0	3.0	18.2	0	0	78.7
LFB-24-05	0.0	2.8	16.7	0	0	80.5
LFB-24-06	0.0	1.6	19.5	0	0	79.0
LFB-24-07	0.0	1.4	18.8	0	0	79.8
LFB-24-08	0.0	1.9	19.0	0	0	79.0

Notes:

GEM5000+ sensitivity for gas detection is +/- 0.3%.

Balance (Bal) gas is the remaining portion of gas after measuring the CH4, CO2, O2, H2S, and CO in an LFG sample.

Based on readings collected during the two sampling events described in Table 3, LFG is not anticipated to be migrating beyond the site boundary.

Surface Emissions Monitoring

In 2024, Ecology announced the addition of WAC 173-408, under Chapter 70A.540 of the Revised Code of Washington (RCW), to reduce methane emissions from MSW landfills. The rule establishes requirements to reduce methane emissions from active and closed landfills that received waste after January 1, 1992. Although the Marshall Landfill ceased receiving waste in 1990 and is therefore not required to follow the standards implemented by Ecology, Herrera conducted one round of surface emissions monitoring at the Marshall Landfill to assess potential for LFG migration through the existing cover system.

Surface Emissions Monitoring Methodology

WAC 173-408-120 provides requirements for surface emissions monitoring for landfills receiving waste after January 1, 1992:

- Landfill surface must be divided into 50,000-square foot grids.
- Testing must be conducted within 3 inches of the surface.
- Walking pattern must be no more than 25-foot spacing intervals and must traverse each monitoring grid.
- Surface testing must be terminated when the average wind speed exceeds 5 miles per hour (mph), or the instantaneous wind speed exceeds 10 mph.
- Surface emissions monitoring must be conducted only when there has been no measurable precipitation in the preceding 72 hours.
- Monitoring should be conducted during average barometric pressure conditions to the extent possible.

Sampling and conditions at the Marshall Landfill during surface emissions monitoring sampling are described below:

- Sampling was conducted with a QED LANDTEC SEM5000 with an extendable wand on March 27, 2024, and March 28, 2024. The SEM5000 is used to measure low concentrations of methane in the field, which is used as an indicator chemical for landfill gas migration. The SEM5000 detects methane down to 0.5 ppm. The wand was held about 3 inches from the landfill surface.
- Sampling at the Marshall Landfill was collected in 3-second intervals with an approximate 1- to 2-mph walking speed of the staff performing sampling.
- 0.02 inches and 0.42 inches of rain were observed at the Spokane International Airport Station (Weather Underground) on March 27 and March 28, respectively.
- Wind speeds were generally below 5 mph during monitoring, with gusts up to 20 mph on March 27, and up to 35 mph on March 28, per the Spokane International Airport Station (Weather Underground).
- Pressure, per the Spokane International Airport Station (Weather Underground), was observed at 27.41 inches on March 27, and 27.33 inches on March 28.

Surface Emissions Monitoring Findings

Generally, surface emissions readings were found between 1 and 4 parts per million (ppm), with discrete locations of higher concentrations observed up to 30.7 ppm. WAC 173-408-080 provides requirements for gas collection and control systems, indicating requirements are not required if, during four consecutive quarterly monitoring periods, there is no measured concentration of 200 ppm or more of methane from surface emissions monitoring.

Surface emissions monitoring results are provided as a figure in Appendix E.

Recommendations and Next Steps

A summary of findings described in this report is included below:

- The lower explosive limit for LFG is not observed at or beyond the property boundary.
- Violations of ambient air quality are not observed at the property boundary.
- Sampling at LFG compliance probes indicates the LFG is not migrating outside of the property boundary.
- Sampling at the existing vents indicate that LFG is not discharged above the lower explosive limit.
- Surface emissions monitoring did not identify methane concentrations above 200 ppm.

Based on the assessment described in this report, additional treatment of LFG is not required by the WAC. In accordance with WAC 173-304-460(3)(f)(ii), Herrera recommends maintaining the existing vents at the Marshall Landfill through the closure construction, with modifications as necessary to maintain a minimum 10-foot vent height.

Appendix A

Site Map and Soil Cover Thickness Figures

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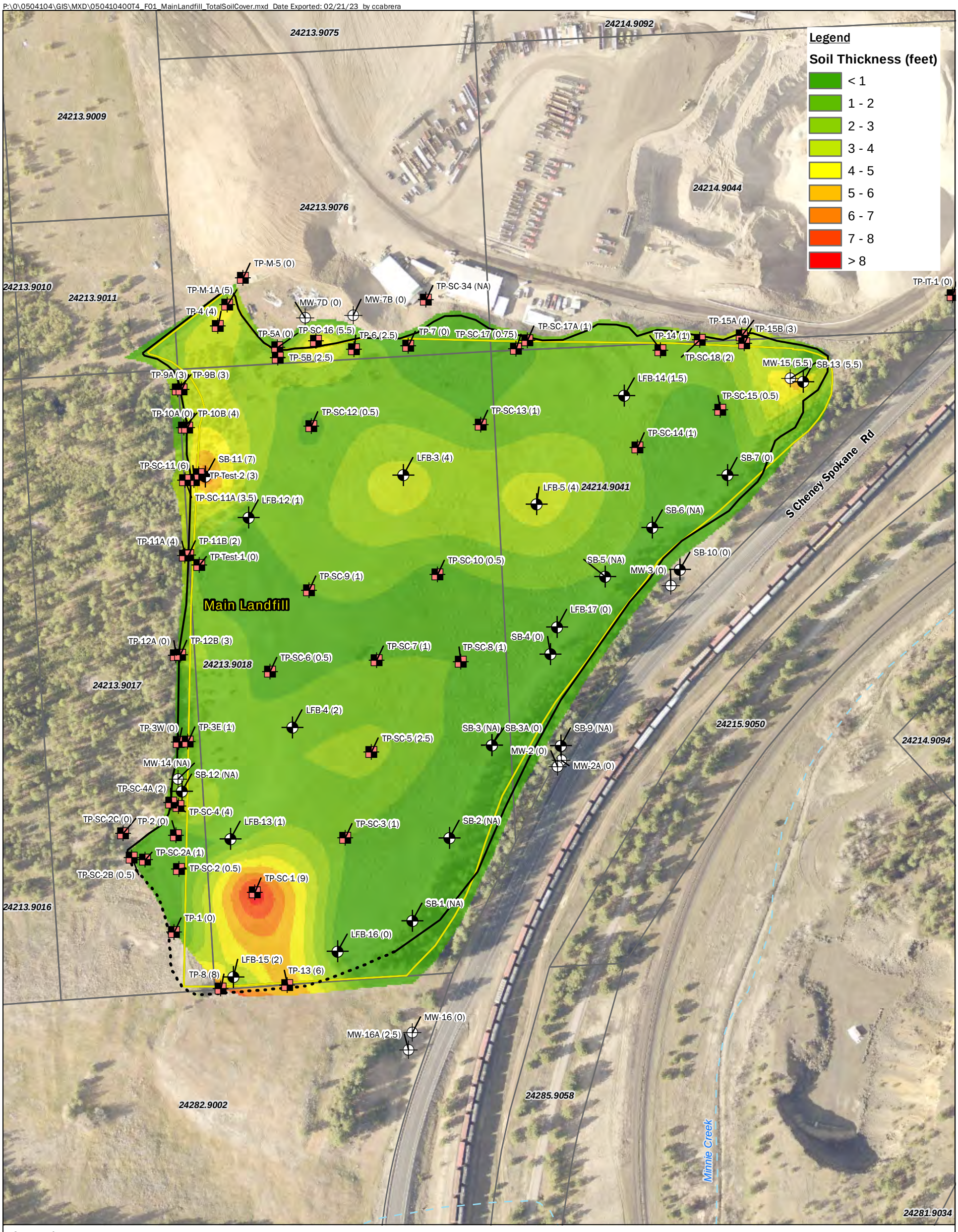
P:\0\0504104\GIS\MXD\050410400T4_F01_MainLandfill_TotalSoilCover.mxd Date Exported: 02/21/23 by ccabrera



Legend

- MW-1A — Groundwater Monitoring Well Designation and Approximate Location
- LFB-13 — Landfill Gas Monitoring Well and Approximate Location
- TPC-1 — Test Pit Designation and Approximate Location
- Approximate Landfill Boundaries[3]
- 2022 Approximate Municipal Solid Waste Boundary of Main Landfill
- 2022 Approximate Estimated Municipal Solid Waste Boundary of Main Landfill
- Ephemeral Stream
- Parcel Boundary
- (0) Approximate Total Soil Cover Thickness in Feet
- (NA) Not Applicable, data point not representative of in-situ soil cover conditions

N W E S

200 0 200

Feet

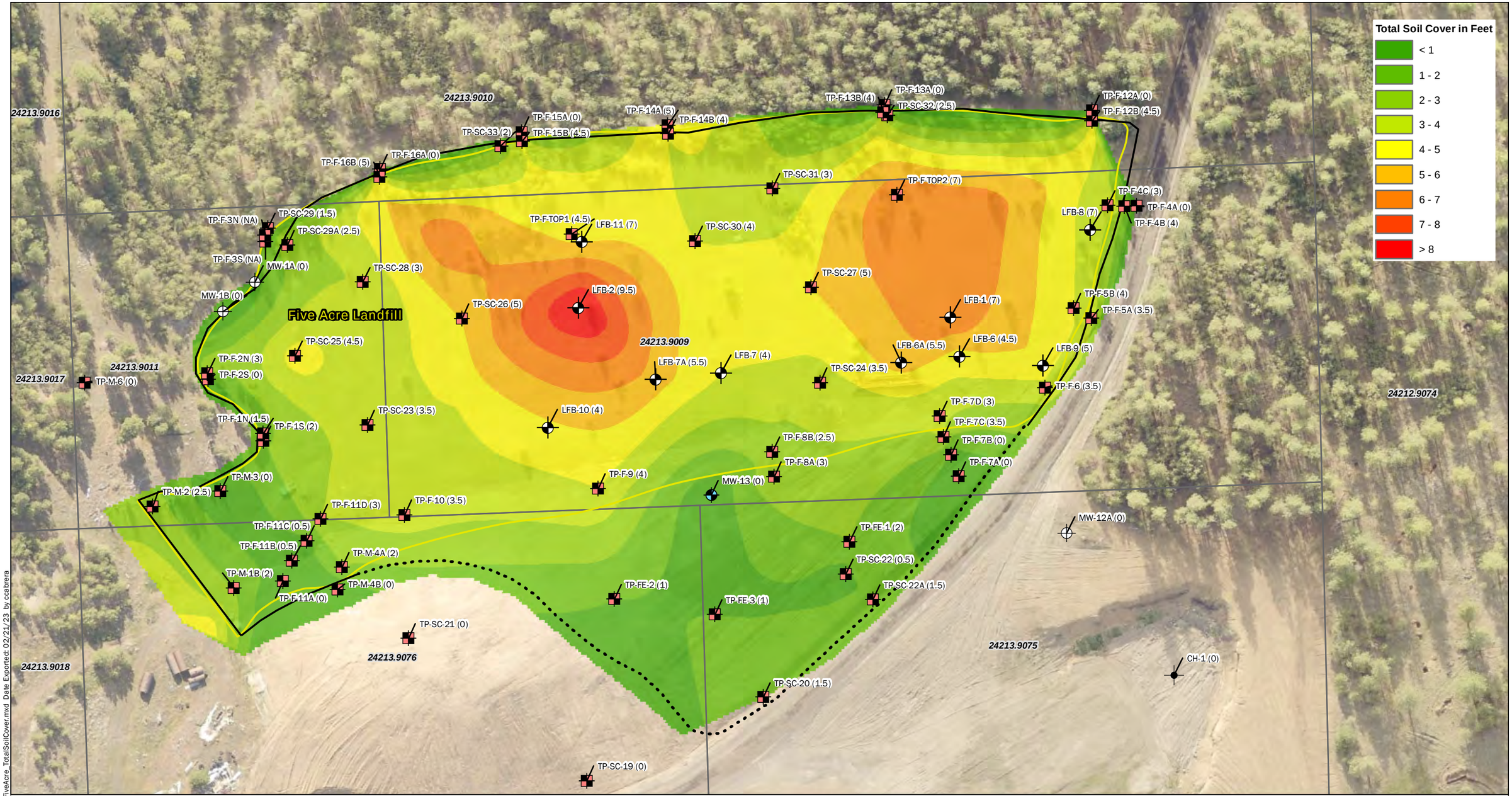
Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. Landfill boundaries have been modified with respect to Fetrow Engineering (1991) based on Remedial Investigation explorations.
Data Source: Street labels and parcels from Spokane County GIS.
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Main Landfill Total Soil Thickness

Marshall Landfill
Spokane County, Washington

GeoEngineers

Figure 2



Data Source: Street labels and parcels from Spokane County GIS.
Boundary Lines from TD&H survey (May, 2015)

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
4. Landfill boundaries have been modified with respect to Fetrow Engineers (1991) based on Remedial Investigation explorations.

Projection: NAD 1983 UTM Zone 11N

Legend

- MW-1A — Groundwater Monitoring Well Designation and Approximate Location
- LFB-8 — Landfill Gas Monitoring Well Designation and Approximate Location
- (NA) — Not Applicable, data point not representative of in-situ soil cover conditions
- LFB-1 — Landfill Gas Monitoring Well and Approximate Location
- TP-4 — Test Pit Designation and Approximate Location
- CH-1 — Abandoned Boring Location
- 2022 Approximate Municipal Solid Waste Boundary of Five Acre Landfill
- 2022 Approximate Estimated Municipal Solid Waste Boundary of Five Acre Landfill
- Parcel Boundary
- (0) — Approximate Total Soil Cover Thickness in Feet

0 100 Feet

Five-Acre Landfill Total Soil Cover

Marshall Landfill
Spokane County, Washington

GeoEngineers

Figure 3

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Appendix B

Historic Landfill Gas Monitoring Data at Marshall Landfill

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Table B-1
Landfill Gas Field Screening Summary
Marshall Landfill Site
Spokane County, Washington

Sample Location	Date	Well Headspace (ppm)	Methane (percent)	Carbon dioxide (percent)	Oxygen (percent)	Hydrogen sulfide (ppm)	Carbon monoxide (ppm)	Barometric Pressure (inches mercury)
LFB-3	11/3/2020	0.00	9.6	16.1	4.3	0.0	3.0	27.52
	3/29/2021	0.00	4.7	16.2	4.5	0.0	4.0	27.53
	5/11/2021	1.40	3.8	12.3	7.4	0.0	2.0	27.63
	8/9/2021	0.00	12.6	12.6	8.8	0.0	5.0	27.59
	11/12/2021	0.00	10.8	17.8	4.3	0.0	7.0	27.64
LFB-4	11/3/2020	0.65	3.2	15.6	2.8	0.0	5.0	27.53
	3/29/2021	0.55	2.5	18.7	0.3	0.0	3.0	27.54
	5/11/2021	1.40	1.7	17.1	2.2	0.0	3.0	27.61
	8/9/2021	0.00	2.3	16.0	5.2	0.0	7.0	27.59
	11/12/2021	0.00	3.8	17.8	1.3	0.0	5.0	27.64
LFB-5	11/3/2020	0.05	5.5	12.7	7.5	0.0	2.0	27.60
	3/29/2021	0.05	1.4	5.2	15.7	0.0	0.0	27.60
	5/11/2021	0.90	1.6	6.3	13.5	0.0	1.0	27.70
	8/9/2021	0.00	13.6	22.2	0.6	0.0	1.0	27.67
	11/12/2021	0.00	4.7	9.8	11.9	0.0	0.0	27.71
LFB-8	11/3/2020	0.10	0.0	8.0	11.5	0.0	0.0	27.53
	3/29/2021	0.00	0.2	7.7	15.5	0.0	0.0	27.57
	5/11/2021	0.00	0.0	3.5	17.2	0.0	0.0	27.64
	8/9/2021	0.00	0.0	3.0	16.5	0.0	0.0	27.61
	11/12/2021	0.00	0.0	6.4	14.1	0.0	0.0	27.62
LFB-9	11/3/2020	0.25	0.0	12.2	4.3	0.0	0.0	27.53
	3/29/2021	0.00	0.2	6.7	16.8	0.0	0.0	27.57
	5/11/2021	0.00	0.1	5.1	16.9	0.0	0.0	27.64
	8/9/2021	0.00	0.0	2.1	17.8	0.0	0.0	27.46
	11/12/2021	0.00	0.0	8.6	9.8	0.0	0.0	27.62
LFB-10	11/3/2020	0.10	0.4	15.1	4.5	0.0	0.0	27.53
	3/29/2021	0.00	0.6	12.6	8.7	0.0	0.0	27.57
	5/11/2021	0.70	0.8	10.7	8.5	0.0	0.0	27.66
	8/9/2021	0.00	0.5	9.2	9.3	0.0	0.0	27.63
	11/12/2021	0.00	1.5	18.0	2.6	0.0	0.0	27.63
LFB-11	11/3/2020	0.00	28.8	25.6	0.0	6.0	0.0	27.53
	3/29/2021	0.00	31.1	27.0	0.7	0.0	0.0	27.58
	5/11/2021	0.00	26.2	23.6	2.0	0.0	1.0	27.64
	8/9/2021	0.00	18.4	24.3	2.3	0.0	2.0	27.62
	11/12/2021	0.00	31.9	28.4	--	0.0	0.0	27.63
LFB-15	11/3/2020	0.80	0.0	5.0	15.1	0.0	0.0	27.63
	3/29/2021	0.50	0.0	6.1	14.7	0.0	0.0	27.67
	5/11/2021	0.00	0.0	4.5	16.7	0.0	0.0	27.70
	8/9/2021	0.00	0.0	5.6	13.4	0.0	0.0	27.68
	11/12/2021	0.00	0.0	6.0	13.0	0.0	0.0	27.75
LFB-16	11/3/2020	0.75	0.0	16.9	3.3	0.0	0.0	27.64
	3/29/2021	0.00	0.4	12.5	9.1	0.0	0.0	27.67
	5/11/2021	0.10	0.0	12.8	6.1	0.0	0.0	27.72
	8/9/2021	0.00	0.0	11.8	6.3	0.0	0.0	27.67
	11/12/2021	0.00	0.0	17.8	3.5	0.0	0.0	27.78
LFB-17	11/3/2020	0.05	5.2	17.5	1.3	0.0	1.0	27.60
	3/29/2021	0.00	0.4	0.4	20.4	0.0	0.0	27.65
	5/11/2021	0.50	0.0	10.2	9.8	0.0	0.0	27.73
	8/9/2021	0.40	5.1	19.5	2.2	0.0	1.0	27.68
	11/12/2021	0.00	6.8	20.7	0.0	0.0	0.0	27.76

Notes:
Well headspace taken with a MiniRae PID
Landfill gas measurements taken with a Landtec GEM 5000+
ppm = parts per million
Shading indicates methane concentration is greater than the lower explosive limit of 5 percent.

Table B-2
Landfill Gas Analytical Results - VOCs[1]
Marshall Landfill Site
Spokane County, Washington

Analyte Group	Analyte	Units	Sample Location	LFB-3		LFB-3		LFB-3		LFB-3		LFB-3		LFB-4		LFB-4		LFB-4	
			Sample Name	LFB-3-110320		LFB-3-032921		LFB-3-051121		LFB-3-080921		LFB-3-111221		LFB-4-110320		LFB-4-032921		LFB-4-051121	
			Sample Date	11/3/2020		3/29/2021		5/11/2021		8/9/2021		11/12/2021		11/3/2020		3/29/2021		5/11/2021	
			MTCA Method B CUL[2]																
VOCs[3]	1,1,1-Trichloroethane	ug/m^3	230,000	21.8	U	1.09	U	1.09	U	2.73	U	1.09	U	43.7	U	1.09	U	1.09	U
	1,1,2,2-Tetrachloroethane	ug/m^3	4.3	20.6	U	0.275	U	0.275	U	0.687	U	0.275	U	41.2	U	0.275	U	0.275	U
	CFC-113	ug/m^3	230,000	30.7	U	1.53	U	1.53	U	3.83	U	1.53	U	61.3	U	1.53	U	1.53	U
	1,1,2-Trichloroethane (TCA)	ug/m^3	16.0	27.3	U	0.218	U	1.09	U	0.546	U	0.218	U	54.6	U	0.218	U	1.09	U
	1,1-Dichloroethane	ug/m^3	160	8.10	U	**8.60**		**6.29**		**2.59**		**4.88**		16.2	U	**2.17**		**2.19**	
	1,1-Dichloroethene (DCE)	ug/m^3	9,100	15.9	U	**1.25**		**1.28**		0.397	U	**0.605**		31.7	U	**2.13**		**1.53**	
	1,2,4-Trichlorobenzene	ug/m^3	91.0	22.3	U	2.97	U	2.97	U	7.42	U	2.97	U	44.5	U	2.97	U	2.97	U
	1,2,4-Trimethylbenzene	ug/m^3	2,700	**183**		**237**		**201**		**162**		**187**		**340**		**64.5**		**60.9**	
	1,2-Dibromoethane (EDB)	ug/m^3	0.420	15.4	U	**0.127**		0.0457	U	0.0229	U	0.00915	U	30.7	U	**0.352**		0.0457	U
	1,2-Dichlorobenzene	ug/m^3	9,100	24.0	U	0.240	U	**6.70**		0.601	U	**6.66**		48.1	U	0.240	U	0.240	U
	1,2-Dichloroethane	ug/m^3	9.6	8.09	U	**1.92**		**1.64**		**0.540**		0.162	U	16.2	U	**6.06**		0.162	U
	1,2-Dichloropropane	ug/m^3	68.0	23.1	U	**1.43**		4.62	U	2.31	U	0.924	U	46.2	U	**1.12**		4.62	U
	1,3,5-Trimethylbenzene	ug/m^3	2,700	**41.6**		**47.4**		7.87	U	19.7	U	7.87	U	**62.8**		**18.1**		7.87	U
	1,3-Butadiene	ug/m^3	8.3	11.1	U	0.0885	U	0.0885	U	**2.34**		0.0885	U	22.1	U	0.0885	U	0.0885	U
	1,3-Dichlorobenzene	ug/m^3	NE	18.0	U	0.241	U	0.241	U	0.601	U	0.241	U	36.1	U	0.241	U	0.241	U
	1,4-Dichlorobenzene	ug/m^3	23.0	**48.7**		**89.7**		**66.2**		**67.0**		**70.1**		**625**		**311**		**286**	
	1,4-Dioxane	ug/m^3	5	**19.9**		**14.10**		**28.8**		**24.0**		**15.7**		**31.7**		5.77	U	28.8	U
	(MEK) 2-Butanone	ug/m^3	NE	29.5	U	4.72	U	4.72	U	11.8	U	4.72	U	59.0	U	**22.4**		4.72	U
	2-Hexanone	ug/m^3	1,400	41.0	U	16.4	U	16.4	U	41.0	U	16.4	U	81.9	U	16.4	U	16.4	U
	Isopropyl Alcohol	ug/m^3	NE	24.6	U	9.83	U	9.83	U	24.6	U	**30.5**		49.2	U	**14.1**		9.83	U
	4-Methyl-2-pentanone (MIBK)	ug/m^3	NE	41.0	U	16.4	U	16.4	U	41.0	U	16.4	U	81.9	U	16.4	U	16.4	U
	Acetone	ug/m^3	1,400,000	**34.1**		**29.7**		19.0	U	47.5	U	**59.8**		**518**		**214**		**27.9**	
	Acrolein	ug/m^3	0.910	2.87	U	0.00917	U	0.00917	U	0.0229	U	0.00917	U	5.73	U	**0.0769**		**0.175**	
	Benzene	ug/m^3	32.0	**155**		**254**		**214**		**121**		**217**		**81.7**		**63.4**		**51.0**	
	Benzyl chloride	ug/m^3	5.1	25.9	U	2.07	U	2.07	U	5.18	U	2.07	U	**92.4**		**74.3**		**51.5**	
	Dichlorobromomethane	ug/m^3	NE	20.1	U	2.68	U	13.4	U	6.70	U	2.68	U	40.2	U	2.68	U	13.4	U
	Bromoform	ug/m^3	230	20.7	U	0.414	U	0.414	U	1.03	U	0.414	U	41.4	U	0.414	U	0.414	U
	Bromomethane	ug/m^3	230	19.4	U	1.55	U	1.55	U	3.88	U	1.55	U	38.8	U	1.55	U	1.55	U
	Carbon disulfide	ug/m^3	32,000	**158**		**156**		**217**		**177**		**165**		93.4	U	**7.77**		**13.8**	
	Carbon tetrachloride	ug/m^3	42	4.13	U	0.252	U	0.252	U	0.629	U	0.252	U	8.27	U	0.252	U	0.252	U
	Chlorobenzene	ug/m^3	2,300	**343**		**396**		**317**		**373**		**651**		**345**		**131**		**80.0**	
	Dibromochloromethane	ug/m^3	NE	42.6	U	0.341	U	1.70	U	0.852	U	0.341	U	85.2	U	0.341	U	1.70	U
	Chloroethane	ug/m^3	NE	**11.9**		**18.2**		**57.9**		**11.2**		**14.9**		**30.9**		**10.4**		**9.01**	
	Chloroform	ug/m^3	11	9.77	U	**0.507**		**0.776**		0.488	U	0.195	U	19.5	U	**1.32**		**0.767**	
	Chloromethane	ug/m^3	4,100	**32.5**		**49.9**		**42.6**		**42.2**		**34.9**		20.7	U	**7.33**		**7.03**	
	cis-1,2-Dichloroethene	ug/m^3	NE	**14.0**		**31.5**		**29.9**		**15.3**		**17.5**		**45.6**		**18.4**		**11.2**	

VOCs[3] cont.	cis-1,3-dichloropropene	ug/m^3	63	18.2	U	0.908	U	4.54	U	2.27	U	0.908	U	36.3	U	0.908	U	4.54	U
	Cyclohexane	ug/m^3	270,000	**27.3**		**52.1**		**27.0**		**20.3**		**49.4**		**319**		**265**		**89.6**	
	Dichlorodifluoromethane (CFC-12)	ug/m^3	4,600	**79.6**		**108**		**73.8**		**162**		**90.4**		**451**		**256**		**174**	
	Dichlorotetrafluoroethane (CFC-114)	ug/m^3	NE	**170**		**139**		**110**		**105**		**168**		**876**		**591**		**431**	
	Ethyl acetate	ug/m^3	3,200	36.0	U	5.77	U	5.77	U	14.4	U	5.77	U	72.1	U	**11.2**		5.77	U
	Ethylbenzene	ug/m^3	46,000	59.0		**181**		**80.9**		**67.5**		**90.4**		**4,080**		**682**		**250**	
	Heptane	ug/m^3	18,000	199		**338**		**214**		**162**		**401**		**188**		**98.3**		**57.3**	
	Hexachlorobutadiene	ug/m^3	11	107	U	4.27	U	4.27	U	10.7	U	4.27	U	213	U	4.27	U	4.27	U
	m,p-Xylene	ug/m^3	4,600	**124**		**198**		**150**		**132**		**133**		**468**		**129**		**93.5**	
	Methyl methacrylate	ug/m^3	32,000	16.4	U	6.55	U	32.8	U	16.4	U	6.55	U	32.8	U	6.55	U	32.8	U
	Methylene chloride	ug/m^3	6,600	69.5	U	5.56	U	5.56	U	13.9	U	5.56	U	139	U	6.70	U	5.56	U
	Naphthalene	ug/m^3	7.4	**8.35**		**24.3**		**48.5**		**33.1**		**47.0**		**77.6**		**22.6**		**55.7**	
	n-Hexane	ug/m^3	32,000	**281**		**310**		**269**		**210**		**456**		**501**		**275**		**193**	
	o-Xylene	ug/m^3	4,600	**128**		**196**		**118**		**131**		**174**		**122**		**41.8**		**45.7**	
	4-Ethyltoluene	ug/m^3	NE	**27.8**		**45.2**		**35.5**		**30.0**		**28.9**		39.3	U	**7.33**		**6.53**	
	Propylene	ug/m^3	NE	**1,030**		**769**		**462**		**479**		2.75	U	**1,030**		**552**		**413**	
	Styrene	ug/m^3	46,000	17.0	U	**8.14**		6.81	U	17.0	U	6.81	U	34.1	U	**8.51**		6.81	U
	Methyl tert-butyl ether (MTBE)	ug/m^3	960	14.4	U	0.721	U	0.721	U	1.8	U	0.721	U	28.8	U	0.721	U	0.721	U
	Tetrachloroethene (PCE)	ug/m^3	960	13.6	U	**10.9**		**11.1**		**6.54**		**7.60**		27.1	U	**8.14**		**13.3**	
	Tetrahydrofuran	ug/m^3	91,000	**63.2**		**142**		**130**		**85.6**		**130**		**121**		**33.9**		**41.0**	
	Toluene	ug/m^3	230,000	**76.0**		**158**		**81.0**		**80.6**		**113**		**78.4**		**141**		**33.8**	
	trans-1,2-Dichloroethene	ug/m^3	1,800	7.93	U	**9.15**		**7.49**		**4.86**		**5.80**		15.9	U	**1.4**		**1.36**	
	trans-1,3-dichloropropene	ug/m^3	63	22.7	U	0.908	U	4.54	U	2.27	U	0.908	U	45.4	U	0.908	U	4.54	U
	Trichloroethene (TCE)	ug/m^3	33	**6.32**		**12.8**		**6.69**		**6.20**		**6.67**		**88.8**		**47.3**		**26.8**	
	Trichlorofluoromethane (CFC-11)	ug/m^3	32,000	22.5	U	**5.76**		2.81	U	**12.8**		**2.62**		44.9	U	1.12	U	**1.30**	
	Vinyl acetate	ug/m^3	9,100	35.2	U	5.63	U	14.1	U	5.63	U	5.63	U	70.40	U	5.63	U	5.63	U
	Vinyl chloride	ug/m^3	28	**456**		**497**		**231**		**477**		0.102	U	**154**		**67.1**		**76.1**	

Analyte Group	Analyte	Units	Sample Location	LFB-4		LFB-4		LFB-5		LFB-5		LFB-5		LFB-5		LFB-5	
			Sample Name	LFB-4-080921		LFB-4-111221		LFB-5-110320		LFB-5-032921		LFB-5-051121		LFB-5-051121		LFB-5-111221	
			Sample Date	8/9/2021		11/12/2021		11/3/2020		3/29/2021		5/11/2021		5/11/2021		11/12/2021	
			MTCA Method B CUL[2]														
VOCs[3]	1,1,1-Trichloroethane	ug/m^3	230,000	2.73	U	1.09	U	21.8	U	1.09	U	1.09	U	2.73	U	1.09	U
	1,1,2,2-Tetrachloroethane	ug/m^3	4.3	0.687	U	0.275	U	20.6	U	0.275	U	0.275	U	0.687	U	0.275	U
	CFC-113	ug/m^3	230,000	3.83	U	1.53	U	30.7	U	1.53	U	1.53	U	3.83	U	1.53	U
	1,1,2-Trichloroethane (TCA)	ug/m^3	16.0	0.546	U	0.218	U	27.3	U	0.218	U	0.218	U	0.546	U	0.218	U
	1,1-Dichloroethane	ug/m^3	160	**1.64**		**2.38**		8.10	U	**1.05**		**1.02**		**0.742**		**1.24**	
	1,1-Dichloroethene (DCE)	ug/m^3	9,100	**0.853**		**1.75**		15.9	U	**0.201**		**0.174**		0.397	U	**0.224**	
	1,2,4-Trichlorobenzene	ug/m^3	91.0	7.42	U	2.97	U	22.3	U	2.97	U	2.97	U	7.42	U	2.97	U
	1,2,4-Trimethylbenzene	ug/m^3	2,700	**70.0**		**106**		**54.2**		9.83	U	9.83	U	24.6	U	9.83	U
	1,2-Dibromoethane (EDB)	ug/m^3	0.420	0.0229	U	0.00915	U	15.4	U	**0.621**		0.00915	U	0.0229	U	0.00915	U
	1,2-Dichlorobenzene	ug/m^3	9,100	0.601	U	0.240	U	24.0	U	0.240	U	0.240	U	0.601	U	0.240	U
	1,2-Dichloroethane	ug/m^3	9.6	**3.87**		**4.41**		8.09	U	**1.740**		**2.30**		0.405	U	1.30	
	1,2-Dichloropropane	ug/m^3	68.0	2.31	U	**1.10**		23.1	U	0.924	U	0.924	U	2.31	U	0.924	U
	1,3,5-Trimethylbenzene	ug/m^3	2,700	19.7	U	7.87	U	14.7	U	7.87	U	7.87	U	19.7	U	7.87	U
	1,3-Butadiene	ug/m^3	8.3	0.221	U	0.0885	U	11.1	U	0.0885	U	0.0885	U	0.221	U	0.0885	U
	1,3-Dichlorobenzene	ug/m^3	NE	0.601	U	0.241	U	18.0	U	0.241	U	0.241	U	0.601	U	0.241	U
	1,4-Dichlorobenzene	ug/m^3	23.0	**516**		**473**		**137**		**19.9**		**35.5**		**41.5**		**11.4**	
	1,4-Dioxane	ug/m^3	5	14.4	U	5.77	U	14.4	U	5.77	U	5.77	U	14.4	U	5.77	U
	(MEK) 2-Butanone	ug/m^3	NE	11.8	U	4.72	U	29.5	U	4.72	U	4.72	U	11.8	U	4.72	U
	2-Hexanone	ug/m^3	1,400	41.0	U	16.4	U	41.0	U	16.4	U	16.4	U	41.0	U	16.4	U
	Isopropyl Alcohol	ug/m^3	NE	24.6	U	9.83	U	**28.8**		9.83	U	9.83	U	24.6	U	9.83	U
	4-Methyl-2-pentanone (MIBK)	ug/m^3	NE	41.0	U	16.4	U	41.0	U	16.4	U	16.4	U	41.0	U	16.4	U
	Acetone	ug/m^3	1,400,000	47.5	U	**36.4**		**63.7**		**35.3**		19.0	U	47.5	U	**27.0**	
	Acrolein	ug/m^3	0.910	0.0229	U	0.00917	U	2.87	U	**0.0182**		**0.639**		0.0229	U	0.00917	U
	Benzene	ug/m^3	32.0	**39.2**		**66.8**		**27.2**		**3.9**		**6.14**		**53.1**		**6.33**	
	Benzyl chloride	ug/m^3	5.1	5.18	U	2.07	U	**28.7**		2.07	U	2.07	U	5.18	U	2.07	U
	Dichlorobromomethane	ug/m^3	NE	6.70	U	2.68	U	20.1	U	2.68	U	2.68	U	6.70	U	2.68	U
	Bromoform	ug/m^3	230	1.03	U	0.414	U	20.7	U	0.414	U	0.414	U	1.03	U	0.414	U
	Bromomethane	ug/m^3	230	3.88	U	1.55	U	19.4	U	1.55	U	1.55	U	3.86	U	1.55	U
	Carbon disulfide	ug/m^3	32,000	**15.1**		**6.47**		46.7	U	**8.64**		**10.8**		12.5	U	**9.16**	
	Carbon tetrachloride	ug/m^3	42	0.629	U	0.252	U	4.13	U	0.253	U	0.252	U	0.629	U	0.252	U
	Chlorobenzene	ug/m^3	2,300	**139**		**208**		**56.1**		**2.67**		**3.99**		**36.8**		**3.65**	
	Dibromochloromethane	ug/m^3	NE	0.852	U	0.341	U	42.6	U	0.341	U	0.341	U	0.852	U	0.341	U
	Chloroethane	ug/m^3	NE	**10.6**	U	**12.2**		10.6	U	4.22	U	4.22	U	10.6	U	4.22	U
	Chloroform	ug/m^3	11	0.488	U	0.195	U	9.77	U	**0.400**		**0.405**		0.488	U	0.195	U
	Chloromethane	ug/m^3	4,100	**8.97**		**114**		**13.4**		**8.31**		**10.7**		1.03	U	**5.24**	
	cis-1,2-Dichloroethene	ug/m^3	NE	**9.96**		**16.1**		**22.1**		**12.0**		**14.8**		**22.3**		**11.7**	

VOCs[3] cont.	cis-1,3-dichloropropene	ug/m^3	63	2.27	U	0.908	U	18.2	U	0.908	U	0.908	U	2.27	U	0.908	U
	Cyclohexane	ug/m^3	270,000	**70.7**		**208**		**77.1**		**15.1**		**19.0**		**31.7**		**24.9**	
	Dichlorodifluoromethane (CFC-12)	ug/m^3	4,600	**121**		0.989	U	**121**		**52.2**		**29.9**		**45.7**		**31.0**	
	Dichlorotetrafluoroethane (CFC-114)	ug/m^3	NE	**349**		1.40	U	**242**		**43.5**		**42.4**		**61.8**		**32.0**	
	Ethyl acetate	ug/m^3	3,200	14.4	U	5.77	U	36.0	U	5.77	U	5.77	U	14.4	U	5.77	U
	Ethylbenzene	ug/m^3	46,000	**627**		**1,380**		**632**		**7.40**		**12.6**		**76.0**		**6.96**	
	Heptane	ug/m^3	18,000	**36.3**		**125**		**31.5**		6.43	U	**13.0**		**106**		**11.3**	
	Hexachlorobutadiene	ug/m^3	11	10.7	U	4.27	U	107	U	4.27	U	4.27	U	10.7	U	4.27	U
	m,p-Xylene	ug/m^3	4,600	**173**		**242**		**76.9**		6.95	U	**7.90**		17.4	U	6.95	U
	Methyl methacrylate	ug/m^3	32,000	16.4	U	6.55	U	16.4	U	6.55	U	6.55	U	16.4	U	6.55	U
	Methylene chloride	ug/m^3	6,600	13.90	U	**5.81**		69.5	U	5.56	U	5.56	U	13.9	U	5.56	U
	Naphthalene	ug/m^3	7.4	**106**		**99.2**		**21.7**		**1.16**		**2.26**		**1.46**		**1.05**	
	n-Hexane	ug/m^3	32,000	**91.7**		**276**		**147**		**49.4**		**51.8**		**181**		**72.4**	
	o-Xylene	ug/m^3	4,600	**47.9**		**61.7**		**27.2**		**2.83**		**4.02**		**5.54**		1.74	U
	4-Ethyltoluene	ug/m^3	NE	**8.82**		**11.1**		19.70	U	**1.32**		0.983	U	2.46	U	0.983	U
	Propylene	ug/m^3	NE	**146**		2.75	U	**1,660**		**368**		**261**		**1,010**		2.75	U
	Styrene	ug/m^3	46,000	17.0	U	6.81	U	17.0	U	6.81	U	6.81	U	17.0	U	6.81	U
	Methyl tert-butyl ether (MTBE)	ug/m^3	960	1.80	U	0.721	U	14.4	U	0.721	U	**5.35**		1.80	U	0.721	U
	Tetrachloroethene (PCE)	ug/m^3	960	**9.27**		**9.65**		13.6	U	**4.48**		**3.75**		**1.52**		**1.10**	
	Tetrahydrofuran	ug/m^3	91,000	**58.0**		**29.8**		**44.4**		**12.4**		**15.9**		**37.4**		**14.4**	
	Toluene	ug/m^3	230,000	**18.6**		**37.1**		15.1	U	**3.17**		**2.12**		**14.4**		1.51	U
	trans-1,2-Dichloroethene	ug/m^3	1,800	1.98	U	**1.40**		7.93	U	**1.47**		**1.58**		**2.45**		**1.55**	
	trans-1,3-dichloropropene	ug/m^3	63	2.27	U	0.908	U	22.7	U	0.908	U	0.908	U	2.27	U	0.908	U
	Trichloroethene (TCE)	ug/m^3	33	**39.5**		**38.9**		**15.1**		**1.00**		**2.04**		**1.24**		**0.868**	
	Trichlorofluoromethane (CFC-11)	ug/m^3	32,000	2.81	U	**1.41**		22.5	U	**3.69**		1.12	U	2.81	U	1.12	U
	Vinyl acetate	ug/m^3	9,100	14.1	U	5.63	U	35.2	U	5.63	U	5.63	U	14.1	U	5.63	U
	Vinyl chloride	ug/m^3	28	**56.7**		**118**		**175**		**91.5**		**92.1**		**208**		**126**	

Analyte Group	Analyte	Units	Sample Location	LFB-8		LFB-8		LFB-8		LFB-8		LFB-8		LFB-9		LFB-9	
			Sample Name	LFB-8-110320		LFB-8-032921		LFB-8-051121		LFB-8-080921		LFB-8-111221		LFB-9-110320		LFB-9-032921	
			Sample Date	11/3/2020		3/29/2021		5/11/2021		8/9/2021		11/12/2021		11/3/2020		3/29/2021	
			MTCA Method B CUL[2]														
VOCs[3]	1,1,1-Trichloroethane	ug/m^3	230,000	2.18	U	1.09	U	1.09	U	1.09	U	1.09	U	2.18	U	1.09	U
	1,1,2,2-Tetrachloroethane	ug/m^3	4.3	2.06	U	0.275	U	0.275	U	0.275	U	0.275	U	2.06	U	0.275	U
	CFC-113	ug/m^3	230,000	3.07	U	1.53	U	1.53	U	1.53	U	1.53	U	3.07	U	1.53	U
	1,1,2-Trichloroethane (TCA)	ug/m^3	16.0	2.73	U	0.218	U	0.218	U	0.218	U	0.218	U	2.73	U	0.218	U
	1,1-Dichloroethane	ug/m^3	160	0.810	U	**0.421**		0.162	U	0.162	U	0.162	U	0.810	U	**1.57**	
	1,1-Dichloroethene (DCE)	ug/m^3	9,100	1.59	U	0.159	U	0.159	U	0.159	U	0.159	U	1.59	U	**0.514**	
	1,2,4-Trichlorobenzene	ug/m^3	91.0	2.23	U	2.97	U	2.97	U	2.97	U	2.97	U	2.23	U	2.97	U
	1,2,4-Trimethylbenzene	ug/m^3	2,700	1.47	U	9.83	U	9.83	U	9.83	U	9.83	U	1.47	U	**12.0**	
	1,2-Dibromoethane (EDB)	ug/m^3	0.420	1.54	U	**0.315**		0.00915	U	0.00915	U	0.00915	U	1.54	U	**0.412**	
	1,2-Dichlorobenzene	ug/m^3	9,100	2.40	U	0.240	U	0.240	U	0.240	U	0.240	U	2.40	U	0.240	U
	1,2-Dichloroethane	ug/m^3	9.6	0.809	U	0.162	U	0.162	U	0.162	U	0.162	U	0.809	U	0.162	U
	1,2-Dichloropropane	ug/m^3	68.0	2.31	U	0.924	U	0.924	U	0.924	U	0.924	U	2.31	U	0.924	U
	1,3,5-Trimethylbenzene	ug/m^3	2,700	1.47	U	7.87	U	7.87	U	7.87	U	7.87	U	1.47	U	**9.14**	
	1,3-Butadiene	ug/m^3	8.3	1.11	U	0.0885	U	0.0885	U	0.0885	U	0.0885	U	1.11	U	0.0885	U
	1,3-Dichlorobenzene	ug/m^3	NE	1.80	U	0.241	U	0.241	U	0.241	U	0.241	U	1.80	U	0.241	U
	1,4-Dichlorobenzene	ug/m^3	23.0	1.80	U	**1.01**		0.241	U	**2.19**		**4.47**		1.80	U	**8.42**	
	1,4-Dioxane	ug/m^3	5	1.44	U	5.77	U	5.77	U	5.77	U	5.77	U	1.44	U	5.77	U
	(MEK) 2-Butanone	ug/m^3	NE	2.95	U	4.72	U	4.72	U	4.72	U	4.72	U	2.95	U	4.72	U
	2-Hexanone	ug/m^3	1,400	4.10	U	16.4	U	16.4	U	16.4	U	16.4	U	4.10	U	16.4	U
	Isopropyl Alcohol	ug/m^3	NE	2.46	U	9.83	U	9.83	U	9.83	U	9.83	U	2.46	U	9.83	U
	4-Methyl-2-pentanone (MIBK)	ug/m^3	NE	4.10	U	16.4	U	16.4	U	16.4	U	16.4	U	4.10	U	16.4	U
	Acetone	ug/m^3	1,400,000	**35.7**		19.0	U	**43.7**		**29.0**		19.0	U	**2.55**		**33.0**	
	Acrolein	ug/m^3	0.910	0.287	U	**0.132**		**0.548**		**1.13**		**0.130**		0.287	U	**0.165**	
	Benzene	ug/m^3	32.0	0.286	U	**1.60**		**0.513**		**0.610**		**0.199**		**0.319**		**9.16**	
	Benzyl chloride	ug/m^3	5.1	2.59	U	2.07	U	2.07	U	2.07	U	2.07	U	2.59	U	2.07	U
	Dichlorobromomethane	ug/m^3	NE	2.01	U	2.68	U	2.68	U	2.68	U	2.68	U	2.01	U	2.68	U
	Bromoform	ug/m^3	230	2.07	U	0.414	U	0.414	U	0.414	U	0.414	U	2.07	U	0.414	U
	Bromomethane	ug/m^3	230	1.94	U	1.55	U	1.55	U	1.55	U	1.55	U	1.94	U	1.55	U
	Carbon disulfide	ug/m^3	32,000	4.67	U	4.98	U	4.98	U	4.98	U	4.98	U	4.67	U	4.98	U
	Carbon tetrachloride	ug/m^3	42	0.413	U	0.252	U	0.252	U	0.252	U	0.252	U	0.413	U	0.252	U
	Chlorobenzene	ug/m^3	2,300	0.921	U	**2.5**		0.184	U	0.184	U	**0.666**		0.921	U	**0.638**	
	Dibromochloromethane	ug/m^3	NE	4.26	U	0.341	U	0.341	U	0.341	U	0.341	U	4.26	U	0.341	U
	Chloroethane	ug/m^3	NE	1.06	U	**7.35**		4.22	U	4.22	U	4.22	U	1.06	U	**77.5**	
	Chloroform	ug/m^3	11	0.977	U	**0.341**		**0.289**		**0.344**		**0.418**		0.977	U	**1.32**	
	Chloromethane	ug/m^3	4,100	1.03	U	**1.44**		**0.768**		0.413	U	0.413	U	1.03	U	**0.991**	
	cis-1,2-Dichloroethene	ug/m^3	NE	0.793	U	1.59	U	1.59	U	1.59	U	1.59	U	0.793	U	**6.26**	

VOCs[3] cont.	cis-1,3-dichloropropene	ug/m^3	63	1.82	U	0.908	U	0.908	U	0.908	U	0.908	U	1.82	U	0.908	U
	Cyclohexane	ug/m^3	270,000	1.38	U	1.38	U	1.38	U	1.38	U	1.38	U	1.38	U	**4.27**	
	Dichlorodifluoromethane (CFC-12)	ug/m^3	4,600	**39.9**		**37.6**		**9.23**		**11.9**		**19.6**		**161**		**29.5**	
	Dichlorotetrafluoroethane (CFC-114)	ug/m^3	NE	**31.2**		**4.29**		1.40	U	1.40	U	1.40	U	**16.3**		**6.02**	
	Ethyl acetate	ug/m^3	3,200	3.60	U	5.77	U	5.77	U	5.77	U	5.77	U	3.60	U	5.77	U
	Ethylbenzene	ug/m^3	46,000	1.74	U	6.95	U	6.95	U	6.95	U	**7.74**		1.74	U	6.95	U
	Heptane	ug/m^3	18,000	1.61	U	6.43	U	6.43	U	6.43	U	6.43	U	1.61	U	**12.6**	
	Hexachlorobutadiene	ug/m^3	11	10.7	U	4.27	U	4.27	U	4.27	U	4.27	U	10.7	U	4.27	U
	m,p-Xylene	ug/m^3	4,600	3.47	U	6.95	U	6.95	U	6.95	U	6.95	U	3.47	U	**12.9**	
	Methyl methacrylate	ug/m^3	32,000	1.64	U	6.55	U	6.55	U	6.55	U	6.55	U	1.64	U	6.55	U
	Methylene chloride	ug/m^3	6,600	6.95	U	5.56	U	5.56	U	5.56	U	5.56	U	6.95	U	5.56	U
	Naphthalene	ug/m^3	7.4	0.524	U	**0.446**		0.210	U	**0.367**		**3.87**		0.524	U	**14.0**	
	n-Hexane	ug/m^3	32,000	**1.55**		7.05	U	7.05	U	7.05	U	7.05	U	1.41	U	**33**	
	o-Xylene	ug/m^3	4,600	1.74	U	**2.76**		1.74	U	1.74	U	1.74	U	1.74	U	**13.9**	
	4-Ethyltoluene	ug/m^3	NE	1.97	U	**1.41**		0.983	U	0.983	U	0.983	U	1.97	U	**2.75**	
	Propylene	ug/m^3	NE	**3.67**		**17**		2.75	U	2.75	U	2.75	U	**13.5**		**114**	
	Styrene	ug/m^3	46,000	1.70	U	6.81	U	6.81	U	6.81	U	6.81	U	1.70	U	6.81	U
	Methyl tert-butyl ether (MTBE)	ug/m^3	960	1.44	U	0.721	U	0.721	U	0.721	U	0.721	U	1.44	U	0.721	U
	Tetrachloroethene (PCE)	ug/m^3	960	**16.6**		**28.3**		**14.3**		**19.3**		**14.9**		**63.1**		**57.5**	
	Tetrahydrofuran	ug/m^3	91,000	1.18	U	4.72	U	4.72	U	4.72	U	4.72	U	1.18	U	4.72	U
	Toluene	ug/m^3	230,000	1.51	U	1.51	U	1.51	U	1.51	U	1.51	U	1.51	U	**1.94**	
	trans-1,2-Dichloroethene	ug/m^3	1,800	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U
	trans-1,3-dichloropropene	ug/m^3	63	2.27	U	0.908	U	0.908	U	0.908	U	0.908	U	2.27	U	0.908	U
	Trichloroethene (TCE)	ug/m^3	33	0.349	U	0.529	U	**0.318**		0.215	U	0.215	U	**2.99**		**3.49**	
	Trichlorofluoromethane (CFC-11)	ug/m^3	32,000	**103**		**103**		**17.3**		**75.0**		**40.5**		**551**		**83.7**	
	Vinyl acetate	ug/m^3	9,100	3.52	U	5.63	U	5.63	U	5.63	U	5.63	U	3.52	U	5.63	U
	Vinyl chloride	ug/m^3	28	**0.412**		**3.63**		0.102	U	0.102	U	0.102	U	0.27	U	**1.14**	

Analyte Group	Analyte	Units	Sample Location	LFB-9		LFB-9		LFB-9		LFB-10		LFB-10		LFB-10		LFB-10	
			Sample Name	LFB-9-051121		LFB-9-080921		LFB-9-111221		LFB-10-110320		LFB-10-032921		LFB-10-051121		LFB-10-080921	
			Sample Date	5/11/2021		8/9/2021		11/12/2021		11/3/2020		3/29/2021		5/11/2021		8/9/2021	
			MTCA Method B CUL[2]														
VOCs[3]	1,1,1-Trichloroethane	ug/m^3	230,000	1.09	U	1.09	U	1.09	U	2.18	U	**1.42**		1.09	U	1.09	U
	1,1,2,2-Tetrachloroethane	ug/m^3	4.3	0.275	U	0.275	U	0.275	U	20.6	U	0.275	U	0.275	U	0.275	U
	CFC-113	ug/m^3	230,000	1.53	U	1.53	U	1.53	U	30.7	U	**3.27**		**1.57**		1.53	U
	1,1,2-Trichloroethane (TCA)	ug/m^3	16.0	0.218	U	0.218	U	0.218	U	27.3	U	0.218	U	0.218	U	0.218	U
	1,1-Dichloroethane	ug/m^3	160	0.162	U	0.162	U	**0.788**		**2.80**		**0.660**		**0.641**		**1.030**	
	1,1-Dichloroethene (DCE)	ug/m^3	9,100	0.159	U	0.159	U	0.159	U	1.59	U	0.159	U	**0.162**		**0.237**	
	1,2,4-Trichlorobenzene	ug/m^3	91.0	2.97	U	2.97	U	2.97	U	22.3	U	2.97	U	2.97	U	2.97	U
	1,2,4-Trimethylbenzene	ug/m^3	2,700	9.83	U	9.83	U	9.83	U	14.7	U	9.83	U	9.83	U	9.83	U
	1,2-Dibromoethane (EDB)	ug/m^3	0.420	**0.0827**		0.00915	U	0.00915	U	15.4	U	**0.0166**		**0.0507**		0.00915	U
	1,2-Dichlorobenzene	ug/m^3	9,100	0.240	U	0.240	U	0.240	U	24.0	U	0.240	U	0.240	U	0.240	U
	1,2-Dichloroethane	ug/m^3	9.6	0.162	U	0.162	U	0.162	U	0.809	U	**0.609**		0.162	U	**0.369**	
	1,2-Dichloropropane	ug/m^3	68.0	0.924	U	0.924	U	0.924	U	23.1	U	0.924	U	0.924	U	0.924	U
	1,3,5-Trimethylbenzene	ug/m^3	2,700	7.87	U	7.87	U	7.87	U	14.7	U	7.87	U	7.87	U	7.87	U
	1,3-Butadiene	ug/m^3	8.3	0.0885	U	0.0885	U	0.0885	U	1.11	U	0.0885	U	0.0885	U	0.0885	U
	1,3-Dichlorobenzene	ug/m^3	NE	**0.274**		**0.568**		**0.257**		18.0	U	0.241	U	0.241	U	**0.284**	
	1,4-Dichlorobenzene	ug/m^3	23.0	**1.41**		0.241	U	**2.85**		18.0	U	**1.86**		**2.16**		**5.77**	
	1,4-Dioxane	ug/m^3	5	5.77	U	5.77	U	5.77	U	14.4	U	5.77	U	5.77	U	5.77	U
	(MEK) 2-Butanone	ug/m^3	NE	4.72	U	4.72	U	4.72	U	2.95	U	4.72	U	4.72	U	4.72	U
	2-Hexanone	ug/m^3	1,400	16.4	U	16.4	U	16.4	U	41.0	U	16.4	U	16.4	U	16.4	U
	Isopropyl Alcohol	ug/m^3	NE	9.83	U	9.83	U	9.83	U	2.46	U	9.83	U	9.83	U	9.83	U
	4-Methyl-2-pentanone (MIBK)	ug/m^3	NE	16.4	U	16.4	U	16.4	U	41.0	U	16.4	U	16.4	U	16.4	U
	Acetone	ug/m^3	1,400,000	19.0	U	19.0	U	19.0	U	**25.7**		**111**		19.0	U	19.0	U
	Acrolein	ug/m^3	0.910	**0.184**		**0.159**		**0.181**		0.287	U	**2.89**		**0.410**		**0.709**	
	Benzene	ug/m^3	32.0	**0.263**		0.128	U	**0.681**		**1.01**		**0.928**		**1.96**		**0.546**	
	Benzyl chloride	ug/m^3	5.1	2.07	U	2.07	U	2.07	U	25.9	U	2.07	U	2.07	U	2.07	U
	Dichlorobromomethane	ug/m^3	NE	2.68	U	2.68	U	2.68	U	20.1	U	2.68	U	2.68	U	2.68	U
	Bromoform	ug/m^3	230	0.414	U	0.414	U	0.414	U	20.7	U	0.414	U	0.414	U	0.414	U
	Bromomethane	ug/m^3	230	1.55	U	1.55	U	1.55	U	1.94	U	**9.07**		1.55	U	1.55	U
	Carbon disulfide	ug/m^3	32,000	4.98	U	4.98	U	4.98	U	4.67	U	4.98	U	4.98	U	4.98	U
	Carbon tetrachloride	ug/m^3	42	0.252	U	0.252	U	0.252	U	0.413	U	0.252	U	**0.261**		0.252	U
	Chlorobenzene	ug/m^3	2,300	0.184	U	0.184	U	0.184	U	9.21	U	0.184	U	0.184	U	0.184	U
	Dibromochloromethane	ug/m^3	NE	0.341	U	0.341	U	0.341	U	42.6	U	0.341	U	0.341	U	0.341	U
	Chloroethane	ug/m^3	NE	4.22	U	4.22	U	4.22	U	**3.10**		4.22	U	4.22	U	4.22	U
	Chloroform	ug/m^3	11	0.195	U	**7.47**		**0.345**		**1.93**		**1.66**		**0.777**		**1.20**	
	Chloromethane	ug/m^3	4,100	**0.464**		0.413	U	0.413	U	1.03	U	**3.30**		**1.95**		**1.23**	
	cis-1,2-Dichloroethene	ug/m^3	NE	1.59	U	1.59	U	1.59	U	**1.52**		1.59	U	**6.22**		1.59	U

VOCs[3] cont.	cis-1,3-dichloropropene	ug/m^3	63	0.908	U	0.908	U	0.908	U	18.2	U	0.908	U	0.908	U	0.908	U
	Cyclohexane	ug/m^3	270,000	**2.33**		1.38	U	1.38	U	13.8	U	1.38	U	**2.88**		**2.86**	
	Dichlorodifluoromethane (CFC-12)	ug/m^3	4,600	**20.7**		**7.26**		**79.1**		**90.1**		**93.4**		**47.5**		**70.4**	
	Dichlorotetrafluoroethane (CFC-114)	ug/m^3	NE	**2.49**		1.40	U	**9.76**		**22.4**		**23.2**		**13.6**		**10.2**	
	Ethyl acetate	ug/m^3	3,200	5.77	U	5.77	U	5.77	U	3.60	U	5.77	U	**8.71**		5.77	U
	Ethylbenzene	ug/m^3	46,000	6.95	U	6.95	U	**10.6**		17.4	U	6.95	U	6.95	U	6.95	U
	Heptane	ug/m^3	18,000	6.43	U	6.43	U	6.43	U	16.1	U	6.43	U	6.43	U	6.43	U
	Hexachlorobutadiene	ug/m^3	11	4.27	U	4.27	U	4.27	U	107	U	4.27	U	4.27	U	4.27	U
	m,p-Xylene	ug/m^3	4,600	6.95	U	6.95	U	6.95	U	34.7	U	6.95	U	6.95	U	6.95	U
	Methyl methacrylate	ug/m^3	32,000	6.55	U	6.55	U	6.55	U	16.4	U	6.55	U	6.55	U	6.55	U
	Methylene chloride	ug/m^3	6,600	5.56	U	5.56	U	5.56	U	6.95	U	5.56	U	5.56	U	5.56	U
	Naphthalene	ug/m^3	7.4	0.210	U	**0.274**		**6.090**		5.24	U	0.210	U	0.210	U	**0.313**	
	n-Hexane	ug/m^3	32,000	7.05	U	7.05	U	7.05	U	**17.9**		7.05	U	**11.1**		7.05	U
	o-Xylene	ug/m^3	4,600	1.74	U	1.74	U	1.74	U	17.4	U	**2.15**		**2.78**		1.74	U
	4-Ethyltoluene	ug/m^3	NE	0.983	U	0.983	U	0.983	U	19.7	U	**1.22**		**1.25**		0.983	U
	Propylene	ug/m^3	NE	**14.7**		2.75	U	2.75	U	**118**		**26.6**		**41.9**		**45.8**	
	Styrene	ug/m^3	46,000	6.81	U	6.81	U	6.81	U	17.0	U	6.81	U	6.81	U	6.81	U
	Methyl tert-butyl ether (MTBE)	ug/m^3	960	0.721	U	0.721	U	0.721	U	1.44	U	0.721	U	0.721	U	0.721	U
	Tetrachloroethene (PCE)	ug/m^3	960	**25.5**		**39.0**		**70.0**		**24.9**		**37.4**		**29.8**		**24.3**	
	Tetrahydrofuran	ug/m^3	91,000	4.72	U	4.72	U	4.72	U	**1.75**		4.72	U	4.72	U	4.72	U
	Toluene	ug/m^3	230,000	1.51	U	1.51	U	1.51	U	15.1	U	1.51	U	**3.05**		1.51	U
	trans-1,2-Dichloroethene	ug/m^3	1,800	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U
	trans-1,3-dichloropropene	ug/m^3	63	0.908	U	0.908	U	0.908	U	22.7	U	0.908	U	0.908	U	0.908	U
	Trichloroethene (TCE)	ug/m^3	33	**0.813**		**0.718**		**3.20**		**6.11**		**2.30**		**4.99**		**3.15**	
	Trichlorofluoromethane (CFC-11)	ug/m^3	32,000	**383**		**216**		**75.1**		**10.4**		**7.38**		**9.34**		**7.3**	
	Vinyl acetate	ug/m^3	9,100	5.63	U	5.63	U	5.63	U	3.52	U	5.63	U	5.63	U	5.63	U
	Vinyl chloride	ug/m^3	28	**2.96**		0.102	U	0.102	U	0.274	U	**0.124**		**0.177**		0.102	U

Analyte Group	Analyte	Units	Sample Location	LFB-10		LFB-11		LFB-11		LFB-11		LFB-11		LFB-11		LFB-15	
			Sample Name	LFB-10-111221		LFB-11-110320		LFB-11-032921		LFB-11-051121		LFB-11-080921		LFB-11-111221		LFB-15-110320	
			Sample Date	11/12/2021		11/3/2020		3/29/2021		5/11/2021		8/9/2021		11/12/2021		11/3/2020	
			MTCA Method B CUL[2]														
VOCs[3]	1,1,1-Trichloroethane	ug/m^3	230,000	1.09	U	21.8	U	1.09	U	1.09	U	2.73	U	1.09	U	21.8	U
	1,1,2,2-Tetrachloroethane	ug/m^3	4.3	0.275	U	20.6	U	0.275	U	0.275	U	0.687	U	0.275	U	20.6	U
	CFC-113	ug/m^3	230,000	1.53	U	30.7	U	1.53	U	1.53	U	**37.2**		**18.8**		30.7	U
	1,1,2-Trichloroethane (TCA)	ug/m^3	16.0	0.218	U	27.3	U	0.218	U	0.218	U	0.546	U	0.218	U	27.3	U
	1,1-Dichloroethane	ug/m^3	160	**2.650**		**21.4**		**30.3**		**25.6**		**19.0**		**26.4**		8.10	U
	1,1-Dichloroethene (DCE)	ug/m^3	9,100	**1.44**		**18.6**		**21.2**		**19.7**		**10.2**		**19.1**		15.9	U
	1,2,4-Trichlorobenzene	ug/m^3	91.0	2.97	U	22.3	U	2.97	U	**5.35**		7.42	U	2.97	U	22.3	U
	1,2,4-Trimethylbenzene	ug/m^3	2,700	9.83	U	**647**		**212**		**294**		**438**		**753**		**291**	
	1,2-Dibromoethane (EDB)	ug/m^3	0.420	0.00915	U	15.4	U	0.00915	U	0.00915	U	0.0229	U	0.00915	U	15.4	U
	1,2-Dichlorobenzene	ug/m^3	9,100	0.240	U	24.0	U	0.240	U	0.240	U	0.601	U	0.240	U	24.0	U
	1,2-Dichloroethane	ug/m^3	9.6	**0.306**		8.09	U	2.40	U	0.162	U	0.405	U	0.162	U	8.09	U
	1,2-Dichloropropane	ug/m^3	68.0	0.924	U	23.1	U	2.09	U	0.924	U	2.31	U	0.924	U	23.1	U
	1,3,5-Trimethylbenzene	ug/m^3	2,700	7.87	U	**192**		**151**		**153**		**143**		**99.8**		14.7	U
	1,3-Butadiene	ug/m^3	8.3	0.0885	U	11.1	U	**9.27**		0.0885	U	0.221	U	0.0885	U	11.1	U
	1,3-Dichlorobenzene	ug/m^3	NE	0.241	U	18.0	U	0.241	U	0.241	U	0.601	U	0.241	U	18.0	U
	1,4-Dichlorobenzene	ug/m^3	23.0	**3.94**		**370**		**226**		**253**		**310**		**267**		**65.8**	
	1,4-Dioxane	ug/m^3	5	5.77	U	**18.2**		**7.40**		5.77	U	14.40	U	5.77	U	**15.7**	
	(MEK) 2-Butanone	ug/m^3	NE	4.72	U	29.5	U	**6.91**		4.72	U	11.8	U	4.72	U	29.5	U
	2-Hexanone	ug/m^3	1,400	16.4	U	41.0	U	16.4	U	16.4	U	41.0	U	16.4	U	41.0	U
	Isopropyl Alcohol	ug/m^3	NE	**14.2**		**27.1**		9.83	U	9.83	U	24.6	U	**36.1**		**30.0**	
	4-Methyl-2-pentanone (MIBK)	ug/m^3	NE	16.4	U	41.0	U	16.4	U	16.4	U	41.0	U	16.4	U	41.0	U
	Acetone	ug/m^3	1,400,000	19.0	U	**1,200**		**22.8**		19.0	U	47.5	U	**60.0**		**73.3**	
	Acrolein	ug/m^3	0.910	0.00917	U	2.87	U	0.00917	U	0.00917	U	0.0229	U	0.00917	U	2.87	U
	Benzene	ug/m^3	32.0	**0.392**		**283**		**372**		**191**		**114**		**304**		**45.3**	
	Benzyl chloride	ug/m^3	5.1	2.07	U	25.9	U	2.07	U	2.07	U	5.18	U	2.07	U	25.9	U
	Dichlorobromomethane	ug/m^3	NE	2.68	U	20.1	U	2.68	U	2.68	U	6.70	U	2.68	U	20.1	U
	Bromoform	ug/m^3	230	0.414	U	20.7	U	0.414	U	0.414	U	1.03	U	0.414	U	20.7	U
	Bromomethane	ug/m^3	230	1.55	U	19.4	U	1.55	U	1.55	U	3.88	U	1.55	U	19.4	U
	Carbon disulfide	ug/m^3	32,000	4.98	U	46.7	U	**25.6**		**17.1**		12.5	U	4.98	U	46.7	U
	Carbon tetrachloride	ug/m^3	42	0.252	U	4.13	U	0.252	U	0.252	U	0.629	U	0.252	U	4.13	U
	Chlorobenzene	ug/m^3	2,300	0.184	U	**50.7**		**37.8**		**15.4**		**16.2**		**54.1**		9.21	U
	Dibromochloromethane	ug/m^3	NE	0.341	U	42.6	U	0.341	U	0.341	U	0.852	U	0.341	U	42.6	U
	Chloroethane	ug/m^3	NE	**5.38**		**1,780**		**2,240**		**2,510**		**365**		**1,970**		**369**	
	Chloroform	ug/m^3	11	**0.697**		9.77	U	**0.827**		**0.754**		0.488	U	0.195	U	9.77	U
	Chloromethane	ug/m^3	4,100	0.413	U	10.3	U	**131**		**15.9**		**7.90**		0.413	U	10.3	U
	cis-1,2-Dichloroethene	ug/m^3	NE	**1.76**		**247**		**235**		**209**		**123**		**263**		**28.4**	

VOCs[3] cont.	cis-1,3-dichloropropene	ug/m^3	63	0.908	U	18.2	U	0.908	U	0.908	U	2.27	U	0.908	U	18.2	U
	Cyclohexane	ug/m^3	270,000	**14.0**		**141**		**179**		**119**		**153**		**139**		**14.4**	
	Dichlorodifluoromethane (CFC-12)	ug/m^3	4,600	0.989	U	**138**		**128**		**123**		**165**		**165**		**46.8**	
	Dichlorotetrafluoroethane (CFC-114)	ug/m^3	NE	1.40	U	**84.3**		**111**		**123**		**90.2**		**75.4**		**48.6**	
	Ethyl acetate	ug/m^3	3,200	5.77	U	36.0	U	5.77	U	5.77	U	14.4	U	5.77	U	36.0	U
	Ethylbenzene	ug/m^3	46,000	6.95	U	**1,820**		**114**		**76.6**		**86.6**		**1,190**		**797**	
	Heptane	ug/m^3	18,000	6.43	U	**969**		**584**		**316**		**463**		**999**		**106**	
	Hexachlorobutadiene	ug/m^3	11	4.27	U	107	U	4.27	U	4.27	U	10.7	U	4.27	U	107	U
	m,p-Xylene	ug/m^3	4,600	6.95	U	**740**		**381**		**340**		**343**		**609**		**99.4**	
	Methyl methacrylate	ug/m^3	32,000	6.55	U	16.4	U	6.55	U	6.55	U	16.4	U	6.55	U	16.4	U
	Methylene chloride	ug/m^3	6,600	5.56	U	69.5	U	**7.14**		5.56	U	13.9	U	**6.17**		69.5	U
	Naphthalene	ug/m^3	7.4	**0.772**		**245**		**170**		**191**		**305**		**206**		**111**	
	n-Hexane	ug/m^3	32,000	**14.8**		**1,400**		**1,120**		**695**		**301**		**1,260**		193	U
	o-Xylene	ug/m^3	4,600	1.74	U	**388**		**324**		**170**		**188**		**379**		69.5	U
	4-Ethyltoluene	ug/m^3	NE	0.983	U	**137**		**50.4**		**41.0**		**33.2**		**104.0**		**20.2**	
	Propylene	ug/m^3	NE	2.75	U	**25,100**		**3,470**		**2,990**		**421**		2.75	U	343	U
	Styrene	ug/m^3	46,000	6.81	U	17.0	U	6.81	U	6.81	U	17.0	U	6.81	U	17.0	U
	Methyl tert-butyl ether (MTBE)	ug/m^3	960	0.721	U	14.40	U	0.721	U	0.721	U	1.80	U	0.721	U	14.4	U
	Tetrachloroethene (PCE)	ug/m^3	960	**25.3**		**19.8**		**20.4**		**21.5**		**17.3**		**18.6**		**70.6**	
	Tetrahydrofuran	ug/m^3	91,000	4.72	U	**378**		**109**		**78.4**		**50.9**		**328**		**46.5**	
	Toluene	ug/m^3	230,000	1.51	U	**885**		**58.6**		**40.6**		**21.4**		**117**		**20.3**	
	trans-1,2-Dichloroethene	ug/m^3	1,800	0.793	U	7.93	U	**4.18**		**3.72**		**2.82**		**3.35**		7.93	U
	trans-1,3-dichloropropene	ug/m^3	63	0.908	U	22.7	U	0.908	U	0.908	U	2.27	U	0.908	U	22.7	U
	Trichloroethene (TCE)	ug/m^3	33	**6.13**		**27.1**		**29.7**		**29.2**		**20.1**		**25.1**		3.49	U
	Trichlorofluoromethane (CFC-11)	ug/m^3	32,000	**2.83**		**398**		**414**		**391**		**100**		**253**		**99.8**	
	Vinyl acetate	ug/m^3	9,100	5.63	U	35.2	U	5.63	U	5.63	U	14.1	U	5.63	U	35.2	U
	Vinyl chloride	ug/m^3	28	**1.46**		**109**		**57.5**		**28.5**		**60.9**		**31.9**		**4.45**	

Analyte Group	Analyte	Units	Sample Location	LFB-15		LFB-15		LFB-15		LFB-15		LFB-16		LFB-16		LFB-16	
			Sample Name	LFB-15-032921		LFB-15-051121		LFB-15-080921		LFB-15-111221		LFB-16-110320		LFB-16-032921		LFB-16-051121	
			Sample Date	3/29/2021		5/11/2021		8/9/2021		11/12/2021		11/3/2020		3/29/2021		5/11/2021	
			MTCA Method B CUL[2]														
VOCs[3]	1,1,1-Trichloroethane	ug/m^3	230,000	**1.54**		**2.57**		1.09	U	1.09	U	2.18	U	1.09	U	1.09	U
	1,1,2,2-Tetrachloroethane	ug/m^3	4.3	0.275	U	0.275	U	0.275	U	0.275	U	2.06	U	0.275	U	0.275	U
	CFC-113	ug/m^3	230,000	1.53	U	1.53	U	1.53	U	1.53	U	3.07	U	1.53	U	1.53	U
	1,1,2-Trichloroethane (TCA)	ug/m^3	16.0	0.218	U	0.218	U	0.218	U	0.218	U	2.73	U	0.218	U	0.218	U
	1,1-Dichloroethane	ug/m^3	160	**0.285**		0.162	U	0.162	U	0.162	U	0.810	U	**0.74**		**0.690**	
	1,1-Dichloroethene (DCE)	ug/m^3	9,100	0.159	U	0.159	U	0.159	U	0.159	U	1.59	U	0.159	U	0.159	U
	1,2,4-Trichlorobenzene	ug/m^3	91.0	2.97	U	2.97	U	2.97	U	2.97	U	2.23	U	2.97	U	2.97	U
	1,2,4-Trimethylbenzene	ug/m^3	2,700	9.83	U	9.83	U	9.83	U	9.83	U	1.47	U	9.83	U	9.83	U
	1,2-Dibromoethane (EDB)	ug/m^3	0.420	**0.0178**		0.00915	U	0.00915	U	0.00915	U	1.54	U	0.00915	U	0.00915	U
	1,2-Dichlorobenzene	ug/m^3	9,100	0.240	U	0.240	U	0.240	U	0.240	U	2.40	U	0.240	U	0.240	U
	1,2-Dichloroethane	ug/m^3	9.6	**0.292**		0.162	U	0.162	U	0.162	U	0.809	U	**0.936**		0.162	U
	1,2-Dichloropropane	ug/m^3	68.0	0.924	U	0.924	U	0.924	U	0.924	U	2.31	U	0.924	U	0.924	U
	1,3,5-Trimethylbenzene	ug/m^3	2,700	7.87	U	7.87	U	7.87	U	7.87	U	1.47	U	7.87	U	7.87	U
	1,3-Butadiene	ug/m^3	8.3	0.0885	U	0.0885	U	0.0885	U	0.0885	U	1.11	U	0.0885	U	0.0885	U
	1,3-Dichlorobenzene	ug/m^3	NE	0.241	U	0.241	U	0.241	U	0.241	U	1.80	U	0.241	U	0.241	U
	1,4-Dichlorobenzene	ug/m^3	23.0	0.241	U	0.241	U	0.241	U	**0.362**		1.80	U	0.241	U	**0.895**	
	1,4-Dioxane	ug/m^3	5	5.77	U	5.77	U	5.77	U	5.77	U	1.44	U	5.77	U	5.77	U
	(MEK) 2-Butanone	ug/m^3	NE	4.72	U	4.72	U	4.72	U	4.72	U	2.95	U	4.72	U	4.72	U
	2-Hexanone	ug/m^3	1,400	16.4	U	16.4	U	16.4	U	16.4	U	4.10	U	16.4	U	16.4	U
	Isopropyl Alcohol	ug/m^3	NE	9.83	U	9.83	U	9.83	U	9.83	U	2.46	U	9.83	U	9.83	U
	4-Methyl-2-pentanone (MIBK)	ug/m^3	NE	16.4	U	16.4	U	16.4	U	16.4	U	4.10	U	16.4	U	16.4	U
	Acetone	ug/m^3	1,400,000	**21.3**		19.0	U	19.0	U	19.0	U	**62.1**		19.0	U	19.0	U
	Acrolein	ug/m^3	0.910	**0.368**		**0.0820**		**0.532**		**0.202**		**2.09**		**0.163**		**0.127**	
	Benzene	ug/m^3	32.0	**0.247**		**0.243**		**0.314**		0.128	U	**0.349**		**0.254**		**0.453**	
	Benzyl chloride	ug/m^3	5.1	2.07	U	2.07	U	2.07	U	2.07	U	2.59	U	2.07	U	2.07	U
	Dichlorobromomethane	ug/m^3	NE	2.68	U	2.68	U	2.68	U	2.68	U	2.01	U	2.68	U	2.68	U
	Bromoform	ug/m^3	230	0.414	U	0.414	U	0.414	U	0.414	U	2.07	U	0.414	U	0.414	U
	Bromomethane	ug/m^3	230	1.55	U	1.55	U	1.55	U	1.55	U	1.94	U	1.55	U	1.55	U
	Carbon disulfide	ug/m^3	32,000	**7.12**		4.98	U	4.98	U	4.98	U	4.67	U	**10.4**		**11.8**	
	Carbon tetrachloride	ug/m^3	42	0.252	U	0.252	U	0.252	U	0.252	U	0.413	U	0.252	U	0.252	U
	Chlorobenzene	ug/m^3	2,300	0.184	U	0.184	U	0.184	U	0.184	U	0.921	U	0.184	U	0.184	U
	Dibromochloromethane	ug/m^3	NE	0.341	U	0.341	U	0.341	U	0.341	U	4.26	U	0.341	U	0.341	U
	Chloroethane	ug/m^3	NE	4.22	U	4.22	U	4.22	U	4.22	U	**1.43**		4.22	U	4.22	U
	Chloroform	ug/m^3	11	**0.212**		**0.506**		0.195	U	0.195	U	0.977	U	**0.616**		**0.444**	
	Chloromethane	ug/m^3	4,100	**3.64**		**0.444**		**0.810**		0.413	U	**3.52**		**8.5**		**4.53**	
	cis-1,2-Dichloroethene	ug/m^3	NE	1.59	U	**1.75**		1.59	U	1.59	U	0.793	U	1.59	U	**1.92**	

VOCs[3] cont.	cis-1,3-dichloropropene	ug/m^3	63	0.908	U	0.908	U	0.908	U	0.908	U	1.82	U	0.908	U	0.908	U
	Cyclohexane	ug/m^3	270,000	1.38	U	1.38	U	1.38	U	1.38	U	1.38	U	1.38	U	1.38	U
	Dichlorodifluoromethane (CFC-12)	ug/m^3	4,600	**11.6**		**10.9**		**18.7**		**22.9**		**14.9**		**12.7**		**14.7**	
	Dichlorotetrafluoroethane (CFC-114)	ug/m^3	NE	**8.93**		**8.83**		**18.4**		**37.7**		**32.2**		**25.4**		**34.5**	
	Ethyl acetate	ug/m^3	3,200	5.77	U	5.77	U	5.77	U	5.77	U	3.60	U	5.77	U	5.77	U
	Ethylbenzene	ug/m^3	46,000	6.95	U	6.95	U	6.95	U	6.95	U	1.74	U	6.95	U	6.95	U
	Heptane	ug/m^3	18,000	6.43	U	6.43	U	6.43	U	6.43	U	1.61	U	6.43	U	6.43	U
	Hexachlorobutadiene	ug/m^3	11	4.27	U	4.27	U	4.27	U	4.27	U	10.7	U	4.27	U	4.27	U
	m,p-Xylene	ug/m^3	4,600	6.95	U	6.95	U	6.95	U	6.95	U	3.47	U	6.95	U	6.95	U
	Methyl methacrylate	ug/m^3	32,000	6.55	U	6.55	U	6.55	U	6.55	U	1.64	U	6.55	U	6.55	U
	Methylene chloride	ug/m^3	6,600	5.56	U	5.56	U	5.56	U	5.56	U	6.95	U	5.56	U	5.56	U
	Naphthalene	ug/m^3	7.4	**0.467**		0.210	U	0.210	U	**0.675**		0.524	U	0.210	U	0.210	U
	n-Hexane	ug/m^3	32,000	7.05	U	7.05	U	7.05	U	7.05	U	**1.66**		7.05	U	7.05	U
	o-Xylene	ug/m^3	4,600	1.74	U	1.74	U	1.74	U	1.74	U	1.74	U	1.74	U	1.74	U
	4-Ethyltoluene	ug/m^3	NE	**1.10**		0.983	U	0.983	U	0.983	U	1.97	U	0.983	U	0.983	U
	Propylene	ug/m^3	NE	2.75	U	2.75	U	2.75	U	2.75	U	**4.06**		**3.05**		2.75	U
	Styrene	ug/m^3	46,000	6.81	U	6.81	U	6.81	U	6.81	U	1.70	U	6.81	U	6.81	U
	Methyl tert-butyl ether (MTBE)	ug/m^3	960	0.721	U	0.721	U	0.721	U	0.721	U	1.44	U	0.721	U	0.721	U
	Tetrachloroethene (PCE)	ug/m^3	960	**59.5**		**91.5**		**81.1**		**114**		**56.1**		**50.5**		**55.3**	
	Tetrahydrofuran	ug/m^3	91,000	4.72	U	4.72	U	4.72	U	4.72	U	1.18	U	4.72	U	4.72	U
	Toluene	ug/m^3	230,000	1.51	U	1.51	U	1.51	U	1.51	U	1.51	U	1.51	U	1.51	U
	trans-1,2-Dichloroethene	ug/m^3	1,800	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U	0.793	U
	trans-1,3-dichloropropene	ug/m^3	63	0.908	U	0.908	U	0.908	U	0.908	U	2.27	U	0.908	U	0.908	U
	Trichloroethene (TCE)	ug/m^3	33	**1.99**		**2.71**		**1.04**		**1.03**		0.349	U	0.215	U	**0.908**	
	Trichlorofluoromethane (CFC-11)	ug/m^3	32,000	**13.9**		**31.9**		**3.90**		**42.40**		**26.4**		**36.6**		**38.5**	
	Vinyl acetate	ug/m^3	9,100	5.63	U	5.63	U	5.63	U	5.63	U	3.52	U	5.63	U	5.63	U
	Vinyl chloride	ug/m^3	28	**0.425**		0.102	U	**0.159**		0.102	U	**0.465**		**0.756**		**0.749**	

Analyte Group	Analyte	Units	Sample Location	LFB-16		LFB-16		LFB-17		LFB-17		LFB-17		LFB-17		LFB-17	
			Sample Name	LFB-16-080921		LFB-16-111221		LFB-17-110320		LFB-17-032921		LFB-17-051121		LFB-17-080921		LFB-17-111221	
			Sample Date	8/9/2021		11/12/2021		11/3/2020		3/29/2021		5/11/2021		8/9/2021		11/12/2021	
			MTCA Method B CUL[2]														
VOCs[3]	1,1,1-Trichloroethane	ug/m^3	230,000	1.09	U	1.09	U	21.8	U	1.09	U	1.09	U	2.73	U	1.09	U
	1,1,2,2-Tetrachloroethane	ug/m^3	4.3	0.275	U	0.275	U	2.06	U	0.275	U	0.275	U	0.275	U	0.275	U
	CFC-113	ug/m^3	230,000	1.53	U	1.53	U	3.07	U	1.53	U	1.53	U	1.53	U	1.53	U
	1,1,2-Trichloroethane (TCA)	ug/m^3	16.0	0.218	U	0.218	U	27.3	U	0.218	U	0.218	U	0.218	U	0.218	U
	1,1-Dichloroethane	ug/m^3	160	**0.436**		0.162	U	8.10	U	**1.70**		**1.29**		**1.52**		**2.02**	
	1,1-Dichloroethene (DCE)	ug/m^3	9,100	0.159	U	0.159	U	15.9	U	0.159	U	0.159	U	0.397	U	**0.463**	
	1,2,4-Trichlorobenzene	ug/m^3	91.0	2.97	U	2.97	U	2.23	U	2.97	U	2.97	U	2.97	U	2.97	U
	1,2,4-Trimethylbenzene	ug/m^3	2,700	9.83	U	9.83	U	**2.83**		9.83	U	9.83	U	9.83	U	9.83	U
	1,2-Dibromoethane (EDB)	ug/m^3	0.420	0.00915	U	0.00915	U	15.4	U	**0.0722**		**0.0584**		0.00915	U	0.00915	U
	1,2-Dichlorobenzene	ug/m^3	9,100	0.240	U	0.240	U	2.40	U	0.240	U	0.240	U	0.240	U	0.240	U
	1,2-Dichloroethane	ug/m^3	9.6	**0.285**		0.162	U	8.09	U	**0.669**		**0.784**		0.405	U	**0.220**	
	1,2-Dichloropropane	ug/m^3	68.0	0.924	U	0.924	U	23.1	U	0.924	U	0.924	U	0.924	U	0.924	U
	1,3,5-Trimethylbenzene	ug/m^3	2,700	7.87	U	7.87	U	1.47	U	7.87	U	7.87	U	7.87	U	7.87	U
	1,3-Butadiene	ug/m^3	8.3	0.0885	U	0.0885	U	11.1	U	0.0885	U	0.0885	U	0.221	U	0.0885	U
	1,3-Dichlorobenzene	ug/m^3	NE	**0.526**		0.241	U	1.80	U	0.241	U	0.241	U	0.241	U	0.241	U
	1,4-Dichlorobenzene	ug/m^3	23.0	0.241	U	**0.542**		**33.6**		**14.8**		**18.0**		**23.8**		**26.5**	
	1,4-Dioxane	ug/m^3	5	5.77	U	5.77	U	14.4	U	5.77	U	5.77	U	5.77	U	5.77	U
	(MEK) 2-Butanone	ug/m^3	NE	4.72	U	4.72	U	29.5	U	4.72	U	4.72	U	11.8	U	4.72	U
	2-Hexanone	ug/m^3	1,400	16.4	U	16.4	U	4.10	U	16.4	U	16.4	U	16.4	U	16.4	U
	Isopropyl Alcohol	ug/m^3	NE	9.83	U	**24.3**		24.6	U	9.83	U	9.83	U	24.6	U	9.83	U
	4-Methyl-2-pentanone (MIBK)	ug/m^3	NE	16.4	U	16.4	U	4.10	U	16.4	U	16.4	U	16.4	U	16.4	U
	Acetone	ug/m^3	1,400,000	19.0	U	19.0	U	**43.7**		**69.3**		19.0	U	47.5	U	19.0	U
	Acrolein	ug/m^3	0.910	**0.175**		**0.121**		2.87	U	**0.659**		**0.132**		0.0229	U	0.00917	U
	Benzene	ug/m^3	32.0	**0.175**		0.128	U	**15.7**		**2.14**		**1.24**		**8.59**		**21.5**	
	Benzyl chloride	ug/m^3	5.1	2.07	U	2.07	U	2.59	U	2.07	U	**2.82**		2.07	U	**2.07**	
	Dichlorobromomethane	ug/m^3	NE	2.68	U	2.68	U	20.1	U	2.68	U	2.68	U	2.68	U	2.68	U
	Bromoform	ug/m^3	230	0.414	U	0.414	U	2.07	U	0.414	U	0.414	U	0.414	U	0.414	U
	Bromomethane	ug/m^3	230	1.55	U	1.55	U	19.4	U	1.55	U	1.55	U	3.88	U	1.55	U
	Carbon disulfide	ug/m^3	32,000	**13.1**		4.98	U	46.7	U	**14.6**		**9.13**		12.5	U	4.98	U
	Carbon tetrachloride	ug/m^3	42	0.252	U	0.252	U	4.13	U	0.252	U	0.252	U	0.629	U	0.252	U
	Chlorobenzene	ug/m^3	2,300	0.184	U	0.184	U	9.21	U	**0.387**		0.184	U	**0.726**		**4.73**	
	Dibromochloromethane	ug/m^3	NE	0.341	U	0.341	U	42.6	U	0.341	U	0.341	U	0.341	U	0.341	U
	Chloroethane	ug/m^3	NE	4.22	U	4.22	U	**24.3**		4.22	U	4.22	U	10.6	U	4.22	U
	Chloroform	ug/m^3	11	0.195	U	0.195	U	9.77	U	**0.609**		**0.529**		0.488	U	0.195	U
	Chloromethane	ug/m^3	4,100	**1.96**		**0.772**		10.3	U	**8.77**		**5.65**		**1.21**		0.413	U
	cis-1,2-Dichloroethene	ug/m^3	NE	1.59	U	1.59	U	**15.7**		1.59	U	**2.68**		**11.9**		**17.4**	

VOCs[3] cont.	cis-1,3-dichloropropene	ug/m^3	63	0.908	U	0.908	U	18.2	U	0.908	U	0.908	U	0.908	U	0.908	U
	Cyclohexane	ug/m^3	270,000	1.38	U	1.38	U	13.8	U	1.38	U	**2.44**		**6.26**		**6.65**	
	Dichlorodifluoromethane (CFC-12)	ug/m^3	4,600	**18.6**		**18.9**		**79.9**		**16.0**		**14.2**		**31.3**		**34.0**	
	Dichlorotetrafluoroethane (CFC-114)	ug/m^3	NE	**87.1**		**49.0**		**47.9**		**7.66**		**5.87**		**41.8**		**32.8**	
	Ethyl acetate	ug/m^3	3,200	5.77	U	5.77	U	36.0	U	5.77	U	5.77	U	14.4	U	5.77	U
	Ethylbenzene	ug/m^3	46,000	6.95	U	6.95	U	**11.9**		6.95	U	6.95	U	6.95	U	**17.2**	
	Heptane	ug/m^3	18,000	6.43	U	6.43	U	**6.08**		6.43	U	6.43	U	**56.2**		**59.3**	
	Hexachlorobutadiene	ug/m^3	11	4.27	U	4.27	U	10.7	U	4.27	U	4.27	U	4.27	U	4.27	U
	m,p-Xylene	ug/m^3	4,600	6.95	U	6.95	U	**8.74**		6.95	U	6.95	U	6.95	U	**10.5**	
	Methyl methacrylate	ug/m^3	32,000	6.55	U	6.55	U	16.4	U	6.55	U	6.55	U	6.55	U	6.55	U
	Methylene chloride	ug/m^3	6,600	5.56	U	5.56	U	69.5	U	5.56	U	5.56	U	13.9	U	5.56	U
	Naphthalene	ug/m^3	7.4	**0.363**		**0.996**		**1.77**		**1.45**		**1.60**		**1.15**		**4.07**	
	n-Hexane	ug/m^3	32,000	7.05	U	7.05	U	**27.3**		7.05	U	7.05	U	**27.9**		**34.1**	
	o-Xylene	ug/m^3	4,600	1.74	U	1.74	U	**4.72**		**2.53**		1.74	U	**1.99**		**4.64**	
	4-Ethyltoluene	ug/m^3	NE	0.983	U	0.983	U	1.97	U	**1.32**		**1.26**		0.983	U	**1.17**	
	Propylene	ug/m^3	NE	2.75	U	2.75	U	**1,050**		**21.4**		**23.7**		**332.0**		2.75	U
	Styrene	ug/m^3	46,000	6.81	U	6.81	U	1.70	U	6.81	U	6.81	U	6.81	U	6.81	U
	Methyl tert-butyl ether (MTBE)	ug/m^3	960	0.721	U	0.721	U	14.4	U	0.721	U	0.721	U	1.80	U	0.721	U
	Tetrachloroethene (PCE)	ug/m^3	960	**59.0**		**59.7**		**129**		**111**		**135**		**144**		**121**	
	Tetrahydrofuran	ug/m^3	91,000	4.72	U	4.72	U	11.8	U	4.72	U	4.72	U	11.8	U	4.72	U
	Toluene	ug/m^3	230,000	1.51	U	1.51	U	15.1	U	1.51	U	1.51	U	**2.47**		**5.96**	
	trans-1,2-Dichloroethene	ug/m^3	1,800	0.793	U	0.793	U	7.93	U	0.793	U	0.793	U	1.98	U	0.793	U
	trans-1,3-dichloropropene	ug/m^3	63	0.908	U	0.908	U	22.7	U	0.908	U	0.908	U	0.908	U	0.908	U
	Trichloroethene (TCE)	ug/m^3	33	0.215	U	0.215	U	**12.0**		**3.81**		**4.42**		**7.30**		**7.32**	
	Trichlorofluoromethane (CFC-11)	ug/m^3	32,000	**59.6**		**15.9**		**60.3**		**85.8**		**136**		**96.1**		**54.3**	
	Vinyl acetate	ug/m^3	9,100	5.63	U	5.63	U	35.2	U	5.63	U	5.63	U	14.1	U	5.63	U
	Vinyl chloride	ug/m^3	28	**0.350**		0.102	U	**7.85**		**1.09**		**0.647**		**12.0**		**8.24**	

Notes:

[1]Samples analyzed by Freemont Analyticals.

[2]Model Toxics Control Act (MTCA) Method B Deep Soil Gas Screening Levels

[3]Volatile organic compounds (VOCs) analyzed by EPA Air Method Toxic Organics - 15

NE = not established; U = analyte was not detected at concentrations greater than the laboratory reporting limit; ug/m = micrograms per cubic meter

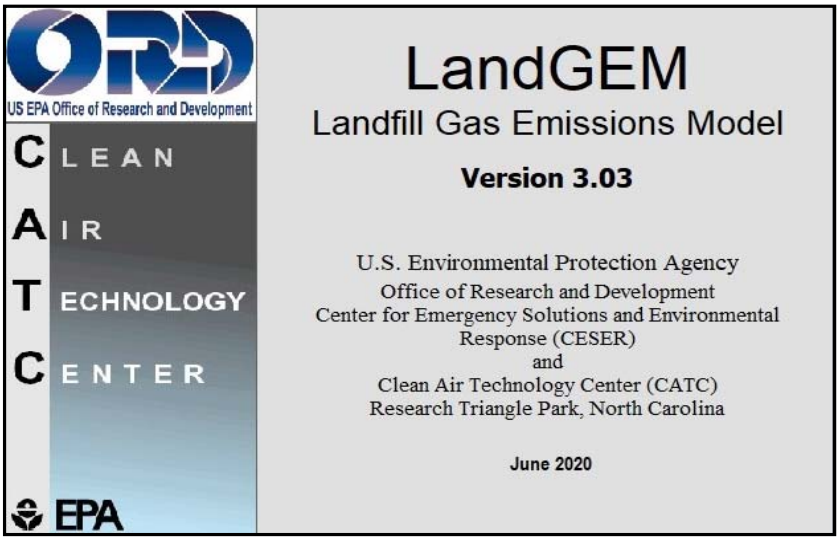
Bold indicates that the analyte was detected at concentrations greater than the laboratory reporting limit

Bold and gray shading indicates analyte was detected above selected screening level.

Appendix C

Landfill Gas Modeling Data

HERRERA
Science + Planning + Design



Summary Report

Landfill Name or Identifier: Marshall Landfill

Date: Tuesday, November 8, 2022

Description/Comments:
CAA - 50% by volume assuming typical MSW placed.

About LandGEM:

First-Order Decomposition Rate Equation:

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

Where,
Q_{CH4} = annual methane generation in the year of the calculation ($m^3/year$)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate ($year^{-1}$)
L_0 = potential methane generation capacity (m^3/Mg)
M_i = mass of waste accepted in the i^{th} year (Mg)
t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

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

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

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**1970**	
Landfill Closure Year (with 80-year limit)	**1990**	
Actual Closure Year (without limit)	***1990***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity		*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.020**	*year $^{-1}$*
Potential Methane Generation Capacity, L_0	**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)*
1970	79,460	87,406	0	0
1971	79,460	87,406	79,460	87,406
1972	79,460	87,406	158,921	174,813
1973	79,460	87,406	238,381	262,219
1974	79,460	87,406	317,842	349,626
1975	79,460	87,406	397,302	437,032
1976	79,460	87,406	476,763	524,439
1977	79,460	87,406	556,223	611,845
1978	79,460	87,406	635,683	699,252
1979	79,460	87,406	715,144	786,658
1980	79,460	87,406	794,604	874,065
1981	79,460	87,406	874,065	961,471
1982	79,460	87,406	953,525	1,048,878
1983	79,460	87,406	1,032,986	1,136,284
1984	79,460	87,406	1,112,446	1,223,691
1985	79,460	87,406	1,191,906	1,311,097
1986	79,460	87,406	1,271,367	1,398,504
1987	79,460	87,406	1,350,827	1,485,910
1988	79,460	87,406	1,430,288	1,573,317
1989	79,460	87,406	1,509,748	1,660,723
1990	79,460	87,406	1,589,209	1,748,130
1991	0	0	1,668,669	1,835,536
1992	0	0	1,668,669	1,835,536
1993	0	0	1,668,669	1,835,536
1994	0	0	1,668,669	1,835,536
1995	0	0	1,668,669	1,835,536
1996	0	0	1,668,669	1,835,536
1997	0	0	1,668,669	1,835,536
1998	0	0	1,668,669	1,835,536
1999	0	0	1,668,669	1,835,536
2000	0	0	1,668,669	1,835,536
2001	0	0	1,668,669	1,835,536
2002	0	0	1,668,669	1,835,536
2003	0	0	1,668,669	1,835,536
2004	0	0	1,668,669	1,835,536
2005	0	0	1,668,669	1,835,536
2006	0	0	1,668,669	1,835,536
2007	0	0	1,668,669	1,835,536
2008	0	0	1,668,669	1,835,536
2009	0	0	1,668,669	1,835,536

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2010	0	0	1,668,669	1,835,536
2011	0	0	1,668,669	1,835,536
2012	0	0	1,668,669	1,835,536
2013	0	0	1,668,669	1,835,536
2014	0	0	1,668,669	1,835,536
2015	0	0	1,668,669	1,835,536
2016	0	0	1,668,669	1,835,536
2017	0	0	1,668,669	1,835,536
2018	0	0	1,668,669	1,835,536
2019	0	0	1,668,669	1,835,536
2020	0	0	1,668,669	1,835,536
2021	0	0	1,668,669	1,835,536
2022	0	0	1,668,669	1,835,536
2023	0	0	1,668,669	1,835,536
2024	0	0	1,668,669	1,835,536
2025	0	0	1,668,669	1,835,536
2026	0	0	1,668,669	1,835,536
2027	0	0	1,668,669	1,835,536
2028	0	0	1,668,669	1,835,536
2029	0	0	1,668,669	1,835,536
2030	0	0	1,668,669	1,835,536
2031	0	0	1,668,669	1,835,536
2032	0	0	1,668,669	1,835,536
2033	0	0	1,668,669	1,835,536
2034	0	0	1,668,669	1,835,536
2035	0	0	1,668,669	1,835,536
2036	0	0	1,668,669	1,835,536
2037	0	0	1,668,669	1,835,536
2038	0	0	1,668,669	1,835,536
2039	0	0	1,668,669	1,835,536
2040	0	0	1,668,669	1,835,536
2041	0	0	1,668,669	1,835,536
2042	0	0	1,668,669	1,835,536
2043	0	0	1,668,669	1,835,536
2044	0	0	1,668,669	1,835,536
2045	0	0	1,668,669	1,835,536
2046	0	0	1,668,669	1,835,536
2047	0	0	1,668,669	1,835,536
2048	0	0	1,668,669	1,835,536
2049	0	0	1,668,669	1,835,536

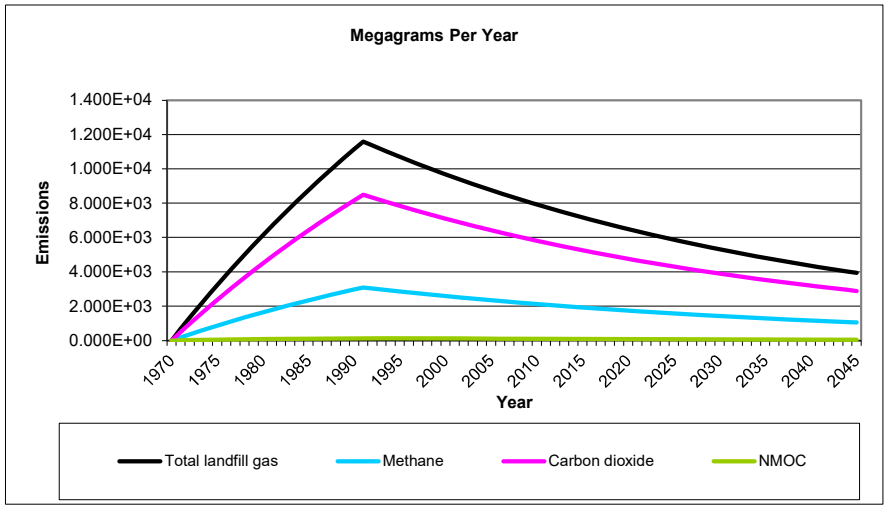
Pollutant Parameters

		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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6.000E+03
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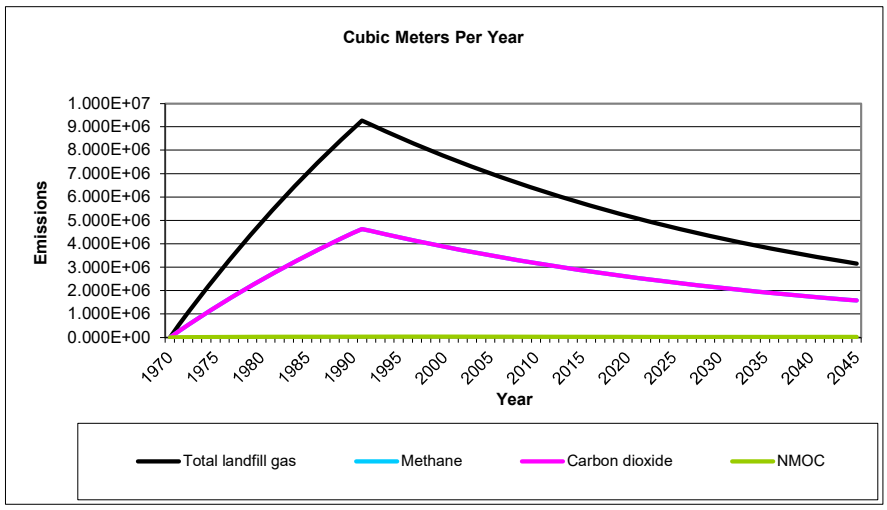
Total landfill gas
Methane
Carbon dioxide
NMOC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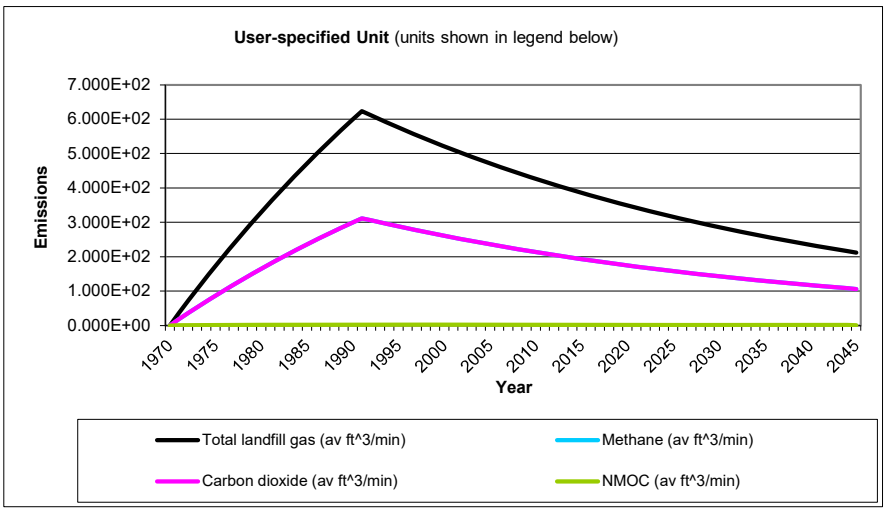
1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045
Year
Total landfill gas
Methane
Carbon dioxide
NMOC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4.000E+02
3.000E+02
2.000E+02
1.000E+02
0.000E+00
1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045
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)*
1970	0	0	0	0	0	0
1971	6.687E+02	5.355E+05	3.598E+01	1.786E+02	2.677E+05	1.799E+01
1972	1.324E+03	1.060E+06	7.125E+01	3.537E+02	5.302E+05	3.562E+01
1973	1.967E+03	1.575E+06	1.058E+02	5.253E+02	7.874E+05	5.291E+01
1974	2.597E+03	2.079E+06	1.397E+02	6.936E+02	1.040E+06	6.985E+01
1975	3.214E+03	2.574E+06	1.729E+02	8.585E+02	1.287E+06	8.646E+01
1976	3.819E+03	3.058E+06	2.055E+02	1.020E+03	1.529E+06	1.027E+02
1977	4.412E+03	3.533E+06	2.374E+02	1.179E+03	1.767E+06	1.187E+02
1978	4.993E+03	3.999E+06	2.687E+02	1.334E+03	1.999E+06	1.343E+02
1979	5.563E+03	4.455E+06	2.993E+02	1.486E+03	2.227E+06	1.497E+02
1980	6.122E+03	4.902E+06	3.294E+02	1.635E+03	2.451E+06	1.647E+02
1981	6.669E+03	5.341E+06	3.588E+02	1.781E+03	2.670E+06	1.794E+02
1982	7.206E+03	5.770E+06	3.877E+02	1.925E+03	2.885E+06	1.939E+02
1983	7.732E+03	6.192E+06	4.160E+02	2.065E+03	3.096E+06	2.080E+02
1984	8.248E+03	6.604E+06	4.438E+02	2.203E+03	3.302E+06	2.219E+02
1985	8.753E+03	7.009E+06	4.709E+02	2.338E+03	3.505E+06	2.355E+02
1986	9.249E+03	7.406E+06	4.976E+02	2.470E+03	3.703E+06	2.488E+02
1987	9.734E+03	7.795E+06	5.237E+02	2.600E+03	3.897E+06	2.619E+02
1988	1.021E+04	8.176E+06	5.493E+02	2.727E+03	4.088E+06	2.747E+02
1989	1.068E+04	8.550E+06	5.744E+02	2.852E+03	4.275E+06	2.872E+02
1990	1.113E+04	8.916E+06	5.990E+02	2.974E+03	4.458E+06	2.995E+02
1991	1.158E+04	9.275E+06	6.232E+02	3.094E+03	4.637E+06	3.116E+02
1992	1.135E+04	9.091E+06	6.108E+02	3.033E+03	4.546E+06	3.054E+02
1993	1.113E+04	8.911E+06	5.987E+02	2.972E+03	4.456E+06	2.994E+02
1994	1.091E+04	8.735E+06	5.869E+02	2.914E+03	4.367E+06	2.934E+02
1995	1.069E+04	8.562E+06	5.753E+02	2.856E+03	4.281E+06	2.876E+02
1996	1.048E+04	8.392E+06	5.639E+02	2.799E+03	4.196E+06	2.819E+02
1997	1.027E+04	8.226E+06	5.527E+02	2.744E+03	4.113E+06	2.763E+02
1998	1.007E+04	8.063E+06	5.418E+02	2.690E+03	4.032E+06	2.709E+02
1999	9.870E+03	7.903E+06	5.310E+02	2.636E+03	3.952E+06	2.655E+02
2000	9.674E+03	7.747E+06	5.205E+02	2.584E+03	3.873E+06	2.603E+02
2001	9.483E+03	7.593E+06	5.102E+02	2.533E+03	3.797E+06	2.551E+02
2002	9.295E+03	7.443E+06	5.001E+02	2.483E+03	3.722E+06	2.501E+02
2003	9.111E+03	7.296E+06	4.902E+02	2.434E+03	3.648E+06	2.451E+02
2004	8.931E+03	7.151E+06	4.805E+02	2.385E+03	3.576E+06	2.402E+02
2005	8.754E+03	7.010E+06	4.710E+02	2.338E+03	3.505E+06	2.355E+02
2006	8.580E+03	6.871E+06	4.617E+02	2.292E+03	3.435E+06	2.308E+02
2007	8.411E+03	6.735E+06	4.525E+02	2.247E+03	3.367E+06	2.263E+02
2008	8.244E+03	6.601E+06	4.436E+02	2.202E+03	3.301E+06	2.218E+02
2009	8.081E+03	6.471E+06	4.348E+02	2.158E+03	3.235E+06	2.174E+02
2010	7.921E+03	6.343E+06	4.262E+02	2.116E+03	3.171E+06	2.131E+02
2011	7.764E+03	6.217E+06	4.177E+02	2.074E+03	3.109E+06	2.089E+02
2012	7.610E+03	6.094E+06	4.094E+02	2.033E+03	3.047E+06	2.047E+02
2013	7.460E+03	5.973E+06	4.013E+02	1.993E+03	2.987E+06	2.007E+02
2014	7.312E+03	5.855E+06	3.934E+02	1.953E+03	2.927E+06	1.967E+02
2015	7.167E+03	5.739E+06	3.856E+02	1.914E+03	2.870E+06	1.928E+02
2016	7.025E+03	5.625E+06	3.780E+02	1.876E+03	2.813E+06	1.890E+02
2017	6.886E+03	5.514E+06	3.705E+02	1.839E+03	2.757E+06	1.852E+02
2018	6.750E+03	5.405E+06	3.631E+02	1.803E+03	2.702E+06	1.816E+02
2019	6.616E+03	5.298E+06	3.560E+02	1.767E+03	2.649E+06	1.780E+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)
2020	6.485E+03	5.193E+06	3.489E+02	1.732E+03	2.596E+06	1.745E+02
2021	6.357E+03	5.090E+06	3.420E+02	1.698E+03	2.545E+06	1.710E+02
2022	6.231E+03	4.989E+06	3.352E+02	1.664E+03	2.495E+06	1.676E+02
2023	6.107E+03	4.890E+06	3.286E+02	1.631E+03	2.445E+06	1.643E+02
2024	5.986E+03	4.794E+06	3.221E+02	1.599E+03	2.397E+06	1.610E+02
2025	5.868E+03	4.699E+06	3.157E+02	1.567E+03	2.349E+06	1.579E+02
2026	5.752E+03	4.606E+06	3.095E+02	1.536E+03	2.303E+06	1.547E+02
2027	5.638E+03	4.514E+06	3.033E+02	1.506E+03	2.257E+06	1.517E+02
2028	5.526E+03	4.425E+06	2.973E+02	1.476E+03	2.213E+06	1.487E+02
2029	5.417E+03	4.337E+06	2.914E+02	1.447E+03	2.169E+06	1.457E+02
2030	5.309E+03	4.252E+06	2.857E+02	1.418E+03	2.126E+06	1.428E+02
2031	5.204E+03	4.167E+06	2.800E+02	1.390E+03	2.084E+06	1.400E+02
2032	5.101E+03	4.085E+06	2.745E+02	1.363E+03	2.042E+06	1.372E+02
2033	5.000E+03	4.004E+06	2.690E+02	1.336E+03	2.002E+06	1.345E+02
2034	4.901E+03	3.925E+06	2.637E+02	1.309E+03	1.962E+06	1.318E+02
2035	4.804E+03	3.847E+06	2.585E+02	1.283E+03	1.923E+06	1.292E+02
2036	4.709E+03	3.771E+06	2.534E+02	1.258E+03	1.885E+06	1.267E+02
2037	4.616E+03	3.696E+06	2.483E+02	1.233E+03	1.848E+06	1.242E+02
2038	4.524E+03	3.623E+06	2.434E+02	1.209E+03	1.811E+06	1.217E+02
2039	4.435E+03	3.551E+06	2.386E+02	1.185E+03	1.776E+06	1.193E+02
2040	4.347E+03	3.481E+06	2.339E+02	1.161E+03	1.740E+06	1.169E+02
2041	4.261E+03	3.412E+06	2.292E+02	1.138E+03	1.706E+06	1.146E+02
2042	4.177E+03	3.344E+06	2.247E+02	1.116E+03	1.672E+06	1.124E+02
2043	4.094E+03	3.278E+06	2.203E+02	1.094E+03	1.639E+06	1.101E+02
2044	4.013E+03	3.213E+06	2.159E+02	1.072E+03	1.607E+06	1.079E+02
2045	3.933E+03	3.150E+06	2.116E+02	1.051E+03	1.575E+06	1.058E+02
2046	3.855E+03	3.087E+06	2.074E+02	1.030E+03	1.544E+06	1.037E+02
2047	3.779E+03	3.026E+06	2.033E+02	1.009E+03	1.513E+06	1.017E+02
2048	3.704E+03	2.966E+06	1.993E+02	9.895E+02	1.483E+06	9.965E+01
2049	3.631E+03	2.907E+06	1.954E+02	9.699E+02	1.454E+06	9.768E+01
2050	3.559E+03	2.850E+06	1.915E+02	9.507E+02	1.425E+06	9.574E+01
2051	3.489E+03	2.793E+06	1.877E+02	9.318E+02	1.397E+06	9.385E+01
2052	3.419E+03	2.738E+06	1.840E+02	9.134E+02	1.369E+06	9.199E+01
2053	3.352E+03	2.684E+06	1.803E+02	8.953E+02	1.342E+06	9.017E+01
2054	3.285E+03	2.631E+06	1.768E+02	8.776E+02	1.315E+06	8.838E+01
2055	3.220E+03	2.579E+06	1.733E+02	8.602E+02	1.289E+06	8.663E+01
2056	3.157E+03	2.528E+06	1.698E+02	8.432E+02	1.264E+06	8.492E+01
2057	3.094E+03	2.478E+06	1.665E+02	8.265E+02	1.239E+06	8.323E+01
2058	3.033E+03	2.429E+06	1.632E+02	8.101E+02	1.214E+06	8.159E+01
2059	2.973E+03	2.380E+06	1.599E+02	7.941E+02	1.190E+06	7.997E+01
2060	2.914E+03	2.333E+06	1.568E+02	7.783E+02	1.167E+06	7.839E+01
2061	2.856E+03	2.287E+06	1.537E+02	7.629E+02	1.144E+06	7.684E+01
2062	2.800E+03	2.242E+06	1.506E+02	7.478E+02	1.121E+06	7.531E+01
2063	2.744E+03	2.197E+06	1.476E+02	7.330E+02	1.099E+06	7.382E+01
2064	2.690E+03	2.154E+06	1.447E+02	7.185E+02	1.077E+06	7.236E+01
2065	2.637E+03	2.111E+06	1.419E+02	7.043E+02	1.056E+06	7.093E+01
2066	2.584E+03	2.069E+06	1.390E+02	6.903E+02	1.035E+06	6.952E+01
2067	2.533E+03	2.028E+06	1.363E+02	6.766E+02	1.014E+06	6.815E+01
2068	2.483E+03	1.988E+06	1.336E+02	6.633E+02	9.942E+05	6.680E+01
2069	2.434E+03	1.949E+06	1.309E+02	6.501E+02	9.745E+05	6.547E+01
2070	2.386E+03	1.910E+06	1.284E+02	6.372E+02	9.552E+05	6.418E+01

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)*
2071	2.338E+03	1.873E+06	1.258E+02	6.246E+02	9.363E+05	6.291E+01
2072	2.292E+03	1.835E+06	1.233E+02	6.123E+02	9.177E+05	6.166E+01
2073	2.247E+03	1.799E+06	1.209E+02	6.001E+02	8.996E+05	6.044E+01
2074	2.202E+03	1.763E+06	1.185E+02	5.883E+02	8.817E+05	5.924E+01
2075	2.159E+03	1.729E+06	1.161E+02	5.766E+02	8.643E+05	5.807E+01
2076	2.116E+03	1.694E+06	1.138E+02	5.652E+02	8.472E+05	5.692E+01
2077	2.074E+03	1.661E+06	1.116E+02	5.540E+02	8.304E+05	5.579E+01
2078	2.033E+03	1.628E+06	1.094E+02	5.430E+02	8.139E+05	5.469E+01
2079	1.993E+03	1.596E+06	1.072E+02	5.323E+02	7.978E+05	5.361E+01
2080	1.953E+03	1.564E+06	1.051E+02	5.217E+02	7.820E+05	5.254E+01
2081	1.915E+03	1.533E+06	1.030E+02	5.114E+02	7.665E+05	5.150E+01
2082	1.877E+03	1.503E+06	1.010E+02	5.013E+02	7.514E+05	5.048E+01
2083	1.839E+03	1.473E+06	9.897E+01	4.913E+02	7.365E+05	4.948E+01
2084	1.803E+03	1.444E+06	9.701E+01	4.816E+02	7.219E+05	4.850E+01
2085	1.767E+03	1.415E+06	9.509E+01	4.721E+02	7.076E+05	4.754E+01
2086	1.732E+03	1.387E+06	9.321E+01	4.627E+02	6.936E+05	4.660E+01
2087	1.698E+03	1.360E+06	9.136E+01	4.536E+02	6.799E+05	4.568E+01
2088	1.664E+03	1.333E+06	8.955E+01	4.446E+02	6.664E+05	4.478E+01
2089	1.631E+03	1.306E+06	8.778E+01	4.358E+02	6.532E+05	4.389E+01
2090	1.599E+03	1.281E+06	8.604E+01	4.272E+02	6.403E+05	4.302E+01
2091	1.568E+03	1.255E+06	8.434E+01	4.187E+02	6.276E+05	4.217E+01
2092	1.536E+03	1.230E+06	8.267E+01	4.104E+02	6.152E+05	4.133E+01
2093	1.506E+03	1.206E+06	8.103E+01	4.023E+02	6.030E+05	4.051E+01
2094	1.476E+03	1.182E+06	7.942E+01	3.943E+02	5.910E+05	3.971E+01
2095	1.447E+03	1.159E+06	7.785E+01	3.865E+02	5.793E+05	3.893E+01
2096	1.418E+03	1.136E+06	7.631E+01	3.789E+02	5.679E+05	3.816E+01
2097	1.390E+03	1.113E+06	7.480E+01	3.714E+02	5.566E+05	3.740E+01
2098	1.363E+03	1.091E+06	7.332E+01	3.640E+02	5.456E+05	3.666E+01
2099	1.336E+03	1.070E+06	7.187E+01	3.568E+02	5.348E+05	3.593E+01
2100	1.309E+03	1.048E+06	7.044E+01	3.497E+02	5.242E+05	3.522E+01
2101	1.283E+03	1.028E+06	6.905E+01	3.428E+02	5.138E+05	3.452E+01
2102	1.258E+03	1.007E+06	6.768E+01	3.360E+02	5.037E+05	3.384E+01
2103	1.233E+03	9.874E+05	6.634E+01	3.294E+02	4.937E+05	3.317E+01
2104	1.209E+03	9.678E+05	6.503E+01	3.228E+02	4.839E+05	3.251E+01
2105	1.185E+03	9.487E+05	6.374E+01	3.164E+02	4.743E+05	3.187E+01
2106	1.161E+03	9.299E+05	6.248E+01	3.102E+02	4.649E+05	3.124E+01
2107	1.138E+03	9.115E+05	6.124E+01	3.040E+02	4.557E+05	3.062E+01
2108	1.116E+03	8.934E+05	6.003E+01	2.980E+02	4.467E+05	3.001E+01
2109	1.094E+03	8.757E+05	5.884E+01	2.921E+02	4.379E+05	2.942E+01
2110	1.072E+03	8.584E+05	5.767E+01	2.863E+02	4.292E+05	2.884E+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)*
1970	0	0	0	0	0	0
1971	4.901E+02	2.677E+05	1.799E+01	7.678E+00	2.142E+03	1.439E-01
1972	9.705E+02	5.302E+05	3.562E+01	1.520E+01	4.242E+03	2.850E-01
1973	1.441E+03	7.874E+05	5.291E+01	2.258E+01	6.300E+03	4.233E-01
1974	1.903E+03	1.040E+06	6.985E+01	2.981E+01	8.317E+03	5.588E-01
1975	2.355E+03	1.287E+06	8.646E+01	3.690E+01	1.029E+04	6.917E-01
1976	2.799E+03	1.529E+06	1.027E+02	4.385E+01	1.223E+04	8.219E-01
1977	3.234E+03	1.767E+06	1.187E+02	5.066E+01	1.413E+04	9.495E-01
1978	3.660E+03	1.999E+06	1.343E+02	5.733E+01	1.599E+04	1.075E+00
1979	4.077E+03	2.227E+06	1.497E+02	6.387E+01	1.782E+04	1.197E+00
1980	4.487E+03	2.451E+06	1.647E+02	7.029E+01	1.961E+04	1.318E+00
1981	4.888E+03	2.670E+06	1.794E+02	7.657E+01	2.136E+04	1.435E+00
1982	5.281E+03	2.885E+06	1.939E+02	8.273E+01	2.308E+04	1.551E+00
1983	5.667E+03	3.096E+06	2.080E+02	8.877E+01	2.477E+04	1.664E+00
1984	6.045E+03	3.302E+06	2.219E+02	9.469E+01	2.642E+04	1.775E+00
1985	6.415E+03	3.505E+06	2.355E+02	1.005E+02	2.804E+04	1.884E+00
1986	6.778E+03	3.703E+06	2.488E+02	1.062E+02	2.962E+04	1.990E+00
1987	7.134E+03	3.897E+06	2.619E+02	1.118E+02	3.118E+04	2.095E+00
1988	7.483E+03	4.088E+06	2.747E+02	1.172E+02	3.270E+04	2.197E+00
1989	7.825E+03	4.275E+06	2.872E+02	1.226E+02	3.420E+04	2.298E+00
1990	8.160E+03	4.458E+06	2.995E+02	1.278E+02	3.566E+04	2.396E+00
1991	8.489E+03	4.637E+06	3.116E+02	1.330E+02	3.710E+04	2.493E+00
1992	8.321E+03	4.546E+06	3.054E+02	1.303E+02	3.636E+04	2.443E+00
1993	8.156E+03	4.456E+06	2.994E+02	1.278E+02	3.564E+04	2.395E+00
1994	7.994E+03	4.367E+06	2.934E+02	1.252E+02	3.494E+04	2.347E+00
1995	7.836E+03	4.281E+06	2.876E+02	1.228E+02	3.425E+04	2.301E+00
1996	7.681E+03	4.196E+06	2.819E+02	1.203E+02	3.357E+04	2.255E+00
1997	7.529E+03	4.113E+06	2.763E+02	1.179E+02	3.290E+04	2.211E+00
1998	7.380E+03	4.032E+06	2.709E+02	1.156E+02	3.225E+04	2.167E+00
1999	7.234E+03	3.952E+06	2.655E+02	1.133E+02	3.161E+04	2.124E+00
2000	7.090E+03	3.873E+06	2.603E+02	1.111E+02	3.099E+04	2.082E+00
2001	6.950E+03	3.797E+06	2.551E+02	1.089E+02	3.037E+04	2.041E+00
2002	6.812E+03	3.722E+06	2.501E+02	1.067E+02	2.977E+04	2.000E+00
2003	6.677E+03	3.648E+06	2.451E+02	1.046E+02	2.918E+04	1.961E+00
2004	6.545E+03	3.576E+06	2.402E+02	1.025E+02	2.861E+04	1.922E+00
2005	6.416E+03	3.505E+06	2.355E+02	1.005E+02	2.804E+04	1.884E+00
2006	6.289E+03	3.435E+06	2.308E+02	9.851E+01	2.748E+04	1.847E+00
2007	6.164E+03	3.367E+06	2.263E+02	9.656E+01	2.694E+04	1.810E+00
2008	6.042E+03	3.301E+06	2.218E+02	9.465E+01	2.641E+04	1.774E+00
2009	5.922E+03	3.235E+06	2.174E+02	9.278E+01	2.588E+04	1.739E+00
2010	5.805E+03	3.171E+06	2.131E+02	9.094E+01	2.537E+04	1.705E+00
2011	5.690E+03	3.109E+06	2.089E+02	8.914E+01	2.487E+04	1.671E+00
2012	5.577E+03	3.047E+06	2.047E+02	8.737E+01	2.438E+04	1.638E+00
2013	5.467E+03	2.987E+06	2.007E+02	8.564E+01	2.389E+04	1.605E+00
2014	5.359E+03	2.927E+06	1.967E+02	8.395E+01	2.342E+04	1.574E+00
2015	5.253E+03	2.870E+06	1.928E+02	8.229E+01	2.296E+04	1.542E+00
2016	5.149E+03	2.813E+06	1.890E+02	8.066E+01	2.250E+04	1.512E+00
2017	5.047E+03	2.757E+06	1.852E+02	7.906E+01	2.206E+04	1.482E+00
2018	4.947E+03	2.702E+06	1.816E+02	7.749E+01	2.162E+04	1.453E+00
2019	4.849E+03	2.649E+06	1.780E+02	7.596E+01	2.119E+04	1.424E+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)*
2020	4.753E+03	2.596E+06	1.745E+02	7.445E+01	2.077E+04	1.396E+00
2021	4.659E+03	2.545E+06	1.710E+02	7.298E+01	2.036E+04	1.368E+00
2022	4.566E+03	2.495E+06	1.676E+02	7.154E+01	1.996E+04	1.341E+00
2023	4.476E+03	2.445E+06	1.643E+02	7.012E+01	1.956E+04	1.314E+00
2024	4.387E+03	2.397E+06	1.610E+02	6.873E+01	1.917E+04	1.288E+00
2025	4.300E+03	2.349E+06	1.579E+02	6.737E+01	1.879E+04	1.263E+00
2026	4.215E+03	2.303E+06	1.547E+02	6.604E+01	1.842E+04	1.238E+00
2027	4.132E+03	2.257E+06	1.517E+02	6.473E+01	1.806E+04	1.213E+00
2028	4.050E+03	2.213E+06	1.487E+02	6.345E+01	1.770E+04	1.189E+00
2029	3.970E+03	2.169E+06	1.457E+02	6.219E+01	1.735E+04	1.166E+00
2030	3.891E+03	2.126E+06	1.428E+02	6.096E+01	1.701E+04	1.143E+00
2031	3.814E+03	2.084E+06	1.400E+02	5.975E+01	1.667E+04	1.120E+00
2032	3.739E+03	2.042E+06	1.372E+02	5.857E+01	1.634E+04	1.098E+00
2033	3.665E+03	2.002E+06	1.345E+02	5.741E+01	1.602E+04	1.076E+00
2034	3.592E+03	1.962E+06	1.318E+02	5.627E+01	1.570E+04	1.055E+00
2035	3.521E+03	1.923E+06	1.292E+02	5.516E+01	1.539E+04	1.034E+00
2036	3.451E+03	1.885E+06	1.267E+02	5.407E+01	1.508E+04	1.013E+00
2037	3.383E+03	1.848E+06	1.242E+02	5.299E+01	1.478E+04	9.934E-01
2038	3.316E+03	1.811E+06	1.217E+02	5.195E+01	1.449E+04	9.737E-01
2039	3.250E+03	1.776E+06	1.193E+02	5.092E+01	1.420E+04	9.544E-01
2040	3.186E+03	1.740E+06	1.169E+02	4.991E+01	1.392E+04	9.355E-01
2041	3.123E+03	1.706E+06	1.146E+02	4.892E+01	1.365E+04	9.170E-01
2042	3.061E+03	1.672E+06	1.124E+02	4.795E+01	1.338E+04	8.988E-01
2043	3.000E+03	1.639E+06	1.101E+02	4.700E+01	1.311E+04	8.810E-01
2044	2.941E+03	1.607E+06	1.079E+02	4.607E+01	1.285E+04	8.636E-01
2045	2.883E+03	1.575E+06	1.058E+02	4.516E+01	1.260E+04	8.465E-01
2046	2.826E+03	1.544E+06	1.037E+02	4.426E+01	1.235E+04	8.297E-01
2047	2.770E+03	1.513E+06	1.017E+02	4.339E+01	1.210E+04	8.133E-01
2048	2.715E+03	1.483E+06	9.965E+01	4.253E+01	1.186E+04	7.972E-01
2049	2.661E+03	1.454E+06	9.768E+01	4.169E+01	1.163E+04	7.814E-01
2050	2.608E+03	1.425E+06	9.574E+01	4.086E+01	1.140E+04	7.659E-01
2051	2.557E+03	1.397E+06	9.385E+01	4.005E+01	1.117E+04	7.508E-01
2052	2.506E+03	1.369E+06	9.199E+01	3.926E+01	1.095E+04	7.359E-01
2053	2.456E+03	1.342E+06	9.017E+01	3.848E+01	1.074E+04	7.213E-01
2054	2.408E+03	1.315E+06	8.838E+01	3.772E+01	1.052E+04	7.071E-01
2055	2.360E+03	1.289E+06	8.663E+01	3.697E+01	1.031E+04	6.931E-01
2056	2.313E+03	1.264E+06	8.492E+01	3.624E+01	1.011E+04	6.793E-01
2057	2.268E+03	1.239E+06	8.323E+01	3.552E+01	9.910E+03	6.659E-01
2058	2.223E+03	1.214E+06	8.159E+01	3.482E+01	9.714E+03	6.527E-01
2059	2.179E+03	1.190E+06	7.997E+01	3.413E+01	9.522E+03	6.398E-01
2060	2.136E+03	1.167E+06	7.839E+01	3.345E+01	9.333E+03	6.271E-01
2061	2.093E+03	1.144E+06	7.684E+01	3.279E+01	9.148E+03	6.147E-01
2062	2.052E+03	1.121E+06	7.531E+01	3.214E+01	8.967E+03	6.025E-01
2063	2.011E+03	1.099E+06	7.382E+01	3.151E+01	8.790E+03	5.906E-01
2064	1.971E+03	1.077E+06	7.236E+01	3.088E+01	8.616E+03	5.789E-01
2065	1.932E+03	1.056E+06	7.093E+01	3.027E+01	8.445E+03	5.674E-01
2066	1.894E+03	1.035E+06	6.952E+01	2.967E+01	8.278E+03	5.562E-01
2067	1.857E+03	1.014E+06	6.815E+01	2.908E+01	8.114E+03	5.452E-01
2068	1.820E+03	9.942E+05	6.680E+01	2.851E+01	7.953E+03	5.344E-01
2069	1.784E+03	9.745E+05	6.547E+01	2.794E+01	7.796E+03	5.238E-01
2070	1.748E+03	9.552E+05	6.418E+01	2.739E+01	7.641E+03	5.134E-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)*
2071	1.714E+03	9.363E+05	6.291E+01	2.685E+01	7.490E+03	5.033E-01
2072	1.680E+03	9.177E+05	6.166E+01	2.632E+01	7.342E+03	4.933E-01
2073	1.647E+03	8.996E+05	6.044E+01	2.580E+01	7.196E+03	4.835E-01
2074	1.614E+03	8.817E+05	5.924E+01	2.528E+01	7.054E+03	4.740E-01
2075	1.582E+03	8.643E+05	5.807E+01	2.478E+01	6.914E+03	4.646E-01
2076	1.551E+03	8.472E+05	5.692E+01	2.429E+01	6.777E+03	4.554E-01
2077	1.520E+03	8.304E+05	5.579E+01	2.381E+01	6.643E+03	4.464E-01
2078	1.490E+03	8.139E+05	5.469E+01	2.334E+01	6.512E+03	4.375E-01
2079	1.460E+03	7.978E+05	5.361E+01	2.288E+01	6.383E+03	4.288E-01
2080	1.432E+03	7.820E+05	5.254E+01	2.243E+01	6.256E+03	4.204E-01
2081	1.403E+03	7.665E+05	5.150E+01	2.198E+01	6.132E+03	4.120E-01
2082	1.375E+03	7.514E+05	5.048E+01	2.155E+01	6.011E+03	4.039E-01
2083	1.348E+03	7.365E+05	4.948E+01	2.112E+01	5.892E+03	3.959E-01
2084	1.321E+03	7.219E+05	4.850E+01	2.070E+01	5.775E+03	3.880E-01
2085	1.295E+03	7.076E+05	4.754E+01	2.029E+01	5.661E+03	3.804E-01
2086	1.270E+03	6.936E+05	4.660E+01	1.989E+01	5.549E+03	3.728E-01
2087	1.244E+03	6.799E+05	4.568E+01	1.950E+01	5.439E+03	3.654E-01
2088	1.220E+03	6.664E+05	4.478E+01	1.911E+01	5.331E+03	3.582E-01
2089	1.196E+03	6.532E+05	4.389E+01	1.873E+01	5.226E+03	3.511E-01
2090	1.172E+03	6.403E+05	4.302E+01	1.836E+01	5.122E+03	3.442E-01
2091	1.149E+03	6.276E+05	4.217E+01	1.800E+01	5.021E+03	3.373E-01
2092	1.126E+03	6.152E+05	4.133E+01	1.764E+01	4.921E+03	3.307E-01
2093	1.104E+03	6.030E+05	4.051E+01	1.729E+01	4.824E+03	3.241E-01
2094	1.082E+03	5.910E+05	3.971E+01	1.695E+01	4.728E+03	3.177E-01
2095	1.060E+03	5.793E+05	3.893E+01	1.661E+01	4.635E+03	3.114E-01
2096	1.039E+03	5.679E+05	3.816E+01	1.628E+01	4.543E+03	3.052E-01
2097	1.019E+03	5.566E+05	3.740E+01	1.596E+01	4.453E+03	2.992E-01
2098	9.987E+02	5.456E+05	3.666E+01	1.565E+01	4.365E+03	2.933E-01
2099	9.790E+02	5.348E+05	3.593E+01	1.534E+01	4.278E+03	2.875E-01
2100	9.596E+02	5.242E+05	3.522E+01	1.503E+01	4.194E+03	2.818E-01
2101	9.406E+02	5.138E+05	3.452E+01	1.473E+01	4.111E+03	2.762E-01
2102	9.219E+02	5.037E+05	3.384E+01	1.444E+01	4.029E+03	2.707E-01
2103	9.037E+02	4.937E+05	3.317E+01	1.416E+01	3.949E+03	2.654E-01
2104	8.858E+02	4.839E+05	3.251E+01	1.388E+01	3.871E+03	2.601E-01
2105	8.683E+02	4.743E+05	3.187E+01	1.360E+01	3.795E+03	2.550E-01
2106	8.511E+02	4.649E+05	3.124E+01	1.333E+01	3.719E+03	2.499E-01
2107	8.342E+02	4.557E+05	3.062E+01	1.307E+01	3.646E+03	2.450E-01
2108	8.177E+02	4.467E+05	3.001E+01	1.281E+01	3.574E+03	2.401E-01
2109	8.015E+02	4.379E+05	2.942E+01	1.256E+01	3.503E+03	2.354E-01
2110	7.856E+02	4.292E+05	2.884E+01	1.231E+01	3.434E+03	2.307E-01

Confirmational Sampling Results and Analysis

Vent 1

			Reported Concentration (µg/m³)							Standard Comparison Check		
Toxic Air Pollutants (TAPs)	CAS Number	ASIL (µg/m³)	Reported Concentration (µg/m³)	Averaging Period	Hours/Averaging Period	Flow Volume per Averaging Period (scf)	Small Quantity Emission Rate (SQER) (lbs/averaging period)	De Minimis Rate (lbs/averaging period)	Loading Rates (lbs/averaging period)	Loading Rates (lbs/hour)	Loading < SQER?	Loading < De Minimis?
1,1,1-Trichloroethane (methyl chloroform)	71-55-6	5000	43.7	24-hr	24	160896	370.0	19.000	0.0004389	0.0000183	YES	YES
1,1,2,2-Tetrachloroethane	79-34-5	0.017	41.2	year	8760	58727040	2.8	0.140	0.1510475	0.0000172	YES	NO
1,1,2-Trichloroethane (vinyl trichloride)	79-00-5	0.063	54.6	year	8760	58727040	10.0	0.510	0.2001746	0.0000229	YES	YES
1,1-Dichloroethane (ethylidene dichloride)	75-34-3	0.63	30.3	year	8760	58727040	100.0	5.100	0.1110859	0.0000127	YES	YES
1,1-Dichloroethylene (1,1-DCE)	75-35-4	200	31.7	24-hr	24	160896	15.0	0.740	0.0003184	0.0000133	YES	YES
1,2,4-Trimethylbenzene	95-63-6	60	753	24-hr	24	160896	4.4	0.220	0.0075634	0.0003151	YES	YES
Ethylene dibromide (EDB, 1,2-dibromoethane)	106-93-4	0.0017	30.7	year	8760	58727040	0.3	0.014	0.1125524	0.0000128	YES	NO
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	0.038	16.2	year	8760	58727040	6.2	0.310	0.0593925	0.0000068	YES	YES
1,2-Dichloropropane (propylene dichloride)	78-87-5	0.1	46.2	year	8760	58727040	16.0	0.810	0.1693785	0.0000193	YES	YES
1,3,5-Trimethylbenzene	108-67-8	60	192	24-hr	24	160896	4.4	0.220	0.0019285	0.0000804	YES	YES
1,3-Butadiene (Vinyl ethylene)	106-99-0	0.033	22.1	year	8760	58727040	5.4	0.270	0.0810231	0.0000092	YES	YES
1,4-Dichlorobenzene	106-46-7	0.091	625	year	8760	58727040	15.0	0.740	2.2913760	0.0002616	YES	NO
1,4-Dioxane (1,4-Diethylene dioxide)	123-91-1	0.2	31.7	year	8760	58727040	32.0	1.600	0.1162186	0.0000133	YES	YES
Methyl ethyl ketone (2-Butanone)	78-93-3	5000	59	24-hr	24	160896	370.0	19.000	0.0005926	0.0000247	YES	YES
2-Hexanone (Methyl butyl ketone)	591-78-6	30	81.9	24-hr	24	160896	2.2	0.110	0.0008226	0.0000343	YES	YES
Isopropyl alcohol	67-63-0	3200	49.2	1-hr	1	6704	5.9	0.300	0.0000206	0.0000206	YES	YES
4-Methyl-2-pentanone (Methyl isobutyl ketone)(MIBK)	108-10-1	3000	81.9	24-hr	24	160896	220.0	11.000	0.0008226	0.0000343	YES	YES
Acrolein	107-02-8	0.35	5.73	24-hr	24	160896	0.0	0.001	0.0000576	0.0000024	YES	YES
Benzene	71-43-2	0.13	372	year	8760	58727040	21.0	1.000	1.3638270	0.0001557	YES	NO
Benzyl chloride	100-44-7	0.02	92.4	year	8760	58727040	3.3	0.170	0.3387570	0.0000387	YES	NO
Tribromomethane (Bromoform)	75-25-2	0.91	41.4	year	8760	58727040	150.0	7.400	0.1517807	0.0000173	YES	YES
Bromomethane (methyl bromide)	74-83-9	5	38.8	24-hr	24	160896	0.4	0.019	0.0003897	0.0000162	YES	YES
Carbon disulfide	75-15-0	800	217	24-hr	24	160896	59.0	3.000	0.0021796	0.0000908	YES	YES
Carbon tetrachloride	56-23-5	0.17	8.27	year	8760	58727040	27.0	1.400	0.0303195	0.0000035	YES	YES
Chlorobenzene	108-90-7	1000	651	24-hr	24	160896	74.0	3.700	0.0065389	0.0002725	YES	YES
Chloroethane (ethyl chloride)	75-00-3	30000	2510	24-hr	24	160896	2200.0	110.000	0.0252114	0.0010505	YES	YES
Chloroform	67-66-3	0.043	19.5	year	8760	58727040	7.1	0.350	0.0714909	0.0000082	YES	YES
Chloromethane (methyl chloride)	74-87-3	90	131	24-hr	24	160896	6.7	0.330	0.0013158	0.0000548	YES	YES
Cyclohexane	110-82-7	6000	319	24-hr	24	160896	440.0	22.000	0.0032042	0.0001335	YES	YES
Ethyl benzene	100-41-4	0.4	4080	year	8760	58727040	65.0	3.200	14.9581022	0.0017075	YES	NO
1,1,2,3,4,4-Hexachloro-1,3-butadiene(Hexachlorobutadiene)	87-68-3	0.045	213	year	8760	58727040	7.4	0.370	0.7809009	0.0000891	YES	NO
m-Xylene	108-38-3	220	740	24-hr	24	160896	16.0	0.820	0.0074328	0.0003097	YES	YES
p-Xylene	106-42-3	220	740	24-hr	24	160896	16.0	0.820	0.0074328	0.0003097	YES	YES
Methyl methacrylate	80-62-6	700	32.8	24-hr	24	160896	52.0	2.600	0.0003295	0.0000137	YES	YES
Dichloromethane	75-09-2	60	139	year	8760	58727040	9800.0	490.000	0.5096020	0.0000582	YES	YES
Naphthalene	91-20-3	0.029	305	year	8760	58727040	4.8	0.240	1.1181915	0.0001276	YES	NO
n-Hexane	110-54-3	700	1400	24-hr	24	160896	52.0	2.600	0.0140621	0.0005859	YES	YES
o-Xylene	95-47-6	220	388	24-hr	24	160896	16.0	0.820	0.0038972	0.0001624	YES	YES
Propylene	115-07-1	3000	25100	24-hr	24	160896	220.0	11.000	0.2521141	0.0105048	YES	YES
Styrene (Vinylbenzene)	100-42-5	870	34.1	24-hr	24	160896	65.0	3.200	0.0003425	0.0000143	YES	YES
Methyl tert-butyl ether (MTBE)	1634-04-4	3.8	28.8	year	8760	58727040	620.0	31.000	0.1055866	0.0000121	YES	YES
Tetrachloroethylene (Perchloroethylene)	127-18-4	0.16	144	year	8760	58727040	27.0	1.300	0.5279330	0.0000603	YES	YES
Tetrahydrofuran (Diethylene oxide)	109-99-9	2000	378	24-hr	24	160896	150.0	7.400	0.0037968	0.0001582	YES	YES
Toluene	108-88-3	5000	885	24-hr	24	160896	370.0	19.000	0.0088893	0.0003704	YES	YES
trans-1,2-Dichloroethene	156-60-5	810	15.9	24-hr	24	160896	60.0	3.000	0.0001597	0.0000067	YES	YES
Trichloroethylene (Trichloroethene) (TCE)	79-01-6	0.21	88.8	year	8760	58727040	34.0	1.700	0.3255587	0.0000372	YES	YES
Sigma-Aldrich Vinyl acetate	108-05-4	200	70.4	24-hr	24	160896	15.0	0.740	0.0007071	0.0000295	YES	YES
Vinyl chloride	75-01-4	0.11	497	year	8760	58727040	18.0	0.920	1.8221022	0.0002080	YES	NO

title	**Enter Title**	**Vent 1**
emission_rate	**Emmision rate (lb/hr):**	**0.875847331**
units	**English or Metric Units?**	*English**
source_type	**FLARE, POINTCAP,or POINTHOR Source?**	*Point**
stack_height	**Stack Height (ft):**	**10**
stack_diameter	**stack diameter (in)**	**6**
stack_temp	**Stack Temp (F):**	*0*
exit_type	**Option for Flow Rate or Exit Velocity**	*Flow Rate (AFCM)**
exit_rate	**Exit Flow Rate (ACFM):**	**111.7333333**
urban_rural	**Rural or Urban:**	*Rural**
dist_amb_air	**Distance to ambient air(ft):**	**90**
incl_NO2	**Include NO2 Chemistry option:**	*No chemistry or pollutant is not NO_2**
incl_bldg_downwash	**Include Building downwash:**	*No*
incl_terrain_height	**Include Terrain Heights:**	*No*
max_dist_to_probe	**Max Distance to Probe (M):**	**187.44**
incl_disrete_receptors	**Include up to 10 discrete receptors:**	*Yes*
receptors_file	**Path to receptors file**	*receptors.txt*
incl_flagpole_receptors	**Use flagpole receptors:**	**No**
source_elev	**Source Elevation (FT):**	*0*
temp_min	**Min Temp (F):**	**5**
temp_max	**Max Temp (F):**	**90**
wind_speed_min	**Min Wind Speed(m/s):**	**0.5**
wind_height	**Anemometer Height(M):**	**10**
surface_chars	**Surface Characteristics Option:**	*AERMET seasonal tables**
dominant_surface	**dominant surface profile:**	*Grassland**
dominant_climate	**Dominant climate profile:**	*Dry Conditions**
adjust_u	**Adjust u:**	*No*
debug	**Debug:**	*No*

Toxic Air Pollutants (TAPs)	CAS Number	Modeled Concentration (ug/m^3)	Methane %	Distance from Vent (ft)
Methane	74-82-8	1.40E+03	0.014%	89.99
Methane	74-82-8	1.00E+03	0.010%	164.04
Methane	74-82-8	9.61E+02	0.010%	179.99
Methane	74-82-8	8.18E+02	0.008%	246.06
Methane	74-82-8	8.09E+02	0.008%	250.00
Methane	74-82-8	6.87E+02	0.007%	328.08
Methane	74-82-8	6.44E+02	0.006%	400.00
Methane	74-82-8	6.36E+02	0.006%	410.11
Methane	74-82-8	5.78E+02	0.006%	492.13
Methane	74-82-8	5.74E+02	0.006%	500.00
Methane	74-82-8	5.30E+02	0.005%	574.15
Methane	74-82-8	4.81E+02	0.005%	656.17

Appendix D

Landfill Gas Compliance Monitoring Probe Logs

HERRERA
Science + Planning + Design

DEPARTMENT OF ECOLOGY
State of Washington

Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:
- [x] Construction
- [ ] Decommission ⇨ Original NOI No. _____

Ecology Well ID Tag No. BPE-872
Site Well Name LFB-24-04
Consulting Firm HERRERA
Was a variance approved for this well/boring? ☐ Yes ☒ No
If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

☒ Driller ☐ Trainee ☐ Engineer
Name (Print Last, First Name) Rider, Dan
Driller/Engineer/Trainee Signature *Dan Rider*
License No. 3223
Company Name Anderson Environmental Contracting LLC

If trainee box is checked, sponsor's license number: _____
Sponsor's signature _____

Notice of Intent No. RE25910
Type of Well:
- [x] Resource Protection Well
- [ ] Remediation Well
- [ ] Geotechnical Soil Boring
- [ ] Environmental Boring
- [ ] Injection Point
- [ ] Grounding Well
- [ ] Ground Source Heat Pump
- [ ] Other _____

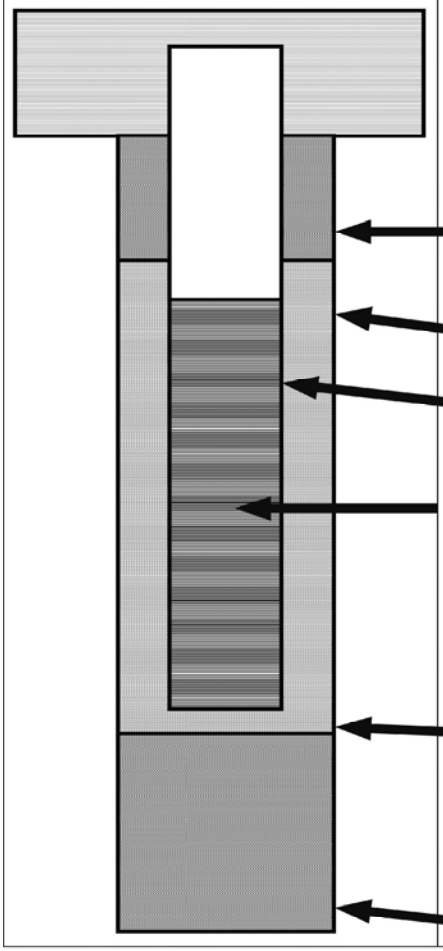
↳ ☐ Soil- ☒ Vapor- ☐ Water-sampling

Property Owner MARSHALL PROPERTIES
Well Street Address UNASSIGNED ADDRESS
City CHENEY County SPOKANE
Tax Parcel No. 24213.9009

Location (see instructions): WWM ☐ or EWM ☒
NE ¼-¼ SW ¼, Section 21 Town 24N Range 42E
Latitude (Example: 47.12345) 47.555396
Longitude (Example: -120.12345) -117.512024
(WGS 84 Coordinate System)

Borehole diameter 8 inches Casing diameter 1 inches
Static water level DRY ft below top of casing Date _____
☒ Above-ground completion with bollards ☐ Flush monument
↳ Stick-up of top of well casing 3 ft above ground surface
Start Date 03/25/2024 Completed Date 03/25/2024

Construction/Design



Well Data

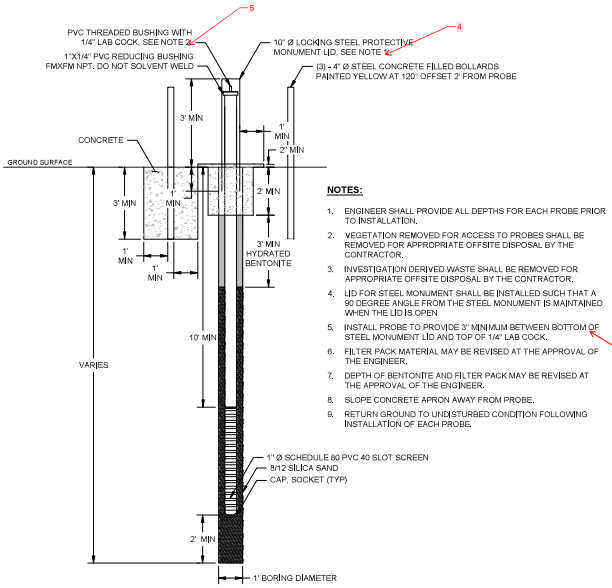
Concrete Surface Seal Depth	2'	FT
Blank Casing (dia x dep)	1" x 12'	
Material	SCHEDULE 40 PVC	
Backfill		FT
Type		
Seal	2' - 9'	FT
Gravel Pack	9' - 43'	FT
Material	SAND	
Screen (dia x dep)	1" x 30'	
Slot Size	.004	
Material	SCHEDULE 40 PVC	
Well Depth	42'	FT
Backfill		
Material		
Total Hole Depth	43'	FT

Formation Description

0' - 21': FT
GRAVELS, COBBLES, AND BROWN SOIL

21' - 43': FT
BEDROCK

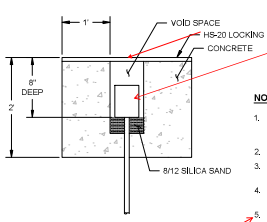
FT
PLEASE SEE ATTACHMENT



NOTES:

1. ENGINEER SHALL PROVIDE ALL DEPTHS FOR EACH PROBE PRIOR TO INSTALLATION.
2. VEGETATION REMOVED FOR ACCESS TO PROBES SHALL BE REMOVED FOR APPROPRIATE OFFSITE DISPOSAL BY THE CONTRACTOR.
3. INVESTIGATION DERIVED WASTE SHALL BE REMOVED FOR APPROPRIATE OFFSITE DISPOSAL BY THE CONTRACTOR.
4. LID FOR STEEL MONUMENT SHALL BE INSTALLED SUCH THAT A 90 DEGREE ANGLE FROM THE STEEL MONUMENT IS MAINTAINED WHEN THE LID IS OPEN
5. INSTALL PROBE TO PROVIDE 3" MINIMUM BETWEEN BOTTOM OF STEEL MONUMENT LID AND TOP OF 1/4" LAB COCK.
6. FILTER PACK MATERIAL MAY BE REVISED AT THE APPROVAL OF THE ENGINEER.
7. DEPTH OF BENTONITE AND FILTER PACK MAY BE REVISED AT THE APPROVAL OF THE ENGINEER.
8. SLOPE CONCRETE APRON AWAY FROM PROBE.
9. RETURN GROUND TO UNDISTURBED CONDITION FOLLOWING INSTALLATION OF EACH PROBE.

DETAIL - SURFACE MOUNTED LANDFILL GAS MONITORING PROBE (1 / -)
SCALE: NTS



SHOW TOP OF PROBE CONSISTENT WITH DETAIL 1 (PVC THREADED BUSHING, PVC REDUCING BUSHING)

NOTES:

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5. PROVIDE A MINIMUM OF 6" CLEAR SPACE BETWEEN TOP OF MONITORING PROBE AND BOTTOM OF LID.

3" FOR EACH

DETAIL - PLAN VIEW - FLUSH MOUNTED LANDFILL GAS MONITORING PROBE (2 / -)
SCALE: NTS

CALL 811 BEFORE YOU DIG

30% DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH AT FULL SIZE. IF NOT ONE INCH SCALE ACCORDINGLY.

HERRERA Science + Planning + Design herrerainc.com

DRAFT

DESIGNED: NB	DRAWN: MM
DESIGNED: JE	DRAWN: -
DESIGNED:	CHECKED:
SCALE: AS NOTED	APPROVED: MMS

MARSHALL LANDFILL
CLEANUP AND CLOSURE

LFG SYSTEM DETAILS

DATE: DECEMBER 2023
PROJECT NO: 21-07716-000
DRAWING NO: C2.40.01
SHEET NO: 20 OF 35

DEPARTMENT OF ECOLOGY
State of Washington

Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:
- [x] Construction
- [ ] Decommission ⇨ Original NOI No. _____

Ecology Well ID Tag No. BPE-873
Site Well Name LFB-24-05
Consulting Firm HERRERA
Was a variance approved for this well/boring? ☐ Yes ☒ No
If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

☒ Driller ☐ Trainee ☐ Engineer
Name (Print Last, First Name) Rider, Dan
Driller/Engineer/Trainee Signature *Dan Rider*
License No. 3223
Company Name Anderson Environmental Contracting LLC

If trainee box is checked, sponsor's license number: _____
Sponsor's signature _____

Notice of Intent No. RE25910

Type of Well:
- [x] Resource Protection Well
- [ ] Remediation Well
- [ ] Geotechnical Soil Boring
- [ ] Environmental Boring
- [ ] Injection Point
- [ ] Grounding Well
- [ ] Ground Source Heat Pump
- [ ] Other _____

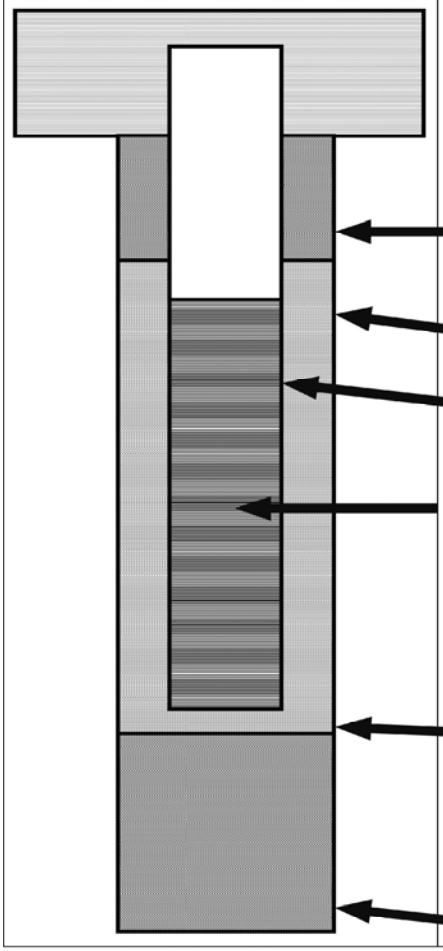
↳ ☐ Soil- ☒ Vapor- ☐ Water-sampling

Property Owner MARSHALL PROPERTIES
Well Street Address UNASSIGNED ADDRESS
City CHENEY County SPOKANE
Tax Parcel No. 24213.9009

Location (see instructions): WWM ☐ or EWM ☒
NE ¼-¼ SW ¼, Section 21 Town 24N Range 42E
Latitude (Example: 47.12345) 47.555071
Longitude (Example: -120.12345) -117.512475
(WGS 84 Coordinate System)

Borehole diameter 8 inches Casing diameter 1 inches
Static water level DRY ft below top of casing Date _____
☒ Above-ground completion with bollards ☐ Flush monument
↳ Stick-up of top of well casing 3 ft above ground surface
Start Date 03/26/2024 Completed Date 03/26/2024

Construction/Design



Well Data

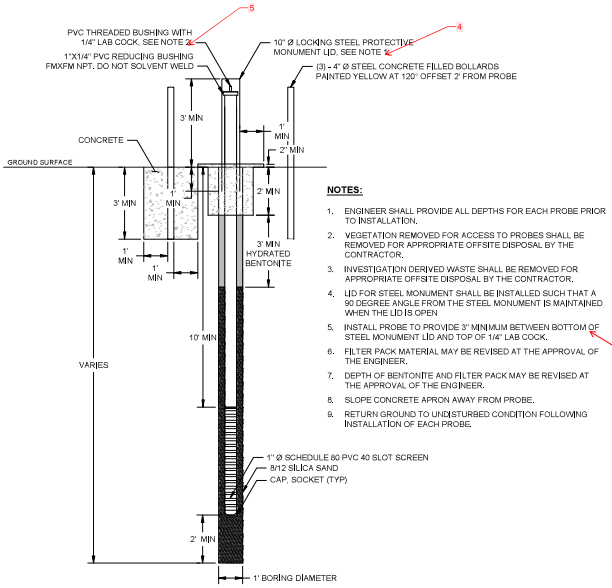
Concrete Surface Seal Depth	2' FT
Blank Casing (dia x dep)	1" x 10'
Material	SCHEDULE 40 PVC
Backfill	FT
Type	
Seal	2' - 7' FT
Gravel Pack	7' - 52' FT
Material	SAND
Screen (dia x dep)	1" x 40'
Slot Size	.004
Material	SCHEDULE 40 PVC
Well Depth	50' FT
Backfill	
Material	
Total Hole Depth	52' FT

Formation Description

0' - 12': FT
BROWN SOIL, GRAVELS, AND COBBLES

12' - 52': FT
COBBLES, SAND, AND GRAVEL

FT
PLEASE SEE ATTACHMENT



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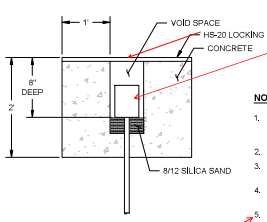
8. SLOPE CONCRETE APRON AWAY FROM PROBE.
9. RETURN GROUND TO UNDISTURBED CONDITION FOLLOWING INSTALLATION OF EACH PROBE.

DETAIL - SURFACE MOUNTED LANDFILL GAS MONITORING PROBE (1 / -)
SCALE: NTS



SHOW TOP OF PROBE CONSISTENT WITH DETAIL 1 (PVC THREADED BUSHING, PVC REDUCING BUSHING)

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3" FOR EACH

DETAIL - PLAN VIEW - FLUSH MOUNTED LANDFILL GAS MONITORING PROBE (2 / -)
SCALE: NTS

CALL 811 BEFORE YOU DIG

30% DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH AT FULL SIZE. IF NOT ONE INCH SCALE ACCORDINGLY.

HERRERA Science + Planning + Design herrerainc.com

DRAFT

DESIGNED: NB	DRAWN: MM
DESIGNED: JE	DRAWN: -
DESIGNED:	CHECKED:
SCALE: AS NOTED	APPROVED: MMS

MARSHALL LANDFILL
CLEANUP AND CLOSURE

LFG SYSTEM DETAILS

DATE: DECEMBER 2023
PROJECT NO: 21-07716-000
DRAWING NO: C2.40.01
SHEET NO: 20 OF 35

DEPARTMENT OF ECOLOGY
State of Washington

Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:
- [x] Construction
- [ ] Decommission ⇨ Original NOI No. _____

Ecology Well ID Tag No. BPE-874
Site Well Name LFB-24-06
Consulting Firm HERRERA
Was a variance approved for this well/boring? ☐ Yes ☒ No
If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

☒ Driller ☐ Trainee ☐ Engineer
Name (Print Last, First Name) Rider, Dan
Driller/Engineer/Trainee Signature *Dan Rider*
License No. 3223
Company Name Anderson Environmental Contracting LLC

If trainee box is checked, sponsor's license number: _____
Sponsor's signature _____

Notice of Intent No. RE25909
Type of Well:
- [x] Resource Protection Well
- [ ] Remediation Well
- [ ] Geotechnical Soil Boring
- [ ] Environmental Boring
- [ ] Injection Point
- [ ] Grounding Well
- [ ] Ground Source Heat Pump
- [ ] Other _____

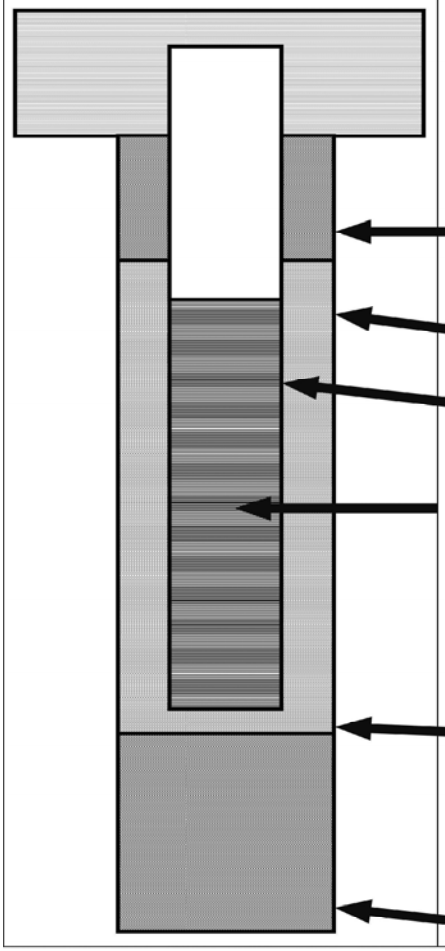
↳ ☐ Soil- ☒ Vapor- ☐ Water-sampling

Property Owner MARSHALL PROPERTIES
Well Street Address UNASSIGNED ADDRESS
City CHENEY County SPOKANE
Tax Parcel No. 24213.9009

Location (see instructions): WWM ☐ or EWM ☒
SE ¼-¼ SW ¼, Section 21 Town 24N Range 42E
Latitude (Example: 47.12345) 47.553574
Longitude (Example: -120.12345) -117.511119
(WGS 84 Coordinate System)

Borehole diameter 8 inches Casing diameter 1 inches
Static water level DRY ft below top of casing Date _____
☒ Above-ground completion with bollards ☐ Flush monument
↳ Stick-up of top of well casing 3 ft above ground surface
Start Date 03/27/2024 Completed Date 03/27/2024

Construction/Design



Well Data

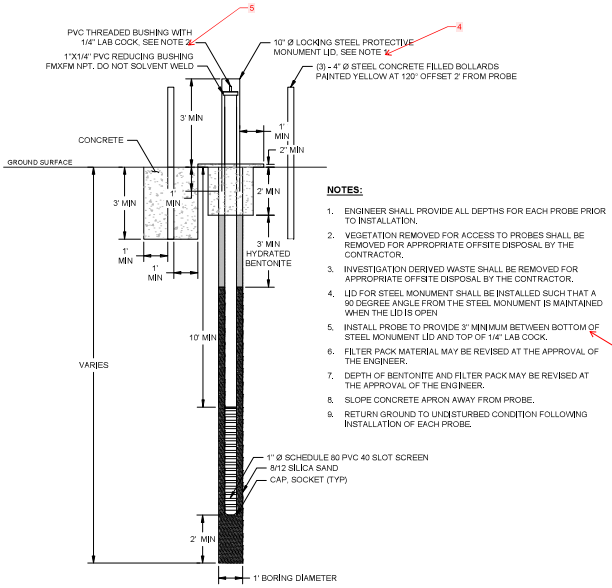
Concrete Surface Seal Depth	2' FT
Blank Casing (dia x dep)	1" x 10'
Material	SCHEDULE 40 PVC
Backfill	FT
Type	
Seal	2' - 7' FT
Gravel Pack	7' - 62' FT
Material	SAND
Screen (dia x dep)	1" x 50'
Slot Size	.004
Material	SCHEDULE 40 PVC
Well Depth	60' FT
Backfill	
Material	
Total Hole Depth	62' FT

Formation Description

0' - 6': FT
SILTY BROWN SOIL AND COBBLES

6' - 62': FT
SAND, GRAVEL, AND COBBLES

FT
PLEASE SEE ATTACHMENT



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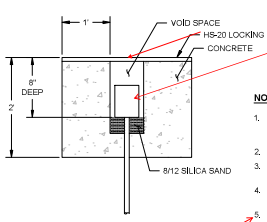
DETAIL - SURFACE MOUNTED LANDFILL GAS MONITORING PROBE (1 / -)
SCALE: NTS



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3" FOR EACH

DETAIL - PLAN VIEW - FLUSH MOUNTED LANDFILL GAS MONITORING PROBE (2 / -)
SCALE: NTS

CALL 811 BEFORE YOU DIG

30% DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

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HERRERA Science + Planning + Design herrerainc.com

DRAFT

DESIGNED: NB	DRAWN: MM
DESIGNED: JE	DRAWN: -
DESIGNED:	CHECKED:
SCALE: AS NOTED	APPROVED: MMS

MARSHALL LANDFILL
CLEANUP AND CLOSURE

LFG SYSTEM DETAILS

DATE: DECEMBER 2023
PROJECT NO: 21-07716-000
DRAWING NO: C2.40.01
SHEET NO: 20 OF 35

DEPARTMENT OF ECOLOGY
State of Washington

Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:

■ Construction
☐ Decommission ⇨ Original NOI No. _____

Ecology Well ID Tag No. BPE-875

Site Well Name LFB-24-07

Consulting Firm HERRERA

Was a variance approved for this well/boring? ☐ Yes ■ No

If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

■ Driller ☐ Trainee ☐ Engineer

Name (Print Last, First Name) Rider, Dan

Driller/Engineer/Trainee Signature *Dan Rider*

License No. 3223

Company Name Anderson Environmental Contracting LLC

If trainee box is checked, sponsor's license number: _____

Sponsor's signature _____

Notice of Intent No. RE25909

Type of Well:

■ Resource Protection Well ☐ Injection Point
☐ Remediation Well ☐ Grounding Well
☐ Geotechnical Soil Boring ☐ Ground Source Heat Pump
☐ Environmental Boring ☐ Other _____

↳ ☐ Soil- ■ Vapor- ☐ Water-sampling

Property Owner MARSHALL PROPERTIES

Well Street Address UNASSIGNED ADDRESS

City CHENEY County SPOKANE

Tax Parcel No. 24213.9009

Location (see instructions): WWM ☐ or EWM ■

SE ¼-¼ SW ¼, Section 21 Town 24N Range 42E

Latitude (Example: 47.12345) 47.551493

Longitude (Example: -120.12345) -117.511424

(WGS 84 Coordinate System)

Borehole diameter 8 inches Casing diameter 1 inches

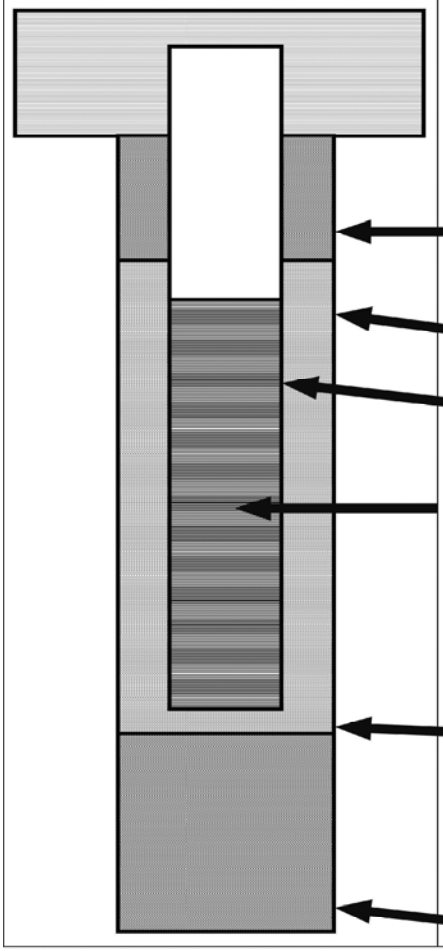
Static water level DRY ft below top of casing Date _____

■ Above-ground completion with bollards ☐ Flush monument

↳ Stick-up of top of well casing 3 ft above ground surface

Start Date 03/28/2024 Completed Date 03/28/2024

Construction/Design



Well Data

Concrete Surface Seal Depth	2'	FT
Blank Casing (dia x dep)	1" x 10'	
Material	SCHEDULE 40 PVC	
Backfill		FT
Type		
Seal	2' - 7'	FT
Gravel Pack	7' - 52'	FT
Material	SAND	
Screen (dia x dep)	1" x 40'	
Slot Size	.004	
Material	SCHEDULE 40 PVC	
Well Depth	50'	FT
Backfill		
Material		
Total Hole Depth	52'	FT

Formation Description

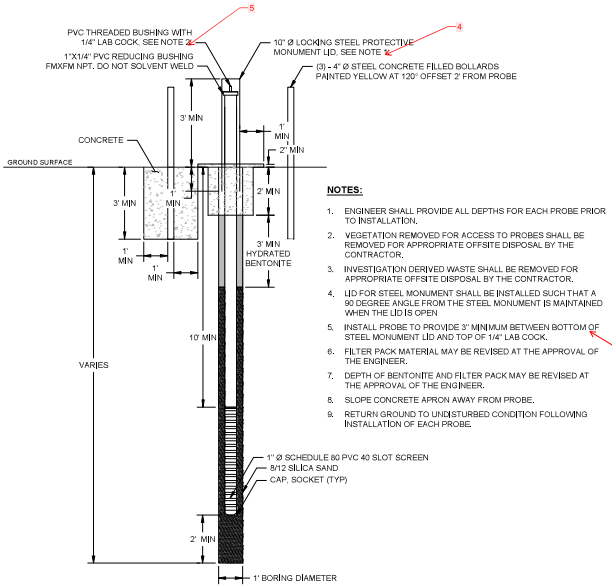
0' - 52': FT

SAND, GRAVEL, AND COBBLES

FT

FT

PLEASE SEE ATTACHMENT



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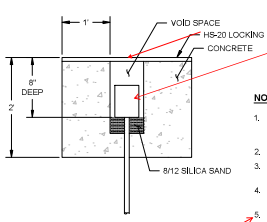
DETAIL - SURFACE MOUNTED LANDFILL GAS MONITORING PROBE (1 / -)
SCALE: NTS



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DETAIL - PLAN VIEW - FLUSH MOUNTED LANDFILL GAS MONITORING PROBE (2 / -)
SCALE: NTS

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No.	REVISION	BY	APP'D	DATE

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SCALE: AS NOTED	APPROVED: MMS

MARSHALL LANDFILL
CLEANUP AND CLOSURE

LFG SYSTEM DETAILS

DATE: DECEMBER 2023
PROJECT NO: 21-07716-000
DRAWING NO: C2.40.01
SHEET NO: 20 OF 35

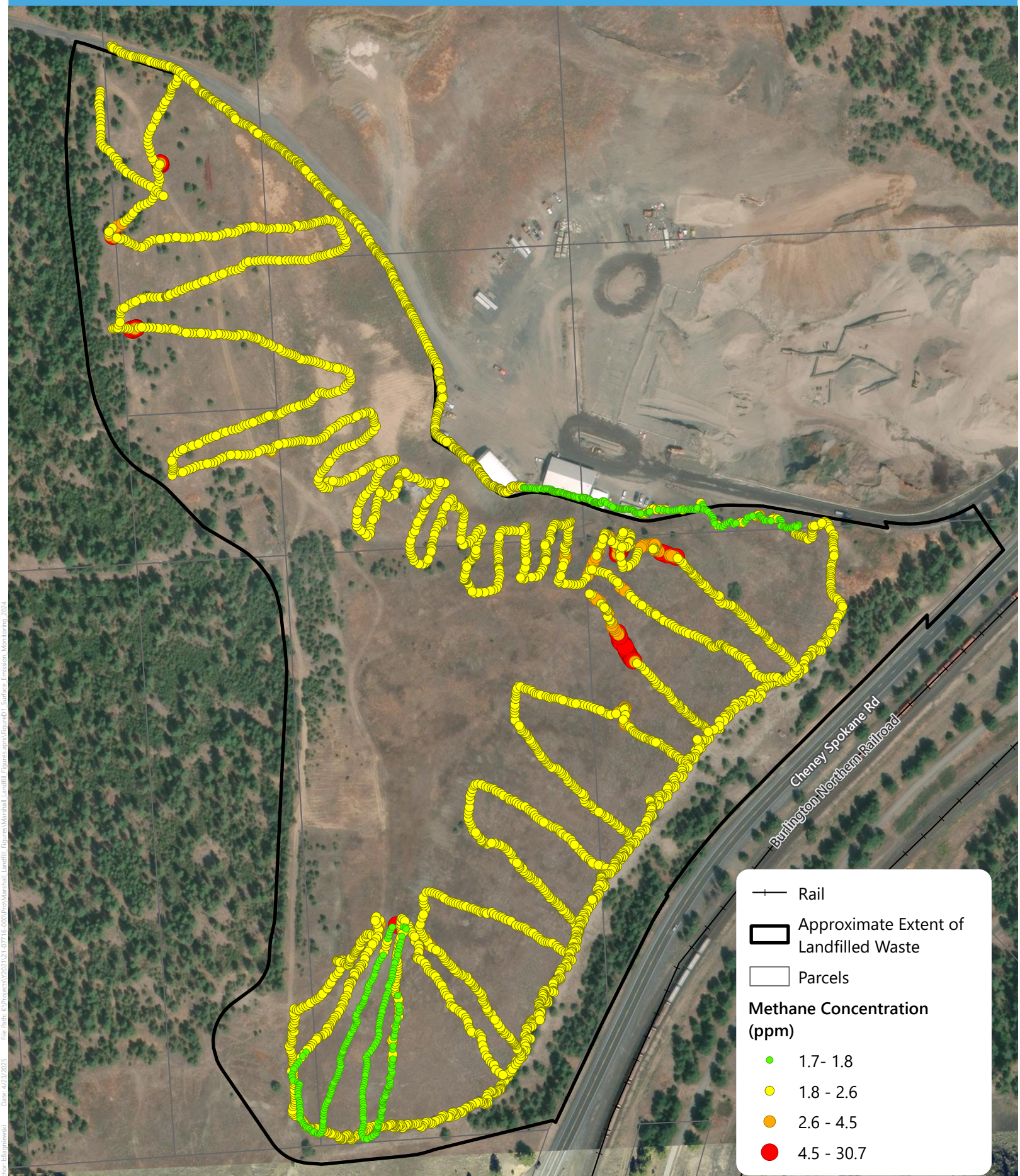
Appendix E

Landfill Gas Surface Emissions Monitoring Map

HERRERA
Science + Planning + Design

HERRERA
Science + Planning + Design

Figure E-1.
Surface Emissions Monitoring, March 2024.



Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Spokane County, Esri (Imagery, 2024)

0 125 250 500 Feet

File Path: K:\Projects\Y2021\21-07716-000\Pro\Marshall_Landfill_Figures.aprx\Figure01_Surface_Emission_Monitoring_2024
Date: 4/23/2025
Author: bBagniewski