# REPORT OF GROUNDWATER MONITORING ACTIVITIES DECEMBER 2022

# Bozeman Landfill
# Bozeman, Montana

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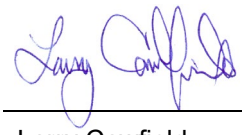

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## APPENDICES

# ACRONYMS/ABBREVIATIONS

| Acronyms/Abbreviations | Definition |
|---|---|
| AVD | Absolute Value Difference |
| ARM | Administrative Rules of Montana |
| amsl | above mean sea level |
| bgs | Below Ground Surface |
| btoc | Below Top of Casing |
| DO | Dissolved Oxygen |
| DEQ | Montana Department of Environmental Quality |
| GPS | Groundwater Protection Standard |
| HHS | Montana Numeric Water Quality Human Health Standard |
| ORP | Oxidation Reduction Potential |
| MCL | Maximum Contaminant Level |
| MDL | Method Detection Limit |
| mg/L | Milligrams per Liter |
| PDS | Passive Diffusion Sampler |
| POC | Point of Compliance |
| PQL | Practical Quantitation Limit |
| PVC | Polyvinyl Chloride |
| QA/QC | Quality Assurance/Quality Control |
| RPD | Relative Percent Difference |
| USEPA | United States Environmental Protection Agency |
| ug/L | Micrograms per Liter |
| VOC | Volatile Organic Compound |

# 1.0 INTRODUCTION

Tetra Tech completed the required semi-annual groundwater monitoring event at the Bozeman Landfill in December 2022 (**Figure 1**). Semi-annual monitoring events are conducted in early summer (typically June) and early winter (late November or early December). Tetra Tech personnel conducted this monitoring event and reporting in accordance with Task Order, 2022 – 2023 Groundwater and Perimeter Methane Monitoring, dated June 30, 2022.

Methods used during monitoring activities are presented in **Section 2.0**. Figures and Tables presenting site location, monitoring sites, selected analytical results, and field data are attached. **Appendix A** provides graphs depicting selected groundwater data over time for several wells. **Appendix B** contains groundwater sampling logs and field notes. **Appendix C** contains copies of the laboratory reports. **Appendix D** contains the Data Review, Verification, & Validation Reports for the June sample set. **Appendix E** provides supporting data for different aspects of the statistical analysis.

# 2.0 METHODS

Groundwater sampling occurred on December 7 and 8, 2022 at the monitoring wells and locations shown in **Figure 2** and in accordance with the Groundwater Sampling and Analysis Plan dated November 12, 2015, as amended by Tetra Tech (2020 and 2022), and subsequently approved by the Montana Department of Environmental Quality (DEQ) (DEQ, 2020, 2022a, and 2022b).

A schedule of monitoring activities and list of analytical constituents for the December monitoring event are presented in **Tables 1** and **2**.

Monitoring activities included measurement of water levels and field parameters, and sampling of monitoring wells, one water supply well (Valley View Vet Well), and a surface water spring (McIlhattan Seep). Per Tetra Tech (2022) monitoring wells were sampled using Passive Diffusion Samplers (PDSs) which eliminate the need to purge the wells while increasing data reliability, particularly for volatile constituents.

## 2.1 WATER LEVEL AND FIELD PARAMETER MEASUREMENTS

Water levels were measured using an electric well probe which was routinely decontaminated before use at each monitoring well. Depth to water measurements were made from the north quadrant of the polyvinyl chloride (PVC) collar of each monitoring well and are expressed as being below top of casing (btoc).

Other field parameters, including temperature, pH, specific conductivity, dissolved oxygen (DO, measured in milligrams per liter) and oxidation reduction potential (ORP, measured in millivolts) were measured. Field parameters were measured from the monitoring wells using a sample aliquot collected from the PDS. In the case of McIlhattan Seep (spring), the multimeter probe was completely submersed in the spring flow at the sampling location. At the Valley View Vet Well, field parameters were measured in water discharging from a spigot using a flow-through cell. All measurements were recorded on a groundwater sampling log (**Appendix B**).

## 2.2 GROUNDWATER SAMPLING

Water samples were collected from each monitoring well or monitoring site in accordance with the Groundwater Monitoring Sampling and Analysis Plan as amended and approved by DEQ (DEQ, 2020, 2022a, and 2022b). In general, the following sampling procedures were used:

- Following water level measurements and removing the PDS to obtain a sample aliquot for field parameter measurement, water remaining in the PDS was transferred directly into appropriate labeled containers and preserved as necessary.
- Pertinent information (sample date, time, well location, etc.) was recorded on the groundwater monitoring log (**Appendix B**).
- Samples were packed in ice-filled coolers and shipped with Chain-of-Custody forms to the analytical laboratory. Chain-of-Custody forms for the sampling event are included with the laboratory report in **Appendix C**.
- Monitoring activities at the McIlhattan Seep (**Figure 2**) consisted of filling a disposable bailer where the spring begins flowing at ground surface and directly filling the sample bottles.

During this semi-annual monitoring event, samples were collected from 11 sites along with five quality assurance/quality control samples (i.e., two field duplicates, two equipment blanks, and one trip blank). Analyses varied between wells, but generally consisted of volatile organic compounds (VOCs), and nitrogen (as NO2 + NO3), as listed in **Tables 1** and **2**. Analytical methods are specified in the laboratory analytical report (**Appendix C**).

The analytical laboratory was contracted to furnish sample containers, preservatives, and trip blanks and to analyze the water samples. For each monitoring event, one trip blank (identified as “Trip Blank”) was prepared and consisted of de-ionized water. Upon receipt of the samples at the laboratory, the trip blank was analyzed for VOCs (in accordance with Method 8260 MSV Low Level), listed in Appendix I to 40 CFR Part 258 contained in ARM 17.50.1306(7), including dichlorodifluoromethane.

Each duplicate sample was collected at the same time as and analyzed for the same constituents as the corresponding natural sample.

Equipment blank samples are provided by the PDS supplier and consist of the same laboratory-grade distilled deionized water used to fill the PDS prior to installation into the monitoring wells. This water is analyzed for the same constituents as the natural samples to ensure that the PDSs are not a source of contamination to the natural samples. Equipment blank “Blank 1” applies to equipment used during the December 2022 sampling event. The laboratory report provided in **Appendix C** includes data for an additional sample, “Blank 2”, which will apply to equipment used during the upcoming June 2023 monitoring event.

Field parameter measurements and laboratory analytical results were entered into the project groundwater database. A statistical analysis was performed on selected constituents and wells following DEQ guidance to determine statistical significance.

# 3.0 DATA PRESENTATION AND ANALYSIS

December 2022 groundwater monitoring results are summarized in this section. Figures and tables cited within this report are presented at the end. Charts detailing selected constituent concentrations and groundwater levels over time are presented in **Appendix A**.

## 3.1 GROUNDWATER OCCURRENCE AND MOVEMENT

### *Groundwater Elevation and Seasonal Variation*

Groundwater elevations were consistent with previous December (and June) monitoring events and ranged between approximately 4,695 feet above mean sea level (ft amsl) near the western perimeter of the site (wells LF-2 and MW-9A) and 4,733 ft amsl near the southeast corner of the site (well MW-17). Wells MW-5 and MW-15, located north of MW-17 along the eastern perimeter of the site, are not monitored in December, but typically have the greatest groundwater elevations (i.e., approximately 4,775 to 4,810 ft amsl).

Groundwater levels/elevations are presented in **Table 3**. **Chart A-1** (in **Appendix A**) depicts changes and trends in groundwater levels, since 1994, in monitoring wells MW-5, MW-8A, and MW-12, which are oriented in a line roughly spanning the upgradient and downgradient extents of the site. Groundwater elevations in these wells experienced an overall decline between 2011 and 2015-2017, before increasing through 2018-2020 then appear to resume a downward trend.

### *Groundwater Flow Direction and Hydraulic Gradient*

Groundwater elevations were generally consistent with those measured during previous monitoring events and indicate that groundwater flows toward the southwest beneath the Unlined Closed Cell (**Figure 3**). Flow direction shifts to the west-southwest between the Lined Closed Cell and the western margin of the site.

The groundwater gradients at the site are historically greatest beneath the unlined cell, least in the area south of the site, and intermediate beneath the lined cell. Groundwater gradients in these areas calculated for the December monitoring event were as follows.

- 3.1% beneath the Unlined Closed Cell, based on inferred data and data measured at MW-2.
- 1.8% beneath the Lined Closed Cell, based on inferred data and data measured at well MW-13.
- 1.4% in the area south of the site, based on data measured at wells LF-3 and MW-20.

Groundwater flow directions and gradients are consistent with previous monitoring events.

## 3.2 GROUNDWATER QUALITY

The following sections discuss results of analyses of inorganic constituents and VOCs. The discussion compares constituent concentrations to United States Environmental Protection Agency's (USEPA) Groundwater Protection Standard (GPS). Alternatively, the GPS may also be equal to the USEPA regulatory levels or Maximum Contaminant Level (MCL) and/or the Montana Numeric Water Quality Human Health Standard (HHS).

### 3.2.1 Organic Constituents

The VOC analysis (8260B MSV Low Level method) measures concentrations of 58 constituents (**Appendix C**).

Eighteen VOC constituents were detected in natural samples (**Table 4**) and included the same constituents detected during previous monitoring events, with the addition of acetone, 2-propanol, and 2-Butanone (MEK) which were not detected during other recent monitoring events. These constituents do not have associated groundwater standards and are believed to have been

introduced as a contaminant in the PDSs or during laboratory analysis as described in **Section 4.0**. A historical summary of selected VOCs is presented in **Table 5**.

**Figures 4** through **7** display concentrations of benzene, tetrachloroethene, trichloroethene, and vinyl chloride at each well monitored in December 2022.

The Montana HHS for vinyl chloride is 0.2 µg/L (with the annotation Health Advisory or HA), while the USEPA MCL for vinyl chloride is 2 µg/L. Exceedances of MCL for vinyl chloride were limited to MW-13 (5.92 ug/L). No exceedances of standards for other VOCs were observed.

Evaluation of VOC results generally indicate detections of the same VOC constituents as in previous monitoring events. Long-term trend charts for selected monitoring wells are presented in **Appendix A** (**Charts A-2** through **A-6**). These charts present selected VOC constituent concentration changes through time, both before and after start-up of the first landfill gas (LFG) extraction system, and the following upgraded LFG extraction system. A more detailed statistical analysis of VOC and inorganic constituent trends and comparison to GPSs are provided in **Section 5.0**.

### 3.2.2 Inorganic Constituents

Inorganic constituents (chloride, sulfate, and nitrate + nitrite as nitrogen) were analyzed in samples collected from select monitoring locations listed in **Table 1**. These data are provided in the analytical laboratory report (**Appendix C**) displayed in **Figure 8**.

Upon evaluation of these data, it was observed that inorganic constituent concentrations were below detection limits at groundwater locations where detectable concentrations were consistently measured in the past. Upon discussion with the PDS manufacturer, it was determined the PDSs' are not appropriate for monitoring these constituents and these data should be disregarded.

Surface water monitored at the McIlhattan Seep location was not collected with a PDS and, therefore, the nitrate + nitrite concentration of 7.7 mg/L is reliable.

## 4.0 DATA VALIDATION

The data validation process is used to determine the adequacy and quality of laboratory analytical data for the Bozeman Landfill. The objective of data validation is to identify unreliable or invalid laboratory measurements and qualify that data for interpretive use. These validations were performed in accordance with Tetra Tech's Groundwater Monitoring Sampling and Analysis Plan (Tetra Tech, 2015) and guidelines prepared by the USEPA (1999, 2004, and 2017). This section also summarizes the Data Review, Verification, & Validation Report for the sample sets presented in this report (**Appendix D**).

The data validation indicates most analytical results reported in this document meet data quality objectives in the SAP (Tetra Tech, 2015); therefore, they are valid, reliable, and qualified for interpretive use.

Data for chloride, nitrate, and sulfate are likely biased low for all samples other than "McIlhattan Seep", as discussed in **Section 3.2.2**. Data for acetone, 2-butanone, and 2-propanol are likely biased high based on detectable concentrations of these constituents in the December 2022 equipment blank.

## 4.1 FIELD QA/QC

Analytical results were evaluated using two field duplicate samples, one event-specific equipment blank (Blank-1) and one trip blank sample, as discussed below. A second equipment blank (Blank-2) was submitted and included in the laboratory samples to assess cross-contamination during the June 2023 monitoring event.

### *Field Duplicates*

Duplicate samples (labeled DUP-1 and DUP-2) were collected from the McIlhattan Seep (DUP-1) and well MW-17 (DUP-2).

Duplicates were shipped with the natural samples the analytical laboratory for analysis of the same parameters analyzed in the corresponding natural sample.

Field duplicate results aid in the assessment of sampling and analytical precision. Analytical results for the natural and duplicate samples collected were evaluated using the following criteria:

- The Relative Percent Difference (RPD) between the two samples was calculated when both values of the natural/duplicate pair were greater than five times the Practical Quantitation Limit (PQL) for a given analyte.
- The Absolute Value Difference (AVD) between the natural and duplicate sample for a given analyte was calculated when one or both values were less than five times the PQL.
- The RPD or AVD was not calculated for values of the natural/duplicate pair that were equal, or if one or both values were below the PQL.

RPDs are calculated by dividing the difference between the two reported values for a given constituent by the average of the two reported values. Analytical results of constituents where the RPD was greater than 20 percent are considered estimated concentrations.

AVDs are calculated by subtracting the results of the two reported values for a given constituent. If the difference exceeds the PQL, then results for this constituent are considered estimated.

Results of comparison of field duplicates with their natural samples indicated the following:

<u>DUP-1 and McIlhattan Seep Samples</u>

- The AVD was calculated for tetrachloroethene and did not exceed the PQL of 0.5 ug/L.
- The RPD was calculated for nitrate + nitrite and approached but did not exceed 20% (RDP = 19.9 %).

<u>DUP-2 and MW-17 Samples</u>

- The AVD was calculated for 1, 2-dichloropropane and methylene chloride and did not exceed the PQL for either constituent.
- The RPD was calculated for 2-propanol, cis-1, 2-dichloroethene and tetrachloroethene but did not exceed 20% for either constituent.

No constituents were flagged as estimates in the project monitoring database based on duplicate sample analytical results.

### *Trip Blanks*

One trip blank was provided and analyzed. The samples were analyzed for VOCs (Method 8260B).

A trip blank consists of deionized water containerized by the laboratory and shipped to Tetra Tech's Bozeman, Montana office with the sample containers. Trip blanks are kept in field coolers during sampling and shipped to the laboratory with the samples upon conclusion of field activities. Analytical results of the trip blank sample(s) were reviewed to determine if any constituent was measured in the sample(s) at detectable concentrations. The results are as follows:

- No constituents were detected in the trip blank.

### *Equipment Blanks*

Two equipment blanks were submitted for analysis, one (Blank 1) was used to evaluate potential contamination introduced by the PDSs used during the December 2022 monitoring event while a second (Blank 2) is specific to PDSs anticipated for use during the June 2023 event. The blank samples were analyzed for the same VOCs as the natural samples.

Acetone, 2-butanone, 2-propanol, and tetrahydrofuran were detected in Blank 1 and in natural samples. Based on discussions with the PDS manufacturer, and non-detect concentrations of these VOCs in the trip blank, it is suspected that contamination was introduced into the samples either during shipping or manufacture of the PDSs. These VOCs should be considered biased high in the December 2022 data set.

## 4.2 LABORATORY QA/QC

The analytical laboratory received groundwater samples on December 9, 2022. Chain-of-Custody documents accompanied the samples from collection to receipt at the laboratory. All samples were properly preserved and analyzed within the respective holding time for each analyte (unless otherwise noted on the report via a qualifier). More information is provided in the Data Review, Verification, & Validation Report contained in **Appendix D**.

Review of all other laboratory quality assurance indicators showed all analyses followed published quality assurance/quality control (QA/QC) criteria and within the laboratory precision and accuracy guidelines. Laboratory QA/QC issues are listed in the laboratory report and mostly pertain to matrix spikes, method blanks, and lab duplicates. The laboratory report indicates that calibration standards had been used, calibration verification had been conducted, laboratory controls were in place and analyzed, laboratory duplicates were used, and laboratory spikes documented.

# 5.0 STATISTICAL ANALYSIS OF WATER QUALITY DATA

The City completed the first of two corrective measures assessments for the Bozeman Landfill in November 1995. A landfill gas extraction system was installed, as the preferred alternative in the first corrective measures assessment and was operated at the site from December 1997 to July 2016. A second corrective measure began operation in August 2016 and is currently in operation. This corrective measure consists of an expanded landfill gas extraction system, a soil vapor extraction system, and a groundwater and vadose zone air injection system, as described in Tetra Tech's Construction Completion Report (March 2018).

According to ARM 17.50.1310(5)(b), remedies selected because of the corrective measures assessment are considered complete when concentrations of all constituents listed in ARM 17.50.1307 have not exceeded the GPSs for a period of three consecutive years based on statistical analysis of the data.

As indicated in the discussion above, there are exceedances of regulatory standards at the site. Of those constituents listed in ARM 17.50.1307, the following constituents have equaled or exceeded regulatory standards at the Bozeman Landfill on at least a single occasion in the last five years (2018-2022):

- Tetrachloroethene
- Methylene Chloride
- Vinyl Chloride
- Nitrate+Nitrite as N

The data set was also screened for VOCs using the double quantification rule. This quasi-statistical rule is often used in detection monitoring to confirm an exceedance in a data set that is predominantly populated with non-detect values. In this instance, the double quantification rule was used to identify well-constituent pairs that exhibit quantified measurements (i.e., at or above the PQL) in two consecutive sampling events within the last five years. Besides those listed above, the following constituents were identified in the VOC screening process:

- *1,1-Dichloroethane*
- 1,2-Dichloropropane
- *Acetone*
- *Chloroethane*
- Cis-1,2-Dichloroethene
- Trichloroethene
- 1,4-Dichlorobenzene
- *2-Propanol*
- Benzene
- Dichlorodifluoromethane
- *Tetrahydrofuran*
- Trichlorofluoromethane

Those constituents with GPSs were evaluated to determine if they are present at statistically significant concentrations above the GPS. Constituents without a GPS are *italicized* in the bulleted list above. In accordance with MCA 17.50.1307(8), constituents identified in the Appendix II list (40 CFR Part 258), for which GPSs have not been promulgated, shall use background concentrations in the place of a GPS. Since these are VOCs, the background concentration would be zero; however, laboratories cannot accurately report concentrations below the PQL. Therefore, PQLs were used as the compliance limit. Constituents not identified in the Appendix II list, and for which GPSs have not been promulgated, were evaluated using trend tests. Additionally, trend tests were used to evaluate inorganic groundwater quality parameters (i.e., chloride and sulfate). Selection and description of the statistical tests employed are described below, as are the results. Supporting data for different aspects of the statistical analysis are provided in **Appendix E**.

## 5.1 STATISTICAL ANALYSIS APPROACH

To conform with the U.S. Environmental Protection Agency's Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities – Unified Guidance (USEPA, 2009), Tetra Tech has updated the statistical approach for the analysis of groundwater samples collected at the Bozeman Landfill. Sanitas ™ Statistical Software (Sanitas, 2013) was used to perform the statistical evaluation.

The proportion of parameter concentrations reported below the method detection limit (MDL) (non-detects) and the statistical distribution of observed data were evaluated when considering the appropriate statistical method. Given the need for intrawell evaluation, which is appropriate for hydrogeologic systems exhibiting natural variability, monitoring program status (corrective action), and the relatively large data set, the statistical method referred to as "confidence intervals" is appropriate for the statistical analyses. This method is endorsed by USEPA since it provides a flexible and statistically accurate method to test how a parameter estimated from a single sample location compares to a fixed numerical limit (USEPA, 2009). Parametric confidence intervals were calculated for data sets that have an identifiable (normal, log-normal, etc.) distribution. Non-parametric confidence intervals were calculated for data sets in which the distribution cannot be determined. The latter method is commonly used when the data set contains a substantial proportion of non-detect values. Confidence intervals are discussed in more detail in the following section.

Confidence intervals cannot be used to evaluate groundwater concentrations for compounds that do not have an associated GPS (MCL, HHS, etc.) or an alternative numerical limit. In instances where GPSs have not been promulgated and the compounds are not identified in the Appendix II list, Mann-Kendall/Sen's Slope tests were performed to evaluate the data for trends. This statistical test is an intrawell non-parametric evaluation of the change in concentration levels over time. To remove any artificial trends introduced by changes to reporting limits over time, the tests were run by replacing historic non-detected values with current-day reporting limits. Metals, chloride, and sulfate data were also evaluated using Mann-Kendall/Sen's Slope tests.

## 5.2 STATISTICAL METHOD – CONFIDENCE INTERVALS

A confidence interval is constructed from sample data and is designed to contain the mean concentration of an analyte, with a designated level of confidence. This confidence interval is then compared to a GPS. In corrective action, the test determines whether concentrations have decreased below a compliance level. Therefore, in corrective action monitoring, the upper confidence level (UCL) is of most importance as it is compared to the GPS. This approach is the recommended statistical strategy in compliance/assessment and corrective action monitoring by the USEPA (USEPA, 2009).

### 5.2.1 Distribution and Censored Data

The distribution of the data is evaluated by applying the Shapiro-Wilk or Shapiro-Francia test of normality to the raw data or, when applicable to the Ladder of Powers (Helsel & Hirsch, 1992) transformed data. If less than 15-percent of the observations are non-detects, these will be replaced with one-half the PQL prior to running the normality test and constructing the confidence intervals. If more than 15-percent, but less than 50-percent, of the data are below the detection limit, the data's sample mean and standard deviation are adjusted according to the method of Kaplan-Meier (USEPA, 2009). If more than 50-percent of the data are below the detection limit, these values are replaced with one-half the MDL and a non-parametric confidence interval is constructed. Estimated data (flagged with a "J"), in which the concentration is reported to be between the MDL and PQL, were treated as valid measurements and were not substituted per the unified guidance (USEPA, 2009).

### 5.2.2 Parametric Confidence Intervals

To construct a parametric confidence interval, it is preferable to have eight or more measurements. The mean, "$\overline{X}$", and the standard deviation of the sample concentration values

are calculated separately for each compliance well (monitoring point). For each well, the confidence interval is calculated as:

$$\bar{x} \pm t_{(1-\alpha,n-1)} \frac{S}{\sqrt{n}}$$

Where:

"S" is the compliance well's standard deviation,

"n" is the number of observations for the compliance point, and

"$t_{(1-\alpha,n-1)}$" is obtained from the Student's t-distribution table (USEPA, 1989) with (n-1) degrees of freedom.

The confidence intervals were constructed with a 99-percent confidence level. If the UCL is above the GPS (the interval overlaps the compliance limit), there is statistically significant evidence of noncompliance.

### 5.2.3 Non-Parametric Confidence Intervals

For non-parametric confidence intervals, the interval is constructed around the median of the sample concentration dataset with a 98-percent confidence level. The procedure requires at least seven observations. The observations are ordered from smallest to largest and unique ranks are assigned separately within the monitoring point dataset. The critical values of the order statistics are determined as follows:

- If the minimum seven observations are used, the critical values are the first and seventh values.
- Otherwise, the smallest integer, "M", is found such that the cumulative binomial distribution with parameters n (sample size) and probability of success (p = 0.5) is at least 0.99. The exact confidence coefficients for sample sizes up to 11 are given by the EPA (Table 6-3; USEPA, 1989). For larger samples, take as an approximation the nearest integer value to:

$$M = \frac{n}{2} + 1 + Z_{(1-\alpha)}\sqrt{\frac{n}{4}}$$

Where:

"$Z_{(1-\alpha)}$" is 1-α percentile from the normal distribution table (Table 4, **Appendix B**; USEPA, 1989).

Once "M" has been determined, (n+1-M) is computed, and the confidence limits are taken as the order statistics, X(M) and X(n+1-M). "X" is the ordered list of values in the dataset. If the upper limit, X(n+1-M), exceeds the compliance limit, there is statistically significant evidence of non-compliance.

## 5.3 RESULTS AND DISCUSSION

Confidence intervals were constructed for the constituents with concentrations exceeding GPSs in the past five years and for those constituents identified by the VOC screening process. Trend

tests were also used to evaluate inorganic data and VOCs identified during the screening process that do not have GPSs and are not on the Appendix II list.

Outputs of the statistical testing results are contained in **Appendix E**. The statistical evaluations that were performed and reported below constitute the statistical basis for demonstrating the regulatory compliance status of the Bozeman Landfill.

### 5.3.1 Confidence Interval Results

Confidence intervals were constructed for 14 VOCs (see **Appendix E**). Nitrate+nitrite for well MW-8A is typically evaluated with confidence intervals. However, it was not evaluated for this analysis due to data quality issues. For the following constituent/well pairs, there was statistically significant evidence of exceedances of the GPSs:

- 1,1-Dichloroethane: MW-6, MW-7A, MW-12, MW-13, MW-17
- Methylene Chloride: MW-17
- Tetrachloroethene: MW-17 and MW-20
- Vinyl chloride: MW-12, MW-13, and MW-18

This list is consistent with past observed exceedances of GPSs. A GPS has not been promogulated for 1,1-dichloroethane, and therefore the PQL was used as the compliance limit. Thus, any confirmed detection (concentrations above the PQL) will exceed the compliance limit. Trend analyses were conducted to further evaluate the VOC exceedances listed above. A discussion of those findings is presented below.

### 5.3.2 Trend Test Results

A 98-percent confidence level was used for the trend analyses. Given the inorganic data quality issues, only the McIlhattan Seep was evaluated for trends. An increasing trend is present in the McIlhattan nitrate+nitrite data set.

No detrimental trends were exhibited in organic data sets. Furthermore, the trend analyses for methylene chloride, tetrachloroethene, and vinyl chloride (the VOCs with statistically significant exceedances of GPSs) showed non-significant or decreasing trends in concentrations. Outputs for the trend analyses are presented in **Appendix E.**

## 6.0 SUMMARY

The following are results from the groundwater monitoring event summarizing data, calculations, and interpretations:

- Groundwater elevations at the landfill were consistent with groundwater elevations measured in previous monitoring events and indicate a southwest groundwater flow beneath the Unlined Closed Cell. In the southwest portion of the site groundwater flow shifts to a west-southwest direction.
- Nineteen VOC constituents were detected and included the same constituents detected in previous groundwater monitoring events at the site. Other VOCs that are not typically observed (acetone, 2-butanone, and 2-propanol) were detected and are attributed to cross contamination from sampling equipment. Exceedances of USEPA regulatory levels and/or Montana HHS were limited to vinyl chloride at MW-13 (5.92 mg/L).

- Statistical evaluations using confidence intervals were completed as described in **Section 5.3.1**. Statistically significant evidence of exceedances of GPSs were identified for the following constituent/well pairs: 1,1-dichloroethane: MW-6, MW-7A, MW-12, MW-13, MW-17; methylene chloride: MW-17; tetrachloroethene: MW-17 and MW-20; and vinyl chloride: MW-12, MW-13, and MW-18. However, it should be noted that the VOC data sets exhibit non-significant, or decreasing, trends.
- Trend analyses were conducted as described in **Section 5.3.2**. A statistically significant increasing trend was identified for nitrate+nitrite in the McIlhattan Seep data set.
- Acetone, 2-butanone, 2-propanol, and tetrahydrofuran were detected in the equipment blank and in natural samples and, therefore, these results should be considered biased high. Additionally, it was determined that the specific type of PDSs used in the December 2022 monitoring event are inappropriate for sampling anions and metals. For these reasons a different type of passive sampler (i.e., Dual Membrane Passive Diffusion Bags) will be employed during future monitoring events.

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**USEPA, 2009.** Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Unified Guidance. Office of Resource Conservation and Recovery, United States Environmental Protection Agency. March.

**ONLINE REFERENCE:**

U.S. EPA Maximum Contaminant Levels
http://water.epa.gov/drink/contaminants/

Montana DEQ Solid Waste Program Laws and Rules:
http://www.deq.mt.gov/SolidWaste/LawsRules.mcpx

# TABLES

***Table 1 – December Groundwater Monitoring Schedule***

| Groundwater Monitoring Station | Field Parameters [1] | VOCs [2] | Chloride and Sulfate | Nitrate + Nitrite as Nitrogen |
|---|---|---|---|---|
| Method | Field Meter | 8260 (Low Level) | 300.0 | 353.2 |
| LF – 2 | X | X | | X |
| LF – 3 | X | X | X | X |
| MW – 6 * | X | X | X | X |
| MW - 8A * | X | X | X | X |
| MW - 9A | X | X | X | X |
| MW – 12 | X | X | X | X |
| MW – 13 | X | X | X | X |
| MW – 17 | X | X | X | |
| MW – 18 | X | X | X | |
| MW – 20 | X | X | X | |
| McIlhattan Seep | X | X | | X |
| Dup 1 | | X | | X |
| Dup 2 | | X | X | |
| Blank 1 | | X | X | X |
| Blank 2 | | X | X | X |
| Trip Blank | | X | | |

[1] Field parameters include pH, specific conductivity, dissolved oxygen, and oxidation-reduction potential.

[2] VOCs = Volatile organic compounds as listed in **Table 3**.

* Point of Compliance.

***Table 2 – Volatile Organic Compounds Required for Groundwater Monitoring***

| Parameter[1] | Parameter[1] |
|---|---|
| 1,1,1,2-Tetrachloroethane | Bromodichloromethane |
| 1,1,1-Trichloroethane | Bromoform |
| 1,1,2,2-Tetrachloroethane | Chloroform |
| 1,1,2-Trichloroethane | Chloromethane |
| 1,1,2-Trichlorotrifluoroethane | Cyclohexane |
| 1,1-Dichloroethane | Dibromochloromethane |
| 1,1-Dichloroethene | Dibromomethane |
| 1,2,3-Trichloropropane | Dichlorodifluoromethane |
| 1,2,4-Trimethylbenzene | Ethylbenzene |
| 1,2-Dibromo-3-chloropropane | Iodomethane |
| 1,2-Dibromoethane (EDB) | Isopropylbenzene (Cumene) |
| 1,2-Dichlorobenzene | Methyl-tert-butyl ether |
| 1,2-Dichloroethane | Methylene Chloride |
| 1,2-Dichloropropane | Styrene |
| 1,4-Dichlorobenzene | Tetrachloroethene |
| 1,4-Dioxane (p-Dioxane) | Tetrahydrofuran |
| 2-Butanone (MEK) | Toluene |
| 2-Hexanone | Trichloroethene |
| 2-Propanol | Trichlorofluoromethane |
| 4-Methyl-2-pentanone (MIBK) | Vinyl acetate |
| Acetone | Vinyl chloride |
| Acrylonitrile | Xylene (Total) |
| Benzene | cis-1,2-Dichloroethene |
| Bromochloromethane | cis-1,3-Dichloropropene |
| Bromodichloromethane | n-Hexane |
| Bromoform | n-Propylbenzene |
| Bromomethane | trans-1,2-Dichloroethene |
| Carbon disulfide | trans-1,3-Dichloropropene |
| Carbon tetrachloride | trans-1,4-Dichloro-2-butene |
| Chlorobenzene | 1,2-Dichloroethane-d4 (S) |
| Chloroethane | Toluene-d8 (S) |
| Bromochloromethane | 4-Bromofluorobenzene (S) |

[1] Volatile Organic Compounds analyzed using Method 8260 (low level).

**TABLE 3**
**Groundwater Levels**
**Bozeman Landfill, Bozeman Montana**



| MEASURING POINT ELEVATION (in feet above mean sea level) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4,709.50 | | 4,723.59 | | 4,759.77 | | 4,717.87 | | 4,888.98 | | 4,734.14 | | 4,732.67 | |
| **MPE change** | **Initial MPE** | **4702.71** | **Initial MPE** | **4717.1** | **Initial MPE** | **4751.89** | **Initial MPE** | **4710.90** | **Initial MPE** | **4882.37** | **Initial MPE** | **4738.68** | **Initial MPE** | **4727.23** |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6/30/1998 | 4728.69 | -- | -- |
| | 6/4/2014 | 4709.50 | 6/4/2014 | 4723.59 | 6/4/2014 | 4759.77 | 6/4/2014 | 4717.87 | 6/4/2014 | 4888.98 | 6/4/2014 | 4734.14 | 6/4/2014 | 4732.67 |
| **Well No.** | **LF-2** | | **LF-3** | | **MW-3** | | **MW-4** | | **MW-5** | | **MW-6[1]** | | **MW-6B** | |
| **Monitoring Event** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** |
| May-86 | 14.20 | 4695.30 | 15.50 | 4708.09 | 48.76 | 4703.13 | 20.60 | 4697.27 | -- | -- | -- | -- | -- | -- |
| October-86 | 14.53 | 4694.97 | 15.20 | 4708.39 | 48.87 | 4703.02 | 20.64 | 4697.23 | -- | -- | -- | -- | -- | -- |
| August-92 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45.40 | 4698.73 | -- | -- |
| February-93 | -- | -- | 16.39 | 4707.20 | -- | -- | 22.35 | 4695.52 | 112.66 | 4776.32 | 43.57 | 4700.56 | -- | -- |
| July-93 | 14.52 | 4694.98 | 15.10 | 4708.49 | 49.91 | 4701.98 | 21.73 | 4696.14 | 111.60 | 4777.38 | 43.35 | 4700.78 | -- | -- |
| January-94 | 14.72 | 4694.78 | 14.85 | 4708.74 | 49.50 | 4702.39 | 20.70 | 4697.17 | 110.76 | 4778.22 | 43.02 | 4701.11 | -- | -- |
| June-94 | 15.42 | 4694.08 | 15.45 | 4708.14 | 50.34 | 4701.55 | 20.97 | 4696.90 | 110.26 | 4778.72 | 42.91 | 4701.22 | -- | -- |
| February-95 | 14.43 | 4695.07 | 14.72 | 4708.87 | 50.41 | 4701.48 | 20.67 | 4697.20 | 110.71 | 4778.27 | 42.88 | 4701.25 | -- | -- |
| June-95 | 14.7 | 4694.80 | 14.88 | 4708.71 | 50.27 | 4701.62 | 20.08 | 4697.79 | 110.06 | 4778.92 | 42.71 | 4701.42 | -- | -- |
| November-95 | 14.39 | 4695.11 | 15.33 | 4708.26 | 49.87 | 4702.02 | 20.51 | 4697.36 | 109.70 | 4779.28 | 42.80 | 4701.33 | -- | -- |
| June-96 | 13.68 | 4695.82 | 13.92 | 4709.67 | 49.30 | 4702.59 | 20.78 | 4697.09 | 109.50 | 4779.48 | 42.55 | 4701.58 | -- | -- |
| December-96 | 14.29 | 4695.21 | 14.34 | 4709.25 | 48.82 | 4703.07 | 20.3 | 4697.57 | 110.10 | 4778.88 | 44.77 | 4699.36 | -- | -- |
| June-97 | 12.31 | 4697.19 | 12.40 | 4711.19 | 47.07 | 4704.82 | 13.39 | 4704.48 | 108.64 | 4780.34 | 39.85 | 4704.28 | -- | -- |
| December-97 | 14.16 | 4695.34 | 14.00 | 4709.59 | 48.02 | 4703.87 | 20.37 | 4697.50 | 106.71 | 4782.27 | 42.73 | 4701.40 | -- | -- |
| June-98 | 13.21 | 4696.29 | 12.98 | 4710.61 | -- | -- | 19.27 | 4698.60 | 106.10 | 4782.88 | 30.95 | 4703.19 | -- | -- |
| December-98 | 14.32 | 4695.18 | 13.82 | 4709.77 | 47.97 | 4703.92 | 20.37 | 4697.50 | 105.75 | 4783.23 | 31.24 | 4702.90 | -- | -- |
| June-99 | 14.07 | 4695.43 | 13.53 | 4710.06 | 47.74 | 4704.15 | 20.25 | 4697.62 | 106.01 | 4782.97 | 31.13 | 4703.01 | -- | -- |
| December-99 | 14.42 | 4695.08 | 14.31 | 4709.28 | 48.22 | 4703.67 | 20.54 | 4697.33 | 106.86 | 4782.12 | 31.33 | 4702.81 | -- | -- |
| June-00 | -- | -- | 13.98 | 4709.61 | 48.28 | 4703.61 | 20.47 | 4697.40 | 108.22 | 4780.76 | 31.33 | 4702.81 | -- | -- |
| November-00 | 14.53 | 4694.97 | 14.23 | 4709.36 | 48.77 | 4703.12 | 20.69 | 4697.18 | 109.69 | 4779.29 | 31.53 | 4702.61 | -- | -- |
| June-01 | 14.27 | 4695.23 | 13.97 | 4709.62 | 48.91 | 4702.98 | 20.60 | 4697.27 | 110.61 | 4778.37 | 31.66 | 4702.48 | -- | -- |
| December-01 | 14.63 | 4694.87 | 14.01 | 4709.58 | 49.40 | 4702.49 | 20.83 | 4697.04 | 111.77 | 4777.21 | 31.79 | 4702.35 | -- | -- |
| June-02 | 13.31 | 4696.19 | 13.66 | 4709.93 | 48.59 | 4703.30 | 19.72 | 4698.15 | 112.47 | 4776.51 | 31.59 | 4702.55 | -- | -- |
| December-02 | 14.78 | 4694.72 | 14.22 | 4709.37 | 49.85 | 4702.04 | 20.92 | 4696.95 | 113.26 | 4775.72 | 31.87 | 4702.27 | -- | -- |
| June-03 | 14.20 | 4695.30 | 14.02 | 4709.57 | 49.35 | 4702.54 | 20.41 | 4697.46 | 113.52 | 4775.46 | 31.79 | 4702.35 | | |
| December-03 | 14.92 | 4694.58 | 14.35 | 4709.24 | 50.32 | 4701.57 | 21.02 | 4696.85 | 114.30 | 4774.68 | 31.96 | 4702.18 | | |
| June-04 | 14.36 | 4695.14 | 14.23 | 4709.36 | 50.13 | 4701.76 | 20.72 | 4697.15 | 114.94 | 4774.04 | 31.95 | 4702.19 | | |
| December-04 | 14.71 | 4694.79 | 14.71 | 4708.88 | 50.53 | 4701.36 | 20.99 | 4696.88 | 115.68 | 4773.30 | 32.43 | 4701.71 | | |
| June-05 | 14.13 | 4695.37 | 14.13 | 4709.46 | 50.05 | 4701.84 | 20.57 | 4697.30 | 116.01 | 4772.97 | 31.92 | 4702.22 | | |
| December-05 | 14.86 | 4694.64 | 14.29 | 4709.30 | 50.72 | 4701.17 | 20.98 | 4696.89 | 116.85 | 4772.13 | 32.07 | 4702.07 | | |
| March-06 | -- | -- | 14.02 | 4709.57 | -- | -- | -- | -- | -- | -- | 31.94 | 4702.20 | | |
| June-06 | 13.95 | 4695.55 | 14.85 | 4708.74 | -- | -- | 21.80 | 4696.07 | 114.39 | 4774.59 | 31.90 | 4702.24 | | |
| September-06 | | | 14.24 | 4709.35 | -- | -- | -- | -- | -- | -- | -- | -- | | |
| December-06 | | | 13.98 | 4709.61 | -- | -- | 20.91 | 4696.96 | 116.45 | 4772.53 | 29.9 | 4704.24 | | |
| March-07 | | | 13.22 | 4710.37 | -- | -- | -- | -- | -- | -- | 31.55 | 4702.59 | - | - |
| June-07 | | | 13.63 | 4709.96 | -- | -- | 18.95 | 4698.92 | 115.69 | 4773.29 | 31.43 | 4702.71 | | |
| December-07 | -- | -- | 14.07 | 4709.52 | -- | -- | 20.86 | 4697.01 | 115.51 | 4773.47 | 31.94 | 4702.20 | | |
| June-08 | | | 12.74 | 4710.85 | -- | -- | 18.92 | 4698.95 | 114.88 | 4774.10 | 31.19 | 4702.95 | | |
| December-08 | | | 13.98 | 4709.61 | -- | -- | 20.8 | 4697.07 | 114.07 | 4774.91 | 33.8 | 4700.34 | | |
| June-09 | | | 13.24 | 4710.35 | -- | -- | 19.8 | 4698.07 | 113.42 | 4775.56 | 31.62 | 4702.52 | | |
| December-09 | | | 13.87 | 4709.72 | -- | -- | 20.6 | 4697.27 | 113.03 | 4775.95 | 31.78 | 4702.36 | | |
| June-10 | | | 12.94 | 4710.65 | -- | -- | 19.76 | 4698.11 | 112.45 | 4776.53 | 31.41 | 4702.73 | | |
| December-10 | 14.32 | 4695.18 | 13.81 | 4709.78 | -- | -- | 20.69 | 4697.18 | 111.97 | 4777.01 | 31.52 | 4702.62 | | |
| June-11 | 12.73 | 4696.77 | 12.66 | 4710.93 | -- | -- | 19.29 | 4698.58 | 110.63 | 4778.35 | 30.99 | 4703.15 | | |
| December-11 | 14.29 | 4695.21 | 13.71 | 4709.88 | -- | -- | 20.48 | 4697.39 | 110.05 | 4778.93 | 31.40 | 4702.74 | | |
| June-12 | 14.12 | 4695.38 | 13.52 | 4710.07 | -- | -- | 20.39 | 4697.48 | 110.12 | 4778.86 | 31.29 | 4702.85 | 18.69 | 4713.98 |
| December-12 | 14.26 | 4695.24 | 13.93 | 4709.66 | 49.24 | 4702.65 | 20.73 | 4697.14 | 111.31 | 4777.67 | 31.44 | 4702.70 | 19.40 | 4713.27 |
| June-13 | 14.05 | 4695.45 | 14.33 | 4709.26 | -- | -- | 20.69 | 4697.18 | 112.36 | 4776.62 | 31.47 | 4702.67 | 19.25 | 4713.42 |
| December-13 | 14.28 | 4695.22 | 13.77 | 4709.82 | -- | -- | 20.75 | 4697.12 | 113.12 | 4775.86 | 31.56 | 4702.58 | 19.34 | 4713.33 |
| March-14 | 13.30 | 4696.20 | 13.22 | 4710.37 | -- | -- | 19.86 | 4698.01 | 113.02 | 4775.96 | 31.33 | 4702.81 | 19.34 | 4713.33 |
| August-14 | 14.24 | 4695.26 | 14.23 | 4709.36 | -- | -- | 20.70 | 4697.17 | 112.85 | 4776.13 | 31.52 | 4702.62 | 19.41 | 4713.26 |
| December-14 | 14.17 | 4695.33 | 13.87 | 4709.72 | -- | -- | 20.76 | 4697.11 | 112.95 | 4776.03 | 31.52 | 4702.62 | 19.30 | 4713.37 |
| June-15 | 14.28 | 4695.22 | 14.19 | 4709.40 | -- | -- | 20.66 | 4697.21 | 113.89 | 4775.09 | 31.55 | 4702.59 | 19.46 | 4713.21 |
| December-15 | 14.31 | 4695.19 | 14.00 | 4709.59 | -- | -- | 20.82 | 4697.05 | 114.89 | 4774.09 | 31.65 | 4702.49 | 19.55 | 4713.12 |
| June-16 | 14.20 | 4695.30 | 14.26 | 4709.33 | -- | -- | 20.50 | 4697.37 | 115.95 | 4773.03 | 31.55 | 4702.59 | 19.53 | 4713.14 |
| December-16 | 14.30 | 4695.20 | 13.95 | 4709.64 | -- | -- | 20.87 | 4697.00 | 116.24 | 4772.74 | 31.75 | 4702.39 | 19.66 | 4713.01 |
| June-17 | 13.57 | 4695.93 | 13.44 | 4710.15 | -- | -- | 20.03 | 4697.84 | 116.10 | 4772.88 | 31.42 | 4702.72 | 19.13 | 4713.54 |
| December-17 | 14.16 | 4695.34 | 13.89 | 4709.70 | -- | -- | 20.79 | 4697.08 | 115.88 | 4773.10 | 31.69 | 4702.45 | 19.53 | 4713.14 |
| August-18 | 14.06 | 4695.44 | 14.43 | 4709.16 | -- | -- | 20.32 | 4697.55 | 114.00 | 4774.98 | 31.35 | 4702.79 | 19.02 | 4713.65 |
| November-18 | 14.11 | 4695.39 | 13.84 | 4709.75 | -- | -- | 20.66 | 4697.21 | 113.12 | 4775.86 | 31.42 | 4702.72 | 18.94 | 4713.73 |
| June-19 | 13.34 | 4696.16 | 13.54 | 4710.05 | -- | -- | 19.91 | 4697.96 | 112.30 | 4776.68 | 31.11 | 4703.03 | 18.27 | 4714.40 |
| December-19 | 14.00 | 4695.50 | 13.58 | 4710.01 | -- | -- | 20.51 | 4697.36 | 112.14 | 4776.84 | 31.32 | 4702.82 | 15.68 | 4716.99 |
| June-20 | 13.95 | 4695.55 | 14.25 | 4709.34 | -- | -- | 20.48 | 4697.39 | 112.51 | 4776.47 | 31.25 | 4702.89 | 18.80 | 4713.87 |
| December-20 | 14.90 | 4694.60 | 13.68 | 4709.91 | -- | -- | 20.72 | 4697.15 | 112.59 | 4776.39 | 31.38 | 4702.76 | 18.94 | 4713.73 |
| June-21 | 14.28 | 4695.22 | 14.56 | 4709.03 | -- | -- | 20.62 | 4697.25 | 113.59 | 4775.39 | 31.39 | 4702.75 | 19.13 | 4713.54 |
| December-21 | 14.41 | 4695.09 | 13.82 | 4709.77 | -- | -- | 20.72 | 4697.15 | 114.05 | 4774.93 | 31.53 | 4702.61 | -- | -- |
| June-22 | 13.47 | 4696.03 | 13.29 | 4710.30 | -- | -- | 19.85 | 4698.02 | 114.49 | 4774.49 | 31.24 | 4702.90 | -- | -- |
| December-22 | 14.10 | 4695.40 | 13.75 | 4709.84 | -- | -- | -- | -- | -- | -- | 31.58 | 4702.56 | -- | -- |

MPE change : Measuring point elevation change. Collar elevations were resurveyed on 6/4/2014 and used to calculate DTW for all dates after accounting for PVC removal/addition, where applicable.
DTW : Depth to water below measuring point (feet)
ELEV : Groundwater elevation above mean sea level (feet). Well locations shown on Figure 2.
1 : 9.99 feet of PVC was removed on 06/30/1998.
-- : Blank cell denotes no available data

**TABLE 3 (Continued)**
**Groundwater Levels**
**Bozeman Landfill, Bozeman Montana**



| MEASURING POINT ELEVATION (in feet above mean sea level) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4764.64 | | 4764.71 | | 4754.58 | | 4754.84 | | 4753.98 | | 4722.11 | | 4722.32 | |
| **MPE change** | **Initial MPE** | **4755.51** | **Initial MPE** | **4755.52** | **Initial MPE** | **4748.22** | **Initial MPE** | **4747.98** | **Initial MPE** | **4747.63** | **Initial MPE** | **4715.27** | **Initial MPE** | **4715.50** |
| | 7/6/2011 | 4757.87 | 7/6/2011 | 4757.95 | -- | -- | 7/3/2012 | 4748.47 | -- | -- | -- | -- | -- | -- |
| | 6/4/2014 | 4764.64 | 6/4/2014 | 4764.71 | 6/4/2014 | 4754.58 | 6/4/2014 | 4754.84 | 6/4/2014 | 4753.98 | 6/4/2014 | 4722.11 | 6/4/2014 | 4722.32 |
| **Well No.** | **MW-7A[2]** | | **MW-7B[2]** | | **MW-8A** | | **MW-8B[3]** | | **MW-8C** | | **MW-9A** | | **MW-9B** | |
| **Monitoring Event** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** |
| August-92 | 55.50 | 4706.74 | -- | -- | 46.90 | 4707.68 | 48.50 | 4704.83 | -- | -- | 27.75 | 4694.36 | -- | -- |
| February-93 | 55.11 | 4707.13 | 55.25 | 4707.06 | 48.81 | 4705.77 | 48.96 | 4704.37 | -- | -- | 29.66 | 4692.45 | 29.97 | 4692.35 |
| July-93 | 54.35 | 4707.89 | 54.55 | 4707.76 | 47.69 | 4706.89 | 47.90 | 4705.43 | -- | -- | 28.59 | 4693.52 | 28.84 | 4693.48 |
| January-94 | 49.50 | 4712.74 | 49.48 | 4712.83 | 47.69 | 4706.89 | 47.99 | 4705.34 | -- | -- | 28.96 | 4693.15 | 29.31 | 4693.01 |
| June-94 | 54.43 | 4707.81 | 54.42 | 4707.89 | 47.51 | 4707.07 | 47.81 | 4705.52 | -- | -- | 28.77 | 4693.34 | 29.05 | 4693.27 |
| February-95 | 54.43 | 4707.81 | 54.45 | 4707.86 | 47.82 | 4706.76 | 47.53 | 4705.80 | -- | -- | 28.71 | 4693.40 | 28.99 | 4693.33 |
| June-95 | 53.98 | 4708.26 | 53.93 | 4708.38 | 46.54 | 4708.04 | 46.84 | 4706.49 | -- | -- | 28.17 | 4693.94 | 28.42 | 4693.90 |
| November-95 | 54.10 | 4708.14 | -- | -- | 47.07 | 4707.51 | 47.37 | 4705.96 | -- | -- | 28.52 | 4693.59 | 28.75 | 4693.57 |
| June-96 | 53.91 | 4708.33 | 53.93 | 4708.38 | 46.44 | 4708.14 | 46.72 | 4706.61 | -- | -- | 27.76 | 4694.35 | 27.92 | 4694.40 |
| December-96 | 54.78 | 4707.46 | 54.21 | 4708.10 | 46.97 | 4707.61 | 47.25 | 4706.08 | -- | -- | 28.08 | 4694.03 | 28.23 | 4694.09 |
| June-97 | 53.03 | 4709.21 | 53.05 | 4709.26 | 45.09 | 4709.49 | 45.41 | 4707.92 | -- | -- | 25.45 | 4696.66 | 25.33 | 4696.99 |
| December-97 | 53.79 | 4708.45 | 53.80 | 4708.51 | 46.38 | 4708.20 | 46.69 | 4706.64 | -- | -- | 28.39 | 4693.72 | 28.61 | 4693.71 |
| June-98 | 53.49 | 4708.75 | 53.50 | 4708.81 | 45.65 | 4708.93 | 45.94 | 4707.39 | -- | -- | 26.91 | 4695.20 | 26.96 | 4695.36 |
| December-98 | 53.73 | 4708.51 | 53.74 | 4708.57 | 46.32 | 4708.26 | 46.60 | 4706.73 | -- | -- | 28.40 | 4693.71 | 28.61 | 4693.71 |
| June-99 | 53.64 | 4708.60 | 53.66 | 4708.65 | 46.06 | 4708.52 | 46.36 | 4706.97 | -- | -- | 28.23 | 4693.88 | 28.43 | 4693.89 |
| December-99 | 53.87 | 4708.37 | 53.91 | 4708.40 | 46.59 | 4707.99 | 46.87 | 4706.46 | -- | -- | 28.56 | 4693.55 | 28.79 | 4693.53 |
| June-00 | 53.95 | 4708.29 | 53.96 | 4708.35 | 46.68 | 4707.90 | 46.96 | 4706.37 | -- | -- | 28.33 | 4693.78 | 28.54 | 4693.78 |
| November-00 | 54.23 | 4708.01 | 54.26 | 4708.05 | 47.09 | 4707.49 | 47.40 | 4705.93 | -- | -- | 28.65 | 4693.46 | 28.91 | 4693.41 |
| June-01 | 54.30 | 4707.94 | 54.37 | 4707.94 | 47.20 | 4707.38 | 47.51 | 4705.82 | -- | -- | 28.51 | 4693.60 | 28.71 | 4693.61 |
| December-01 | 54.78 | 4707.46 | 54.69 | 4707.62 | 47.66 | 4706.92 | 47.96 | 4705.37 | -- | -- | 28.82 | 4693.29 | 28.82 | 4693.50 |
| June-02 | 54.21 | 4708.03 | 54.25 | 4708.06 | 46.87 | 4707.71 | 47.13 | 4706.20 | -- | -- | 26.93 | 4695.18 | 26.98 | 4695.34 |
| December-02 | 54.81 | 4707.43 | 54.91 | 4707.40 | 48.08 | 4706.50 | 48.34 | 4704.99 | -- | -- | 29.03 | 4693.08 | 29.24 | 4693.08 |
| June-03 | 54.56 | 4707.68 | -- | -- | 47.63 | 4706.95 | 47.92 | 4705.41 | -- | -- | 28.50 | 4693.61 | 28.70 | 4693.62 |
| December-03 | 55.03 | 4707.21 | 55.06 | 4707.25 | 48.49 | 4706.09 | 48.73 | 4704.60 | -- | -- | 29.04 | 4693.07 | 29.27 | 4693.05 |
| June-04 | 55.01 | 4707.23 | 55.03 | 4707.28 | 48.34 | 4706.24 | 48.59 | 4704.74 | -- | -- | 28.59 | 4693.52 | 28.78 | 4693.54 |
| December-04 | 55.22 | 4707.02 | 55.23 | 4707.08 | 48.67 | 4705.91 | 48.89 | 4704.44 | -- | -- | 28.86 | 4693.25 | 29.11 | 4693.21 |
| June-05 | 54.92 | 4707.32 | 54.95 | 4707.36 | 48.34 | 4706.24 | 48.55 | 4704.78 | -- | -- | 28.19 | 4693.92 | 28.37 | 4693.95 |
| December-05 | 55.35 | 4706.89 | 55.39 | 4706.92 | 48.91 | 4705.67 | 49.13 | 4704.20 | -- | -- | 28.94 | 4693.17 | 29.20 | 4693.12 |
| March-06 | 55.14 | 4707.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| June-06 | 55.00 | 4707.24 | 55.00 | 4707.31 | 48.28 | 4706.30 | 48.49 | 4704.84 | -- | -- | 28.10 | 4694.01 | 28.31 | 4694.01 |
| September-06 | 55.32 | 4706.92 | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| December-06 | 55.14 | 4707.10 | | | 48.7 | 4705.88 | -- | -- | -- | -- | 29.1 | 4693.01 | -- | -- |
| March-07 | 55.02 | 4707.22 | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| June-07 | 54.32 | 4707.92 | | | 46.83 | 4707.75 | -- | -- | -- | -- | 26.97 | 4695.14 | -- | -- |
| December-07 | 54.95 | 4707.29 | -- | -- | 48.44 | 4706.14 | -- | -- | -- | -- | 28.55 | 4693.56 | -- | -- |
| June-08 | 53.74 | 4708.50 | | | 46.29 | 4708.29 | -- | -- | -- | -- | 26.98 | 4695.13 | -- | -- |
| December-08 | 54.6 | 4707.64 | | | 48.04 | 4706.54 | -- | -- | -- | -- | 28.54 | 4693.57 | -- | -- |
| June-09 | 53.97 | 4708.27 | | | 46.77 | 4707.81 | -- | -- | -- | -- | 27.8 | 4694.31 | -- | -- |
| December-09 | 54.41 | 4707.83 | | | 47.78 | 4706.80 | -- | -- | -- | -- | 28.45 | 4693.66 | -- | -- |
| June-10 | 53.88 | 4708.36 | | | 46.52 | 4708.06 | -- | -- | -- | -- | 26.96 | 4695.15 | -- | -- |
| December-10 | 54.24 | 4708.00 | 54.31 | 4708.00 | 47.44 | 4707.14 | 47.72 | 4705.61 | -- | -- | 28.36 | 4693.75 | 28.58 | 4693.74 |
| June-11 | 53.15 | 4709.09 | 53.25 | 4709.06 | 45.51 | 4709.07 | 45.80 | 4707.53 | -- | -- | 26.83 | 4695.28 | 26.89 | 4695.43 |
| December-11 | 56.41 | 4708.23 | 56.49 | 4708.22 | 47.02 | 4707.56 | 47.31 | 4706.02 | -- | -- | 28.32 | 4693.79 | 28.56 | 4693.76 |
| June-12 | 56.36 | 4708.28 | 56.45 | 4708.26 | 46.95 | 4707.63 | 47.28 | 4706.05 | 42.62 | 4711.36 | 28.18 | 4693.93 | 28.38 | 4693.94 |
| December-12 | 56.69 | 4707.95 | 56.80 | 4707.91 | 47.50 | 4707.08 | 47.77 | 4707.07 | 43.09 | 4710.89 | 28.39 | 4693.72 | 28.62 | 4693.70 |
| June-13 | 56.81 | 4707.83 | 56.81 | 4707.90 | 47.74 | 4706.84 | 48.02 | 4706.82 | 43.31 | 4710.67 | 28.28 | 4693.83 | 28.53 | 4693.79 |
| December-13 | 56.92 | 4707.72 | 57.02 | 4707.69 | 47.85 | 4706.73 | 48.10 | 4706.74 | 43.32 | 4710.66 | 28.48 | 4693.63 | 28.70 | 4693.62 |
| March-14 | -- | -- | -- | -- | 46.65 | 4707.93 | -- | -- | 42.60 | 4711.38 | 27.48 | 4694.63 | -- | -- |
| August-14 | 56.87 | 4707.77 | 56.94 | 4707.77 | 47.65 | 4706.93 | 48.92 | 4705.92 | 43.53 | 4710.45 | 28.35 | 4693.76 | 28.60 | 4693.72 |
| December-14 | 56.91 | 4707.73 | 57.00 | 4707.71 | 47.75 | 4706.83 | 47.99 | 4706.85 | 43.29 | 4710.69 | 28.29 | 4693.82 | 28.52 | 4693.80 |
| June-15 | 57.00 | 4707.64 | 57.09 | 4707.62 | 48.90 | 4705.68 | 48.17 | 4706.67 | 43.58 | 4710.40 | 28.34 | 4693.77 | 28.56 | 4693.76 |
| December-15 | 57.21 | 4707.43 | 57.31 | 4707.40 | 48.28 | 4706.30 | 48.49 | 4706.35 | 43.63 | 4710.35 | 28.42 | 4693.69 | 28.67 | 4693.65 |
| June-16 | 57.10 | 4707.54 | 57.20 | 4707.51 | 47.99 | 4706.59 | 48.20 | 4706.64 | 43.60 | 4710.38 | 28.25 | 4693.86 | 28.45 | 4693.87 |
| December-16 | 57.35 | 4707.29 | 57.45 | 4707.26 | 48.42 | 4706.16 | 48.61 | 4706.23 | 43.76 | 4710.22 | 28.47 | 4693.64 | 28.73 | 4693.59 |
| June-17 | 56.80 | 4707.84 | 56.90 | 4707.81 | 47.30 | 4707.28 | 47.55 | 4707.29 | 43.21 | 4710.77 | 27.81 | 4694.30 | 28.01 | 4694.31 |
| December-17 | 57.26 | 4707.38 | 57.39 | 4707.32 | 48.32 | 4706.26 | 48.56 | 4706.28 | 43.70 | 4710.28 | 28.32 | 4693.79 | 28.55 | 4693.77 |
| August-18 | 56.65 | 4707.99 | 56.74 | 4707.97 | 47.25 | 4707.33 | 47.67 | 4707.17 | 43.38 | 4710.60 | 28.07 | 4694.04 | 28.30 | 4694.02 |
| November-18 | 56.77 | 4707.87 | 56.87 | 4707.84 | 47.64 | 4706.94 | 47.90 | 4706.94 | 43.22 | 4710.76 | 28.21 | 4693.90 | 28.45 | 4693.87 |
| June-19 | 55.97 | 4708.67 | 56.09 | 4708.62 | 46.48 | 4708.10 | 46.74 | 4708.10 | 42.44 | 4711.54 | 27.62 | 4694.49 | 27.82 | 4694.50 |
| December-19 | 56.59 | 4708.05 | 56.69 | 4708.02 | 47.43 | 4707.15 | 47.69 | 4707.15 | 42.96 | 4711.02 | 28.13 | 4693.98 | 28.38 | 4693.94 |
| June-20 | 56.54 | 4708.10 | 56.70 | 4708.01 | 47.33 | 4707.25 | 47.62 | 4707.22 | 43.13 | 4710.85 | 28.00 | 4694.11 | 28.25 | 4694.07 |
| December-20 | 56.77 | 4707.87 | 56.88 | 4707.83 | 47.66 | 4706.92 | 47.92 | 4706.92 | 43.12 | 4710.86 | 28.25 | 4693.86 | 28.55 | 4693.77 |
| June-21 | 56.82 | 4707.82 | 56.92 | 4707.79 | 47.72 | 4706.86 | 48.02 | 4706.82 | 43.41 | 4710.57 | 28.22 | 4693.89 | 28.48 | 4693.84 |
| December-21 | 57.11 | 4707.53 | -- | -- | 48.12 | 4706.46 | -- | -- | -- | -- | 28.42 | 4693.69 | 28.72 | 4693.60 |
| June-22 | 56.40 | 4708.24 | -- | -- | 47.09 | 4707.49 | 47.38 | 4707.46 | 42.81 | 4711.17 | 27.69 | 4694.42 | 27.90 | 4694.42 |
| December-22 | -- | -- | -- | -- | 48.10 | 4706.48 | -- | -- | -- | -- | 28.25 | 4693.86 | -- | -- |

DTW : Depth to water below measuring point (feet)
ELEV : Groundwater elevation above mean sea level (feet). Well locations shown on Figure 2.
2 : Approximately 2.4 feet of PVC was added on 7/6/2011.
3 : Approximately 1.5 feet of PVC was added on 7/3/12.
-- : Blank cell denotes no data

**TABLE 3 (Continued)**
**Groundwater Levels**
**Bozeman Landfill, Bozeman Montana**



| MEASURING POINT ELEVATION (in feet above mean sea level) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4681.43 | | 4785.49 | | 4772.15 | | 4749.50 | | 4804.85 | | 4856.71 | | 4720.96 | |
| **MPE change** | **Initial MPE** | **4675.01** | **Initial MPE** | **4778.15** | **Initial MPE** | **4763.02** | **Initial MPE** | **4748.73** | **Initial MPE** | **4797.94** | **Initial MPE** | **4845.00** | **Initial MPE** | **4717.33** |
| | -- | -- | -- | -- | -- | -- | 6/30/1998 | 4742.54 | -- | -- | -- | -- | -- | -- |
| | 6/4/2014 | 4681.43 | 6/4/2014 | 4785.49 | 6/4/2014 | 4772.15 | 6/4/2014 | 4749.50 | 6/4/2014 | 4804.85 | 6/4/2014 | 4856.71 | 6/4/2014 | 4720.96 |
| **Well No.** | **MW-10** | | **MW-11** | | **MW-12** | | **MW-13[4]** | | **MW-14** | | **MW-15** | | **MW-16** | |
| **Monitoring Event** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** |
| June-95 | 6.58 | 4674.85 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| September-95 | -- | -- | 51.40 | 4734.09 | 55.03 | 4717.12 | 49.45 | 4706.24 | -- | -- | -- | -- | -- | -- |
| November-95 | 2.07 | 4679.36 | 51.55 | 4733.94 | 55.09 | 4717.06 | 49.56 | 4706.13 | -- | -- | -- | -- | -- | -- |
| June-96 | 1.63 | 4679.80 | 51.72 | 4733.77 | 54.77 | 4717.38 | 49.16 | 4706.53 | -- | -- | -- | -- | -- | -- |
| December-96 | 1.85 | 4679.58 | 51.83 | 4733.66 | 55.13 | 4717.02 | 49.53 | 4706.16 | -- | -- | -- | -- | -- | -- |
| June-97 | 0.90 | 4680.53 | 51.35 | 4734.14 | 53.82 | 4718.33 | 47.27 | 4708.42 | -- | -- | -- | -- | -- | -- |
| December-97 | 1.78 | 4679.65 | 51.42 | 4734.07 | 54.26 | 4717.89 | 59.16 | 4696.53 | -- | -- | -- | -- | -- | -- |
| June-98 | 1.38 | 4680.05 | 51.44 | 4734.05 | 53.83 | 4718.32 | 48.72 | 4700.78 | -- | -- | -- | -- | -- | -- |
| December-98 | 2.20 | 4679.23 | 51.52 | 4733.97 | 54.17 | 4717.98 | 49.14 | 4700.36 | -- | -- | -- | -- | -- | -- |
| June-99 | 1.61 | 4679.82 | 51.51 | 4733.98 | 54.64 | 4717.51 | 49.01 | 4700.49 | -- | -- | -- | -- | -- | -- |
| December-99 | 2.32 | 4679.11 | 51.69 | 4733.80 | 54.96 | 4717.19 | 43.13 | 4706.37 | -- | -- | -- | -- | -- | -- |
| June-00 | 1.95 | 4679.48 | 51.76 | 4733.73 | 55.11 | 4717.04 | 43.21 | 4706.29 | -- | -- | -- | -- | -- | -- |
| November-00 | 2.44 | 4678.99 | 51.99 | 4733.50 | 55.44 | 4716.71 | 43.49 | 4706.01 | -- | -- | -- | -- | -- | -- |
| June-01 | 1.38 | 4680.05 | 52.03 | 4733.46 | 55.75 | 4716.40 | 43.60 | 4705.90 | 32.96 | 4771.89 | -- | -- | -- | -- |
| December-01 | 2.55 | 4678.88 | 52.27 | 4733.22 | 56.06 | 4716.09 | 43.87 | 4705.63 | 33.71 | 4771.14 | 47.77 | 4808.94 | -- | -- |
| June-02 | 1.25 | 4680.18 | 52.12 | 4733.37 | 55.90 | 4716.25 | 43.45 | 4706.05 | -- | -- | -- | -- | -- | -- |
| December-02 | 2.70 | 4678.73 | 52.39 | 4733.10 | 56.49 | 4715.66 | 44.10 | 4705.40 | 34.28 | 4770.57 | 48.63 | 4808.08 | -- | -- |
| June-03 | 1.18 | 4680.25 | 52.22 | 4733.27 | 56.39 | 4715.76 | 43.87 | 4705.63 | 33.53 | 4771.32 | 48.10 | 4808.61 | -- | -- |
| December-03 | 2.59 | 4678.84 | 52.47 | 4733.02 | 56.91 | 4715.24 | 44.31 | 4705.19 | 34.65 | 4770.20 | 49.44 | 4807.27 | -- | -- |
| June-04 | 1.81 | 4679.62 | 52.44 | 4733.05 | 57.04 | 4715.11 | 44.26 | 4705.24 | 34.46 | 4770.39 | 49.89 | 4806.82 | -- | -- |
| December-04 | 2.45 | 4678.98 | 53.01 | 4732.48 | 57.17 | 4714.98 | 44.44 | 4705.06 | 35.34 | 4769.51 | 50.76 | 4805.95 | -- | -- |
| June-05 | 1.45 | 4679.98 | 52.47 | 4733.02 | 57.15 | 4715.00 | 44.26 | 4705.24 | 34.66 | 4770.19 | 50.35 | 4806.36 | -- | -- |
| December-05 | 2.57 | 4678.86 | 52.77 | 4732.72 | 57.39 | 4714.76 | 44.60 | 4704.90 | 35.82 | 4769.03 | 51.74 | 4804.97 | -- | -- |
| March-06 | -- | -- | -- | -- | 57.25 | 4714.90 | 44.32 | 4705.18 | -- | -- | -- | -- | -- | -- |
| June-06 | 1.90 | 4679.53 | 53.9 | 4731.59 | 57.20 | 4714.95 | 44.20 | 4705.30 | 34.41 | 4770.44 | 50.30 | 4806.41 | -- | -- |
| December-06 | 2.4 | 4679.03 | 52.5 | 4732.99 | 57.19 | 4714.96 | 44.37 | 4705.13 | 35.07 | 4769.78 | 50.49 | 4806.22 | -- | -- |
| June-07 | 1.51 | 4679.92 | 52.03 | 4733.46 | 57.79 | 4714.36 | 43.34 | 4706.16 | 33.16 | 4771.69 | 48.12 | 4808.59 | -- | -- |
| December-07 | 2.25 | 4679.18 | 52.31 | 4733.18 | 56.98 | 4715.17 | 44.2 | 4705.30 | 34.9 | 4769.95 | 48.31 | 4808.40 | -- | -- |
| June-08 | 1.24 | 4680.19 | 51.82 | 4733.67 | 56.1 | 4716.05 | 42.95 | 4706.55 | 31.19 | 4773.66 | 45.78 | 4810.93 | -- | -- |
| December-08 | 1.82 | 4679.61 | 52.06 | 4733.43 | 56.55 | 4715.60 | 43.94 | 4705.56 | 32.75 | 4772.10 | 45.51 | 4811.20 | -- | -- |
| June-09 | 1.22 | 4680.21 | 51.7 | 4733.79 | 55.8 | 4716.35 | 43.27 | 4706.23 | 31.37 | 4773.48 | 44.82 | 4811.89 | -- | -- |
| December-09 | 1.99 | 4679.44 | 51.85 | 4733.64 | 56.21 | 4715.94 | 43.75 | 4705.75 | 32.29 | 4772.56 | 45.37 | 4811.34 | -- | -- |
| June-10 | 1.00 | 4680.43 | 51.63 | 4733.86 | 55.71 | 4716.44 | 43.04 | 4706.46 | 31.12 | 4773.73 | 44.61 | 4812.10 | -- | -- |
| December-10 | 1.78 | 4679.65 | 51.79 | 4733.70 | 55.95 | 4716.20 | 43.54 | 4705.96 | 31.84 | 4773.01 | 44.35 | 4812.36 | -- | -- |
| June-11 | 0.80 | 4680.63 | 51.18 | 4734.31 | 54.59 | 4717.56 | 42.40 | 4707.10 | 29.01 | 4775.84 | 41.52 | 4815.19 | -- | -- |
| December-11 | 2.09 | 4679.34 | 51.57 | 4733.92 | 55.40 | 4716.75 | 43.28 | 4706.22 | 31.10 | 4773.75 | 42.60 | 4814.11 | -- | -- |
| June-12 | 1.66 | 4679.77 | 51.54 | 4733.95 | 55.46 | 4716.69 | 43.26 | 4706.24 | 31.46 | 4773.39 | 43.95 | 4812.76 | 26.02 | 4694.94 |
| December-12 | 2.03 | 4679.40 | 51.84 | 4733.65 | 55.85 | 4716.30 | 43.59 | 4705.91 | 32.83 | 4772.02 | 45.98 | 4810.73 | 26.24 | 4694.72 |
| June-13 | 1.58 | 4679.85 | 51.85 | 4733.64 | 56.25 | 4715.90 | 43.70 | 4705.80 | 33.24 | 4771.61 | 47.20 | 4809.51 | 26.24 | 4694.72 |
| December-13 | -- | -- | 52.00 | 4733.49 | 56.13 | 4716.02 | 43.81 | 4705.69 | 33.90 | 4770.95 | 48.80 | 4807.91 | 26.03 | 4694.93 |
| March-14 | 1.40 | 4680.03 | 51.76 | 4733.73 | 55.72 | 4716.43 | 43.46 | 4706.04 | 33.23 | 4771.62 | 49.05 | 4807.66 | 25.64 | 4695.32 |
| August-14 | 2.43 | 4679.00 | 51.80 | 4733.69 | 56.34 | 4715.81 | 43.65 | 4705.85 | -- | -- | 47.02 | 4809.69 | 26.18 | 4694.78 |
| December-14 | 1.95 | 4679.48 | 51.85 | 4733.64 | 56.16 | 4715.99 | 43.70 | 4705.80 | 33.30 | 4771.55 | 47.60 | 4809.11 | 26.24 | 4694.72 |
| June-15 | 2.33 | 4679.10 | 51.93 | 4733.56 | 56.52 | 4715.63 | 43.81 | 4705.69 | 33.75 | 4771.10 | 48.83 | 4807.88 | 26.19 | 4694.77 |
| December-15 | 2.51 | 4678.92 | 52.80 | 4732.69 | 56.55 | 4715.60 | 44.40 | 4705.10 | 34.81 | 4770.04 | 50.34 | 4806.37 | 26.36 | 4694.60 |
| June-16 | 0.65 | 4680.78 | 52.00 | 4733.49 | 56.64 | 4715.51 | 43.90 | 4705.60 | 34.53 | 4770.32 | 50.80 | 4805.91 | 26.18 | 4694.78 |
| December-16 | 2.43 | 4679.00 | 52.14 | 4733.35 | 56.75 | 4715.40 | 44.15 | 4705.35 | 35.60 | 4769.25 | 51.80 | 4804.91 | 24.44 | 4696.52 |
| June-17 | 1.53 | 4679.90 | 51.78 | 4733.71 | 56.23 | 4715.92 | 43.56 | 4705.94 | 33.44 | 4771.41 | 49.88 | 4806.83 | 25.78 | 4695.18 |
| December-17 | 1.94 | 4679.49 | 51.84 | 4733.65 | 56.83 | 4715.32 | 44.09 | 4705.41 | 34.47 | 4770.38 | 50.02 | 4806.69 | 26.30 | 4694.66 |
| August-18 | 2.04 | 4679.39 | 51.31 | 4734.18 | 56.14 | 4716.01 | 43.38 | 4706.12 | 32.10 | 4772.75 | 45.25 | 4811.46 | 25.92 | 4695.04 |
| November-18 | 2.07 | 4679.36 | 51.30 | 4734.19 | 56.03 | 4716.12 | 43.61 | 4705.89 | 32.05 | 4772.80 | 44.91 | 4811.80 | 25.98 | 4694.98 |
| June-19 | 1.60 | 4679.83 | 51.08 | 4734.41 | 55.09 | 4717.06 | 42.84 | 4706.66 | 31.16 | 4773.69 | 43.82 | 4812.89 | 25.31 | 4695.65 |
| December-19 | 2.06 | 4679.37 | 51.25 | 4734.24 | 55.70 | 4716.45 | 43.42 | 4706.08 | 31.68 | 4773.17 | 43.36 | 4813.35 | 25.92 | 4695.04 |
| June-20 | 1.90 | 4679.53 | 51.37 | 4734.12 | 55.97 | 4716.18 | 43.34 | 4706.16 | 31.93 | 4772.92 | 44.89 | 4811.82 | 25.81 | 4695.15 |
| December-20 | 2.53 | 4678.90 | 51.49 | 4734.00 | 55.99 | 4716.16 | 43.58 | 4705.92 | -- | -- | 44.81 | 4811.90 | -- | -- |
| June-21 | 2.33 | 4679.10 | 51.57 | 4733.92 | 56.26 | 4715.89 | 43.61 | 4705.89 | -- | -- | 46.60 | 4810.11 | -- | -- |
| December-21 | 2.52 | 4678.91 | 51.88 | 4733.61 | 56.36 | 4715.79 | 43.92 | 4705.58 | -- | -- | 48.55 | 4808.16 | -- | -- |
| June-22 | 1.61 | 4679.82 | 51.45 | 4734.04 | 55.57 | 4716.58 | 43.25 | 4706.25 | -- | -- | 48.17 | 4808.54 | -- | -- |
| December-22 | -- | -- | -- | -- | 56.41 | 4715.74 | 43.91 | 4705.59 | -- | -- | -- | -- | -- | -- |

MPE change : Measuring point elevation change. Collar elevations were resurveyed on 6/4/2014 and used to calculate DTW for all dates after accounting for PVC removal/addition, where applicable.

DTW : Depth to water below measuring point (feet)

ELEV : Groundwater elevation above mean sea level (feet). Well locations shown on Figure 2.

4 : 6.19 feet of PVC casing was removed on 06/30/1999.

-- : Blank cell denotes no data

**TABLE 3 (Continued)**
**Groundwater Levels**
**Bozeman Landfill, Bozeman Montana**



| MEASURING POINT ELEVATION (in feet above mean sea level) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4810.03 | | 4772.36 | | 4724.94 | | 4778.01 | | 4704.56 | | 4693.62 | | 4689.79 | |
| **Well No.** | **MW-17** | | **MW-18** | | **MW-19** | | **MW-20** | | **MW-21** | | **MW-22** | | **MW-23** | |
| **Monitoring Event** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** |
| March-14 | 75.60 | 4734.43 | 47.23 | 4725.13 | 21.23 | 4703.71 | 53.20 | 4724.81 | 9.39 | 4695.17 | 3.81 | 4689.81 | 5.49 | 4684.30 |
| August-14 | 76.12 | 4733.91 | 47.89 | 4724.47 | 22.05 | 4702.89 | 54.14 | 4723.87 | 9.77 | 4694.79 | 4.86 | 4688.76 | 6.28 | 4683.51 |
| December-14 | 75.84 | 4734.19 | 47.42 | 4724.94 | 22.07 | 4702.87 | 53.38 | 4724.63 | 10.17 | 4694.39 | 4.83 | 4688.79 | 6.24 | 4683.55 |
| June-15 | 76.50 | 4733.53 | 48.02 | 4724.34 | 22.15 | 4702.79 | 54.23 | 4723.78 | 9.58 | 4694.98 | 4.55 | 4689.07 | 5.83 | 4683.96 |
| December-15 | 76.85 | 4733.18 | 47.85 | 4724.51 | 22.30 | 4702.64 | 54.60 | 4723.41 | 10.70 | 4693.86 | 5.23 | 4688.39 | 6.56 | 4683.23 |
| June-16 | 77.40 | 4732.63 | 47.90 | 4724.46 | 22.10 | 4702.84 | 54.67 | 4723.34 | 9.62 | 4694.94 | 4.41 | 4689.21 | 5.73 | 4684.06 |
| December-16 | 79.35 | 4730.68 | 47.89 | 4724.47 | 22.09 | 4702.85 | 56.24 | 4721.77 | NM | -- | NM | -- | NM | -- |
| June-17 | 77.35 | 4732.68 | 47.45 | 4724.91 | 21.75 | 4703.19 | 54.61 | 4723.40 | 9.09 | 4695.47 | 3.98 | 4689.64 | 5.32 | 4684.47 |
| December-17 | 77.68 | 4732.35 | 48.15 | 4724.21 | 22.12 | 4702.82 | 54.68 | 4723.33 | 10.51 | 4694.05 | 4.77 | 4688.85 | 5.92 | 4683.87 |
| August-18 | 77.10 | 4732.93 | 47.81 | 4724.55 | 22.02 | 4702.92 | 54.92 | 4723.09 | 9.67 | 4694.89 | 4.50 | 4689.12 | 5.92 | 4683.87 |
| November-18 | 76.43 | 4733.60 | 47.44 | 4724.92 | 22.05 | 4702.89 | 54.03 | 4723.98 | 10.42 | 4694.14 | 4.96 | 4688.66 | 6.22 | 4683.57 |
| June-19 | 76.08 | 4733.95 | 46.56 | 4725.80 | 21.67 | 4703.27 | 53.37 | 4724.64 | 8.29 | 4696.27 | 3.83 | 4689.79 | 5.40 | 4684.39 |
| December-19 | 75.89 | 4734.14 | 46.91 | 4725.45 | 21.94 | 4703.00 | 53.41 | 4724.60 | 10.08 | 4694.48 | 4.72 | 4688.90 | 6.10 | 4683.69 |
| June-20 | 76.04 | 4733.99 | 47.68 | 4724.68 | 22.06 | 4702.88 | 54.60 | 4723.41 | 9.18 | 4695.38 | 4.20 | 4689.42 | 5.62 | 4684.17 |
| December-20 | 75.82 | 4734.21 | 47.03 | 4725.33 | 22.00 | 4702.94 | 53.43 | 4724.58 | 10.72 | 4693.84 | 5.17 | 4688.45 | 6.56 | 4683.23 |
| June-21 | 76.28 | 4733.75 | 47.95 | 4724.41 | 22.21 | 4702.73 | 54.69 | 4723.32 | 9.41 | 4695.15 | 4.62 | 4689.00 | 6.13 | 4683.66 |
| December-21 | 75.92 | 4734.11 | 47.37 | 4724.99 | 22.13 | 4702.81 | 53.85 | 4724.16 | 11.23 | 4693.33 | 5.49 | 4688.13 | 6.65 | 4683.14 |
| June-22 | 76.25 | 4733.78 | 47.00 | 4725.36 | 21.80 | 4703.14 | 54.06 | 4723.95 | 8.65 | 4695.91 | 3.75 | 4689.87 | 5.25 | 4684.54 |
| December-22 | 76.51 | 4733.52 | 47.57 | 4724.79 | -- | -- | 54.12 | 4723.89 | -- | -- | -- | -- | -- | -- |

DTW : Depth to water below measuring point (feet)
ELEV : Groundwater elevation above mean sea level (feet). Well locations shown on Figure 2.
-- : Blank cell denotes no data

**TABLE 3 (Continued)**
**Groundwater Levels**
**Bozeman Landfill, Bozeman Montana**

| MEASURING POINT ELEVATION (in feet above mean sea level) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4804.52 | | 4775.45 | | 4732.82 | | 4729.45 | | -- | | -- | | -- | |
| **Well No.** | **MW-24** | | **MW-25** | | **MW-26** | | **MW-27** | | | | | | | |
| **Monitoring Event** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | **DTW** | **ELEV** | | | | | | |
| March-14 | 74.50 | 4730.02 | 50.22 | 4725.23 | 14.41 | 4718.41 | -- | -- | -- | -- | -- | -- | -- | -- |
| August-14 | 75.45 | 4729.07 | 50.75 | 4724.70 | 14.79 | 4718.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| December-14 | 74.90 | 4729.62 | 50.72 | 4724.73 | 15.03 | 4717.79 | 19.73 | 4709.72 | -- | -- | -- | -- | -- | -- |
| June-15 | 75.70 | 4728.82 | 50.95 | 4724.50 | 14.89 | 4717.93 | 19.89 | 4709.56 | -- | -- | -- | -- | -- | -- |
| December-15 | 75.90 | 4728.62 | 51.06 | 4724.39 | 15.14 | 4717.68 | -- | -- | -- | -- | -- | -- | -- | -- |
| June-16 | 76.80 | 4727.72 | 51.00 | 4724.45 | 14.69 | 4718.13 | 19.75 | 4709.70 | -- | -- | -- | -- | -- | -- |
| December-16 | 76.30 | 4728.22 | 51.23 | 4724.22 | 15.18 | 4717.64 | 19.75 | 4709.70 | -- | -- | -- | -- | -- | -- |
| June-17 | 76.45 | 4728.07 | 50.78 | 4724.67 | 14.43 | 4718.39 | 19.41 | 4710.04 | -- | -- | -- | -- | -- | -- |
| December-17 | 76.53 | 4727.99 | 50.78 | 4724.67 | 14.50 | 4718.32 | 19.74 | 4709.71 | -- | -- | -- | -- | -- | -- |
| August-18 | 76.39 | 4728.13 | 50.88 | 4724.57 | 14.68 | 4718.14 | 19.91 | 4709.54 | -- | -- | -- | -- | -- | -- |
| November-18 | 75.53 | 4728.99 | 51.00 | 4724.45 | 14.87 | 4717.95 | 19.71 | 4709.74 | -- | -- | -- | -- | -- | -- |
| June-19 | 76.20 | 4728.32 | 50.19 | 4725.26 | 14.42 | 4718.40 | 19.38 | 4710.07 | -- | -- | -- | -- | -- | -- |
| December-19 | 74.85 | 4729.67 | 50.63 | 4724.82 | 14.86 | 4717.96 | 19.69 | 4709.76 | -- | -- | -- | -- | -- | -- |
| June-20 | 75.48 | 4729.04 | 50.59 | 4724.86 | 14.63 | 4718.19 | 19.83 | 4709.62 | -- | -- | -- | -- | -- | -- |
| December-20 | 74.68 | 4729.84 | -- | -- | -- | -- | 19.65 | 4709.80 | -- | -- | -- | -- | -- | -- |
| June-21 | 75.84 | 4728.68 | -- | -- | -- | -- | 19.97 | 4709.48 | -- | -- | -- | -- | -- | -- |
| December-21 | 75.28 | 4729.24 | 50.95 | 4724.50 | 15.24 | 4717.58 | 19.72 | 4709.73 | -- | -- | -- | -- | -- | -- |
| June-22 | 75.45 | 4729.07 | 50.95 | 4724.50 | -- | -- | 19.55 | 4709.90 | -- | -- | -- | -- | -- | -- |
| December-22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

ELEV : Groundwater elevation above mean sea level (feet). Well locations shown on Figure 2.
-- : Blank cell denotes no data

**TABLE 4**
**Summary of Volatile Organic Compound Detections**
**December 2022 Groundwater Monitoring**
**Bozeman Landfill, Bozeman, Montana**

| | Sampling Site | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LF-2 | LF-3 | MW-6 | MW-8A | MW-9A | MW-12 | MW-13 | MW-17 | MW-18 | MW-20 | McIL-HATTAN SEEP | TRIP BLANK 1 | DUP 1 | DUP 2 | Blank 1 (Dec. 2022 Equipment Blank) | Blank 2 (June 2023 Equipment Blank) |
| **Analyte** | December 7 and 8, 2022 | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | | | | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | | | | | | | | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | | | | | | | | | | | | | | | | |
| 1,1,2-Trichloroethane | | | | | | | | | | | | | | | | |
| 1,1,2-Trichlorotrifluoroethane | | | | | | | | | | | | | | | | |
| **1,1-Dichloroethane** | | | 0.950 | | 0.389 J | 0.540 | | 0.454 J | | | | | | | | |
| 1,1-Dichloroethene | | | | | | | | | | | | | | | | |
| 1,2,3-Trichloropropane | | | | | | | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | | | | | | | | | | | | | | | | |
| 1,2-Dibromo3chloropropane | | | | | | | | | | | | | | | | |
| 1,2-Dibromoethane (EDB) | | | | | | | | | | | | | | | | |
| **1,2-Dichlorobenzene** | | | | | | | 0.107 J | | | | | | | | | |
| **1,2-Dichloroethane** | | | | | | | 0.979 | | | | | | | | | |
| **1,2-Dichloropropane** | | | | | | | 0.282 J | 1.06 | 0.182 J | | | | | 1.11 | | |
| **1,4-Dichlorobenzene** | | | | | | | 0.603 | | 0.456 J | | | | | | | |
| 1,4-Dioxane (p-Dioxane) | | | | | | | | | | | | | | | | |
| **2-Butanone (MEK)** | 1.44 J | 1.29 J | 2.24 J | 1.23 J | 2.61 J | | 1.94 J | 1.22 J | | 1.19 J | | | | | 5.68 | 2.61 J |
| 2-Hexanone | | | | | | | | | | | | | | | | |
| **2-Propanol** | 34.1 | 35.7 | 93.5 | 40.1 | 51.9 | 27.5 | 102 | 36.5 | 45.9 | 36.3 | | | | 34.2 | 92.4 | 1090 |
| **4-Methyl-2-pentanone (MIBK)** | | | | | | | | | | | | | | | 1.81 J | 1.07 J |
| **Acetone** | 19.6 J | 21.9 J | 33.9 | 18.3 J | 60.5 | 26.5 | 50.0 | 17.4 J | | 15.9 J | | | | 17.8 J | 62.2 | 15.5 J |
| Acrylonitrile | | | | | | | | | | | | | | | | |
| **Benzene** | | | | | | | 0.456 J | | 0.102 J | | | | | | | |
| Bromochloromethane | | | | | | | | | | | | | | | | |
| Bromodichloromethane | | | | | | | | | | | | | | | | |
| Bromoform | | | | | | | | | | | | | | | | |
| Bromomethane | | | | | | | | | | | | | | | | |
| Carbon disulfide | | | | | | | | | | | | | | | | |
| Carbon tetrachloride | | | | | | | | | | | | | | | | |
| **Chlorobenzene** | | | | | | | 0.279 J | | | | | | | | | |
| **Chloroethane** | | | | | | | 1.09 J | | | | | | | | | |
| **Chloroform** | | | | | | | | 0.127 J | | | | | | 0.131 J | | |
| Chloromethane | | | | | | | | | | | | | | | | |
| **cis-1,2-Dichloroethene** | 0.203 J | 0.635 | 1.07 | 0.355 J | 0.656 | 2.06 | 0.870 | 11.4 | 0.418 J | | 0.156 J | | 0.228 J | 11.0 | | |
| cis-1,3-Dichloropropene | | | | | | | | | | | | | | | | |
| Cyclohexane | | | | | | | | | | | | | | | | |
| Dibromochloromethane | | | | | | | | | | | | | | | | |
| Dibromomethane | | | | | | | | | | | | | | | | |
| Dichlorodifluoromethane | | | | | | | | | | | | | | | | |
| Ethylbenzene | | | | | | | | | | | | | | | | |
| Iodomethane | | | | | | | | | | | | | | | | |
| Isopropylbenzene (Cumene) | | | | | | | | | | | | | | | | |
| **Methylene Chloride** | | | | | | | | 2.73 | | | | | | 2.72 | | |
| Methyl-tert-butyl ether | | | | | | | | | | | | | | | | |
| n-Hexane | | | | | | | | | | | | | | | | |
| n-Propylbenzene | | | | | | | | | | | | | | | | |
| Styrene | | | | | | | | | | | | | | | | |
| **Tetrachloroethene** | 0.396 J | 0.884 | | 0.366 J | 0.871 | | | 4.31 | | 1.73 | 0.546 | | 0.423 J | 4.38 | | |
| **Tetrahydrofuran** | | | 2.68 J | | 2.77 J | | 2.61 J | | 1.01 J | | | | | | 2.74 J | |
| Toluene | | | | | | | | | | | | | | | | |
| trans-1,2-Dichloroethene | | | | | | | | | | | | | | | | |
| trans-1,3-Dichloropropene | | | | | | | | | | | | | | | | |
| trans-1,4-Dichloro-2-butene | | | | | | | | | | | | | | | | |
| **Trichloroethene** | | 0.300 J | 0.411 J | | 0.675 | | 0.263 J | 1.93 | 0.219 J | | | | | | | |
| Trichlorofluoromethane | | | | | | | | | | | | | | | | |
| Vinyl acetate | | | | | | | | | | | | | | | | |
| **Vinyl chloride** | | | | | | 0.319 J | **5.92** | | 0.912 | | | | | | | |
| Xylene (Total) | | | | | | | | | | | | | | | | |

Notes:
Concentrations in micrograms per liter (µg/L)
**Bolded** Analyte Name - Analyte detected above Method Detection Limit in at least one sample.
**Bolded** Values - Constituent concentration exceeding USEPA Drinking Water Standards, Maximum Contaminant Level (Vinyl Chloride) and/or Montana Human Health Standard
Reference - 2019, DEQ. Circular DEQ-7 Montana Numeric Water Quality Standards. June.
Blank record and/or field - Analyte Not Detected above minimum detection limit (MDL)
J - Estimated Concentration (less than analytical practical quantitation limit or PQL but greater than the analytical MDL)

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-9A | 12/8/2022 | U 0.0941 | 0.656 | U 0.43 | J 0.389 | U 0.96 | 0.871 | 0.675 | U 0.234 |
| LF-2 | 12/6/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | 1.3 | U 1 | U 1 |
| | 6/14/2011 | U 0.038 | U 0.08 | U 2 | U 0.072 | U 0.021 | 1.1 | U 0.05 | U 0.049 |
| | 12/5/2011 | U 0.047 | 0.27 | U 5 | U 0.072 | U 0.13 | 1.4 | J 0.23 | U 0.16 |
| | 6/4/2012 | J 0.12 | J 0.25 | U 2 | U 0.072 | U 0.13 | 1.9 | J 0.31 | U 0.16 |
| | 12/6/2012 | U 0.047 | J 0.15 | U 2 | U 0.072 | U 0.13 | 1.1 | J 0.14 | U 0.16 |
| | 6/12/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | 0.86 | J 0.12 | U 0.2 |
| | 12/18/2013 | U 0.24 | J 0.29 | U 2 | U 0.25 | U 0.5 | 0.83 | J 0.15 | U 0.1 |
| | 3/27/2014 | U 0.24 | J 0.37 | U 2 | U 0.25 | U 0.5 | 0.89 | J 0.16 | U 0.1 |
| | 8/21/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | 1.2 | J 0.13 | U 0.082 |
| | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | 0.98 | J 0.31 | U 0.082 |
| | 6/15/2015 | U 0.21 | J 0.36 | U 0.56 | U 0.22 | U 0.64 | 0.67 | J 0.23 | U 0.081 |
| | 12/1/2015 | U 0.21 | J 0.37 | U 0.56 | U 0.22 | U 0.64 | 0.75 | J 0.19 | U 0.081 |
| | 6/15/2016 | U 0.21 | J 0.48 | U 0.56 | U 0.22 | U 0.64 | 0.72 | U 0.14 | U 0.081 |
| | 8/25/2016 | U 0.042 | J 0.44 | U 0.097 | U 0.055 | U 0.08 | 0.84 | J 0.12 | U 0.084 |
| | 11/28/2016 | U 0.042 | J 0.36 | U 0.097 | U 0.055 | U 0.08 | 0.65 | J 0.14 | U 0.098 |
| | 4/17/2017 | U 0.042 | J 0.29 | U 0.097 | U 0.055 | U 0.08 | 0.62 | U 0.044 | U 0.098 |
| | 6/16/2017 | U 0.042 | J 0.48 | U 0.097 | U 0.055 | U 0.08 | 0.76 | J 0.094 | U 0.098 |
| | 9/20/2017 | U 0.13 | J 0.48 | U 1.2 | U 0.14 | U 1.1 | 0.73 | U 0.18 | U 0.096 |
| | 11/29/2017 | U 0.13 | 0.55 | U 1.2 | U 0.14 | U 1.1 | 0.96 | U 0.18 | U 0.096 |
| | 3/27/2018 | U 0.13 | J 0.36 | U 1.2 | U 0.14 | U 1.1 | 0.74 | U 0.18 | U 0.096 |
| | 8/20/2018 | U 0.1 | J 0.4 | U 0.98 | U 0.17 | U 0.16 | 1.1 | U 0.15 | U 0.092 |
| | 10/16/2018 | U 0.1 | J 0.42 | U 0.98 | U 0.17 | J 0.52 | 0.8 | U 0.15 | U 0.092 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| LF-2 | 11/27/2018 | U 0.1 | J 0.42 | U 0.98 | U 0.17 | U 0.16 | 0.73 | U 0.15 | U 0.092 |
| | 3/27/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | J 0.42 | U 0.15 | U 0.092 |
| | 6/12/2019 | U 0.1 | J 0.27 | U 0.98 | U 0.17 | U 0.16 | 0.65 | U 0.15 | U 0.092 |
| | 9/24/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | J 0.48 | U 0.15 | U 0.092 |
| | 12/3/2019 | U 0.1 | J 0.26 | U 0.98 | U 0.17 | U 0.48 | 0.67 | U 0.15 | U 0.092 |
| | 3/23/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | 0.6 | U 0.11 | U 0.098 |
| | 6/23/2020 | U 0.12 | J 0.39 | U 2 | U 0.14 | U 0.16 | 0.63 | U 0.11 | U 0.098 |
| | 9/21/2020 | U 0.0941 | J 0.275 | U 0.43 | U 0.1 | U 0.96 | 0.526 | U 0.19 | U 0.234 |
| | 12/1/2020 | U 0.0941 | J 0.365 | U 0.43 | U 0.1 | UL0 0.96 | 0.615 | U 0.19 | U 0.234 |
| | 3/19/2021 | U 0.0941 | J 0.308 | U 0.43 | U 0.1 | U 0.96 | J 0.439 | U 0.19 | U 0.234 |
| | 6/22/2021 | U 0.0941 | J 0.214 | U 0.43 | U 0.1 | U 0.96 | J 0.486 | U 0.19 | U 0.234 |
| | 12/15/2021 | U 0.0941 | J 0.288 | U 0.43 | U 0.1 | U 0.96 | J 0.399 | U 0.19 | U 0.234 |
| | 6/21/2022 | U 0.0941 | J- 0.223 | U 0.43 | UJ- 0.1 | U 0.96 | J 0.407 | UJ- 0.19 | UJ 0.234 |
| | 12/7/2022 | U 0.0941 | J 0.203 | U 0.43 | U 0.1 | U 0.96 | J 0.396 | U 0.19 | U 0.234 |
| LF-3 | 1/18/1994 | U 2 | U 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 6/27/1994 | U 1 | U 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 2/1/1995 | U 1 | U 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 6/28/1995 | U 1 | U 1 | U 1 | U 1 | U 1 | 3 | 1 | U 1 |
| | 11/28/1995 | U 1 | U 1 | U 5 | U 1 | U 1 | 6 | 2 | U 1 |
| | 6/25/1996 | U 1 | 1 | U 5 | U 1 | U 1 | 6 | 2 | U 1 |
| | 12/11/1996 | U 1 | U* 1 | U 5 | U 1 | U 1 | 5 | 2 | U 1 |
| | 6/19/1997 | U 1 | 1 | U 1 | U 1 | U 2 | 6 | 2 | U 2 |
| | 12/15/1997 | U 1 | 1 | U 5 | U 1 | U 1 | 2 | 6 | U 1 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

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**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| LF-3 | 3/24/1998 | U 1 | 1 | U 5 | U 1 | U 1 | 7 | 2 | U 1 |
| | 6/29/1998 | U 1 | U 1 | <(2) 5 | (2) U 1 | < (2) 1 | 6 | 3 | U 1 |
| | 9/29/1998 | U 1 | 1 | 11 | U 1 | U 1 | 7 | 3 | U 1 |
| | 12/14/1998 | U 1 | 1 | UB 5 | U 1 | U 1 | 6 | 6 | U 1 |
| | 3/15/1999 | U 1 | U 1 | U 5 | U 1 | | 6 | 2 | U 1 |
| | 6/22/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | 1 | U 1 |
| | 9/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | 1 | U 1 |
| | 12/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | 5 | 2 | U 1 |
| | 3/22/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | 5 | 2 | U 1 |
| | 6/7/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | 1 | U 1 |
| | 9/22/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | 1 | U 1 |
| | 11/28/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | 1 | U 1 |
| | 3/22/2001 | U 1 | 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 6/11/2001 | U 1 | 1 | U 5 | U 1 | U 1 | 5 | 2 | U 1 |
| | 9/19/2001 | U 1 | 1 | U(1,3) 5 | U 1 | 1 | 5 | 3 | U 1 |
| | 12/17/2001 | U 1 | 1 | U 5 | U 1 | U 1 | 6 | 2 | U 1 |
| | 3/25/2002 | U 1 | 1 | U 5 | U 1 | 2 | 6 | 1 | U 1 |
| | 6/13/2002 | U 1 | 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 9/24/2002 | U 1 | 1 | UJR 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 12/12/2002 | U 1 | 1 | U 5 | U 1 | U 1 | 6 | 1 | U 1 |
| | 3/24/2003 | U 1 | 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 6/9/2003 | U 1 | 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 9/25/2003 | U 1 | 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

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**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| LF-3 | 12/4/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | 1 | UJF% 1 |
| | 3/25/2004 | U 1 | 1 | U 5 | U 1 | U 1 | 4 | U 1 | U 1 |
| | 6/9/2004 | U 1 | 1 | U 5 | U 1 | U 1 | 4 | U 1 | U 1 |
| | 9/9/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | U 1 | U 1 |
| | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | U 1 | U 1 |
| | 3/29/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | U 1 | U 1 |
| | 6/16/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | U 1 | U 1 |
| | 9/20/2005 | U 1 | U 1 | BU 5 | U 1 | U 1 | 3 | U 1 | U 1 |
| | 12/13/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | U 1 | U 1 |
| | 3/16/2006 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | U 1 | U 1 |
| | 6/12/2006 | U 0.5 | 0.8 | U 5 | U 1 | U 1 | 2.7 | 0.5 | U 0.5 |
| | 9/20/2006 | U 0.5 | 0.6 | U 5 | U 1 | U 1 | 2.3 | U 0.5 | U 0.5 |
| | 12/5/2006 | U 0.5 | 0.7 | U 5 | U 1 | U 1 | 2.7 | U 0.5 | U 0.5 |
| | 3/13/2007 | U 0.5 | 0.8 | U 5 | U 1 | U 1 | 2.7 | 0.6 | U 0.5 |
| | 6/21/2007 | U 0.5 | 0.9 | U 5 | U 1 | U 1 | 2.6 | 0.6 | UJF% 0.5 |
| | 12/11/2007 | U 0.5 | 0.8 | U 5 | U 1 | U 1 | 2.5 | 0.6 | U 0.5 |
| | 6/25/2008 | U 0.5 | 1 | U 5 | U 1 | U 1 | 2.9 | 0.7 | U 0.5 |
| | 12/8/2008 | U 1 | 1.6 | U 4 | U 1 | U 1 | 3.9 | 1.1 | U 0.4 |
| | 6/2/2009 | U 0.5 | 1.5 | U 2 | U 0.5 | U 2 | 4.5 | 1 | U 0.2 |
| | 12/10/2009 | U 0.5 | 1.8 | UB 2 | U 0.5 | U 2 | 4.4 | 1 | U 0.2 |
| | 6/16/2010 | U 0.5 | 2.1 | 30.4 | U 0.5 | U 0.5 | 4.4 | 1.1 | U 0.5 |
| | 12/6/2010 | U 1 | 1.2 | U 1 | U 1 | U 1 | 3.9 | U 1 | U 1 |
| | 6/13/2011 | U 0.038 | 1.9 | U 2 | J 0.11 | J 0.11 | 3.9 | 0.96 | U 0.049 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| LF-3 | 12/6/2011 | U 0.047 | 1.8 | U 5 | U 0.072 | U 0.13 | 3.8 | 0.9 | U 0.16 |
| | 6/4/2012 | J 0.053 | 1.9 | U 2 | J 0.086 | U 0.13 | 4.1 | 0.94 | U 0.16 |
| | 12/6/2012 | U 0.047 | 1.8 | U 2 | J 0.14 | U 0.13 | 3.8 | 0.88 | U 0.16 |
| | 6/12/2013 | U 0.24 | 2.3 | U 2 | U 0.25 | U 0.5 | 4.2 | 1 | U 0.2 |
| | 12/18/2013 | U 0.24 | 2.2 | U 2 | U 0.25 | U 0.5 | 3.4 | 0.78 | U 0.1 |
| | 3/26/2014 | U 0.24 | 2 | U 2 | U 0.25 | U 0.5 | 2.4 | 0.61 | U 0.1 |
| | 8/20/2014 | U 0.073 | 2.4 | U 2 | U 0.077 | U 0.34 | 5.5 | 1.1 | U 0.082 |
| | 12/10/2014 | U 0.073 | 3.4 | U 2 | U 0.087 | U 0.34 | 4.2 | 0.94 | U 0.082 |
| | 6/15/2015 | U 0.21 | 2.1 | U 0.56 | U 0.22 | U 0.64 | 3.9 | 0.82 | U 0.081 |
| | 12/1/2015 | U 0.21 | 2.4 | U 0.56 | U 0.22 | U 0.64 | 3.8 | 0.94 | U 0.081 |
| | 6/15/2016 | U 0.21 | 2.7 | U 0.56 | U 0.22 | U 0.64 | 3.6 | 0.76 | U 0.081 |
| | 8/25/2016 | U 0.042 | 2.9 | U 0.097 | U 0.055 | U 0.08 | 4.1 | 0.94 | U 0.084 |
| | 11/28/2016 | U 0.042 | 2.5 | U 0.097 | U 0.055 | U 0.08 | 3.9 | 0.71 | U 0.098 |
| | 4/17/2017 | U 0.042 | 2.7 | U 0.097 | U 0.055 | U 0.08 | 3.3 | 0.88 | U 0.098 |
| | 6/15/2017 | U 0.042 | 2.4 | U 0.097 | U 0.055 | U 0.08 | 2.9 | 0.88 | U 0.098 |
| | 9/20/2017 | U 0.13 | 2.3 | U 1.2 | U 0.14 | U 1.1 | 3.4 | 0.82 | U 0.096 |
| | 11/29/2017 | U 0.13 | 2.3 | U 1.2 | U 0.14 | U 1.1 | 3.4 | 0.7 | U 0.096 |
| | 3/27/2018 | U 0.13 | 2 | U 1.2 | U 0.14 | U 1.1 | 3.4 | 0.88 | U 0.096 |
| | 8/20/2018 | U 0.1 | 2.3 | U 0.98 | U 0.17 | U 0.16 | 3.5 | 0.93 | U 0.092 |
| | 10/16/2018 | U 0.1 | 2.1 | U 0.98 | U 0.17 | J 0.71 | 2.9 | 0.82 | U 0.092 |
| | 11/27/2018 | U 0.1 | 1.7 | U 0.98 | U 0.17 | U 0.16 | 3 | 0.7 | U 0.092 |
| | 3/27/2019 | 39.9 | 1.3 | U 0.98 | U 0.17 | U 0.16 | 1.8 | 0.45 | U 0.092 |
| | 6/12/2019 | U 0.1 | 1.5 | U 0.98 | U 0.17 | U 0.16 | 2.4 | 0.58 | U 0.092 |

**Notes:** µg/L - micrograms per liter
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- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| LF-3 | 9/24/2019 | U 0.1 | 1.4 | U 0.98 | U 0.17 | U 0.48 | 1.9 | 0.49 | U 0.092 |
| | 12/3/2019 | U 0.1 | 1.3 | U 0.98 | U 0.17 | U 0.48 | 2.4 | 0.62 | U 0.092 |
| | 3/23/2020 | U 0.12 | 1.4 | U 2 | U 0.14 | U 0.16 | 1.8 | 0.46 | U 0.098 |
| | 6/23/2020 | U 0.12 | 1.3 | U 2 | U 0.14 | U 0.16 | 1.8 | 0.49 | U 0.098 |
| | 9/21/2020 | U 0.0941 | 0.995 | U 0.43 | U 0.1 | U 0.96 | 1.7 | J 0.488 | U 0.234 |
| | 12/1/2020 | U 0.0941 | 1.08 | U 0.43 | J 0.104 | UL0 0.96 | 1.74 | J 0.495 | U 0.234 |
| | 3/19/2021 | U 0.0941 | 1.07 | U 0.43 | U 0.1 | U 0.96 | 1.56 | J 0.481 | U 0.234 |
| | 6/22/2021 | U 0.0941 | 0.73 | U 0.43 | U 0.1 | U 0.96 | 1.32 | J 0.383 | U 0.234 |
| | 12/14/2021 | U 0.0941 | 0.785 | U 0.43 | U 0.1 | U 0.96 | 1.44 | J 0.321 | U 0.234 |
| | 6/22/2022 | U 0.0941 | J- 0.915 | U 0.43 | UJ- 0.1 | U 0.96 | J- 1.01 | UJ- 0.278 | UJ- 0.234 |
| | 12/7/2022 | U 0.0941 | 0.635 | U 0.43 | U 0.1 | U 0.96 | 0.884 | J 0.3 | U 0.234 |
| MW-4 | 1/18/1994 | U 2 | U 1 | U 5 | 2 | U 1 | 4 | 2 | U 1 |
| | 6/27/1994 | U 1 | U 1 | U* 5 | 2 | U 1 | 4 | 2 | U 1 |
| | 1/31/1995 | U 1 | U 1 | U* 5 | 1 | U 1 | 3 | 2 | U 1 |
| | 6/27/1995 | U 1 | U 1 | JX 1 | 1 | U 1 | 2 | 1 | U 1 |
| | 11/28/1995 | U 1 | U 1 | U* 5 | 1 | U 1 | 3 | 1 | U 1 |
| | 6/25/1996 | U 1 | U 1 | U 5 | 1 | U 1 | 3 | 2 | U 1 |
| | 12/11/1996 | U 1 | U* 1 | U 5 | U 1 | U 1 | 2 | 1 | U 1 |
| | 6/19/1997 | U 1 | U 1 | U 1 | U 1 | U 2 | 2 | U 1 | U 2 |
| | 12/15/1997 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 6/29/1998 | U 1 | <(2) 1 | <(5) 5 | U 1 | < (2) 1 | 2 | 1 | U 1 |
| | 12/14/1998 | U 1 | U 1 | UB 5 | U 1 | U 1 | 2 | 2 | U 1 |
| | 6/22/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |

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- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-4 | 12/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | 1 | U 1 |
| | 6/7/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 11/28/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | 1 | U 1 |
| | 6/11/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | 1 | U 1 |
| | 12/17/2001 | U 1 | 1 | U 5 | U 1 | U 1 | 1 | 1 | U 1 |
| | 6/13/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | 1 | U 1 |
| | 12/11/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 6/9/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 12/4/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | UJF% 1 |
| | 6/9/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/16/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/14/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/12/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.5 | U 0.5 | U 0.5 |
| | 12/5/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/19/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.6 | U 0.5 | UJF% 0.5 |
| | 12/11/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.5 | U 0.5 | U 0.5 |
| | 6/23/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.5 | U 0.5 | U 0.5 |
| | 12/8/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/1/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | J 0.98 | J 0.54 | U 0.2 |
| | 12/10/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | J 0.83 | J 0.56 | U 0.2 |
| | 6/15/2010 | U 0.5 | 0.51 | 27.6 | U 0.5 | U 0.5 | 0.85 | 0.66 | U 0.5 |
| | 12/7/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |

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- Value greater than the HHS

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-4 | 6/13/2011 | U 0.038 | J 0.49 | U 2 | J 0.24 | J 0.097 | 0.78 | 0.66 | U 0.049 |
| | 12/7/2011 | U 0.047 | J 0.4 | U 5 | J 0.25 | U 0.13 | 0.87 | 0.64 | U 0.16 |
| | 6/4/2012 | J 0.51 | J 0.48 | U 2 | J 0.25 | U 0.13 | 1.2 | 0.86 | U 0.16 |
| | 12/4/2012 | U 0.047 | J 0.45 | U 2 | J 0.29 | U 0.13 | 1.1 | 0.79 | U 0.16 |
| | 6/10/2013 | U 0.24 | J 0.5 | U 2 | J 0.42 | U 0.5 | 1.1 | 0.97 | U 0.2 |
| | 12/16/2013 | U 0.24 | J 0.47 | U 2 | J 0.45 | U 0.5 | 1 | 0.77 | U 0.1 |
| | 3/26/2014 | U 0.24 | 0.53 | U 2 | J 0.45 | U 0.5 | 1 | 0.86 | U 0.1 |
| | 8/20/2014 | U 0.073 | J 0.4 | U 2 | U 0.077 | U 0.34 | 1.6 | 0.89 | U 0.082 |
| | 12/8/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | 1.2 | 1 | U 0.082 |
| | 6/16/2015 | U 0.21 | U 0.25 | U 0.56 | J 0.45 | U 0.64 | 1.2 | 0.78 | U 0.081 |
| | 11/30/2015 | U 0.21 | J 0.48 | U 0.56 | U 0.22 | U 0.64 | 1.1 | 0.73 | U 0.081 |
| | 6/14/2016 | U 0.21 | J 0.43 | U 0.56 | J 0.28 | U 0.64 | 1 | 0.74 | U 0.081 |
| | 11/29/2016 | U 0.042 | J 0.45 | U 0.097 | U 0.055 | U 0.08 | 0.88 | 0.65 | U 0.098 |
| | 6/14/2017 | U 0.042 | 0.55 | U 0.097 | U 0.055 | U 0.08 | 0.79 | 0.64 | U 0.098 |
| | 11/30/2017 | U 0.13 | 0.59 | U 1.2 | U 0.14 | U 1.1 | 1 | 0.57 | U 0.096 |
| | 8/20/2018 | U 0.1 | 0.58 | U 0.98 | J 0.37 | J 0.41 | 1 | 0.59 | U 0.092 |
| | 11/29/2018 | U 0.1 | 0.54 | U 0.98 | J 0.31 | U 0.16 | 0.81 | 0.49 | U 0.092 |
| | 6/12/2019 | U 0.1 | 0.59 | U 0.98 | U 0.17 | U 0.16 | 0.79 | 0.43 | U 0.092 |
| | 12/2/2019 | U 0.1 | 0.61 | U 0.98 | J 0.26 | U 0.48 | 0.88 | J 0.38 | U 0.092 |
| | 6/22/2020 | U 0.12 | 0.61 | U 2 | J 0.36 | U 0.16 | 0.82 | 0.5 | U 0.098 |
| | 11/30/2020 | U 0.0941 | 0.6 | U 0.43 | J 0.369 | UL0 0.96 | 0.842 | J 0.466 | U 0.234 |
| | 6/21/2021 | U 0.0941 | J 0.492 | U 0.43 | J 0.317 | U 0.96 | 0.674 | J 0.439 | U 0.234 |
| | 12/13/2021 | U 0.0941 | 0.508 | U 0.43 | J 0.346 | U 0.96 | 0.825 | J 0.398 | U 0.234 |

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- Value greater than the HHS

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J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-4 | 6/21/2022 | U 0.0941 | 0.57 | U 0.43 | 0.595 | U 0.96 | 0.616 | UJ- 0.35 | UJ 0.234 |
| MW-5 | 1/17/1994 | U 2 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/27/1994 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 1/31/1995 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/27/1995 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 11/27/1995 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/25/1996 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/11/1996 | U 1 | U 1 | U 5 | U 1 | U* 1 | U 1 | U 1 | U 1 |
| | 6/19/1997 | U 1 | U 1 | U 1 | U 1 | U 2 | U 1 | U 1 | U 2 |
| | 12/15/1997 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/29/1998 | U 1 | U 1 | U 5 | U 1 | 1 | U 1 | U 1 | U 1 |
| | 12/14/1998 | U 1 | U 1 | UB 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/22/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/7/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 11/28/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/11/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/17/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/13/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/11/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/9/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/3/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | UJF% 1 |
| | 6/9/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-5 | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/16/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/14/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/12/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/5/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/19/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | UJF% 0.5 |
| | 12/11/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/23/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/8/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/1/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 12/3/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 6/14/2010 | U 0.5 | U 0.5 | 38.3 | U 0.5 | U 0.5 | U 0.5 | U 0.5 | U 0.5 |
| | 12/6/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/13/2011 | J 0.07 | U 0.08 | U 2 | U 0.072 | J 0.057 | U 0.041 | U 0.05 | U 0.049 |
| | 12/6/2011 | U 0.047 | U 0.08 | U 5 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/4/2012 | J 0.073 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 12/4/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/10/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.12 | U 0.2 |
| | 12/16/2013 | 2.1 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 8/21/2014 | 6.2 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.082 |
| | 12/9/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 6/16/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/30/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |

**Notes:** µg/L - micrograms per liter
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-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-5 | 6/14/2016 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/29/2016 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 6/15/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 11/30/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 8/20/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 11/28/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 6/10/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 12/2/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| | 6/22/2020 | 1.4 | U 0.2 | U 2 | U 0.14 | J 0.24 | U 0.093 | U 0.11 | U 0.098 |
| | 11/30/2020 | J 0.173 | U 0.126 | U 0.43 | U 0.1 | UL0 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/21/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/13/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/23/2022 | UJ- 0.0941 | UJ- 0.126 | UJ- 0.43 | UJ- 0.1 | UJ- 0.96 | UJ- 0.3 | UJ- 0.19 | UJ- 0.234 |
| MW-6 | 8/3/1993 | U 1 | 2.3 | U 1 | 1.7 | U 1 | U 1 | 5.1 | 3.7 |
| | 1/18/1994 | U 2 | 2 | U 5 | U 1 | U 1 | 1 | 5 | 6 |
| | 6/28/1994 | U 1 | 3 | U 5 | 3 | U 1 | 1 | 6 | 8 |
| | 2/1/1995 | U* 1 | 3 | U 5 | 3 | U 1 | 1 | 5 | 12 |
| | 6/27/1995 | U 1 | 2 | U 1 | U 1 | U 1 | U 1 | 3 | 9 |
| | 11/28/1995 | U 1 | 1 | U 5 | 2 | U 1 | 1 | 3 | 6 |
| | 6/25/1996 | U 1 | U* 1 | U 5 | 2 | 1 | 1 | 2 | 11 |
| | 12/11/1996 | U 1 | U 1 | U 5 | 2 | U 1 | U* 1 | 2 | 11 |
| | 6/19/1997 | U 1 | U 1 | U 1 | U 1 | U 2 | 1 | U 1 | U 2 |
| | 12/16/1997 | U 1 | U 1 | U 5 | 2 | U 1 | 2 | U 1 | 14 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-6 | 3/23/1998 | U 1 | U 1 | U 5 | 2 | U 1 | U 1 | 2 | 13 |
| | 6/29/1998 | U 1 | <(2) 1 | U 5 | 1 | U 1 | <(2) 1 | 1 | 15 |
| | 9/29/1998 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | 1 | 9 |
| | 3/15/1999 | U 1 | U 1 | U 5 | U 1 | | U 1 | 1 | 9 |
| | 6/22/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 9 |
| | 9/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 9 |
| | 12/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 10 |
| | 3/22/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 4 |
| | 6/7/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 3 |
| | 9/22/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 3 |
| | 11/28/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 3 |
| | 3/21/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/11/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 9/19/2001 | U 1 | U 1 | U(1,3) 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/18/2001 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | 1 | U 1 |
| | 3/25/2002 | U 1 | 1 | U 5 | U 1 | U 1 | U 1 | 2 | U 1 |
| | 6/13/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 9/24/2002 | U 1 | 1 | UJR 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 12/12/2002 | U 1 | 2 | U 5 | 1 | U 1 | U 1 | 2 | U 1 |
| | 3/24/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 6/9/2003 | U 1 | 1 | U 5 | U 1 | U 1 | U 1 | 2 | U 1 |
| | 9/25/2003 | U 1 | 2 | U 5 | U 1 | U 1 | U 1 | 2 | U 1 |
| | 12/4/2003 | U 1 | 1 | U 5 | U 1 | U 1 | U 1 | 2 | UJF% 1 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-6 | 3/24/2004 | U 1 | 2 | U 5 | 1 | U 1 | U 1 | 2 | U 1 |
| | 6/8/2004 | U 1 | 2 | U 5 | U 1 | U 1 | U 1 | 2 | U 1 |
| | 9/9/2004 | U 1 | 1 | U 5 | U 1 | U 1 | U 1 | 2 | U 1 |
| | 12/7/2004 | U 1 | 2 | U 5 | U 1 | U 1 | U 1 | 2 | U 1 |
| | 3/29/2005 | U 1 | 2 | U 5 | 1 | U 1 | U 1 | 2 | U 1 |
| | 6/16/2005 | U 1 | 1 | U 5 | 1 | U 1 | 2 | 2 | U 1 |
| | 9/20/2005 | U 1 | 2 | BU 5 | U 1 | U 1 | U 1 | 3 | U 1 |
| | 12/14/2005 | U 1 | 1 | U 5 | 1 | U 1 | 2 | 2 | U 1 |
| | 3/16/2006 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | 1 | U 1 |
| | 6/13/2006 | U 0.5 | 0.8 | U 5 | 1.1 | U 1 | 2.5 | 1.1 | U 0.5 |
| | 9/21/2006 | U 0.5 | 1.8 | U 5 | U 1 | U 1 | 0.9 | 2.2 | U 0.5 |
| | 12/6/2006 | U 0.5 | 1.5 | U 5 | 1 | U 1 | 1.8 | 1.6 | U 0.5 |
| | 3/15/2007 | U 0.5 | 1 | U 5 | 1 | U 1 | 1.4 | 1 | U 0.5 |
| | 6/20/2007 | U 0.5 | 0.8 | U 5 | U 1 | U 1 | 1.1 | 1 | UJF% 0.5 |
| | 12/10/2007 | U 0.5 | 1.8 | U 5 | 1.1 | U 1 | 1.3 | 1.9 | U 0.5 |
| | 6/24/2008 | U 0.5 | 0.8 | U 5 | U 1 | U 1 | 0.9 | 0.8 | U 0.5 |
| | 12/9/2008 | U 1 | 1.8 | U 4 | 1.4 | U 1 | 1.7 | 2.2 | U 0.4 |
| | 6/2/2009 | U 0.5 | 1.4 | U 2 | 1.1 | U 2 | J 0.88 | 1.3 | U 0.2 |
| | 12/9/2009 | U 0.5 | 1.8 | UB 2 | 1.3 | U 2 | 1.7 | 1.8 | 2.1 |
| | 6/15/2010 | U 0.5 | 1.5 | 19.1 | 1.1 | U 0.5 | 1.3 | 1.4 | 2.4 |
| | 12/7/2010 | U 1 | 2.2 | U 1 | 1.1 | U 1 | 1 | 1.5 | 5.3 |
| | 6/13/2011 | J 0.31 | 1.3 | U 2 | 0.94 | U 0.021 | 0.78 | 0.96 | 5.2 |
| | 12/5/2011 | U 0.047 | 1 | U 5 | 0.89 | U 0.13 | 1.5 | 0.88 | 1.2 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-6 | 6/5/2012 | J 0.21 | 2.5 | U 2 | 1.1 | U 0.13 | 0.93 | 1.1 | 1.8 |
| | 12/4/2012 | J 0.12 | 2.1 | U 2 | 0.95 | U 0.13 | 0.97 | 0.79 | 1.5 |
| | 6/10/2013 | U 0.24 | 2.3 | U 2 | 1.2 | U 0.5 | 0.8 | 0.82 | 0.65 |
| | 12/16/2013 | U 0.24 | 2.9 | U 2 | 1.3 | U 0.5 | 0.64 | 0.66 | 1.2 |
| | 8/20/2014 | J 0.15 | 2 | U 2 | 1 | U 0.34 | 0.69 | 0.63 | 0.74 |
| | 12/9/2014 | U 0.073 | 1.9 | U 2 | 1.3 | U 0.34 | 1 | 0.77 | 0.82 |
| | 6/17/2015 | U 0.21 | 1.1 | U 0.56 | 0.91 | U 0.64 | 0.79 | 0.51 | 0.58 |
| | 12/2/2015 | U 0.21 | 2.1 | U 0.56 | 0.82 | U 0.64 | 0.57 | 0.5 | 0.9 |
| | 6/15/2016 | U 0.21 | 2.1 | U 0.56 | 1.1 | U 0.64 | 0.53 | J 0.32 | 0.23 |
| | 11/29/2016 | J 0.05 | 2.3 | U 0.097 | 1.1 | U 0.08 | 0.59 | 0.44 | 0.4 |
| | 6/14/2017 | U 0.042 | 1.8 | U 0.097 | 1.2 | U 0.08 | 0.6 | 0.44 | 0.21 |
| | 12/1/2017 | U 0.13 | 2.1 | U 1.2 | 0.98 | U 1.1 | 0.82 | 0.42 | 0.49 |
| | 8/20/2018 | J 0.14 | 1.6 | U 0.98 | 0.94 | J 0.2 | 0.7 | 0.45 | 0.74 |
| | 11/29/2018 | J 0.21 | 1.6 | U 0.98 | 0.83 | U 0.16 | J 0.48 | J 0.37 | 2.1 |
| | 6/13/2019 | J 0.18 | 1.8 | U 0.98 | 0.81 | U 0.16 | J 0.41 | J 0.27 | 1.5 |
| | 12/3/2019 | J 0.19 | 1.6 | U 0.98 | 0.87 | U 0.48 | J 0.31 | J 0.26 | 1.8 |
| | 6/23/2020 | J 0.19 | 1.8 | U 2 | 1.3 | U 0.16 | J 0.43 | 0.41 | 1.6 |
| | 12/1/2020 | J 0.264 | 1.9 | U 0.43 | 1.38 | UL0 0.96 | J 0.331 | J 0.332 | 2.38 |
| | 6/21/2021 | J 0.175 | 1.45 | U 0.43 | 1.06 | U 0.96 | U 0.3 | J 0.258 | 1.29 |
| | 12/13/2021 | J 0.14 | 1.7 | U 0.43 | 1.15 | U 0.96 | U 0.3 | J 0.291 | 1.24 |
| | 6/21/2022 | J 0.149 | 1.73 | U 0.43 | 1.29 | U 0.96 | U 0.3 | UJ- 0.291 | J 0.78 |
| | 12/8/2022 | U 0.0941 | 1.07 | U 0.43 | 0.95 | U 0.96 | U 0.3 | J 0.411 | U 0.234 |
| MW-6B | 6/5/2012 | U 0.047 | U 0.08 | U 2 | U 0.5 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |

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## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-6B | 12/4/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/10/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.12 | U 0.2 |
| | 12/16/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 6/17/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 6/14/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 6/13/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| MW-7A | 1/18/1994 | U 2 | U 1 | 12 | 6 | U 1 | 27 | 4 | U 1 |
| | 6/28/1994 | U* 1 | U 1 | 18 | 7 | U 1 | 32 | 5 | U 1 |
| | 2/1/1995 | U 1 | U 1 | 14 | 6 | U 1 | 24 | 4 | 1 |
| | 6/27/1995 | 2 | U 1 | JX 17 | 6 | U 1 | 13 | 5 | U 1 |
| | 11/27/1995 | U* 1 | U 1 | 10 | 4 | U 1 | 17 | 4 | 1 |
| | 6/25/1996 | 2 | U* 1 | 15 | 5 | U 1 | 16 | 6 | 4 |
| | 12/11/1996 | U* 1 | U 1 | 10 | 3 | U 1 | 10 | 4 | 2 |
| | 6/20/1997 | 2 | U 1 | 15 | 4 | U 2 | 13 | 5 | 7 |
| | 12/16/1997 | 2 | 1 | JX 18 | 5 | U 1 | 5 | 13 | 5 |
| | 3/23/1998 | 2 | U 1 | 14 | 4 | U 1 | 11 | 4 | 4 |
| | 6/30/1998 | 2 | 1 | 15 | 4 | U 1 | 11 | 4 | 6 |
| | 9/29/1998 | 2 | 1 | 19 | 4 | U 1 | 11 | 4 | 3 |
| | 12/14/1998 | 2 | 1 | B 21 | 5 | U 1 | 11 | 11 | 4 |
| | 3/15/1999 | 2 | U 1 | 14 | 4 | | 10 | 3 | 3 |
| | 6/22/1999 | 2 | U 1 | U 5 | 4 | U 5 | 6 | 3 | 4 |
| | 9/13/1999 | 2 | U 1 | U 5 | 3 | U 1 | 8 | 3 | 3 |
| | 12/14/1999 | 1 | U 1 | U 5 | 3 | U 1 | 7 | 2 | 2 |

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## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-7A | 3/22/2000 | 1 | U 1 | U 5 | 3 | U 1 | 9 | 3 | 2 |
| | 6/7/2000 | U 1 | U 1 | U 5 | 3 | U 1 | 7 | U 1 | 3 |
| | 9/22/2000 | U 1 | U 1 | U 5 | 3 | U 1 | 7 | 2 | 3 |
| | 11/28/2000 | U 1 | U 1 | U 5 | 3 | U 1 | 7 | 2 | 3 |
| | 3/21/2001 | U 1 | U 1 | U 5 | 4 | U 1 | 11 | 3 | 2 |
| | 6/11/2001 | 1 | U 1 | U 5 | 4 | U 1 | 12 | 3 | 3 |
| | 9/19/2001 | U 1 | U 1 | U(1,3) 5 | 3 | U 1 | 8 | 2 | U 1 |
| | 12/17/2001 | U 1 | U 1 | U 5 | 5 | U 1 | 11 | 3 | 2 |
| | 3/25/2002 | U 1 | U 1 | U 5 | 3 | U 1 | 9 | 2 | 1 |
| | 6/13/2002 | U 1 | U 1 | U 5 | 5 | U 1 | 10 | 3 | 2 |
| | 9/24/2002 | U 1 | U 1 | UJR 5 | 3 | U 1 | 8 | 2 | 1 |
| | 12/12/2002 | U 1 | U 1 | U 5 | 5 | U 1 | 12 | 3 | 1 |
| | 3/24/2003 | U 1 | U 1 | U 5 | 3 | U 1 | 9 | 2 | U 1 |
| | 6/10/2003 | U 1 | U 1 | U 5 | 3 | U 1 | 9 | 2 | U 1 |
| | 9/25/2003 | U 1 | U 1 | U 5 | 3 | U 1 | 8 | 2 | U 1 |
| | 12/4/2003 | U 1 | U 1 | U 5 | 4 | U 1 | 7 | 2 | UJF% 1 |
| | 3/24/2004 | U 1 | U 1 | U 5 | 2 | U 1 | 4 | U 1 | U 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | 2 | U 1 | 6 | 1 | U 1 |
| | 9/9/2004 | U 1 | U 1 | U 5 | 1 | U 1 | 5 | U 1 | U 1 |
| | 12/7/2004 | U 1 | U 1 | U 5 | 2 | U 1 | 6 | 1 | U 1 |
| | 3/29/2005 | U 1 | U 1 | U 5 | 1 | U 1 | 3 | U 1 | U 1 |
| | 6/17/2005 | U 1 | U 1 | U 5 | 2 | U 1 | 6 | 1 | U 1 |
| | 9/20/2005 | U 1 | U 1 | BU 5 | 1 | U 1 | 3 | U 1 | U 1 |

**Notes:** µg/L - micrograms per liter
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NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

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J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-7A | 12/14/2005 | U 1 | U 1 | U 5 | 1 | U 1 | 4 | U 1 | U 1 |
| | 3/16/2006 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | U 1 | U 1 |
| | 6/13/2006 | U 0.5 | U 0.5 | U 5 | 1.6 | U 1 | 4.2 | 0.7 | U 0.5 |
| | 9/21/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 2.7 | U 0.5 | U 0.5 |
| | 12/7/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 1.7 | U 0.5 | U 0.5 |
| | 3/15/2007 | U 0.5 | U 0.5 | U 5 | 1 | U 1 | 2.2 | U 0.5 | U 0.5 |
| | 6/20/2007 | 0.5 | U 0.5 | U 5 | U 1 | U 1 | 2.3 | 0.6 | UJF% 0.5 |
| | 12/10/2007 | U 0.5 | U 0.5 | U 5 | 1.3 | U 1 | 2.4 | 0.5 | U 0.5 |
| | 6/24/2008 | U 0.5 | U 0.5 | U 5 | 1.5 | U 1 | 3.5 | 0.7 | U 0.5 |
| | 12/10/2008 | U 1 | U 1 | U 4 | 2.9 | U 1 | 5.5 | 1.3 | 0.53 |
| | 6/2/2009 | U 0.5 | U 0.5 | U 2 | 1.6 | U 2 | 4 | J 0.81 | U 0.2 |
| | 12/9/2009 | U 0.5 | U 0.5 | UB 2 | 3.1 | U 2 | 5.6 | 1.4 | 0.57 |
| | 6/16/2010 | U 0.5 | U 0.5 | 30.2 | 1.7 | U 0.5 | 3.4 | 0.83 | U 0.5 |
| | 12/7/2010 | U 1 | U 1 | U 1 | 4.3 | U 1 | 8.6 | 1.9 | U 1 |
| | 6/14/2011 | 0.52 | J 0.41 | U 2 | 4.6 | U 0.021 | 7.9 | 2 | 0.7 |
| | 12/6/2011 | 0.72 | 0.67 | U 5 | 5.3 | U 0.13 | 8.3 | 2.3 | 0.88 |
| | 6/5/2012 | 0.91 | 0.94 | U 2 | 6.5 | U 0.13 | 12 | 3 | 1.1 |
| | 12/5/2012 | 0.56 | 0.7 | U 2 | 4.6 | U 0.13 | 7.7 | 2 | 0.71 |
| | 6/12/2013 | J 0.28 | 0.54 | U 2 | 3.6 | U 0.5 | 5 | 1.4 | J 0.25 |
| | 12/17/2013 | U 0.24 | J 0.47 | U 2 | 3.3 | U 0.5 | 3.9 | 1.1 | 0.22 |
| | 8/20/2014 | J 0.21 | 0.71 | U 2 | 2.8 | U 0.34 | 6.9 | 1.8 | U 0.082 |
| | 12/9/2014 | J 0.37 | U 0.11 | U 2 | 4.7 | U 0.34 | 7 | 1.7 | 0.56 |
| | 6/16/2015 | J 0.23 | U 0.25 | U 0.56 | 3.8 | U 0.64 | 5.3 | 1.6 | J 0.27 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-7A | 12/2/2015 | U 0.21 | 0.54 | U 0.56 | 2.5 | U 0.64 | 3.9 | 1.4 | 0.22 |
| | 6/15/2016 | J 0.26 | 0.57 | U 0.56 | 2.9 | U 0.64 | 3.3 | 1.5 | 0.25 |
| | 11/30/2016 | J 0.098 | J 0.3 | U 0.097 | 1.6 | U 0.08 | 2.1 | 0.98 | J 0.18 |
| | 6/15/2017 | J 0.19 | 0.71 | U 0.097 | 3.1 | U 0.08 | 2.5 | 2.1 | 0.43 |
| | 12/1/2017 | U 0.13 | 0.5 | U 1.2 | 1.8 | U 1.1 | 1.9 | 1.5 | J 0.17 |
| | 8/23/2018 | J 0.36 | 0.94 | U 0.98 | 2.9 | U 0.16 | 2.3 | 3 | 0.5 |
| | 11/28/2018 | J 0.18 | 0.66 | U 0.98 | 2 | U 0.16 | 1.8 | 2 | 0.29 |
| | 6/10/2019 | U 0.1 | J 0.3 | U 0.98 | 1.5 | U 0.16 | 1.3 | 1.2 | J 0.1 |
| | 12/2/2019 | J 0.19 | 0.57 | U 0.98 | 2 | U 0.48 | 1.6 | 1.7 | 0.36 |
| | 6/22/2020 | J 0.18 | 0.65 | U 2 | 2.5 | U 0.16 | 1.4 | 2 | 0.24 |
| | 11/30/2020 | J 0.204 | 0.641 | U 0.43 | 2.92 | UL0 0.96 | 1.44 | 1.96 | J 0.45 |
| | 6/21/2021 | J 0.116 | J 0.298 | U 0.43 | 1.42 | U 0.96 | 0.817 | 1.17 | U 0.234 |
| | 12/13/2021 | J 0.164 | J 0.487 | U 0.43 | 1.94 | U 0.96 | 1.24 | 1.22 | J 0.469 |
| | 6/21/2022 | J 0.263 | 0.712 | U 0.43 | 2.32 | U 0.96 | 1.29 | 1.63 | J 0.391 |
| MW-7B | 8/3/1993 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 1/18/1994 | U 2 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/28/1994 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 2/1/1995 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/27/1995 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/6/2011 | U 0.047 | U 0.08 | U 5 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/5/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/16/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 6/15/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-7B | 6/10/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| MW-8A | 1/19/1994 | U 2 | U 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 6/28/1994 | U 1 | 1 | U 5 | U 1 | U 1 | 4 | 3 | U 1 |
| | 2/1/1995 | U 1 | 1 | U 5 | 1 | U 1 | 4 | 3 | U 1 |
| | 6/27/1995 | U 1 | 1 | U 1 | 1 | U 1 | 2 | 3 | U 1 |
| | 11/28/1995 | U 1 | 1 | U* 5 | 2 | U 1 | 3 | 3 | U 1 |
| | 6/25/1996 | U 1 | 2 | U 5 | 2 | U 1 | 3 | 3 | U 1 |
| | 12/12/1996 | U 1 | 1 | U 5 | 1 | U 1 | 2 | 3 | U 1 |
| | 6/19/1997 | U 1 | 1 | U 1 | 1 | U 2 | 2 | 2 | U 2 |
| | 12/16/1997 | U 1 | 3 | U 5 | 1 | U 1 | 3 | 3 | U 1 |
| | 6/30/1998 | U 1 | 4 | <(2) 5 | 2 | U 1 | 4 | 5 | U 1 |
| | 12/15/1998 | U 1 | 5 | UB 5 | 1 | U 1 | 4 | 4 | U 1 |
| | 6/22/1999 | U 1 | 3 | U 5 | U 1 | U 1 | 2 | 3 | U 1 |
| | 12/14/1999 | U 1 | 3 | U 5 | U 1 | U 1 | 2 | 3 | U 1 |
| | 6/8/2000 | U 1 | 2 | U 5 | U 1 | U 1 | 2 | 3 | U 1 |
| | 11/29/2000 | U 1 | 2 | U 5 | U 1 | U 1 | 2 | 2 | U 1 |
| | 6/12/2001 | U 1 | 1 | U 5 | U 1 | U 1 | 2 | 2 | U 1 |
| | 12/18/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | 1 | U 1 |
| | 6/14/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | 1 | U 1 |
| | 12/13/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 6/10/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 12/3/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | UJF% 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-8A | 12/7/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/16/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/14/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/13/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.7 | U 0.5 | U 0.5 |
| | 12/6/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.7 | U 0.5 | U 0.5 |
| | 6/20/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.8 | U 0.5 | UJF% 0.5 |
| | 12/10/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.6 | U 0.5 | U 0.5 |
| | 6/24/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.6 | U 0.5 | U 0.5 |
| | 12/9/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/1/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | J 0.86 | U 0.5 | U 0.2 |
| | 12/9/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | J 0.85 | U 0.5 | U 0.2 |
| | 6/15/2010 | U 0.5 | U 0.5 | 20 | U 0.5 | U 0.5 | 0.81 | U 0.5 | U 0.5 |
| | 12/7/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | 1.3 | U 1 | U 1 |
| | 6/14/2011 | U 0.038 | U 0.08 | U 2 | U 0.072 | U 0.021 | 0.64 | J 0.28 | U 0.049 |
| | 12/5/2011 | U 0.047 | J 0.42 | U 5 | U 0.072 | U 0.13 | 0.6 | J 0.3 | U 0.16 |
| | 6/5/2012 | U 0.047 | J 0.46 | U 2 | U 0.072 | U 0.13 | 0.8 | J 0.35 | U 0.16 |
| | 12/4/2012 | U 0.047 | 0.62 | U 2 | U 0.072 | U 0.13 | 0.65 | J 0.28 | U 0.16 |
| | 6/12/2013 | U 0.24 | 0.77 | U 2 | U 0.25 | U 0.5 | 0.68 | J 0.33 | U 0.2 |
| | 12/16/2013 | U 0.24 | 0.96 | U 2 | U 0.25 | U 0.5 | 0.63 | J 0.34 | U 0.1 |
| | 3/27/2014 | U 0.24 | 0.95 | U 2 | U 0.25 | U 0.5 | 0.65 | J 0.35 | U 0.1 |
| | 8/20/2014 | U 0.073 | 1.2 | U 2 | U 0.077 | U 0.34 | 1.3 | J 0.36 | U 0.082 |
| | 12/8/2014 | U 0.073 | 1.4 | U 2 | U 0.087 | U 0.34 | 0.99 | 0.58 | U 0.082 |
| | 6/17/2015 | U 0.21 | 0.65 | U 0.56 | U 0.22 | U 0.64 | 0.84 | J 0.38 | U 0.081 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-8A | 12/2/2015 | U 0.21 | 1.1 | U 0.56 | U 0.22 | U 0.64 | 0.84 | J 0.37 | U 0.081 |
| | 6/14/2016 | U 0.21 | 1 | U 0.56 | U 0.22 | U 0.64 | 0.81 | J 0.39 | U 0.081 |
| | 11/29/2016 | U 0.042 | 1.2 | U 0.097 | U 0.055 | U 0.08 | 0.84 | 0.41 | U 0.098 |
| | 6/14/2017 | U 0.042 | 1.3 | U 0.097 | U 0.055 | U 0.08 | 0.7 | J 0.32 | U 0.098 |
| | 12/1/2017 | U 0.13 | 1.2 | U 1.2 | U 0.14 | U 1.1 | 0.95 | J 0.35 | U 0.096 |
| | 8/23/2018 | U 0.1 | 0.63 | U 0.98 | U 0.17 | U 0.16 | 0.7 | U 0.15 | U 0.092 |
| | 11/28/2018 | U 0.1 | 0.59 | U 0.98 | U 0.17 | U 0.16 | 0.69 | J 0.21 | U 0.092 |
| | 6/12/2019 | U 0.1 | 0.52 | U 0.98 | U 0.17 | U 0.16 | 0.52 | U 0.15 | U 0.092 |
| | 12/2/2019 | U 0.1 | 0.51 | U 0.98 | U 0.17 | U 0.48 | 0.56 | U 0.15 | U 0.092 |
| | 6/22/2020 | U 0.12 | 0.63 | U 2 | U 0.14 | U 0.16 | J 0.44 | J 0.15 | U 0.098 |
| | 11/30/2020 | U 0.0941 | 0.627 | U 0.43 | U 0.1 | UL0 0.96 | 0.532 | J 0.218 | U 0.234 |
| | 6/21/2021 | U 0.0941 | J 0.357 | U 0.43 | U 0.1 | U 0.96 | J 0.37 | U 0.19 | U 0.234 |
| | 12/14/2021 | U 0.0941 | J 0.492 | U 0.43 | U 0.1 | U 0.96 | J 0.495 | U 0.19 | U 0.234 |
| | 6/21/2022 | U 0.0941 | 0.537 | U 0.43 | J 0.122 | U 0.96 | J 0.34 | J 0.227 | UJ 0.234 |
| | 12/7/2022 | U 0.0941 | J 0.355 | U 0.43 | U 0.1 | U 0.96 | J 0.366 | U 0.19 | U 0.234 |
| MW-8B | 2/1/1995 | U 1 | 2 | U 5 | 1 | U 1 | 4 | 3 | U 1 |
| | 12/5/2011 | U 0.047 | J 0.29 | U 5 | U 0.072 | U 0.13 | 0.81 | J 0.43 | U 0.16 |
| | 6/5/2012 | J 0.056 | J 0.23 | U 2 | U 0.072 | U 0.13 | 0.83 | J 0.38 | U 0.16 |
| | 6/17/2015 | U 0.21 | J 0.29 | U 0.56 | U 0.22 | U 0.64 | 0.78 | J 0.38 | U 0.081 |
| | 6/14/2017 | U 0.042 | 1.2 | U 0.097 | U 0.055 | U 0.08 | 0.72 | J 0.33 | U 0.098 |
| | 6/12/2019 | U 0.1 | 0.95 | U 0.98 | U 0.17 | U 0.16 | 0.68 | J 0.24 | U 0.092 |
| MW-8C | 6/5/2012 | J 0.064 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |

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## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-8C | 12/4/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/12/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.12 | U 0.2 |
| | 12/16/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 6/17/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 6/14/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 6/12/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| MW-9A | 1/18/1994 | U 2 | U 1 | U 5 | 2 | U 1 | 4 | 2 | U 1 |
| | 6/27/1994 | U 1 | U 1 | U 5 | 2 | U 1 | 5 | 2 | U 1 |
| | 1/31/1995 | U 1 | U* 1 | U 5 | 1 | U 1 | 4 | 2 | U 1 |
| | 6/27/1995 | U 1 | U 1 | U 1 | 1 | U 1 | 2 | U 1 | U 1 |
| | 11/28/1995 | U 1 | U 1 | U* 5 | 1 | U 1 | 3 | 1 | U 1 |
| | 6/25/1996 | U 1 | U 1 | U 5 | U* 1 | U 1 | 2 | U* 1 | U 1 |
| | 12/11/1996 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | U* 1 | U 1 |
| | 6/19/1997 | U 1 | U 1 | U 1 | U 1 | U 2 | 1 | U 1 | U 2 |
| | 12/16/1997 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 6/29/1998 | U 1 | U 1 | 5 | (2) U 1 | < (2) 1 | 1 | U(2) 1 | U 1 |
| | 12/14/1998 | U 1 | U 1 | UB 5 | U 1 | U 1 | 1 | 1 | U 1 |
| | 6/22/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 6/7/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 11/28/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | U 1 | U 1 |
| | 6/11/2001 | U 1 | U 1 | U 5 | 1 | U 1 | 2 | 1 | U 1 |
| | 12/17/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | 1 | U 1 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-9A | 6/13/2002 | U 1 | 1 | U 5 | U 1 | U 1 | 2 | 1 | U 1 |
| | 12/12/2002 | U 1 | 1 | U 5 | U 1 | U 1 | 2 | 1 | U 1 |
| | 6/9/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 12/4/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | UJF% 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 12/7/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 6/16/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 12/14/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | U 1 | U 1 |
| | 6/13/2006 | U 0.5 | 0.5 | U 5 | U 1 | U 1 | 1 | 0.5 | U 0.5 |
| | 12/6/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.9 | 0.5 | U 0.5 |
| | 6/20/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.8 | 0.5 | UJF% 0.5 |
| | 12/10/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.6 | U 0.5 | U 0.5 |
| | 6/24/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.7 | U 0.5 | U 0.5 |
| | 12/9/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/1/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | 1.2 | J 0.55 | U 0.2 |
| | 12/4/2009 | U 0.5 | J 0.62 | UB 2 | U 0.5 | U 2 | 1.2 | J 0.71 | U 0.2 |
| | 6/15/2010 | U 0.5 | 0.59 | 17.7 | U 0.5 | U 0.5 | 1.1 | 0.71 | U 0.5 |
| | 12/7/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | 1.1 | U 1 | U 1 |
| | 6/14/2011 | U 0.038 | J 0.44 | U 2 | J 0.18 | U 0.021 | 0.95 | 0.64 | U 0.049 |
| | 12/5/2011 | U 0.047 | J 0.48 | U 5 | J 0.28 | U 0.13 | 0.95 | 0.75 | U 0.16 |
| | 6/4/2012 | J 0.066 | J 0.47 | U 2 | J 0.27 | U 0.13 | 1.4 | 0.95 | U 0.16 |
| | 12/4/2012 | U 0.047 | J 0.46 | U 2 | J 0.31 | U 0.13 | 1.2 | 0.78 | U 0.16 |
| | 6/10/2013 | U 0.24 | 0.54 | U 2 | J 0.4 | U 0.5 | 1.4 | 0.95 | U 0.2 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-9A | 12/17/2013 | U 0.24 | 0.68 | U 2 | J 0.42 | U 0.5 | 1.2 | 0.85 | U 0.1 |
| | 8/20/2014 | U 0.073 | J 0.37 | U 2 | U 0.077 | U 0.34 | 1.7 | 0.82 | U 0.082 |
| | 12/8/2014 | U 0.073 | U 0.11 | U 2 | 0.51 | U 0.34 | 1.6 | 1.4 | U 0.082 |
| | 6/16/2015 | U 0.21 | U 0.25 | U 0.56 | J 0.44 | U 0.64 | 1.5 | 0.88 | U 0.081 |
| | 11/30/2015 | U 0.21 | 0.64 | U 0.56 | J 0.37 | U 0.64 | 1.3 | 0.92 | U 0.081 |
| | 6/14/2016 | U 0.21 | 0.64 | U 0.56 | J 0.38 | U 0.64 | 1.4 | 0.97 | U 0.081 |
| | 11/29/2016 | U 0.042 | 0.75 | U 0.097 | J 0.4 | U 0.08 | 1.1 | 0.9 | U 0.098 |
| | 6/14/2017 | U 0.042 | 0.75 | U 0.097 | J 0.43 | U 0.08 | 1.1 | 1.1 | U 0.098 |
| | 11/30/2017 | U 0.13 | 0.91 | U 1.2 | J 0.46 | U 1.1 | 1.5 | 0.88 | U 0.096 |
| | 8/20/2018 | U 0.1 | 0.73 | U 0.98 | J 0.39 | J 0.24 | 1.4 | 0.79 | U 0.092 |
| | 11/29/2018 | U 0.1 | 0.76 | U 0.98 | J 0.38 | U 0.16 | 1.3 | 0.82 | U 0.092 |
| | 6/10/2019 | U 0.1 | 0.66 | U 0.98 | J 0.29 | U 0.16 | 1.3 | 0.67 | U 0.092 |
| | 12/2/2019 | U 0.1 | 0.76 | U 0.98 | J 0.36 | U 0.48 | 1.3 | 0.65 | U 0.092 |
| | 6/22/2020 | U 0.12 | 0.75 | U 2 | J 0.43 | U 0.16 | 1.3 | 0.65 | U 0.098 |
| | 11/30/2020 | U 0.0941 | 0.81 | U 0.43 | J 0.476 | UL0 0.96 | 1.21 | 0.738 | U 0.234 |
| | 6/21/2021 | U 0.0941 | 0.556 | U 0.43 | J 0.361 | U 0.96 | 0.923 | 0.536 | U 0.234 |
| | 12/13/2021 | U 0.0941 | 0.697 | U 0.43 | J 0.419 | U 0.96 | 1.1 | 0.566 | U 0.234 |
| | 6/21/2022 | U 0.0941 | 0.75 | U 0.43 | 0.521 | U 0.96 | 0.864 | 0.769 | UJ 0.234 |
| MW-9B | 1/31/1995 | U 1 | U* 1 | U 5 | U* 1 | U 1 | 4 | 2 | U 1 |
| | 12/5/2011 | U 0.047 | 0.67 | U 5 | J 0.28 | U 0.13 | 1.2 | 1.1 | U 0.16 |
| | 6/4/2012 | J 0.052 | 0.53 | U 2 | J 0.19 | U 0.13 | 1.4 | 1 | U 0.16 |
| | 6/16/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 1 | 0.94 | U 0.081 |
| | 6/14/2017 | U 0.042 | 0.66 | U 0.097 | U 0.055 | U 0.08 | 0.91 | 0.69 | U 0.098 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-9B | 6/10/2019 | U 0.1 | 0.68 | U 0.98 | U 0.17 | U 0.16 | 0.93 | 0.61 | U 0.092 |
| MW-10 | 6/27/1994 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 2/2/1995 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 6/28/1995 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 11/28/1995 | U 1 | U 1 | U* 5 | U 1 | U 1 | U* 1 | U* 1 | U 1 |
| | 6/26/1996 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U* 1 | U 1 |
| | 12/12/1996 | U 1 | U 1 | U 5 | U 1 | U* 1 | U 1 | U* 1 | U 1 |
| | 6/20/1997 | U 1 | U 1 | U 1 | U 1 | U 2 | U 1 | U 1 | U 2 |
| | 12/17/1997 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/29/1998 | U 1 | U 1 | U(3) 5 | U 1 | 3 | U 1 | 1 | U 1 |
| | 12/15/1998 | U 1 | U 1 | UB 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/23/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/8/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 11/29/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/12/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 12/18/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 6/14/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/12/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | U 1 |
| | 6/10/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/3/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | UJF% 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |

**Notes:** µg/L - micrograms per liter
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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-10 | 6/17/2005 | U 1 | U 1 | B U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/13/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/13/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | 0.6 | U 0.5 |
| | 12/6/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | 0.6 | U 0.5 |
| | 6/19/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | 0.7 | UJF% 0.5 |
| | 12/10/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | 0.6 | U 0.5 |
| | 6/26/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/9/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/2/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | U 0.5 | J 0.66 | U 0.2 |
| | 12/4/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | U 0.5 | J 0.82 | U 0.2 |
| | 6/16/2010 | U 0.5 | U 0.5 | 42.4 | U 0.5 | U 0.5 | U 0.5 | 0.78 | U 0.5 |
| | 12/6/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/14/2011 | U 0.038 | U 0.08 | U 2 | U 0.072 | U 0.021 | U 0.041 | 0.7 | U 0.049 |
| | 12/6/2011 | U 0.047 | J 0.26 | U 5 | U 0.072 | U 0.13 | U 0.16 | 0.57 | U 0.16 |
| | 6/4/2012 | J 0.093 | J 0.2 | U 2 | U 0.072 | U 0.13 | U 0.16 | 0.58 | U 0.16 |
| | 12/5/2012 | U 0.047 | J 0.17 | U 2 | U 0.072 | U 0.13 | U 0.16 | J 0.5 | U 0.16 |
| | 6/12/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | J 0.39 | U 0.2 |
| | 3/27/2014 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | J 0.33 | U 0.1 |
| | 8/21/2014 | U 0.073 | J 0.18 | U 2 | U 0.077 | U 0.34 | U 0.099 | 0.49 | U 0.082 |
| | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | 0.67 | U 0.082 |
| | 6/15/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | J 0.39 | U 0.081 |
| | 12/1/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | 0.52 | U 0.081 |
| | 6/16/2016 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | J 0.4 | U 0.081 |

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# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-10 | 11/28/2016 | U 0.042 | J 0.25 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | 0.45 | U 0.098 |
| | 6/16/2017 | U 0.042 | J 0.19 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | J 0.33 | U 0.098 |
| | 11/29/2017 | U 0.13 | J 0.43 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | J 0.4 | U 0.096 |
| | 8/22/2018 | U 0.1 | J 0.19 | U 0.98 | U 0.17 | J 0.48 | U 0.17 | J 0.39 | U 0.092 |
| | 11/27/2018 | U 0.1 | J 0.23 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | J 0.32 | U 0.092 |
| | 6/12/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | J 0.3 | U 0.092 |
| | 12/3/2019 | U 0.1 | J 0.27 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | J 0.25 | U 0.092 |
| | 6/23/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | U 0.093 | J 0.29 | U 0.098 |
| | 12/2/2020 | U 0.0941 | J 0.204 | U 0.43 | U 0.1 | UL0 0.96 | U 0.3 | J 0.344 | U 0.234 |
| | 6/21/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/14/2021 | U 0.0941 | J 0.201 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | J 0.271 | U 0.234 |
| | 6/22/2022 | U 0.0941 | JJ- 0.192 | U 0.43 | UJ- 0.1 | U 0.96 | U 0.3 | UJ- 0.212 | UJ 0.234 |
| MW-11 | 11/27/1995 | U 1 | U 1 | U* 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/26/1996 | U 1 | U 1 | U 5 | U 1 | U* 1 | U 1 | U 1 | U 1 |
| | 12/12/1996 | U 1 | U 1 | U 5 | U 1 | U* 1 | U 1 | U 1 | U 1 |
| | 6/19/1997 | U 1 | U 1 | U 1 | U 1 | U 2 | U 1 | U 1 | U 2 |
| | 12/16/1997 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/30/1998 | U 1 | U 1 | U(3) 5 | U 1 | U(3) 1 | U 1 | U 1 | U 1 |
| | 12/14/1998 | U 1 | U 1 | UB 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/22/1999 | U 1 | U 1 | U 5 | U 1 | 1 | U 1 | U 1 | U 1 |
| | 12/14/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/8/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 11/29/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |

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## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-11 | 6/12/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/18/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/14/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/13/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/10/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/3/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | UJF% 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/16/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/13/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/13/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.6 | U 0.5 | U 0.5 |
| | 12/6/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.6 | U 0.5 | U 0.5 |
| | 6/20/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | UJF% 0.5 |
| | 12/10/2007 | U 0.5 | U 0.5 | U 2 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/24/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/9/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/1/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 12/4/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | J 0.54 | U 0.5 | U 0.2 |
| | 6/15/2010 | U 0.5 | U 0.5 | 27.7 | U 0.5 | U 0.5 | U 0.5 | U 0.5 | U 0.5 |
| | 12/7/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/14/2011 | U 0.038 | U 0.08 | U 2 | U 0.072 | U 0.021 | U 0.041 | U 0.05 | U 0.049 |
| | 12/5/2011 | U 0.047 | U 0.08 | U 5 | U 0.072 | U 0.13 | J 0.25 | U 0.11 | U 0.16 |
| | 6/4/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | J 0.32 | U 0.11 | U 0.16 |

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HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
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**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-11 | 12/5/2012 | U 0.047 | U 0.08 | U 2 | J 0.2 | U 0.13 | J 0.34 | U 0.11 | U 0.16 |
| | 6/12/2013 | U 0.24 | U 0.23 | U 2 | J 0.28 | U 0.5 | J 0.38 | U 0.12 | U 0.2 |
| | 12/17/2013 | U 0.24 | U 0.23 | U 2 | J 0.31 | U 0.5 | J 0.41 | U 0.13 | U 0.1 |
| | 8/19/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | J 0.36 | U 0.084 | U 0.082 |
| | 12/8/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | J 0.37 | U 0.084 | U 0.082 |
| | 6/17/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | J 0.26 | U 0.14 | U 0.081 |
| | 12/2/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | J 0.25 | U 0.14 | U 0.081 |
| | 6/14/2016 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/29/2016 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | J 0.2 | U 0.044 | U 0.098 |
| | 6/14/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 12/4/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 8/22/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | J 0.68 | J 0.33 | U 0.15 | U 0.092 |
| | 11/28/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | J 0.2 | U 0.15 | U 0.092 |
| | 6/10/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 12/2/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| | 6/22/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | U 0.093 | U 0.11 | U 0.098 |
| | 11/30/2020 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | UL0 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/21/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/15/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | UJ- 0.1 | U 0.96 | U 0.3 | UJ- 0.19 | UJ 0.234 |
| MW-12 | 11/27/1995 | 9 | 12 | U* 5 | 4 | U 1 | 1 | 11 | 50 |
| | 6/26/1996 | 11 | 10 | U 5 | 5 | U* 1 | U* 1 | 9 | 81 |
| | 12/12/1996 | 7 | 6 | U 5 | 4 | U 1 | U* 1 | 9 | 49 |

**Notes:** µg/L - micrograms per liter
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NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-12 | 6/20/1997 | 8 | 2 | U 1 | 3 | U 2 | U 1 | 2 | 99 |
| | 12/16/1997 | 6 | 1 | U 5 | 3 | U 1 | 1 | U 1 | 48 |
| | 3/24/1998 | 5 | U 1 | U 5 | 3 | U 1 | U 1 | 1 | 44 |
| | 6/30/1998 | 4 | U(3) 1 | U(3) 5 | 2 | U 1 | U 1 | U(3) 1 | 43 |
| | 9/29/1998 | 3 | U 1 | U 5 | 2 | U 1 | U 1 | 1 | 29 |
| | 12/15/1998 | 3 | U 1 | UB 5 | 2 | U 1 | U 1 | U 1 | 22 |
| | 3/17/1999 | 2 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 22 |
| | 6/23/1999 | 2 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 23 |
| | 9/13/1999 | 2 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 25 |
| | 12/14/1999 | 2 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 25 |
| | 3/22/2000 | 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 16 |
| | 6/8/2000 | 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 27 |
| | 9/22/2000 | 2 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 33 |
| | 11/29/2000 | 2 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 29 |
| | 3/21/2001 | 2 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 19 |
| | 6/12/2001 | 1 | U 1 | U 5 | U 1 | U 1 | U 1 | 1 | 18 |
| | 9/19/2001 | 1 | 1 | U(1,3) 5 | U 1 | U 1 | U 1 | 1 | 16 |
| | 12/18/2001 | 2 | 2 | U 5 | 1 | U 1 | U 1 | 2 | 20 |
| | 3/25/2002 | 1 | 2 | U 5 | 1 | U 1 | U 1 | 3 | 21 |
| | 6/14/2002 | 1 | 2 | U 5 | U 1 | U 1 | U 1 | 2 | 22 |
| | 9/24/2002 | 1 | 3 | UJR 5 | U 1 | U 1 | U 1 | 3 | 15 |
| | 12/13/2002 | 1 | 4 | U 5 | U 1 | U 1 | U 1 | 4 | 22 |
| | 3/24/2003 | 1 | 4 | U 5 | U 1 | U 1 | U 1 | 5 | 16 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-12 | 6/10/2003 | 1 | 5 | U 5 | U 1 | U 1 | U 1 | 6 | 14 |
| | 9/25/2003 | 1 | 6 | U 5 | 1 | U 1 | U 1 | 8 | 19 |
| | 12/4/2003 | 2 | 6 | U 5 | 1 | U 1 | U 1 | 8 | JF% 27 |
| | 3/24/2004 | 2 | 7 | U 5 | 1 | U 1 | U 1 | 8 | 24 |
| | 6/8/2004 | 1 | 7 | U 5 | 1 | U 1 | U 1 | 7 | 15 |
| | 9/9/2004 | 1 | 7 | U 5 | 1 | U 1 | U 1 | 9 | 17 |
| | 12/7/2004 | 1 | 7 | U 5 | 1 | U 1 | U 1 | 8 | 16 |
| | 3/29/2005 | 1 | 7 | U 5 | 1 | U 1 | U 1 | 7 | 19 |
| | 6/17/2005 | U 1 | 7 | B U 5 | 1 | U 1 | 1 | 8 | 16 |
| | 9/20/2005 | 1 | 7 | BU 5 | 1 | U 1 | 1 | 7 | 12 |
| | 12/14/2005 | U 1 | 6 | U 5 | 1 | U 1 | 1 | 6 | 15 |
| | 3/16/2006 | U 1 | 6 | U 5 | U 1 | U 1 | 1 | 6 | 19 |
| | 6/13/2006 | 1.2 | 8.3 | U 5 | 1 | U 1 | 1.2 | 6.8 | 13 |
| | 9/21/2006 | 0.8 | 5.9 | U 5 | U 1 | U 1 | 1.5 | 6.3 | 12.5 |
| | 12/7/2006 | 0.5 | 3.6 | U 5 | U 1 | U 1 | U 0.5 | 2.8 | 4.4 |
| | 3/15/2007 | 0.9 | 7.4 | U 5 | 1 | U 1 | 3 | 7 | 11.5 |
| | 6/21/2007 | 1 | 8.2 | U 5 | U 1 | U 1 | 1.8 | 6.5 | JF% 21 |
| | 12/11/2007 | 0.9 | 10 | U 5 | 1.2 | U 1 | 1.2 | 7.5 | 19 |
| | 6/25/2008 | 0.9 | 7.1 | U 5 | U 1 | U 1 | 0.6 | 5.1 | 16 |
| | 12/10/2008 | 1.5 | 7.7 | U 4 | U 1 | U 1 | U 1 | 5.7 | 13.3 |
| | 6/2/2009 | 1.9 | 8 | U 2 | J 0.91 | U 2 | U 0.5 | 5.1 | 19.7 |
| | 12/9/2009 | 2.5 | 11.6 | UB 2 | 1.2 | U 2 | U 0.5 | 6.7 | 26.4 |
| | 6/15/2010 | 2.2 | 9.6 | 22.3 | 1.1 | U 0.5 | U 0.5 | 4.4 | 27.4 |

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- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-12 | 12/7/2010 | 1.8 | 11.3 | U 1 | 1.5 | U 1 | U 1 | 4.5 | J 30.4 |
| | 6/14/2011 | 2 | 4.4 | U 2 | 1.4 | U 0.021 | U 0.041 | 1.9 | J 24.9 |
| | 12/6/2011 | 2.1 | 9.6 | U 5 | 1.7 | U 0.13 | U 0.16 | 4.3 | 17.4 |
| | 6/5/2012 | 2 | 10.8 | U 2 | 2 | U 0.13 | U 0.16 | 3.5 | 20.7 |
| | 12/5/2012 | 1.5 | 9.1 | U 2 | 1.7 | U 0.13 | U 0.16 | 1.5 | 21.2 |
| | 6/12/2013 | 1.4 | 11.1 | U 2 | 1.9 | U 0.5 | U 0.25 | 1 | 17.7 |
| | 12/17/2013 | 1.5 | 6.6 | U 2 | 1.5 | U 0.5 | U 0.25 | 0.42 | 22.4 |
| | 3/27/2014 | 1.7 | 3.9 | U 2 | 1.2 | U 0.5 | U 0.25 | J 0.25 | 19.7 |
| | 8/19/2014 | 1.1 | 7.2 | U 2 | 0.99 | U 0.34 | U 0.099 | J 0.29 | 10.7 |
| | 12/8/2014 | 1.3 | 5.5 | U 2 | 1 | U 0.34 | U 0.12 | U 0.084 | 17 |
| | 6/17/2015 | 1 | 6.8 | U 0.56 | 0.87 | J 0.9 | U 0.19 | J 0.26 | 10.5 |
| | 12/2/2015 | 1.2 | 6.5 | U 0.56 | 1.1 | U 0.64 | U 0.19 | U 0.14 | 11 |
| | 6/14/2016 | 1.1 | 8.3 | U 0.56 | 1.1 | U 0.64 | U 0.19 | U 0.14 | 10.5 |
| | 8/25/2016 | 1.2 | 9.8 | U 0.097 | 1.1 | U 0.08 | U 0.13 | U 0.051 | 10.2 |
| | 11/29/2016 | 0.9 | 6.2 | U 0.097 | 1.1 | U 0.08 | U 0.13 | U 0.044 | 7.9 |
| | 4/17/2017 | 0.72 | 7.4 | U 0.097 | 1.1 | U 0.08 | U 0.13 | U 0.044 | 8.7 |
| | 6/14/2017 | 0.7 | 6.1 | U 0.097 | 1.1 | U 0.08 | U 0.13 | U 0.044 | 9 |
| | 9/20/2017 | 0.79 | 8 | U 1.2 | 0.9 | U 1.1 | U 0.16 | U 0.18 | 5.9 |
| | 12/4/2017 | 0.78 | 6.3 | U 1.2 | 0.98 | U 1.1 | U 0.16 | U 0.18 | 6.3 |
| | 3/27/2018 | 0.74 | 7.7 | U 1.2 | 0.74 | U 1.1 | U 0.16 | U 0.18 | 5.3 |
| | 8/22/2018 | 1 | 6.9 | U 0.98 | 1.2 | U 0.16 | U 0.17 | J 0.21 | 9.4 |
| | 10/16/2018 | 0.64 | 5.1 | U 0.98 | 0.94 | U 0.16 | U 0.17 | U 0.15 | 8.7 |
| | 11/28/2018 | 0.54 | 5.4 | U 0.98 | 0.96 | U 0.16 | U 0.17 | J 0.29 | 10 |

**Notes:** µg/L - micrograms per liter
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NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-12 | 3/27/2019 | 0.86 | 8.5 | U 0.98 | 1.5 | U 0.16 | U 0.17 | J 0.32 | 9.7 |
| | 6/10/2019 | 0.82 | 6.8 | U 0.98 | 1.7 | U 0.16 | U 0.17 | 0.73 | 15.1 |
| | 9/23/2019 | 0.57 | 8.7 | U 0.98 | 1.5 | U 0.16 | U 0.17 | J 0.39 | 6.4 |
| | 12/2/2019 | 0.6 | 9.1 | U 0.98 | 1.6 | U 0.48 | U 0.17 | 0.8 | 8.3 |
| | 3/23/2020 | 0.52 | 8.6 | U 2 | 2.1 | U 0.16 | U 0.093 | 0.79 | 11.2 |
| | 6/22/2020 | 0.65 | 10.3 | U 2 | 2.2 | U 0.16 | U 0.093 | 1.1 | 7.6 |
| | 9/21/2020 | 0.616 | 8.35 | U 0.43 | 1.75 | U 0.96 | U 0.3 | J 0.477 | 4.92 |
| | 12/1/2020 | 0.516 | 6.17 | U 0.43 | 1.8 | UL0 0.96 | U 0.3 | 0.57 | 5.94 |
| | 3/19/2021 | 0.515 | 6.51 | U 0.43 | 1.74 | U 0.96 | U 0.3 | 0.73 | 6.51 |
| | 6/21/2021 | J 0.418 | 6.19 | U 0.43 | 1.4 | U 0.96 | U 0.3 | 0.69 | 5.95 |
| | 12/15/2021 | J 0.221 | 3.3 | U 0.43 | 0.909 | U 0.96 | U 0.3 | J 0.24 | 2.29 |
| | 6/22/2022 | J 0.423 | 3.18 | U 0.43 | J- 0.803 | U 0.96 | U 0.3 | J- 0.306 | J 3.93 |
| | 12/7/2022 | U 0.0941 | 2.06 | U 0.43 | 0.54 | U 0.96 | U 0.3 | U 0.19 | J 0.319 |
| MW-13 | 11/28/1995 | 1 | U 1 | U* 5 | 2 | U 1 | U* 1 | 2 | 21 |
| | 6/25/1996 | 1 | U* 1 | U 5 | 3 | U 1 | U* 1 | 1 | 41 |
| | 12/11/1996 | 1 | U* 1 | U 5 | 2 | U 1 | U 1 | U 1 | 28 |
| | 6/20/1997 | U 1 | 1 | U 1 | 1 | U 2 | 1 | 2 | 26 |
| | 12/16/1997 | 1 | U 1 | U 5 | 2 | U 1 | 2 | U 1 | 29 |
| | 3/23/1998 | 1 | U 1 | U 5 | 2 | U 1 | U 1 | 1 | 29 |
| | 6/30/1998 | 1 | (3) U 1 | U 5 | 1 | U 1 | (3) U 1 | 1 | 34 |
| | 9/29/1998 | 1 | U 1 | U 5 | 1 | U 1 | U 1 | 1 | 24 |
| | 12/14/1998 | 1 | U 1 | UB 5 | 1 | U 1 | U 1 | U 1 | 24 |
| | 3/15/1999 | U 1 | U 1 | 6 | U 1 | U 1 | U 1 | U 1 | 19 |

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- Value greater than the HHS

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**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-13 | 6/23/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 23 |
| | 9/13/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 26 |
| | 12/14/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 27 |
| | 3/22/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 18 |
| | 6/8/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 23 |
| | 9/22/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 24 |
| | 11/29/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 22 |
| | 3/21/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 15 |
| | 6/12/2001 | 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 19 |
| | 9/19/2001 | U 1 | U 1 | U(1,3) 5 | U 1 | U 1 | U 1 | U 1 | 12 |
| | 12/18/2001 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 10 |
| | 3/25/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 11 |
| | 6/13/2002 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 12 |
| | 9/24/2002 | U 1 | U 1 | UJR 5 | U 1 | U 1 | U 1 | U 1 | 10 |
| | 12/13/2002 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 12 |
| | 3/24/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 8 |
| | 6/10/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 7 |
| | 9/25/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 13 |
| | 12/4/2003 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | JF% 15 |
| | 3/24/2004 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 13 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 8 |
| | 9/9/2004 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 11 |
| | 12/7/2004 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 9 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-13 | 3/29/2005 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 11 |
| | 6/17/2005 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 9 |
| | 9/20/2005 | U 1 | U 1 | BU 5 | 1 | U 1 | U 1 | U 1 | 8 |
| | 12/14/2005 | U 1 | U 1 | U 5 | 1 | U 1 | U 1 | U 1 | 9 |
| | 3/16/2006 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | 11 |
| | 6/13/2006 | 0.6 | 0.7 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | 7.1 |
| | 9/21/2006 | 0.6 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | 7.6 |
| | 12/7/2006 | 0.5 | 0.7 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | 9.7 |
| | 3/15/2007 | U 0.5 | 0.8 | U 5 | 1 | U 1 | U 0.5 | U 0.5 | 9.6 |
| | 6/20/2007 | 0.6 | 1 | U 5 | 1 | U 1 | U 0.5 | 0.6 | JF% 20 |
| | 12/11/2007 | 0.6 | 0.9 | U 5 | 1.2 | U 1 | U 0.5 | U 0.5 | 18 |
| | 6/24/2008 | U 0.5 | 0.8 | U 5 | U 1 | U 1 | U 0.5 | 0.5 | 15 |
| | 12/10/2008 | U 1 | 1.3 | U 4 | 1.3 | U 1 | U 1 | U 1 | 20.2 |
| | 6/2/2009 | J 0.53 | 1.1 | U 2 | J 0.96 | U 2 | U 0.5 | J 0.61 | 14.6 |
| | 12/9/2009 | J 0.69 | 1.1 | UB 2 | 1.2 | U 2 | U 0.5 | J 0.61 | 22.5 |
| | 6/16/2010 | 0.68 | 1.1 | 36.3 | 1 | U 0.5 | U 0.5 | 0.55 | 19.9 |
| | 12/7/2010 | U 1 | U 1 | U 1 | 1.1 | U 1 | U 1 | U 1 | J 23.8 |
| | 6/15/2011 | 0.61 | 0.99 | U 2 | 0.96 | U 0.021 | J 0.25 | 0.55 | J 17.9 |
| | 12/7/2011 | 0.79 | 1 | U 5 | 1 | U 0.13 | J 0.29 | 0.5 | 17.7 |
| | 6/6/2012 | 0.69 | 1.1 | U 2 | 0.98 | U 0.13 | J 0.33 | J 0.46 | 19.3 |
| | 12/5/2012 | 0.66 | 1.1 | U 2 | 1.1 | U 0.13 | J 0.23 | J 0.41 | 20.9 |
| | 6/12/2013 | 0.72 | 1.2 | U 2 | 1.5 | U 0.5 | J 0.26 | J 0.36 | 21.1 |
| | 12/17/2013 | 0.59 | 1.1 | U 2 | 1.5 | U 0.5 | U 0.25 | J 0.32 | 18.9 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-13 | 3/27/2014 | 0.68 | 1.1 | U 2 | 1.5 | U 0.5 | U 0.25 | J 0.31 | 17.1 |
| | 8/19/2014 | 0.59 | 0.82 | U 2 | 0.83 | U 0.34 | J 0.25 | 0.45 | 11.7 |
| | 12/9/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | J 0.14 | 0.41 | 16.7 |
| | 6/16/2015 | 0.6 | J 0.27 | U 0.56 | 0.89 | U 0.64 | J 0.23 | J 0.34 | 11.6 |
| | 12/2/2015 | J 0.46 | 0.77 | U 0.56 | 0.8 | U 0.64 | J 0.21 | J 0.35 | 9 |
| | 6/15/2016 | 0.67 | 1 | U 0.56 | 1.1 | U 0.64 | U 0.19 | J 0.39 | 11.2 |
| | 11/30/2016 | J 0.46 | 0.92 | U 0.097 | 0.95 | U 0.08 | U 0.13 | J 0.37 | 8.4 |
| | 6/15/2017 | 0.51 | 1.2 | U 0.097 | 1.1 | U 0.08 | U 0.13 | 0.61 | 9.7 |
| | 12/1/2017 | 0.51 | 1.1 | U 1.2 | 0.93 | U 1.1 | U 0.16 | J 0.39 | 6.7 |
| | 8/23/2018 | 0.57 | 1 | U 0.98 | 0.84 | J 0.69 | J 0.31 | 0.49 | 6.1 |
| | 11/29/2018 | 0.61 | 0.81 | U 0.98 | 0.73 | U 0.16 | U 0.17 | J 0.31 | 8.7 |
| | 6/10/2019 | 0.51 | 0.93 | U 0.98 | 0.83 | U 0.16 | U 0.17 | J 0.21 | 9.7 |
| | 12/2/2019 | 0.53 | 0.95 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | J 0.26 | 10.2 |
| | 6/22/2020 | J 0.45 | 1.2 | U 2 | 1.1 | U 0.16 | U 0.093 | J 0.35 | 8.2 |
| | 11/30/2020 | 0.546 | 1.18 | U 0.43 | 1.43 | U 0.96 | U 0.3 | J 0.327 | 8.9 |
| | 6/21/2021 | J 0.497 | 0.972 | U 0.43 | 1.07 | U 0.96 | U 0.3 | J 0.347 | 8.13 |
| | 12/13/2021 | 0.508 | 1.06 | U 0.43 | 1.23 | U 0.96 | U 0.3 | J 0.336 | 8.06 |
| | 6/21/2022 | J 0.476 | 1.01 | U 0.43 | 1.01 | U 0.96 | U 0.3 | J 0.441 | J 4.09 |
| | 12/8/2022 | J 0.456 | 0.87 | U 0.43 | 0.979 | U 0.96 | U 0.3 | J 0.263 | 5.92 |
| MW-14 | 3/22/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/11/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/12/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/9/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-14 | 12/3/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | UJF% 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/16/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/14/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/13/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/7/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/21/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | UJF% 0.5 |
| | 12/11/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/25/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/10/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/3/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 12/10/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 6/15/2010 | U 0.5 | U 0.5 | 19.7 | U 0.5 | U 0.5 | U 0.5 | U 0.5 | U 0.5 |
| | 12/6/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/15/2011 | U 0.038 | U 0.08 | U 2 | U 0.072 | U 0.021 | U 0.041 | U 0.05 | U 0.049 |
| | 12/5/2011 | U 0.047 | U 0.08 | U 5 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/4/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 12/17/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | J 0.96 | U 0.25 | U 0.13 | U 0.1 |
| | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| MW-15 | 10/8/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/11/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/10/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-15 | 12/3/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | UJF% 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/16/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/14/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/12/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/5/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/19/2007 | U 0.5 | U 0.5 | U 5 | U 1 | 1.2 | U 0.5 | U 0.5 | UJF% 0.5 |
| | 12/10/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/23/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/8/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/1/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 12/4/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 6/14/2010 | U 0.5 | U 0.5 | 32.9 | U 0.5 | U 0.5 | U 0.5 | U 0.5 | U 0.5 |
| | 12/6/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/13/2011 | U 0.038 | U 0.08 | U 2 | U 0.072 | U 0.021 | U 0.041 | U 0.05 | U 0.049 |
| | 12/6/2011 | U 0.047 | U 0.08 | U 5 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/4/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 12/5/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/10/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.12 | U 0.2 |
| | 12/16/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 3/27/2014 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 8/20/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.082 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-15 | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 6/16/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/30/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 6/14/2016 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/29/2016 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 6/15/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 11/30/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 8/20/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | J 0.61 | U 0.17 | U 0.15 | U 0.092 |
| | 11/28/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 6/10/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 12/2/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| | 6/22/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | U 0.093 | U 0.11 | U 0.098 |
| | 11/30/2020 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/21/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/13/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/21/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | UJ 0.234 |
| MW-16 | 6/4/2012 | U 0.047 | 3.4 | U 2 | 1.4 | U 0.13 | 2.2 | 2.9 | U 0.16 |
| | 12/4/2012 | U 0.047 | 3.4 | U 2 | 1 | U 0.13 | 1.2 | 2 | U 0.16 |
| | 6/10/2013 | U 0.24 | 4.3 | U 2 | 1.5 | U 0.5 | 1.4 | 2.1 | U 0.2 |
| | 12/17/2013 | U 0.24 | 4.3 | U 2 | 1.5 | U 0.5 | 1 | 1.4 | U 0.1 |
| MW-17 | 3/25/2014 | J 0.38 | 24.5 | J 5 | 0.57 | U 0.5 | 15.9 | 5.9 | 1.5 |
| | 5/1/2014 | J 0.079 | 27.6 | 5.1 | 0.74 | U 0.34 | 16 | 5.8 | 2.3 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-17 | 8/19/2014 | J 0.098 | 27.4 | 4.7 | 0.63 | U 0.34 | 24.8 | 7.4 | 1 |
| | 12/9/2014 | J 0.34 | 33 | 4.2 | U 0.087 | U 0.34 | 21.8 | 7.7 | 1.5 |
| | 6/17/2015 | U 0.21 | 22 | 4.5 | 0.6 | U 0.64 | 15.7 | 5.4 | 0.93 |
| | 12/2/2015 | U 0.21 | 16.3 | J 2.9 | J 0.36 | U 0.64 | 12.5 | 4.4 | 0.45 |
| | 6/14/2016 | U 0.21 | 9.3 | J 2.1 | U 0.22 | U 0.64 | 7 | 2.5 | 0.26 |
| | 8/25/2016 | U 0.042 | 5.6 | J 0.34 | U 0.055 | U 0.08 | 4 | 1.4 | J 0.14 |
| | 11/30/2016 | U 0.042 | 8.4 | J 1.5 | U 0.055 | U 0.08 | 3.2 | 1.4 | U 0.098 |
| | 4/18/2017 | U 0.042 | 6.5 | J 0.23 | U 0.055 | U 0.08 | 4.5 | 2 | U 0.098 |
| | 6/14/2017 | U 0.042 | 7.4 | J 0.57 | U 0.055 | U 0.08 | 3.8 | 2 | U 0.098 |
| | 9/20/2017 | U 0.13 | 4.9 | U 1.2 | U 0.14 | U 1.1 | 3.7 | 1.5 | U 0.096 |
| | 12/4/2017 | U 0.13 | 5.6 | U 1.2 | U 0.14 | U 1.1 | 3.8 | 1.6 | U 0.096 |
| | 3/27/2018 | U 0.13 | 6 | U 1.2 | U 0.14 | U 1.1 | 4 | 1.7 | U 0.096 |
| | 8/21/2018 | U 0.1 | 16.2 | 6.2 | 0.55 | U 0.16 | 3.5 | 2.1 | U 0.092 |
| | 10/16/2018 | U 0.1 | 17.2 | 7.7 | 0.59 | U 0.16 | 4.5 | 2.6 | J 0.13 |
| | 11/28/2018 | U 0.1 | 18.7 | 9.4 | 0.79 | U 0.16 | 6.2 | 3.2 | 0.35 |
| | 3/27/2019 | U 0.1 | 25.4 | 14.6 | 0.89 | U 0.16 | 8.9 | 3.6 | 0.43 |
| | 6/13/2019 | U 0.1 | 27.5 | 14.2 | 0.93 | U 0.16 | 10 | 4.7 | 0.56 |
| | 9/23/2019 | U 0.1 | 21.4 | 12.6 | 0.81 | U 0.16 | 6.7 | 3.9 | 0.3 |
| | 12/2/2019 | U 0.1 | 24.4 | 12.3 | 0.85 | U 0.48 | 8.9 | 4.4 | 0.3 |
| | 3/23/2020 | U 0.12 | 21.2 | 8.4 | 0.72 | U 0.16 | 8.5 | 3.8 | 0.29 |
| | 6/23/2020 | U 0.12 | 21.6 | 6.9 | 0.81 | U 0.16 | 9.8 | 4.2 | 0.36 |
| | 9/21/2020 | U 0.0941 | 15.1 | 4.11 | 0.549 | U 0.96 | 8.87 | 3.65 | U 0.234 |
| | 12/1/2020 | U 0.0941 | 15.6 | 3.6 | 0.672 | U 0.96 | 8.04 | 3.28 | U 0.234 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-17 | 3/19/2021 | U 0.0941 | 14 | 2.82 | 0.524 | U 0.96 | 7.59 | 3.16 | U 0.234 |
| | 6/22/2021 | U 0.0941 | 11.1 | J 1.82 | J 0.398 | U 0.96 | 7.45 | 2.92 | U 0.234 |
| | 12/14/2021 | U 0.0941 | 9.82 | J 1.61 | J 0.325 | U 0.96 | 5.72 | 1.96 | U 0.234 |
| | 6/22/2022 | U 0.0941 | 6.83 | J 1.01 | UJ- 0.226 | U 0.96 | 4.25 | 1.71 | UJ 0.234 |
| | 12/7/2022 | U 0.0941 | 11.4 | 2.73 | J 0.454 | U 0.96 | 4.31 | 1.93 | U 0.234 |
| MW-18 | 5/2/2014 | 0.66 | 18.5 | U 2 | 0.56 | U 0.34 | 0.87 | J 0.38 | 3.3 |
| | 8/20/2014 | 1.3 | 19 | U 2 | 0.65 | U 0.34 | 0.94 | 0.49 | 2.5 |
| | 12/9/2014 | 1.3 | 17.1 | U 2 | U 0.087 | U 0.34 | 0.51 | 0.5 | 3.9 |
| | 6/16/2015 | 1.1 | 13.4 | U 0.56 | J 0.37 | U 0.64 | J 0.23 | 0.47 | 3.2 |
| | 12/2/2015 | 0.93 | 9.6 | U 0.56 | J 0.34 | U 0.64 | U 0.19 | 0.42 | 3.9 |
| | 6/14/2016 | 0.94 | 6.8 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | J 0.29 | 3.5 |
| | 8/25/2016 | 1.2 | 7.2 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | J 0.3 | 5 |
| | 11/30/2016 | 0.85 | 4.1 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | J 0.35 | 4.1 |
| | 4/18/2017 | 1.1 | 4.3 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | J 0.27 | 5.4 |
| | 6/15/2017 | J 0.48 | 1.5 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | J 0.3 | 2.1 |
| | 9/21/2017 | 0.61 | 2.5 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | J 0.32 | 2.4 |
| | 12/4/2017 | 0.78 | 2.4 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | J 0.29 | 3.9 |
| | 3/27/2018 | 0.71 | 2.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | J 0.25 | 3.9 |
| | 8/21/2018 | J 0.41 | 1.1 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | 1.5 |
| | 10/16/2018 | 0.6 | 1.5 | U 0.98 | U 0.17 | J 0.47 | U 0.17 | J 0.29 | 2.7 |
| | 11/28/2018 | 0.67 | 1.7 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | J 0.32 | 3.8 |
| | 3/27/2019 | 1.2 | 1.9 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | J 0.27 | 4.6 |
| | 6/10/2019 | J 0.18 | J 0.16 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | 0.47 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-18 | 9/23/2019 | J 0.42 | 0.84 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | 1.8 |
| | 12/3/2019 | J 0.45 | 1 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | 2.2 |
| | 3/23/2020 | J 0.45 | 1.2 | U 2 | U 0.14 | U 0.16 | U 0.093 | U 0.11 | 2.7 |
| | 6/22/2020 | J 0.31 | 1.2 | U 2 | U 0.14 | U 0.16 | U 0.093 | J 0.24 | 1.5 |
| | 9/21/2020 | 0.525 | 0.784 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | J 0.218 | 2.38 |
| | 12/1/2020 | J 0.436 | 0.712 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | 1.91 |
| | 3/19/2021 | J 0.354 | 0.704 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | 1.72 |
| | 6/22/2021 | J 0.271 | 0.634 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/14/2021 | J 0.251 | 0.55 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | 1.4 |
| | 6/22/2022 | U 0.0941 | J 0.381 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | J 0.199 | UJ 0.234 |
| | 12/7/2022 | J 0.102 | J 0.418 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | J 0.219 | 0.912 |
| MW-19 | 3/26/2014 | J 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | 0.77 | U 0.13 | U 0.1 |
| | 5/1/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | 0.8 | U 0.084 | U 0.2 |
| | 8/20/2014 | J 0.14 | U 0.11 | U 2 | U 0.077 | U 0.34 | 1.2 | U 0.084 | U 0.082 |
| | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | 1.1 | U 0.084 | U 0.082 |
| | 6/18/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 0.87 | U 0.14 | U 0.081 |
| | 12/1/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 0.9 | U 0.14 | U 0.081 |
| | 6/15/2016 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 0.72 | U 0.14 | U 0.081 |
| | 11/28/2016 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | 0.76 | U 0.044 | U 0.098 |
| | 6/15/2017 | J 0.15 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | 0.72 | U 0.044 | U 0.098 |
| | 11/29/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | 0.88 | U 0.18 | U 0.096 |
| | 8/20/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 0.73 | U 0.15 | U 0.092 |
| | 11/27/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 0.68 | U 0.15 | U 0.092 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-19 | 6/12/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 0.82 | U 0.15 | U 0.092 |
| | 12/4/2019 | J 0.11 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | 0.68 | U 0.15 | U 0.092 |
| | 6/23/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | 0.66 | U 0.11 | U 0.098 |
| | 12/1/2020 | J 0.113 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.716 | U 0.19 | U 0.234 |
| | 6/22/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.515 | U 0.19 | U 0.234 |
| | 12/14/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.628 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.591 | U 0.19 | UJ 0.234 |
| MW-20 | 3/25/2014 | U 0.24 | J 0.32 | U 2 | U 0.25 | U 0.5 | 10.6 | J 0.34 | U 0.1 |
| | 5/2/2014 | J 0.69 | J 0.15 | U 2 | U 0.077 | U 0.34 | 9.4 | J 0.33 | U 0.2 |
| | 8/19/2014 | J 0.14 | 0.95 | U 2 | U 0.077 | U 0.34 | 14.5 | 0.76 | U 0.082 |
| | 12/9/2014 | U 0.073 | 1 | U 2 | U 0.087 | U 0.34 | 13.8 | 0.91 | U 0.082 |
| | 6/17/2015 | U 0.21 | 0.8 | U 0.56 | U 0.22 | U 0.64 | 9.6 | 0.55 | U 0.081 |
| | 12/1/2015 | U 0.21 | 1.2 | U 0.56 | U 0.22 | U 0.64 | 11.7 | 0.7 | U 0.081 |
| | 6/15/2016 | U 0.21 | 0.91 | U 0.56 | U 0.22 | U 0.64 | 9.9 | 0.66 | U 0.081 |
| | 8/25/2016 | U 0.042 | 0.7 | U 0.097 | U 0.055 | U 0.08 | 11.5 | 0.55 | U 0.084 |
| | 11/30/2016 | U 0.042 | J 0.43 | U 0.097 | U 0.055 | U 0.08 | 7.3 | J 0.39 | U 0.098 |
| | 4/17/2017 | U 0.042 | J 0.44 | U 0.097 | U 0.055 | U 0.08 | 6.5 | J 0.4 | U 0.098 |
| | 6/15/2017 | U 0.042 | J 0.43 | U 0.097 | U 0.055 | U 0.08 | 8.5 | 0.47 | U 0.098 |
| | 9/21/2017 | U 0.13 | J 0.29 | U 1.2 | U 0.14 | U 1.1 | 6.7 | J 0.39 | U 0.096 |
| | 12/4/2017 | U 0.13 | J 0.32 | U 1.2 | U 0.14 | U 1.1 | 5.7 | J 0.22 | U 0.096 |
| | 3/27/2018 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | 8.1 | J 0.39 | U 0.096 |
| | 8/22/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | J 0.33 | 8.3 | J 0.34 | U 0.092 |
| | 10/16/2018 | U 0.1 | J 0.16 | U 0.98 | U 0.17 | J 0.24 | 7.4 | 0.41 | U 0.092 |

**Notes:** µg/L - micrograms per liter
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NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-20 | 11/27/2018 | U 0.1 | J 0.25 | U 0.98 | U 0.17 | U 0.16 | 6.7 | J 0.32 | U 0.092 |
| | 3/27/2019 | U 0.1 | J 0.18 | U 0.98 | U 0.17 | U 0.16 | 6.5 | J 0.22 | U 0.092 |
| | 6/13/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 7.1 | J 0.27 | U 0.092 |
| | 9/23/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 3.8 | U 0.15 | U 0.092 |
| | 12/3/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | 6.8 | J 0.16 | U 0.092 |
| | 3/23/2020 | U 0.12 | J 0.23 | U 2 | U 0.14 | U 0.16 | 6.7 | J 0.17 | U 0.098 |
| | 6/23/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | 5 | J 0.2 | U 0.098 |
| | 9/22/2020 | U 0.0941 | J 0.183 | U 0.43 | U 0.1 | U 0.96 | 4.41 | JL0 0.208 | U 0.234 |
| | 12/1/2020 | U 0.0941 | J 0.255 | U 0.43 | U 0.1 | U 0.96 | 5.06 | J 0.267 | U 0.234 |
| | 3/19/2021 | U 0.0941 | J 0.22 | U 0.43 | U 0.1 | U 0.96 | 3.69 | J 0.245 | U 0.234 |
| | 6/22/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 4.51 | U 0.19 | U 0.234 |
| | 12/14/2021 | U 0.0941 | J 0.19 | U 0.43 | U 0.1 | U 0.96 | 4.08 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 2.71 | J 0.194 | UJ 0.234 |
| | 12/7/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 1.73 | U 0.19 | U 0.234 |
| MW-21 | 3/28/2014 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 5/1/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.2 |
| | 8/20/2014 | J 0.18 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.082 |
| | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 12/1/2015 | J 0.24 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/28/2017 | J 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 11/27/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 12/4/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| | 12/2/2020 | J 0.113 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |

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- Value greater than the HHS

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-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-21 | 6/22/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/15/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | UJ 0.234 |
| MW-22 | 3/27/2014 | J 0.33 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 5/1/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.2 |
| | 8/20/2014 | J 0.46 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.082 |
| | 12/10/2014 | J 0.32 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 12/1/2015 | J 0.22 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/28/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 11/27/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 12/4/2019 | J 0.13 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| | 12/2/2020 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/22/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/15/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | UJ 0.234 |
| MW-23 | 3/27/2014 | J 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 5/1/2014 | J 0.2 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.2 |
| | 8/20/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.082 |
| | 12/10/2014 | J 0.33 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 12/1/2015 | J 0.32 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/28/2017 | J 0.24 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 11/27/2018 | J 0.22 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-23 | 12/4/2019 | J 0.2 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| | 12/2/2020 | J 0.16 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/22/2021 | J 0.142 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/15/2021 | J 0.12 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | UJ 0.234 |
| MW-24 | 3/25/2014 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | J 0.3 | U 0.13 | U 0.1 |
| | 5/2/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | J 0.36 | U 0.084 | U 0.2 |
| | 8/21/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | 0.57 | U 0.084 | U 0.082 |
| | 12/8/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | 1.7 | U 0.084 | U 0.082 |
| | 6/18/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 1.1 | U 0.14 | U 0.081 |
| | 12/1/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 1 | U 0.14 | U 0.081 |
| | 6/16/2016 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 0.66 | U 0.14 | U 0.081 |
| | 8/25/2016 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | 0.56 | U 0.051 | U 0.084 |
| | 11/28/2016 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | 1.1 | U 0.044 | U 0.098 |
| | 6/15/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | 1.2 | U 0.044 | U 0.098 |
| | 11/28/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | 1.7 | U 0.18 | U 0.096 |
| | 8/22/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | J 0.95 | 2.8 | U 0.15 | U 0.092 |
| | 11/27/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 3 | U 0.15 | U 0.092 |
| | 6/13/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 2 | U 0.15 | U 0.092 |
| | 12/3/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | 0.8 | U 0.15 | U 0.092 |
| | 6/23/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | J 0.37 | U 0.11 | U 0.098 |
| | 12/2/2020 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.755 | U 0.19 | U 0.234 |
| | 6/22/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.726 | U 0.19 | U 0.234 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-24 | 12/14/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.852 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.558 | U 0.19 | UJ 0.234 |
| MW-25 | 5/2/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.2 |
| | 8/21/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.082 |
| | 12/8/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 11/28/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 12/3/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| MW-26 | 3/27/2014 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 5/1/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.2 |
| | 8/21/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.082 |
| | 12/11/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 11/28/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 12/3/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| MW-27 | 1/16/2015 | J 0.083 | U 0.11 | U 2 | U 0.087 | U 0.34 | 1.2 | U 0.084 | U 0.082 |
| | 6/18/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 1.4 | U 0.14 | U 0.081 |
| | 6/15/2016 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 1.1 | U 0.14 | U 0.081 |
| | 11/28/2016 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | 0.96 | U 0.044 | U 0.098 |
| | 6/19/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | 0.91 | U 0.044 | U 0.098 |
| | 11/29/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | 1.1 | U 0.18 | U 0.096 |
| | 8/22/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | J 0.74 | 0.99 | U 0.15 | U 0.092 |
| | 11/27/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 1.1 | U 0.15 | U 0.092 |
| | 6/13/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 1 | U 0.15 | U 0.092 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| MW-27 | 12/4/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | 1.4 | U 0.15 | U 0.092 |
| | 6/24/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | 1.1 | U 0.11 | U 0.098 |
| | 12/1/2020 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 1.09 | U 0.19 | U 0.234 |
| | 6/22/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.992 | U 0.19 | U 0.234 |
| | 12/14/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 1.13 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | 0.75 | U 0.19 | UJ 0.234 |
| McILHATTAN SEEP | 1/19/1994 | U 2 | 1 | U 5 | U 1 | U 1 | 4 | 3 | U 1 |
| | 1/19/1994 | U 2 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/27/1994 | U 1 | U 1 | U 5 | U 1 | U 1 | 5 | 1 | U 1 |
| | 6/27/1994 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 1/31/1995 | U 1 | U* 1 | U 5 | U* 1 | U 1 | 4 | 1 | U 1 |
| | 6/28/1995 | U 1 | U 1 | U 1 | U 1 | U 1 | 3 | 2 | U 1 |
| | 11/28/1995 | U 1 | U 1 | U* 5 | U* 1 | U 1 | 5 | 1 | U 1 |
| | 6/26/1996 | U 1 | U 1 | U 5 | U 1 | U* 1 | 2 | U* 1 | U 1 |
| | 12/12/1996 | U 1 | U* 1 | U 5 | U* 1 | U* 1 | 3 | U* 1 | U 1 |
| | 6/20/1997 | U 1 | U 1 | U 1 | U 1 | U 2 | U 1 | U 1 | U 2 |
| | 12/17/1997 | U 1 | U 1 | U 5 | U 1 | U 1 | 1 | 4 | U 1 |
| | 6/29/1998 | U 1 | U(3) 1 | 8 | U(3) 1 | U(3) 1 | 3 | 1 | U 1 |
| | 12/15/1998 | U 1 | U 1 | UB 5 | U 1 | U 1 | 4 | 4 | U 1 |
| | 6/23/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | 1 | U 1 |
| | 12/14/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | 2 | U 1 |
| | 6/7/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | 1 | U 1 |
| | 11/29/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | 1 | U 1 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

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-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| McILHATTAN SEEP | 6/12/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | 1 | U 1 |
| | 12/18/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | 1 | U 1 |
| | 6/14/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | U 1 | U 1 |
| | 12/12/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | 4 | 1 | U 1 |
| | 6/10/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | U 1 | U 1 |
| | 12/3/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | U 1 | UJF% 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | U 1 | U 1 |
| | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | 3 | U 1 | U 1 |
| | 6/17/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | U 1 | U 1 |
| | 12/14/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | 2 | U 1 | U 1 |
| | 6/12/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 1.4 | U 0.5 | U 0.5 |
| | 12/7/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 1.8 | 0.5 | U 0.5 |
| | 6/19/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.6 | U 0.5 | UJF% 0.5 |
| | 12/10/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 1.3 | U 0.5 | U 0.5 |
| | 6/26/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | 0.6 | U 0.5 | U 0.5 |
| | 12/9/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | 1.4 | U 1 | U 0.4 |
| | 6/2/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | 1.1 | U 0.5 | U 0.2 |
| | 12/4/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | 1.6 | U 0.5 | U 0.2 |
| | 6/16/2010 | U 0.5 | U 0.5 | 40.4 | U 0.5 | U 0.5 | 1.2 | U 0.5 | U 0.5 |
| | 12/6/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | 1.2 | U 1 | U 1 |
| | 6/14/2011 | U 0.038 | U 0.08 | U 2 | U 0.072 | J 0.061 | 0.73 | J 0.26 | U 0.049 |
| | 12/6/2011 | U 0.047 | J 0.13 | U 5 | U 0.072 | U 0.13 | 1.1 | J 0.3 | U 0.16 |
| | 6/5/2012 | U 0.047 | J 0.19 | U 2 | U 0.072 | U 0.13 | 1.1 | J 0.32 | U 0.16 |

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NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| McILHATTAN SEEP | 12/5/2012 | U 0.047 | J 0.23 | U 2 | U 0.072 | U 0.13 | 1.2 | J 0.32 | U 0.16 |
| | 6/12/2013 | U 0.24 | J 0.3 | U 2 | U 0.25 | U 0.5 | 1.3 | 0.41 | U 0.2 |
| | 12/18/2013 | U 0.24 | J 0.32 | U 2 | U 0.25 | J 0.7 | 1.2 | J 0.39 | U 0.1 |
| | 3/28/2014 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | 1.2 | 0.41 | U 0.1 |
| | 8/21/2014 | U 0.073 | J 0.26 | U 2 | U 0.077 | U 0.34 | 1.7 | J 0.3 | U 0.082 |
| | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 6/15/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | 1.2 | J 0.37 | U 0.081 |
| | 12/1/2015 | U 0.21 | J 0.34 | U 0.56 | U 0.22 | U 0.64 | 1.2 | 0.41 | U 0.081 |
| | 6/16/2016 | U 0.21 | J 0.39 | U 0.56 | U 0.22 | U 0.64 | 0.95 | J 0.3 | U 0.081 |
| | 11/28/2016 | U 0.042 | J 0.39 | U 0.097 | U 0.055 | U 0.08 | 1 | J 0.26 | U 0.098 |
| | 6/16/2017 | U 0.042 | J 0.32 | U 0.097 | U 0.055 | U 0.08 | 0.87 | J 0.35 | U 0.098 |
| | 11/29/2017 | U 0.13 | J 0.37 | U 1.2 | U 0.14 | U 1.1 | 1 | J 0.22 | U 0.096 |
| | 8/22/2018 | U 0.1 | J 0.36 | U 0.98 | U 0.17 | J 0.52 | 0.96 | J 0.25 | U 0.092 |
| | 11/27/2018 | U 0.1 | J 0.32 | U 0.98 | U 0.17 | U 0.16 | 0.83 | J 0.25 | U 0.092 |
| | 6/12/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | 0.59 | U 0.15 | U 0.092 |
| | 12/3/2019 | U 0.1 | J 0.19 | U 0.98 | U 0.17 | U 0.48 | 0.75 | U 0.15 | U 0.092 |
| | 6/23/2020 | U 0.12 | J 0.28 | U 2 | U 0.14 | U 0.16 | 0.69 | U 0.11 | U 0.098 |
| | 12/2/2020 | U 0.0941 | J 0.186 | U 0.43 | U 0.1 | U 0.96 | 0.623 | U 0.19 | U 0.234 |
| | 6/22/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | J 0.492 | U 0.19 | U 0.234 |
| | 12/14/2021 | U 0.0941 | J 0.172 | U 0.43 | U 0.1 | U 0.96 | 0.62 | U 0.19 | U 0.234 |
| | 6/22/2022 | U 0.0941 | J 0.178 | U 0.43 | U 0.1 | U 0.96 | J 0.423 | J 0.199 | UJ 0.234 |
| | 12/7/2022 | U 0.0941 | J 0.156 | U 0.43 | U 0.1 | U 0.96 | 0.546 | U 0.19 | U 0.234 |
| SHOP WELL | 6/13/2011 | U 0.038 | 1 | U 2 | 1.6 | U 0.021 | 3.8 | 2.3 | J 0.13 |

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NA - Not Applicable U - Less than

- Value greater than the HHS

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-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| SHOP WELL | 12/7/2011 | U 0.047 | 0.95 | U 5 | 1.7 | U 0.13 | 3.9 | 2.2 | U 0.16 |
| | 6/4/2012 | U 0.047 | 0.64 | U 2 | 1.2 | U 0.13 | 3.7 | 1.7 | U 0.16 |
| | 12/4/2012 | U 0.047 | 0.86 | U 2 | 1.7 | J 0.21 | 4.5 | 2.1 | U 0.16 |
| | 6/10/2013 | U 0.24 | 0.65 | U 2 | 1.9 | U 0.5 | 4.4 | 1.7 | U 0.2 |
| | 12/16/2013 | U 0.24 | 1.5 | U 2 | 3.7 | U 0.5 | 7.3 | 3 | U 0.1 |
| | 8/19/2014 | U 0.073 | 1 | U 2 | 2.1 | U 0.34 | 8.7 | 2.5 | U 0.082 |
| | 12/8/2014 | U 0.073 | U 0.11 | U 2 | 2.2 | U 0.34 | 7.2 | U 0.084 | U 0.082 |
| | 12/1/2017 | U 0.13 | 1.1 | U 1.2 | 2.3 | U 1.1 | 5.6 | 2 | U 0.096 |
| | 12/3/2019 | U 0.1 | 1.1 | U 0.98 | 1.8 | U 0.48 | 5.8 | 1.8 | U 0.092 |
| | 12/13/2021 | U 0.0941 | 1.18 | U 0.43 | 2.28 | U 0.96 | 5.07 | 1.49 | U 0.234 |
| SNOWFILL WELL | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| VET CLINIC WELL | 1/19/1994 | U 2 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/28/1994 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 1/31/1995 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/28/1995 | U 1 | U 1 | U 1 | U 1 | U 1 | 4 | 2 | U 1 |
| | 11/28/1995 | U 1 | U 1 | U* 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/26/1996 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/12/1996 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/20/1997 | U 1 | U 1 | U 1 | U 1 | U 2 | U 1 | U 1 | U 2 |
| | 12/17/1997 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/30/1998 | U 1 | U 1 | U(3) 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/15/1998 | U 1 | U 1 | UB 5 | U 1 | U 1 | U 1 | U 1 | U 1 |

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- Value greater than the HHS

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**TABLE 5**
**Summary of Selected Volatile Organic Compounds**
**Bozeman Landfill**
**Bozeman, Montana**



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| VET CLINIC WELL | 6/23/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/14/1999 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/7/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 11/28/2000 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/12/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/18/2001 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/14/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/12/2002 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/10/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/4/2003 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | UJF% 1 |
| | 6/8/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/6/2004 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/17/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 12/14/2005 | U 1 | U 1 | U 5 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/12/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/7/2006 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/21/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | UJF% 0.5 |
| | 12/12/2007 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 6/25/2008 | U 0.5 | U 0.5 | U 5 | U 1 | U 1 | U 0.5 | U 0.5 | U 0.5 |
| | 12/9/2008 | U 1 | U 1 | U 4 | U 1 | U 1 | U 1 | U 1 | U 0.4 |
| | 6/2/2009 | U 0.5 | U 0.5 | U 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 12/10/2009 | U 0.5 | U 0.5 | UB 2 | U 0.5 | U 2 | U 0.5 | U 0.5 | U 0.2 |
| | 6/16/2010 | U 0.5 | U 0.5 | 38.1 | U 0.5 | U 0.5 | U 0.5 | U 0.5 | U 0.5 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| VET CLINIC WELL | 12/8/2010 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 | U 1 |
| | 6/15/2011 | U 0.038 | U 0.08 | U 2 | U 0.072 | U 0.021 | U 0.041 | U 0.05 | U 0.049 |
| | 12/7/2011 | U 0.047 | U 0.08 | U 5 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/5/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 12/6/2012 | U 0.047 | U 0.08 | U 2 | U 0.072 | U 0.13 | U 0.16 | U 0.11 | U 0.16 |
| | 6/12/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.12 | U 0.2 |
| | 12/18/2013 | U 0.24 | U 0.23 | U 2 | U 0.25 | U 0.5 | U 0.25 | U 0.13 | U 0.1 |
| | 8/21/2014 | U 0.073 | U 0.11 | U 2 | U 0.077 | U 0.34 | U 0.099 | U 0.084 | U 0.082 |
| | 12/10/2014 | U 0.073 | U 0.11 | U 2 | U 0.087 | U 0.34 | U 0.12 | U 0.084 | U 0.082 |
| | 6/15/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 12/1/2015 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 6/16/2016 | U 0.21 | U 0.25 | U 0.56 | U 0.22 | U 0.64 | U 0.19 | U 0.14 | U 0.081 |
| | 11/28/2016 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 6/16/2017 | U 0.042 | U 0.12 | U 0.097 | U 0.055 | U 0.08 | U 0.13 | U 0.044 | U 0.098 |
| | 11/29/2017 | U 0.13 | U 0.2 | U 1.2 | U 0.14 | U 1.1 | U 0.16 | U 0.18 | U 0.096 |
| | 8/22/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | J 1.2 | U 0.17 | U 0.15 | U 0.092 |
| | 11/27/2018 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 6/12/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.16 | U 0.17 | U 0.15 | U 0.092 |
| | 12/3/2019 | U 0.1 | U 0.15 | U 0.98 | U 0.17 | U 0.48 | U 0.17 | U 0.15 | U 0.092 |
| | 6/23/2020 | U 0.12 | U 0.2 | U 2 | U 0.14 | U 0.16 | U 0.093 | U 0.11 | U 0.098 |
| | 12/2/2020 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 6/22/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |
| | 12/14/2021 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | U 0.234 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

-- - Not collected/analyzed

J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

# TABLE 5
## Summary of Selected Volatile Organic Compounds
## Bozeman Landfill
## Bozeman, Montana



| Sampling Location | Sampling Date | LABORATORY PARAMETERS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Benzene (µg/L) | Cis 1,2-dichloro-ethene (µg/L) | Methylene Chloride (µg/L) | 1,1-Dichloro-ethane (µg/L) | Chloro-methane (µg/L) | Tetrachloro-ethene (µg/L) | Trichloro-ethene (µg/L) | Vinyl chloride (µg/L) |
| **HHS** | | **5** | **70** | **5** | NA | NA | **5** | **5** | **2** |
| VET CLINIC WELL | 6/22/2022 | U 0.0941 | U 0.126 | U 0.43 | U 0.1 | U 0.96 | U 0.3 | U 0.19 | UJ 0.234 |

**Notes:** µg/L - micrograms per liter
HHS - Human Health Standard (EPA Maximum Contaminant Level or HHS in Circular DEQ-7, Montana Numeric WQ Stds, June 2019)
NA - Not Applicable U - Less than

-- - Not collected/analyzed

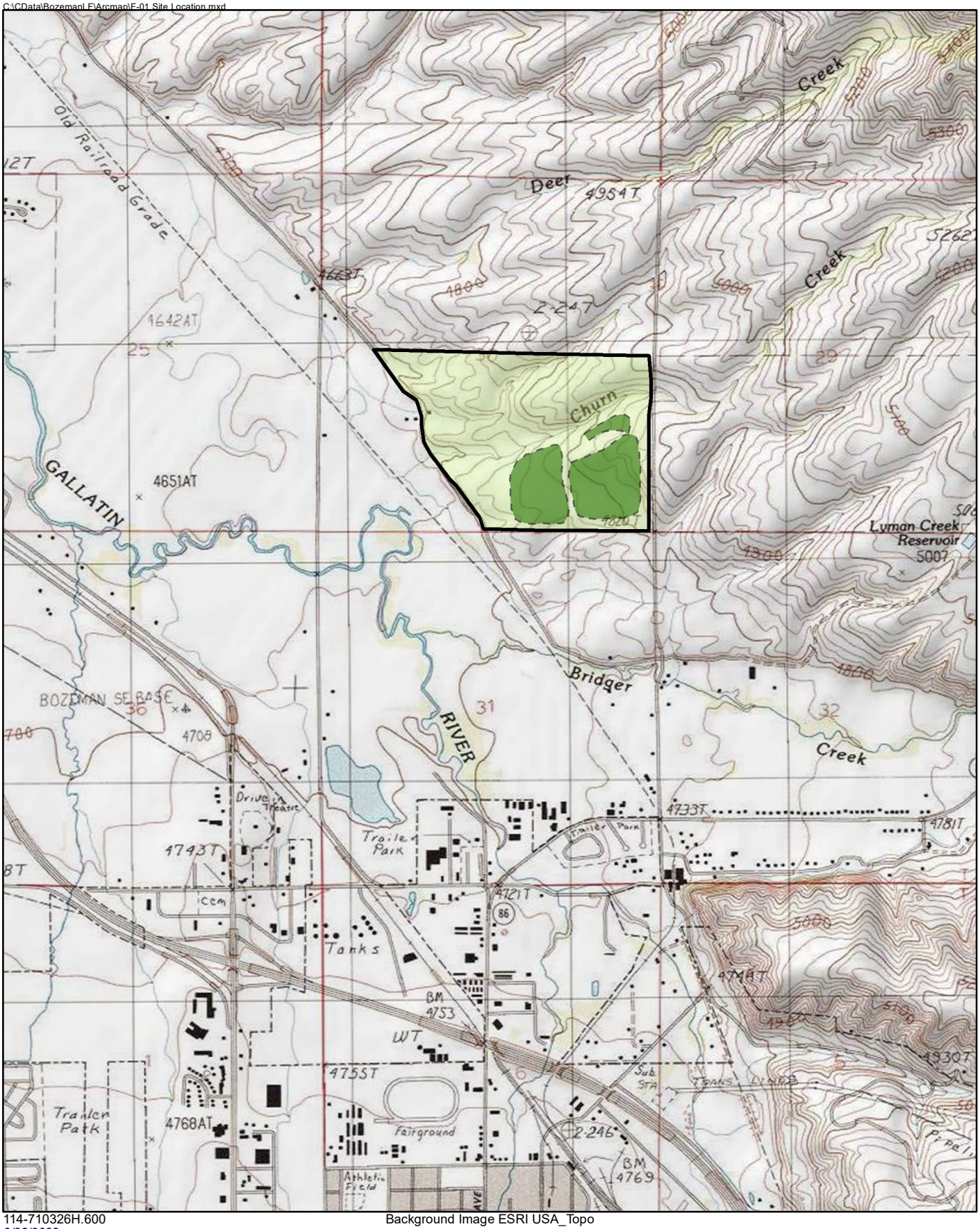
J Analyte detected below the reporting limit, therefore result is an estimate. Other QA/QC data flags are defined in analytical laboratory report.

- Value greater than the HHS

Vinyl Chloride concentration highlighted only if greater than 2 micrograms per liter (EPA Maximum Contaminant Level). Montana HHS is greater than 0.2 micrograms per liter (not highlighted).

# FIGURES

C:\CData\BozemanLF\Arcmap\F-01 Site Location.mxd




114-710326H.600
*9/28/2022*

Background Image ESRI USA_Topo

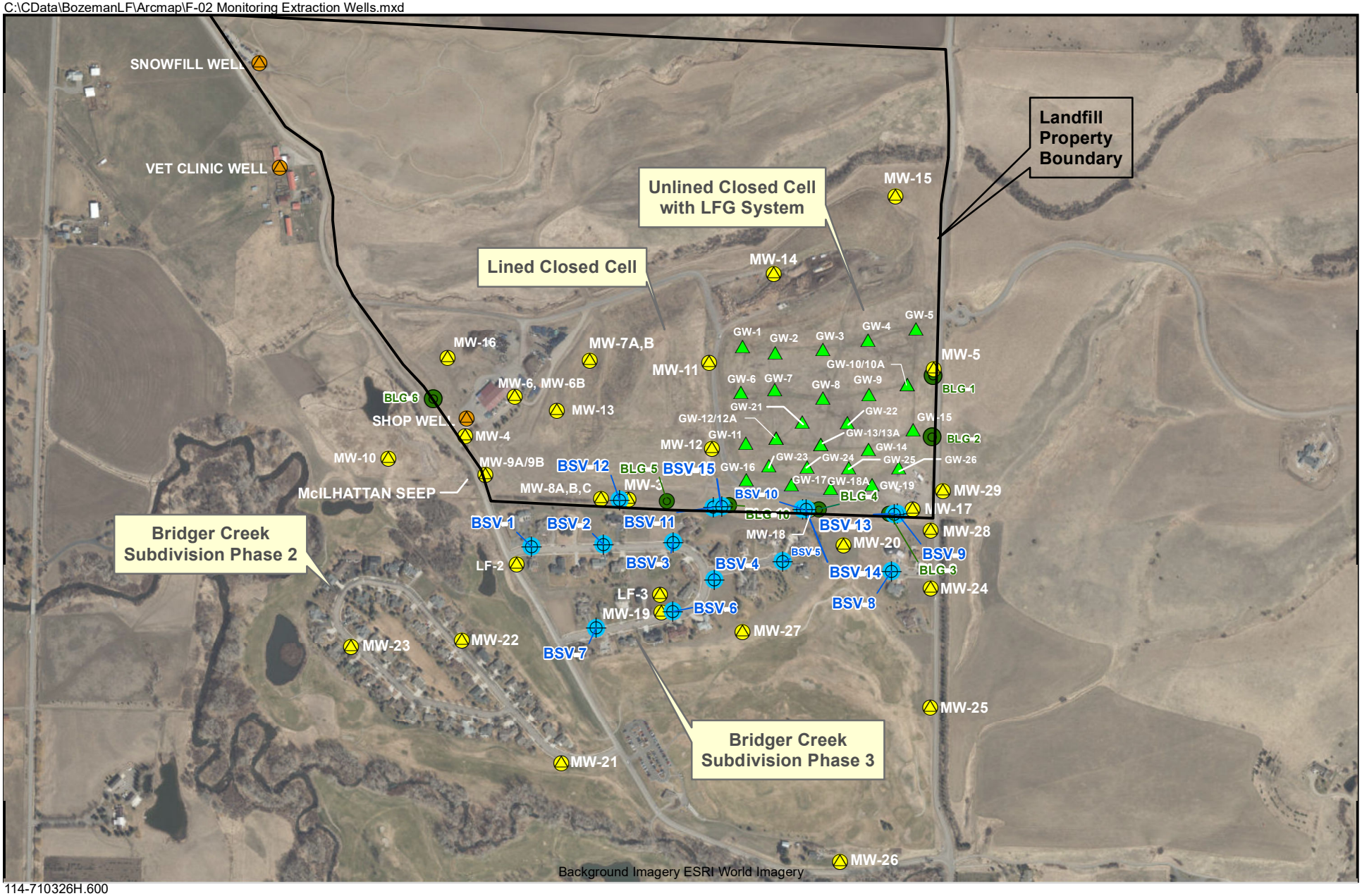
N

Miles

0 1:24,000 0.5

**Site Location Map**
**Bozeman Landfill**
**Bozeman, Montana**
**Figure 1**

C:\CData\BozemanLF\Arcmap\F-02 Monitoring Extraction Wells.mxd




114-710326H.600
9/28/2022

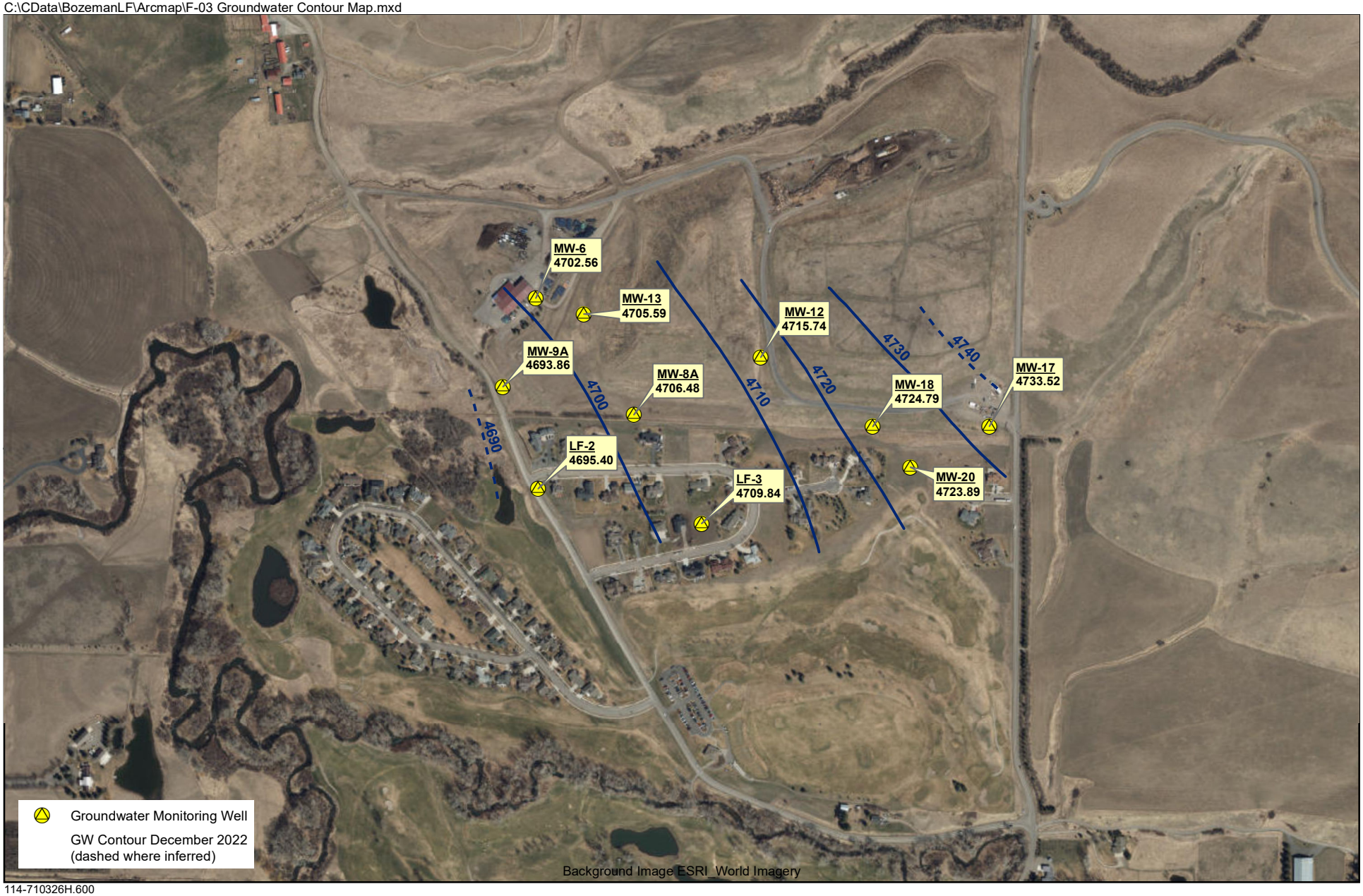
N

Feet
0
500

- Soil Gas Probe
- Groundwater Monitoring Well
- Water Supply Well
- Methane Monitoring Well
- Landfill Gas (LFG) Extraction Well

**Site Plan with Monitoring Stations and Extraction Wells**
**Bozeman Landfill**
**Bozeman, Montana**
**FIGURE 2**

C:\CData\BozemanLF\Arcmap\F-03 Groundwater Contour Map.mxd




114-710326H.600
3/8/2023

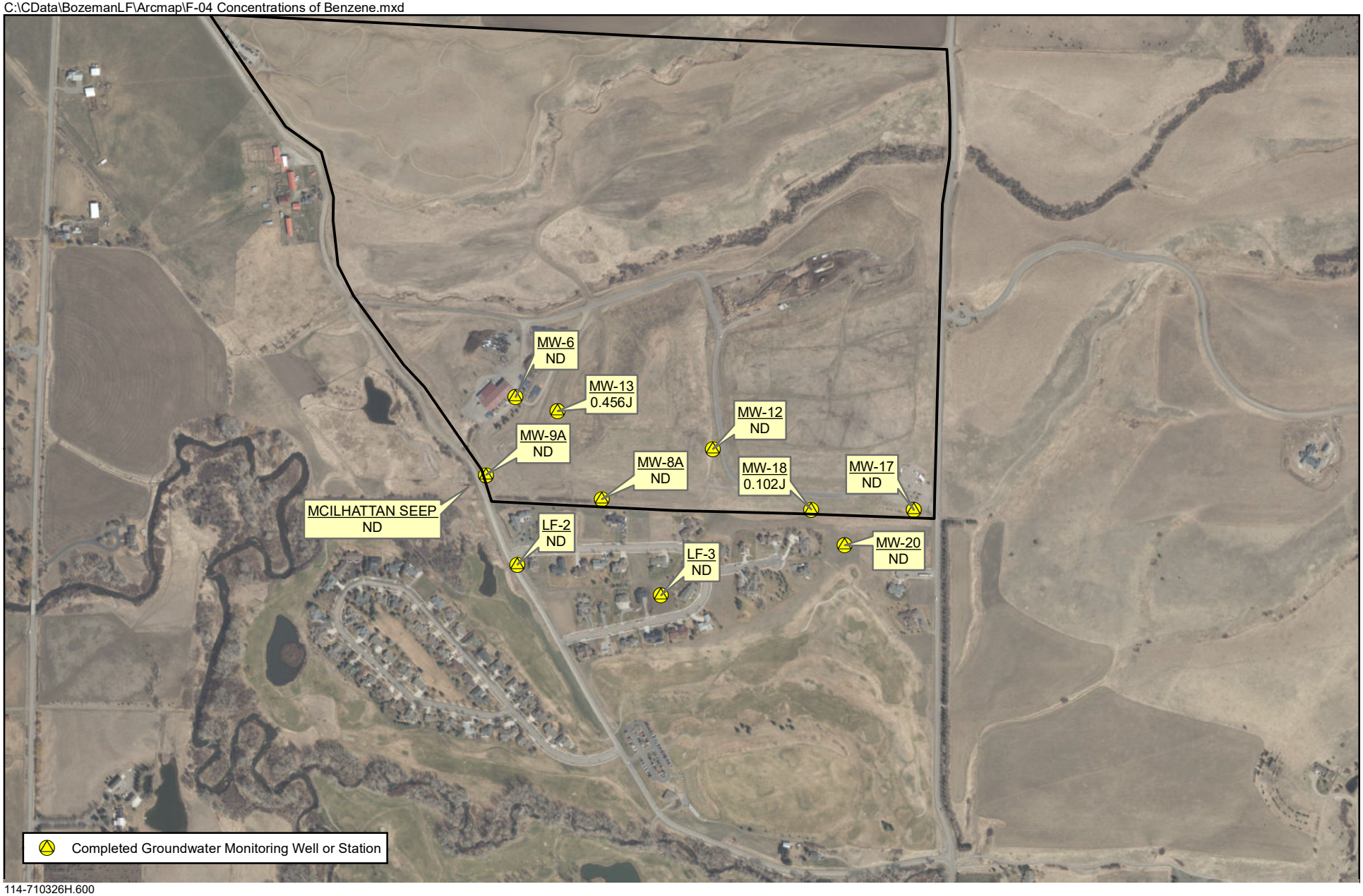
N

0 300 600
Feet

NOTE:
All well locations are approximate.
Only those wells used for preparation of groundwater contour map are shown

**Groundwater Contour Map**
**December 2022**
**Bozeman Landfill**
**Bozeman, Montana**
**FIGURE 3**

C:\CData\BozemanLF\Arcmap\F-04 Concentrations of Benzene.mxd




114-710326H.600
3/8/2023

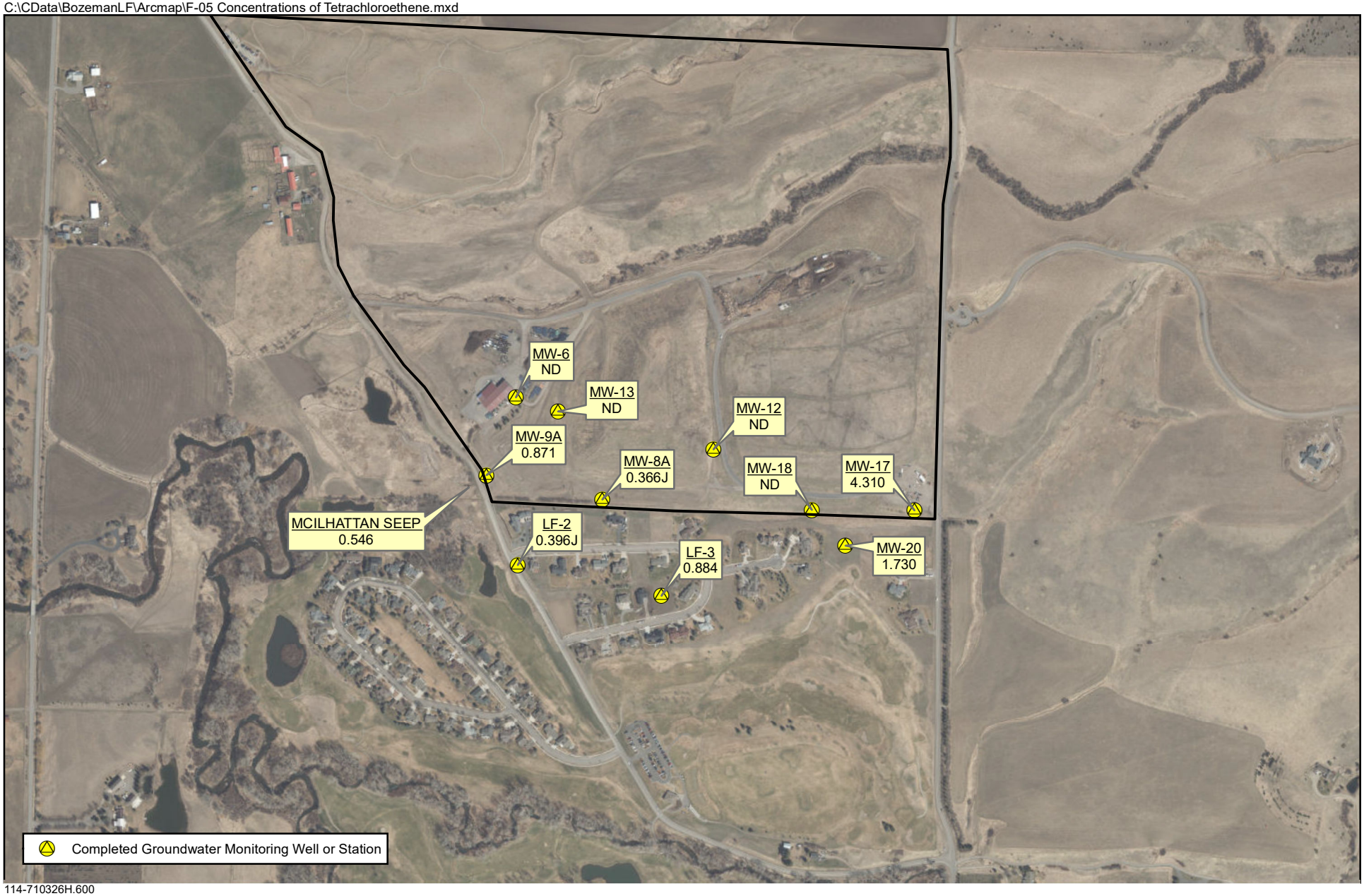
N

0 300 600
Feet

NOTE:
All well locations are approximate
December 2022 Benzene Concentration
J: Indicates Estimated Concentration (less than analytical practical quantitation limit)
Concentration in micrograms per liter
ND: Not Detected Above Minimum Detection Limit
Only wells sampled during monitoring event are shown
Bolded concentrations of constituent indicate exceedance of groundwater protection standard

**Concentrations of Benzene in Groundwater**
**December 2022**
**Bozeman Landfill**
**Bozeman, Montana**
**FIGURE 4**

C:\CData\BozemanLF\Arcmap\F-05 Concentrations of Tetrachloroethene.mxd




114-710326H.600
3/8/2023

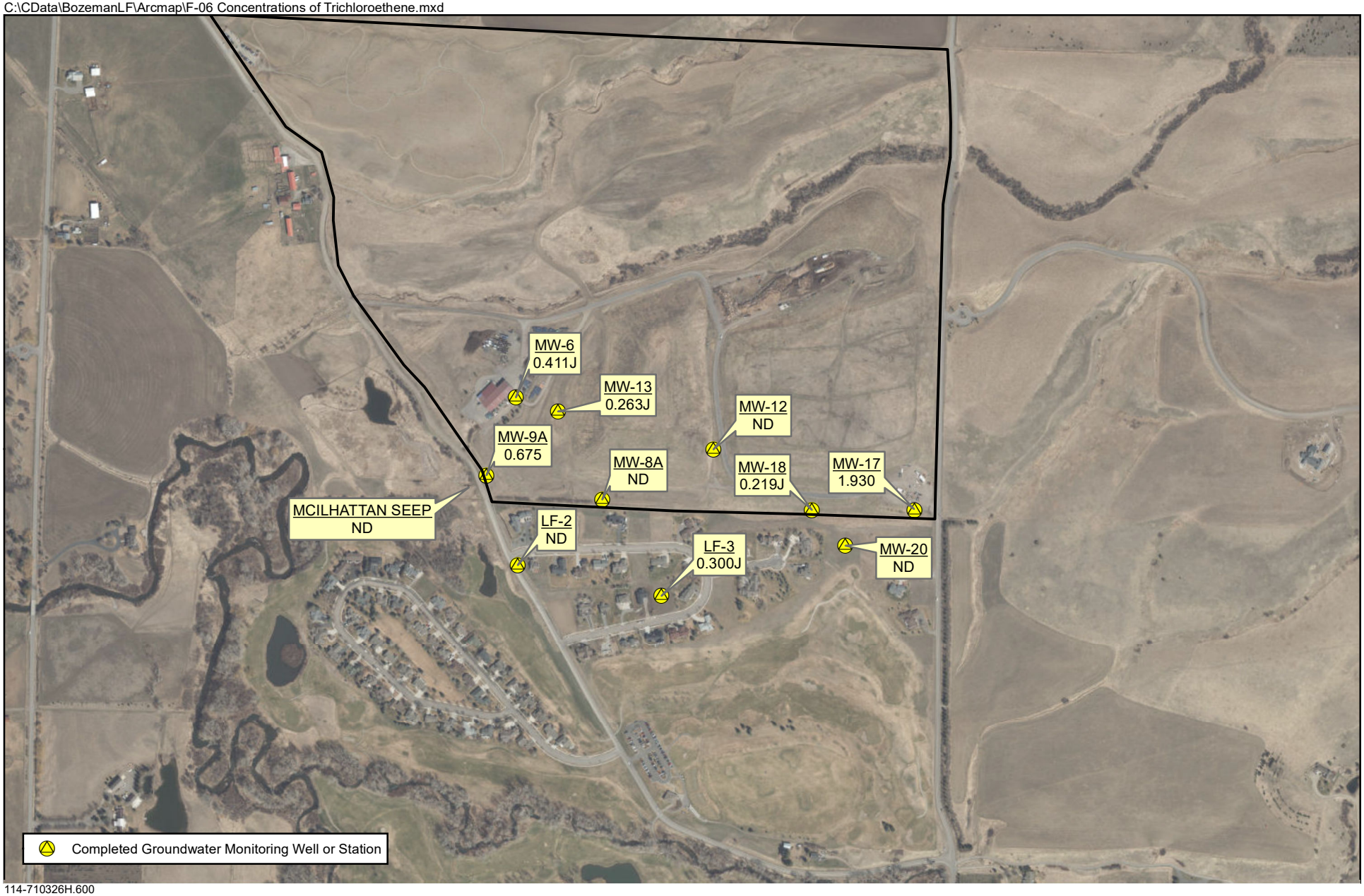
N

0 300 600
Feet

NOTE:
All well locations are approximate
December 2022 Tetrachloroethene Concentration
J: Indicates Estimated Concentration (less than analytical practical quantitation limit)
Concentration in micrograms per liter
ND: Not Detected Above Minimum Detection Limit
Only wells sampled during monitoring event are shown
Bolded concentrations of constituent indicate exceedance of groundwater protection standard

**Concentrations of Tetrachloroethene in Groundwater**
**December 2022**
**Bozeman Landfill**
**Bozeman, Montana**
**FIGURE 5**

C:\CData\BozemanLF\Arcmap\F-06 Concentrations of Trichloroethene.mxd




114-710326H.600
3/8/2023

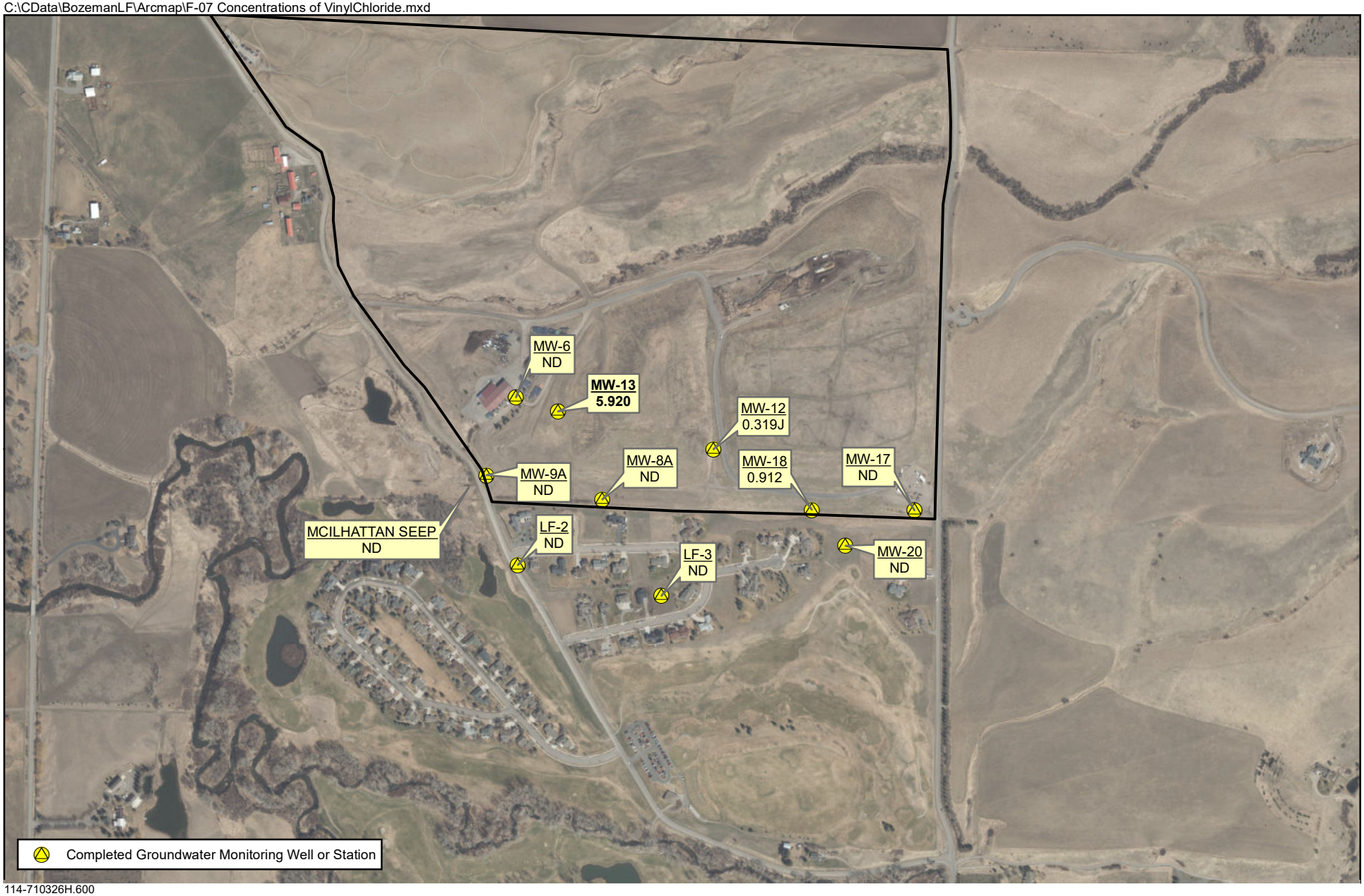
N

0 300 600
Feet

NOTE:
All well locations are approximate
December 2022 Trichloroethene Concentration
J: Indicates Estimated Concentration (less than analytical practical quantitation limit)
Concentration in micrograms per liter
ND: Not Detected Above Minimum Detection Limit
Only wells sampled during monitoring event are shown
Bolded concentrations of constituent indicate exceedance of groundwater protection standard

**Concentrations of Trichloroethene in Groundwater**
**December 2022**
**Bozeman Landfill**
**Bozeman, Montana**
**FIGURE 6**

C:\CData\BozemanLF\Arcmap\F-07 Concentrations of VinylChloride.mxd




114-710326H.600
3/8/2023

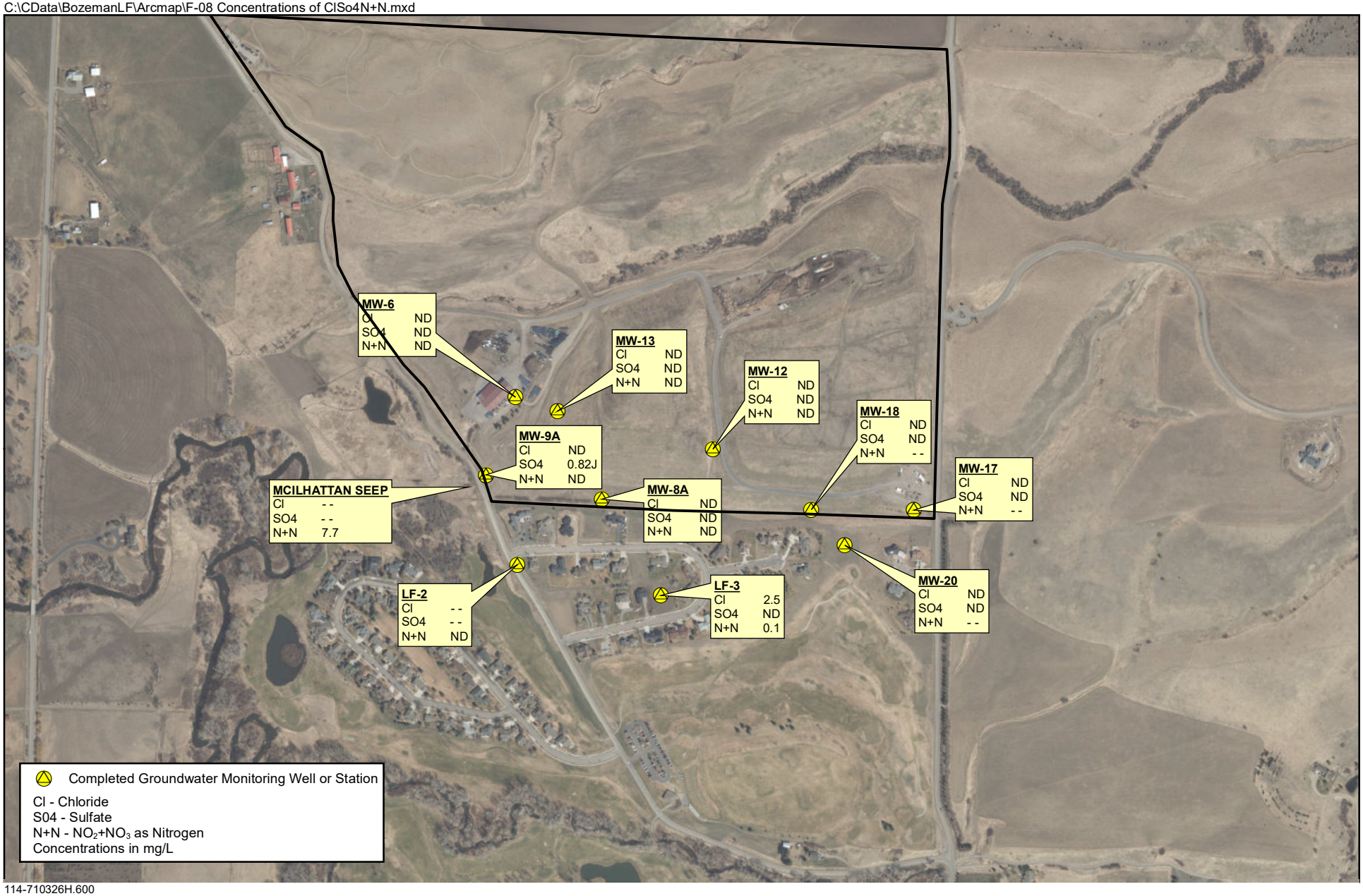
N

0 300 600
Feet

NOTE:
All well locations are approximate
December 2022 Vinyl Chloride Concentration
J: Indicates Estimated Concentration (less than analytical practical quantitation limit)
Concentration in micrograms per liter
ND: Not Detected Above Minimum Detection Limit
Only wells sampled during monitoring event are shown
Bolded concentrations of constituent indicate exceedance of groundwater protection standard

**Concentrations of Vinyl Chloride in Groundwater**
**December 2022**
**Bozeman Landfill**
**Bozeman, Montana**
**FIGURE 7**

C:\CData\BozemanLF\Arcmap\F-08 Concentrations of ClSo4N+N.mxd




114-710326H.600
3/8/2023

N

0 300 600
Feet

NOTE:
All well locations are approximate
December 2022 Chloride,Sulfate and Nitrogen Concentrations
J: Indicates Estimated Concentration (less than analytical practical quantitation limit)
ND: Not Detected Above Minimum Detection Limit
- -: Parameter not analyzed
Only wells sampled during monitoring event are shown
Bolded concentrations of constituent indicate exceedance of groundwater protection standard

**Concentrations of Chloride, Sulfate and Nitrogen in Groundwater**
**December 2022**
**Bozeman Landfill**
**Bozeman, Montana**
**FIGURE 8**

# APPENDIX A GROUNDWATER DATA OVER TIME

**CHART A-1**
**Groundwater Elevations Through Time**

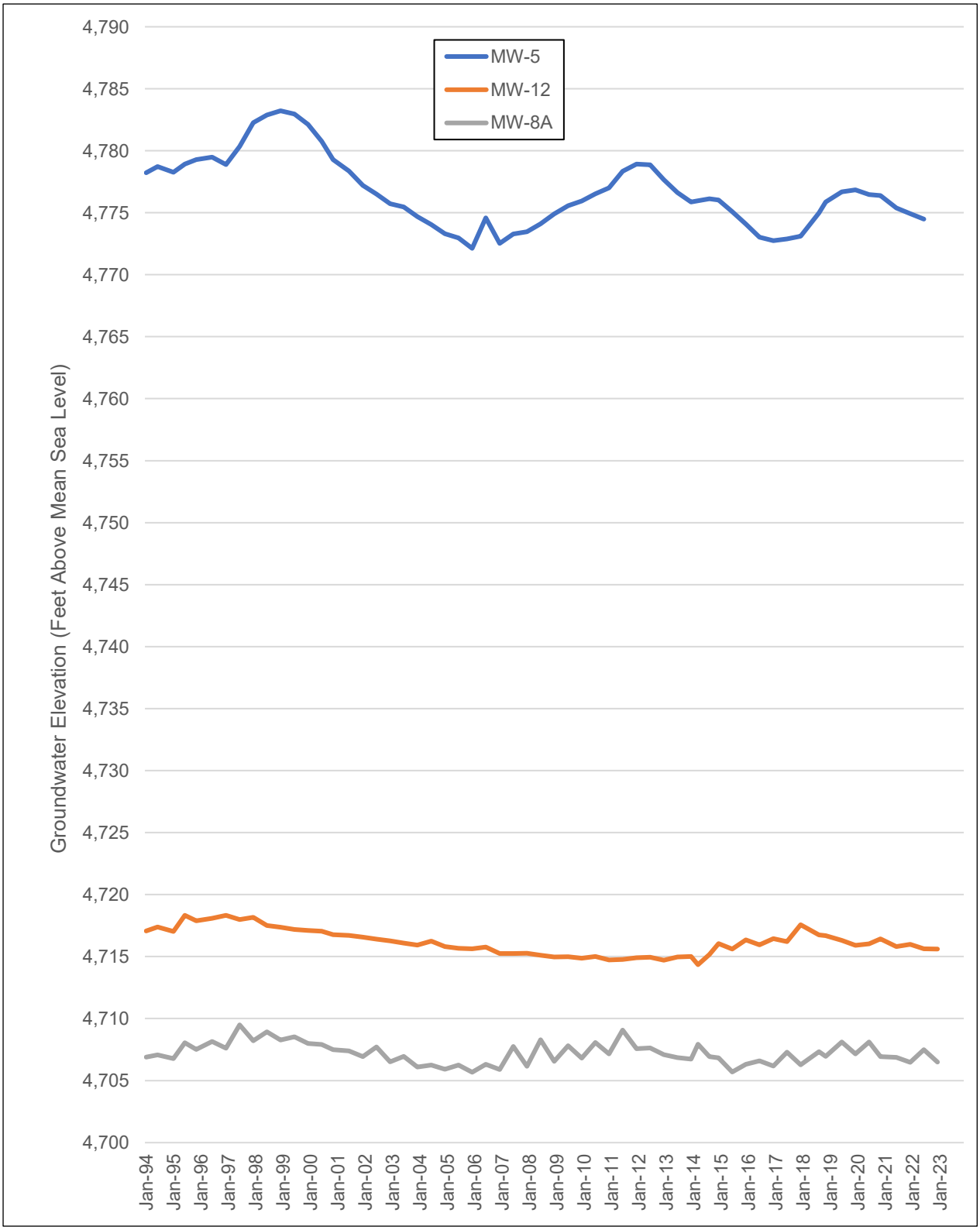


**CHART A-2**

**MW-12 Volatile Organic Compound Concentrations and Groundwater Elevation Over Time**

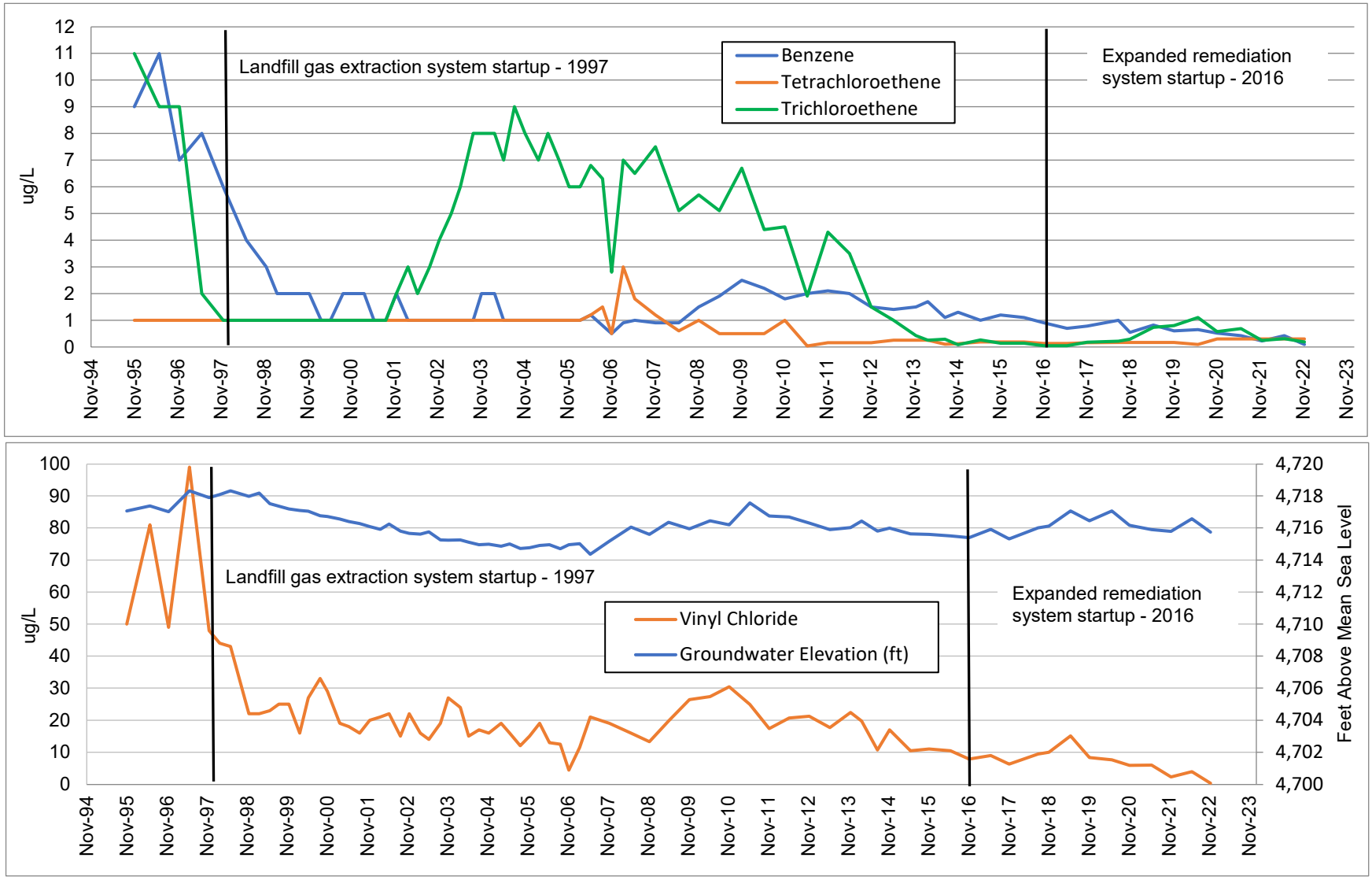


**CHART A-3**

**MW-13 Volatile Organic Compound Concentrations and Groundwater Elevation Over Time**

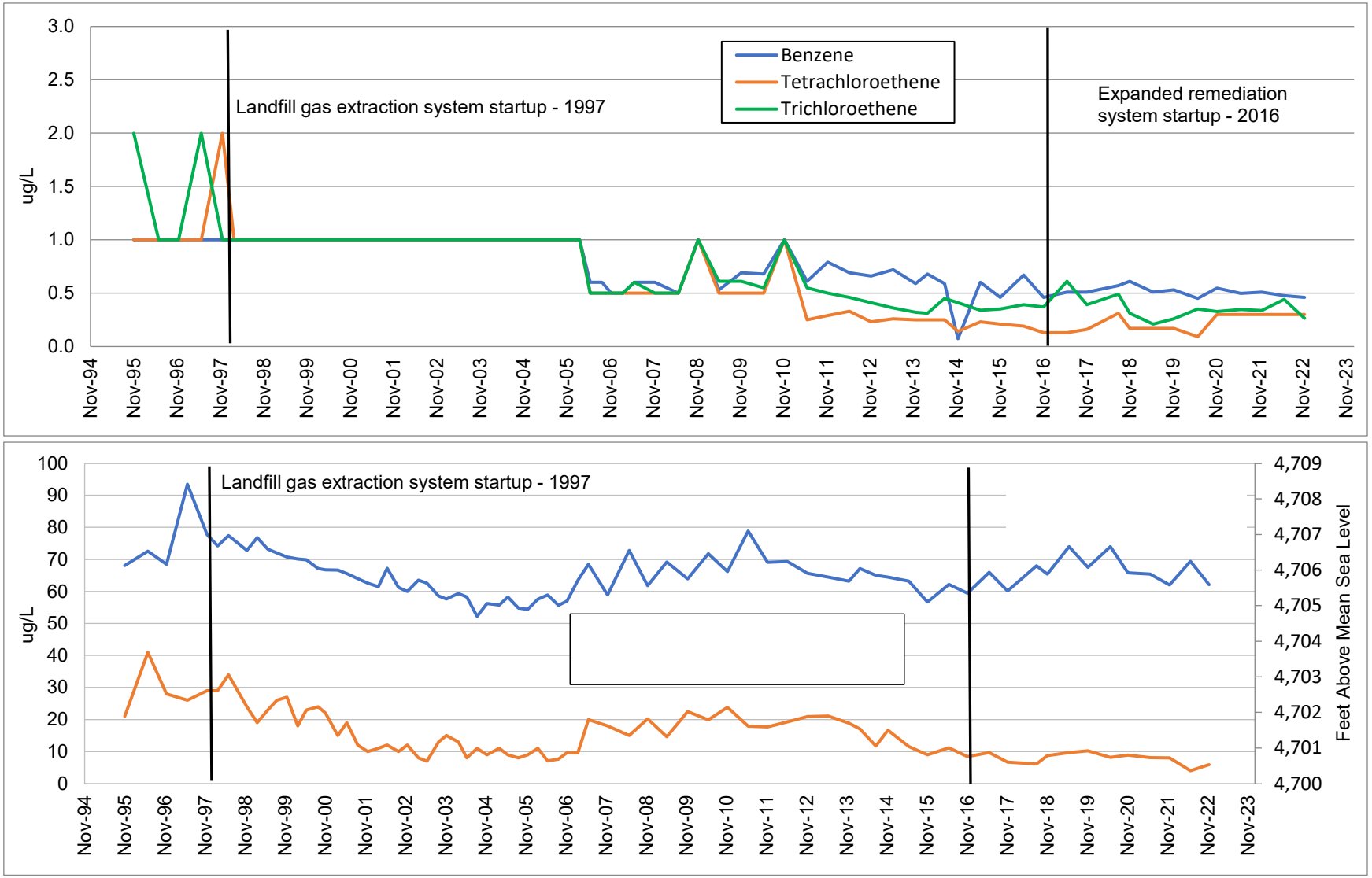


**CHART A-4**

**MW-6 Volatile Organic Compound Concentrations and Groundwater Elevation Over Time**

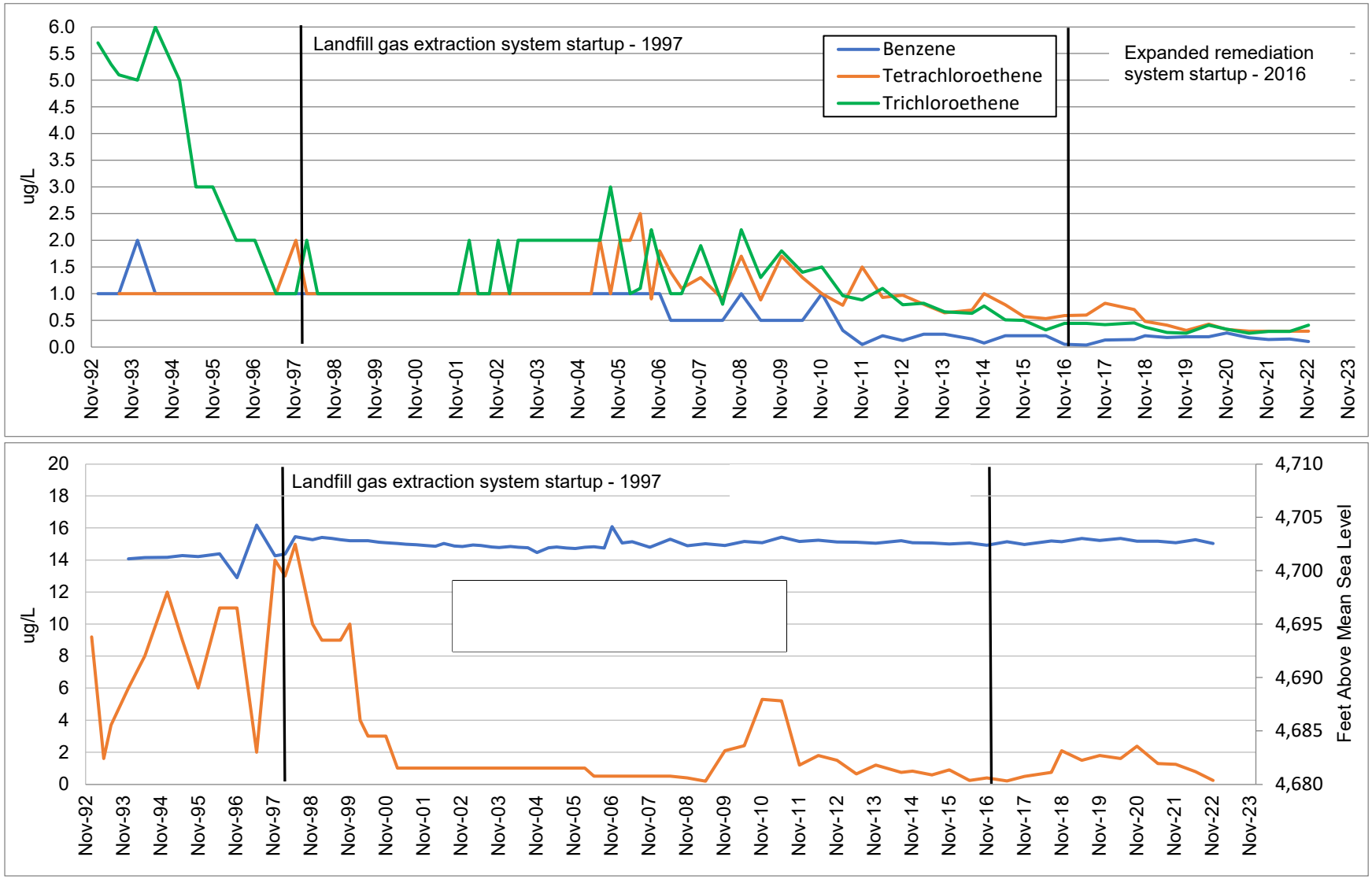


**CHART A-5**

**MW-8A Volatile Organic Compound Concentrations and Groundwater Elevation Over Time**

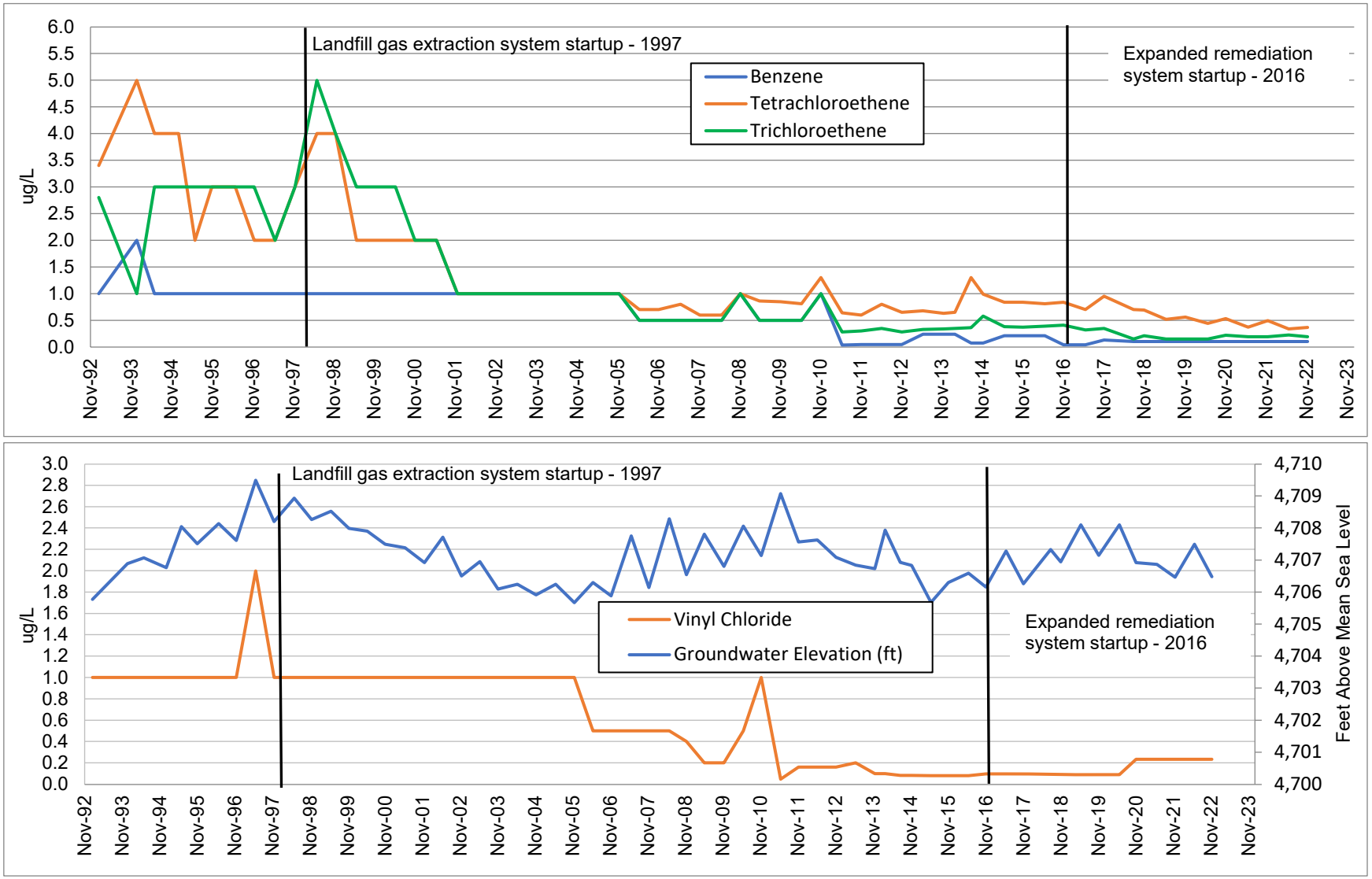
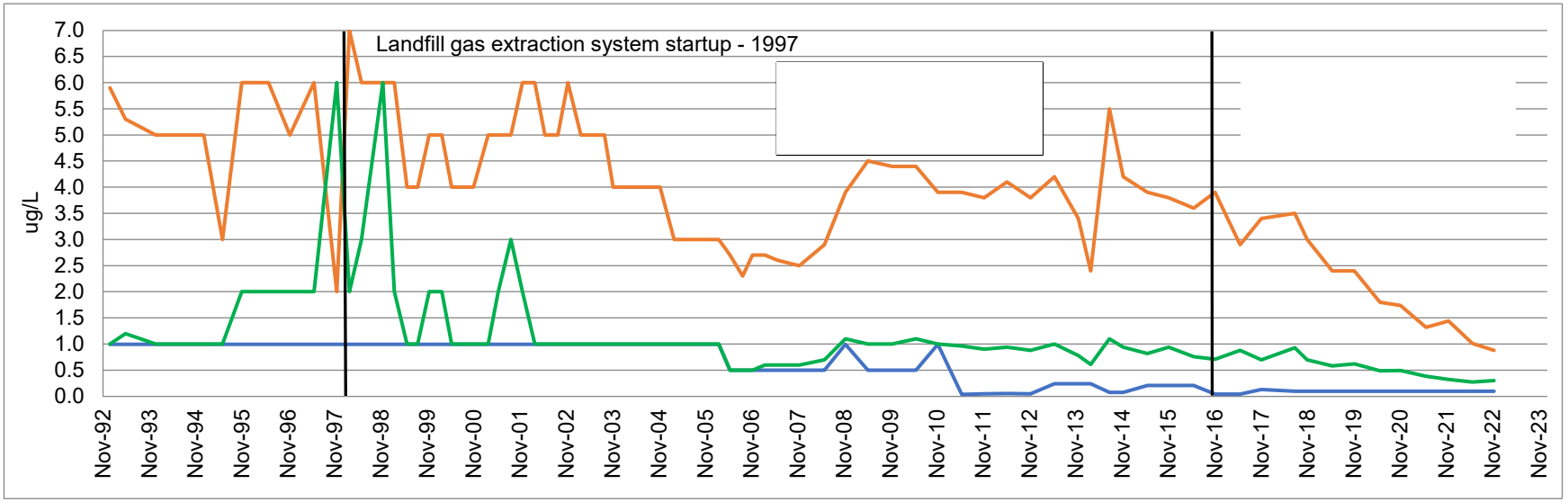
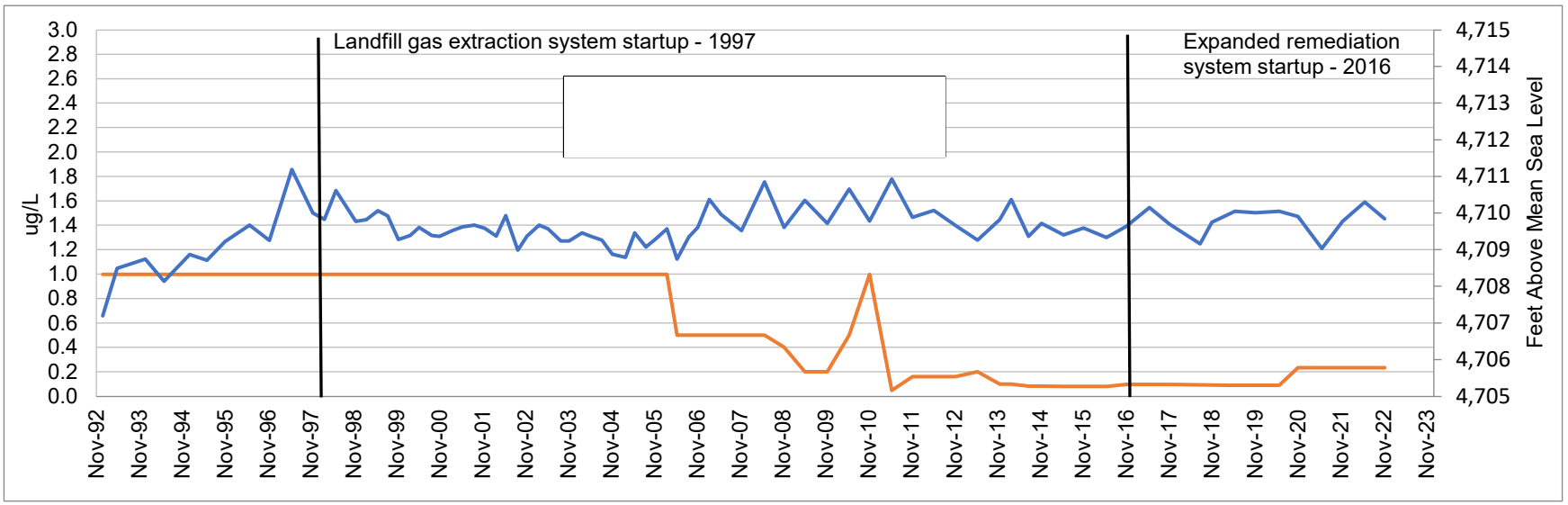


**CHART A-6**

**LF-3 Volatile Organic Compound Concentrations and Groundwater Elevation Over Time**



# APPENDIX B SAMPLING LOGS AND FIELD NOTES

***Table 1. Bozeman Landfill December Field Parameters***

| Groundwater Monitoring Station | Date/Time | Depth to Water | pH | Specific Conductivity | Oxidation/Reduction Potential | Dissolved Oxygen | Temperature |
|---|---|---|---|---|---|---|---|
| **Units** | | **Feet Below Top of Collar** | **Standard Units** | **us/cm** | **Millivolts (mV)** | **mg/L** | **Degrees Celsius** |
| LF – 2 | 12-7-22/12:45 | 14.10 | 5.14 | 26 | 204.9 | 9.75 | 6.77 |
| LF – 3 * | 12-7-22/12:15 | 13.75 | 6.72 | 771 | 161.2 | 8.95 | 10.30 |
| MW – 6 | 12-8-22/12:00 | 31.58 | 4.41 | 8 | 255.7 | 8.01 | 9.81 |
| MW - 8A | 12-7-22/15:40 | 48.10 | 4.32 | ~~7~~ 11 | 151.7 | 9.77 | 4.85 |
| MW - 9A | 12-8-22/10:30 | 28.25 | 4.23 | 21 | 339.5 | 3.84 | 6.12 |
| MW – 12 | 12-7-22/16:15 | 56.41 | 4.39 | 17 | -1.7 | 1.88 | 6.39 |
| MW – 13 | 12-8-22/11:15 | 43.91 | 3.90 | 19 | 268.3 | 1.98 | 8.62 |
| MW – 17 | 12-7-22/14:30 | 76.51 | 4.47 | 17 | ~~216.9~~ 1925 | 10.60 | 7.76 |
| MW – 18 | 12-7-22/15:15 | 47.57 | 4.10 | 20 | 50.8 | ~~1.79~~ 2.06 | 7.36 |
| MW – 20 | 12-7-22/13:45 | 54.12 | 6.02 | 63 | 176.4 | 11.28 | not recorded |
| McIlhattan Seep | 12-7-22/13:00 | NA | ~~6~~ 6.67 | 1013 | 137.7 | 7.14 | 9.60 |
| Dup 1 | 12-7-22/13:15 | Duplicate of natural sample: McIlhatten Seep ~~13:15 12~~ | | | | | |
| Dup 2 | 12-7-22/14:45 | Duplicate of natural sample: MW-17 | | | | | |

Notes: "Blank 1" is equipment (PDS) blank for all samples collected in Dec 2022, AND those installed in Fall 2022 that will be sampled in June 2023.
"Blank 2" is eqpt blank for PDSs installed in ~~Fall~~ Dec 2022 that will be sampled in June 2023,

Blank 1 sampled 12-7-22 10:10
Blank 2 sampled 12-7-22 10:30

All temps are likely biased low due to cold air temperature during meter stabilization

* insufficient volume in PDS for parameter measurement. Data are no-purge Down hole

# APPENDIX C LABORATORY ANALYTICAL REPORTS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

December 22, 2022

Shane Matolyak
Tetra Tech
851 Bridger Drive
Suite 4
Bozeman, MT 59715

RE: Project: Bozeman Landfill
Pace Project No.: 10636539

Dear Shane Matolyak:

Enclosed are the analytical results for sample(s) received by the laboratory on December 09, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace National - Mt. Juliet
- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Gross
jennifer.gross@pacelabs.com
(612)607-1700
Project Manager

Enclosures

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# CERTIFICATIONS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Pace Analytical Services, LLC - Minneapolis MN**

1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
GMP+ Certification #: GMP050884
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification (A2LA) #: R-036
North Dakota Certification (MN) #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

**Pace Analytical Services National**

12065 Lebanon Road, Mt. Juliet, TN 37122
Alabama Certification #: 40660
Alaska Certification 17-026
Arizona Certification #: AZ0612
Arkansas Certification #: 88-0469
California Certification #: 2932
Canada Certification #: 1461.01
Colorado Certification #: TN00003
Connecticut Certification #: PH-0197
DOD Certification: #1461.01
EPA# TN00003
Florida Certification #: E87487
Georgia DW Certification #: 923
Georgia Certification: NELAP
Idaho Certification #: TN00003
Illinois Certification #: 200008
Indiana Certification #: C-TN-01
Iowa Certification #: 364
Kansas Certification #: E-10277
Kentucky UST Certification #: 16
Kentucky Certification #: 90010
Louisiana Certification #: AI30792
Louisiana DW Certification #: LA180010
Maine Certification #: TN0002
Maryland Certification #: 324
Massachusetts Certification #: M-TN003
Michigan Certification #: 9958
Minnesota Certification #: 047-999-395
Mississippi Certification #: TN00003
Missouri Certification #: 340

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# CERTIFICATIONS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Pace Analytical Services National**

Montana Certification #: CERT0086
Nebraska Certification #: NE-OS-15-05
Nevada Certification #: TN-03-2002-34
New Hampshire Certification #: 2975
New Jersey Certification #: TN002
New Mexico DW Certification
New York Certification #: 11742
North Carolina Aquatic Toxicity Certification #: 41
North Carolina Drinking Water Certification #: 21704
North Carolina Environmental Certificate #: 375
North Dakota Certification #: R-140
Ohio VAP Certification #: CL0069
Oklahoma Certification #: 9915
Oregon Certification #: TN200002
Pennsylvania Certification #: 68-02979
Rhode Island Certification #: LAO00356
South Carolina Certification #: 84004
South Dakota Certification
Tennessee DW/Chem/Micro Certification #: 2006
Texas Certification #: T 104704245-17-14
Texas Mold Certification #: LAB0152
USDA Soil Permit #: P330-15-00234
Utah Certification #: TN00003
Virginia Certification #: VT2006
Vermont Dept. of Health: ID# VT-2006
Virginia Certification #: 460132
Washington Certification #: C847
West Virginia Certification #: 233
Wisconsin Certification #: 998093910
Wyoming UST Certification #: via A2LA 2926.01
A2LA-ISO 17025 Certification #: 1461.01
A2LA-ISO 17025 Certification #: 1461.02
AIHA-LAP/LLC EMLAP Certification #:100789

**Pace Analytical Services, LLC**
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## SAMPLE SUMMARY

Project: Bozeman Landfill
Pace Project No.: 10636539

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **10636539001** | **LF-2** | Water | 12/07/22 12:45 | 12/09/22 08:50 |
| **10636539002** | **LF-3** | Water | 12/07/22 12:15 | 12/09/22 08:50 |
| **10636539003** | **MW-6** | Water | 12/08/22 12:00 | 12/09/22 08:50 |
| **10636539004** | **MW-8A** | Water | 12/07/22 15:40 | 12/09/22 08:50 |
| **10636539005** | **MW-9A** | Water | 12/08/22 10:30 | 12/09/22 08:50 |
| **10636539006** | **MW-12** | Water | 12/07/22 16:15 | 12/09/22 08:50 |
| **10636539007** | **MW-13** | Water | 12/08/22 11:15 | 12/09/22 08:50 |
| **10636539008** | **MW-17** | Water | 12/07/22 14:30 | 12/09/22 08:50 |
| **10636539009** | **MW-18** | Water | 12/07/22 15:15 | 12/09/22 08:50 |
| **10636539010** | **MW-20** | Water | 12/07/22 13:45 | 12/09/22 08:50 |
| **10636539011** | **McIlhattan Seep** | Water | 12/07/22 13:00 | 12/09/22 08:50 |
| **10636539012** | **DUP 1** | Water | 12/07/22 13:15 | 12/09/22 08:50 |
| **10636539013** | **DUP 2** | Water | 12/07/22 14:45 | 12/09/22 08:50 |
| **10636539014** | **Blank 1** | Water | 12/07/22 10:10 | 12/09/22 08:50 |
| **10636539015** | **Blank 2** | Water | 12/07/22 10:30 | 12/09/22 08:50 |
| **10636539016** | **Trip Blank** | Water | 12/07/22 00:00 | 12/09/22 08:50 |

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## SAMPLE ANALYTE COUNT

Project: Bozeman Landfill
Pace Project No.: 10636539

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| 10636539001 | LF-2 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539002 | LF-3 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539003 | MW-6 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539004 | MW-8A | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539005 | MW-9A | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539006 | MW-12 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539007 | MW-13 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539008 | MW-17 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| 10636539009 | MW-18 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| 10636539010 | MW-20 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| 10636539011 | McIlhattan Seep | EPA 8260D | JAH | 61 | PAN |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539012 | DUP 1 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539013 | DUP 2 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| 10636539014 | Blank 1 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |
| | | EPA 353.2 | JFP | 1 | PASI-M |
| 10636539015 | Blank 2 | EPA 8260D | JAH | 61 | PAN |
| | | EPA 300.0 | AR3 | 2 | PASI-M |

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## SAMPLE ANALYTE COUNT

Project: Bozeman Landfill
Pace Project No.: 10636539

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| | | EPA 353.2 | JFP | 1 | PASI-M |
| **10636539016** | **Trip Blank** | EPA 8260D | JAH | 61 | PAN |

PAN = Pace National - Mt. Juliet
PASI-M = Pace Analytical Services - Minneapolis

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# PROJECT NARRATIVE

Project: Bozeman Landfill
Pace Project No.: 10636539

**Date:** December 22, 2022

Pace Analytical Services, LLC
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# PROJECT NARRATIVE

Project: Bozeman Landfill
Pace Project No.: 10636539

**Method:** **EPA 8260D**
**Description:** VOA (GC/MS) 8260D
**Client:** Tetra Tech, Inc. - MT
**Date:** December 22, 2022

**General Information:**
16 samples were analyzed for EPA 8260D by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

C5: The reported concentration is an estimate. The continuing calibration standard associated with this data responded high. Data is likely to show a high bias concerning the result.
- MW-13 (Lab ID: 10636539007)
- MW-18 (Lab ID: 10636539009)

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**
All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 1976678

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- LCS (Lab ID: R3873913-1)
  - 1,1,2-Trichlorotrifluoroethane
  - Cyclohexane

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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# PROJECT NARRATIVE

Project: Bozeman Landfill
Pace Project No.: 10636539

**Method:** **EPA 8260D**
**Description:** VOA (GC/MS) 8260D
**Client:** Tetra Tech, Inc. - MT
**Date:** December 22, 2022

Analyte Comments:

QC Batch: 1976678

C3: The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.

- Blank 1 (Lab ID: 10636539014)
  - Vinyl acetate
- Blank 2 (Lab ID: 10636539015)
  - Vinyl acetate
- DUP 1 (Lab ID: 10636539012)
  - Vinyl acetate
- DUP 2 (Lab ID: 10636539013)
  - Vinyl acetate
- LF-2 (Lab ID: 10636539001)
  - Vinyl acetate
- LF-3 (Lab ID: 10636539002)
  - Vinyl acetate
- MW-12 (Lab ID: 10636539006)
  - Vinyl acetate
- MW-13 (Lab ID: 10636539007)
  - Vinyl acetate
- MW-17 (Lab ID: 10636539008)
  - Vinyl acetate
- MW-18 (Lab ID: 10636539009)
  - Vinyl acetate
- MW-20 (Lab ID: 10636539010)
  - Vinyl acetate
- MW-6 (Lab ID: 10636539003)
  - Vinyl acetate
- MW-8A (Lab ID: 10636539004)
  - Vinyl acetate
- MW-9A (Lab ID: 10636539005)
  - Vinyl acetate
- McIlhattan Seep (Lab ID: 10636539011)
  - Vinyl acetate
- Trip Blank (Lab ID: 10636539016)
  - Vinyl acetate

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# PROJECT NARRATIVE

Project: Bozeman Landfill
Pace Project No.: 10636539

**Method:** **EPA 300.0**
**Description:** 300.0 IC Anions
**Client:** Tetra Tech, Inc. - MT
**Date:** December 22, 2022

**General Information:**
12 samples were analyzed for EPA 300.0 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 859575

B: Analyte was detected in the associated method blank.
- BLANK for HBN 859575 [WETA/545 (Lab ID: 4542008)
  - Sulfate

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 859575

C0: Result confirmed by second analysis.
- LF-3 (Lab ID: 10636539002)
  - Chloride
  - Sulfate
- MW-18 (Lab ID: 10636539009)
  - Chloride
  - Sulfate
- MW-20 (Lab ID: 10636539010)
  - Chloride
  - Sulfate
- MW-9A (Lab ID: 10636539005)
  - Chloride
  - Sulfate

E: Analyte concentration exceeded the calibration range. The reported result is estimated.
- MS (Lab ID: 4542010)
  - Sulfate
- MS (Lab ID: 4542012)
  - Chloride

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# PROJECT NARRATIVE

Project: Bozeman Landfill
Pace Project No.: 10636539

**Method:** **EPA 300.0**
**Description:** 300.0 IC Anions
**Client:** Tetra Tech, Inc. - MT
**Date:** December 22, 2022

Analyte Comments:

QC Batch: 859575

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MSD (Lab ID: 4542011)
  - Sulfate
- MSD (Lab ID: 4542013)
  - Chloride

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# PROJECT NARRATIVE

Project: Bozeman Landfill
Pace Project No.: 10636539

**Method:** **EPA 353.2**
**Description:** 353.2 Nitrate + Nitrite
**Client:** Tetra Tech, Inc. - MT
**Date:** December 22, 2022

**General Information:**
11 samples were analyzed for EPA 353.2 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 859102

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10636420003,10636872001

M3: Matrix spike recovery was outside laboratory control limits due to matrix interferences.

- MS (Lab ID: 4540435)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 4540436)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

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# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: LF-2** **Lab ID: 10636539001** Collected: 12/07/22 12:45 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **19.6J** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 67-64-1 | J |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-35-4 | |
| cis-1,2-Dichloroethene | **0.203J** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 156-59-2 | J |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 98-82-8 | |
| 2-Butanone (MEK) | **1.44J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 78-93-3 | J |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 76-13-1 | L0 |
| Tetrachloroethene | **0.396J** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 127-18-4 | J |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: LF-2** **Lab ID: 10636539001** Collected: 12/07/22 12:45 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 123-91-1 | |
| 2-Propanol | **34.1** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 105 | % | 80.0-120 | | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 93.0 | % | 77.0-126 | | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 89.8 | % | 70.0-130 | | 1 | 12/19/22 16:09 | 12/19/22 16:09 | 17060-07-0 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **<0.031** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:37 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: LF-3** **Lab ID: 10636539002** Collected: 12/07/22 12:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **21.9J** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 67-64-1 | J |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-35-4 | |
| cis-1,2-Dichloroethene | **0.635** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 98-82-8 | |
| 2-Butanone (MEK) | **1.29J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 78-93-3 | J |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 76-13-1 | L0 |
| Tetrachloroethene | **0.884** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: LF-3** **Lab ID: 10636539002** Collected: 12/07/22 12:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 79-00-5 | |
| Trichloroethene | **0.300J** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 79-01-6 | J |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 123-91-1 | |
| 2-Propanol | **35.7** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 101 | % | 80.0-120 | | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 93.6 | % | 77.0-126 | | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 92.0 | % | 70.0-130 | | 1 | 12/19/22 16:30 | 12/19/22 16:30 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **2.5** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 10:14 | 16887-00-6 | C0 |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 10:14 | 14808-79-8 | C0 |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **0.10** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:38 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-6** **Lab ID: 10636539003** Collected: 12/08/22 12:00 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **33.9** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-71-8 | |
| 1,1-Dichloroethane | **0.950** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-35-4 | |
| cis-1,2-Dichloroethene | **1.07** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 98-82-8 | |
| 2-Butanone (MEK) | **2.24J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 78-93-3 | J |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 76-13-1 | L0 |
| Tetrachloroethene | **<0.300** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-6** **Lab ID: 10636539003** Collected: 12/08/22 12:00 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **2.68J** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 109-99-9 | J |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 79-00-5 | |
| Trichloroethene | **0.411J** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 79-01-6 | J |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 123-91-1 | |
| 2-Propanol | **93.5** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 102 | % | 80.0-120 | | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 91.1 | % | 77.0-126 | | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 91.4 | % | 70.0-130 | | 1 | 12/19/22 16:51 | 12/19/22 16:51 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 10:28 | 16887-00-6 | |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 10:28 | 14808-79-8 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **<0.031** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:41 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-8A** **Lab ID: 10636539004** Collected: 12/07/22 15:40 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **18.3J** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 67-64-1 | J |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-35-4 | |
| cis-1,2-Dichloroethene | **0.355J** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 156-59-2 | J |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 98-82-8 | |
| 2-Butanone (MEK) | **1.23J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 78-93-3 | J |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 76-13-1 | L0 |
| Tetrachloroethene | **0.366J** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 127-18-4 | J |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-8A** **Lab ID: 10636539004** Collected: 12/07/22 15:40 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 123-91-1 | |
| 2-Propanol | **40.1** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 104 | % | 80.0-120 | | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 94.7 | % | 77.0-126 | | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 95.4 | % | 70.0-130 | | 1 | 12/19/22 17:11 | 12/19/22 17:11 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 10:43 | 16887-00-6 | |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 10:43 | 14808-79-8 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **<0.031** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:42 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-9A** **Lab ID: 10636539005** Collected: 12/08/22 10:30 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **60.5** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-71-8 | |
| 1,1-Dichloroethane | **0.389J** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-34-3 | J |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-35-4 | |
| cis-1,2-Dichloroethene | **0.656** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 98-82-8 | |
| 2-Butanone (MEK) | **2.61J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 78-93-3 | J |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 76-13-1 | L0 |
| Tetrachloroethene | **0.871** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-9A** **Lab ID: 10636539005** Collected: 12/08/22 10:30 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **2.77J** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 109-99-9 | J |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 79-00-5 | |
| Trichloroethene | **0.675** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 123-91-1 | |
| 2-Propanol | **51.9** | ug/L | 25.0 | 8.25 | 5 | 12/21/22 01:04 | 12/21/22 01:04 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 105 | % | 80.0-120 | | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 2037-26-5 | |
| Toluene-d8 (S) | 100 | % | 80.0-120 | | 5 | 12/21/22 01:04 | 12/21/22 01:04 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 92.6 | % | 77.0-126 | | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 460-00-4 | |
| 4-Bromofluorobenzene (S) | 91.9 | % | 77.0-126 | | 5 | 12/21/22 01:04 | 12/21/22 01:04 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 90.8 | % | 70.0-130 | | 1 | 12/19/22 17:33 | 12/19/22 17:33 | 17060-07-0 | |
| 1,2-Dichloroethane-d4 (S) | 97.6 | % | 70.0-130 | | 5 | 12/21/22 01:04 | 12/21/22 01:04 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 11:26 | 16887-00-6 | C0 |
| Sulfate | **0.82J** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 11:26 | 14808-79-8 | B,C0 |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **<0.031** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:43 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-12** **Lab ID: 10636539006** Collected: 12/07/22 16:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **26.5** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-71-8 | |
| 1,1-Dichloroethane | **0.540** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-35-4 | |
| cis-1,2-Dichloroethene | **2.06** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 98-82-8 | |
| 2-Butanone (MEK) | **<1.19** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 78-93-3 | |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 76-13-1 | L0 |
| Tetrachloroethene | **<0.300** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-12** **Lab ID: 10636539006** Collected: 12/07/22 16:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 108-05-4 | C3 |
| Vinyl chloride | **0.319J** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 75-01-4 | J |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 123-91-1 | |
| 2-Propanol | **27.5** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 105 | % | 80.0-120 | | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 93.8 | % | 77.0-126 | | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 87.7 | % | 70.0-130 | | 1 | 12/19/22 17:54 | 12/19/22 17:54 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 11:41 | 16887-00-6 | |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 11:41 | 14808-79-8 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **<0.031** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:44 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-13** **Lab ID: 10636539007** Collected: 12/08/22 11:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **50.0** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 107-13-1 | |
| Benzene | **0.456J** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 71-43-2 | J |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 56-23-5 | |
| Chlorobenzene | **0.279J** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 108-90-7 | J |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 124-48-1 | |
| Chloroethane | **1.09J** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-00-3 | J |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 74-95-3 | |
| 1,2-Dichlorobenzene | **0.107J** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 95-50-1 | J |
| 1,4-Dichlorobenzene | **0.603** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-71-8 | |
| 1,1-Dichloroethane | **0.979** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-35-4 | |
| cis-1,2-Dichloroethene | **0.870** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 156-60-5 | |
| 1,2-Dichloropropane | **0.282J** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 78-87-5 | J |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 98-82-8 | |
| 2-Butanone (MEK) | **1.94J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 78-93-3 | J |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 76-13-1 | L0 |
| Tetrachloroethene | **<0.300** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-13** **Lab ID: 10636539007** Collected: 12/08/22 11:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **2.61J** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 109-99-9 | J |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 79-00-5 | |
| Trichloroethene | **0.263J** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 79-01-6 | J |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 108-05-4 | C3 |
| Vinyl chloride | **5.92** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 75-01-4 | C5 |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 123-91-1 | |
| 2-Propanol | **102** | ug/L | 25.0 | 8.25 | 5 | 12/21/22 01:25 | 12/21/22 01:25 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 102 | % | 80.0-120 | | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 2037-26-5 | |
| Toluene-d8 (S) | 105 | % | 80.0-120 | | 5 | 12/21/22 01:25 | 12/21/22 01:25 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 90.4 | % | 77.0-126 | | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 460-00-4 | |
| 4-Bromofluorobenzene (S) | 93.8 | % | 77.0-126 | | 5 | 12/21/22 01:25 | 12/21/22 01:25 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 89.9 | % | 70.0-130 | | 1 | 12/19/22 18:14 | 12/19/22 18:14 | 17060-07-0 | |
| 1,2-Dichloroethane-d4 (S) | 96.6 | % | 70.0-130 | | 5 | 12/21/22 01:25 | 12/21/22 01:25 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 11:55 | 16887-00-6 | |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 11:55 | 14808-79-8 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **<0.031** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:46 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-17** **Lab ID: 10636539008** Collected: 12/07/22 14:30 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **17.4J** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 67-64-1 | J |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-00-3 | |
| Chloroform | **0.127J** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 67-66-3 | J |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-71-8 | |
| 1,1-Dichloroethane | **0.454J** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-34-3 | J |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-35-4 | |
| cis-1,2-Dichloroethene | **11.4** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 156-60-5 | |
| 1,2-Dichloropropane | **1.06** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 98-82-8 | |
| 2-Butanone (MEK) | **1.22J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 78-93-3 | J |
| Methylene Chloride | **2.73** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 76-13-1 | L0 |
| Tetrachloroethene | **4.31** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-17** **Lab ID: 10636539008** Collected: 12/07/22 14:30 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 79-00-5 | |
| Trichloroethene | **1.93** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 123-91-1 | |
| 2-Propanol | **36.5** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 102 | % | 80.0-120 | | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 89.7 | % | 77.0-126 | | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 92.2 | % | 70.0-130 | | 1 | 12/19/22 18:35 | 12/19/22 18:35 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 12:10 | 16887-00-6 | |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 12:10 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-18** **Lab ID: 10636539009** Collected: 12/07/22 15:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **<11.3** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 107-13-1 | |
| Benzene | **0.102J** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 71-43-2 | J |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 95-50-1 | |
| 1,4-Dichlorobenzene | **0.456J** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 106-46-7 | J |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-35-4 | |
| cis-1,2-Dichloroethene | **0.418J** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 156-59-2 | J |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 156-60-5 | |
| 1,2-Dichloropropane | **0.182J** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 78-87-5 | J |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 98-82-8 | |
| 2-Butanone (MEK) | **<1.19** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 78-93-3 | |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 76-13-1 | L0 |
| Tetrachloroethene | **<0.300** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-18** **Lab ID: 10636539009** Collected: 12/07/22 15:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **1.01J** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 109-99-9 | J |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 79-00-5 | |
| Trichloroethene | **0.219J** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 79-01-6 | J |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 108-05-4 | C3 |
| Vinyl chloride | **0.912** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 75-01-4 | C5 |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 123-91-1 | |
| 2-Propanol | **45.9** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 103 | % | 80.0-120 | | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 94.3 | % | 77.0-126 | | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 92.2 | % | 70.0-130 | | 1 | 12/19/22 18:56 | 12/19/22 18:56 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 12:24 | 16887-00-6 | C0 |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 12:24 | 14808-79-8 | C0 |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-20** **Lab ID: 10636539010** Collected: 12/07/22 13:45 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **15.9J** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 67-64-1 | J |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-35-4 | |
| cis-1,2-Dichloroethene | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 98-82-8 | |
| 2-Butanone (MEK) | **1.19J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 78-93-3 | J |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 76-13-1 | L0 |
| Tetrachloroethene | **1.73** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: MW-20** **Lab ID: 10636539010** Collected: 12/07/22 13:45 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 123-91-1 | |
| 2-Propanol | **36.3** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 105 | % | 80.0-120 | | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 94.5 | % | 77.0-126 | | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 88.3 | % | 70.0-130 | | 1 | 12/19/22 19:17 | 12/19/22 19:17 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 12:39 | 16887-00-6 | C0 |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 12:39 | 14808-79-8 | C0 |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
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## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: McIlhattan Seep** **Lab ID: 10636539011** Collected: 12/07/22 13:00 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **<11.3** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-35-4 | |
| cis-1,2-Dichloroethene | **0.156J** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 156-59-2 | J |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 98-82-8 | |
| 2-Butanone (MEK) | **<1.19** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 78-93-3 | |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 76-13-1 | L0 |
| Tetrachloroethene | **0.546** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: McIlhattan Seep** **Lab ID: 10636539011** Collected: 12/07/22 13:00 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 123-91-1 | |
| 2-Propanol | **<1.65** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 102 | % | 80.0-120 | | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 93.4 | % | 77.0-126 | | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 93.9 | % | 70.0-130 | | 1 | 12/19/22 19:38 | 12/19/22 19:38 | 17060-07-0 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **7.7** | mg/L | 1.0 | 0.31 | 10 | | 12/19/22 11:58 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: DUP 1** **Lab ID: 10636539012** Collected: 12/07/22 13:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **<11.3** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-35-4 | |
| cis-1,2-Dichloroethene | **0.228J** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 156-59-2 | J |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 98-82-8 | |
| 2-Butanone (MEK) | **<1.19** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 78-93-3 | |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 76-13-1 | L0 |
| Tetrachloroethene | **0.423J** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 127-18-4 | J |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: DUP 1** **Lab ID: 10636539012** Collected: 12/07/22 13:15 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 123-91-1 | |
| 2-Propanol | **<1.65** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 104 | % | 80.0-120 | | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 90.1 | % | 77.0-126 | | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 92.1 | % | 70.0-130 | | 1 | 12/19/22 19:59 | 12/19/22 19:59 | 17060-07-0 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **9.4** | mg/L | 1.0 | 0.31 | 10 | | 12/19/22 11:59 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: DUP 2** **Lab ID: 10636539013** Collected: 12/07/22 14:45 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **17.8J** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 67-64-1 | J |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-00-3 | |
| Chloroform | **0.131J** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 67-66-3 | J |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-71-8 | |
| 1,1-Dichloroethane | **0.449J** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-34-3 | J |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-35-4 | |
| cis-1,2-Dichloroethene | **11.0** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 156-60-5 | |
| 1,2-Dichloropropane | **1.11** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 98-82-8 | |
| 2-Butanone (MEK) | **<1.19** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 78-93-3 | |
| Methylene Chloride | **2.72** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 76-13-1 | L0 |
| Tetrachloroethene | **4.38** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: DUP 2** **Lab ID: 10636539013** Collected: 12/07/22 14:45 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 79-00-5 | |
| Trichloroethene | **2.04** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 123-91-1 | |
| 2-Propanol | **34.2** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 101 | % | 80.0-120 | | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 93.1 | % | 77.0-126 | | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 92.3 | % | 70.0-130 | | 1 | 12/19/22 20:20 | 12/19/22 20:20 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **<0.39** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 12:53 | 16887-00-6 | |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 12:53 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: Blank 1** **Lab ID: 10636539014** Collected: 12/07/22 10:10 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **62.2** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-35-4 | |
| cis-1,2-Dichloroethene | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 98-82-8 | |
| 2-Butanone (MEK) | **5.68** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 78-93-3 | |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **1.81J** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 108-10-1 | J |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 76-13-1 | L0 |
| Tetrachloroethene | **<0.300** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: Blank 1** **Lab ID: 10636539014** Collected: 12/07/22 10:10 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **2.74J** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 109-99-9 | J |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 123-91-1 | |
| 2-Propanol | **92.4** | ug/L | 25.0 | 8.25 | 5 | 12/21/22 01:46 | 12/21/22 01:46 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 101 | % | 80.0-120 | | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 2037-26-5 | |
| Toluene-d8 (S) | 105 | % | 80.0-120 | | 5 | 12/21/22 01:46 | 12/21/22 01:46 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 91.6 | % | 77.0-126 | | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 460-00-4 | |
| 4-Bromofluorobenzene (S) | 95.9 | % | 77.0-126 | | 5 | 12/21/22 01:46 | 12/21/22 01:46 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 94.1 | % | 70.0-130 | | 1 | 12/19/22 20:41 | 12/19/22 20:41 | 17060-07-0 | |
| 1,2-Dichloroethane-d4 (S) | 93.9 | % | 70.0-130 | | 5 | 12/21/22 01:46 | 12/21/22 01:46 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **0.41J** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 13:08 | 16887-00-6 | |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 13:08 | 14808-79-8 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **<0.031** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:49 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: Blank 2** **Lab ID: 10636539015** Collected: 12/07/22 10:30 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **15.5J** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 67-64-1 | J |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-35-4 | |
| cis-1,2-Dichloroethene | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 98-82-8 | |
| 2-Butanone (MEK) | **2.61J** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 78-93-3 | J |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **1.07J** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 108-10-1 | J |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 76-13-1 | L0 |
| Tetrachloroethene | **<0.300** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: Blank 2** **Lab ID: 10636539015** Collected: 12/07/22 10:30 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 123-91-1 | |
| 2-Propanol | **1090** | ug/L | 250 | 82.5 | 50 | 12/21/22 02:06 | 12/21/22 02:06 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 100 | % | 80.0-120 | | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 2037-26-5 | |
| Toluene-d8 (S) | 103 | % | 80.0-120 | | 50 | 12/21/22 02:06 | 12/21/22 02:06 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 93.5 | % | 77.0-126 | | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 460-00-4 | |
| 4-Bromofluorobenzene (S) | 94.8 | % | 77.0-126 | | 50 | 12/21/22 02:06 | 12/21/22 02:06 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 92.6 | % | 70.0-130 | | 1 | 12/19/22 21:01 | 12/19/22 21:01 | 17060-07-0 | |
| 1,2-Dichloroethane-d4 (S) | 92.1 | % | 70.0-130 | | 50 | 12/21/22 02:06 | 12/21/22 02:06 | 17060-07-0 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Chloride | **0.42J** | mg/L | 1.2 | 0.39 | 1 | | 12/21/22 13:22 | 16887-00-6 | |
| Sulfate | **<0.43** | mg/L | 1.2 | 0.43 | 1 | | 12/21/22 13:22 | 14808-79-8 | |
| **353.2 Nitrate + Nitrite** | Analytical Method: EPA 353.2<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Nitrogen, NO2 plus NO3 | **0.14** | mg/L | 0.10 | 0.031 | 1 | | 12/19/22 11:50 | | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: Trip Blank** **Lab ID: 10636539016** Collected: 12/07/22 00:00 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Acetone | **<11.3** | ug/L | 25.0 | 11.3 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 67-64-1 | |
| Acrylonitrile | **<0.671** | ug/L | 5.00 | 0.671 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 107-13-1 | |
| Benzene | **<0.0941** | ug/L | 0.500 | 0.0941 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 71-43-2 | |
| Bromodichloromethane | **<0.136** | ug/L | 0.500 | 0.136 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-27-4 | |
| Bromochloromethane | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 74-97-5 | |
| Bromoform | **<0.129** | ug/L | 0.500 | 0.129 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-25-2 | |
| Bromomethane | **<0.605** | ug/L | 2.50 | 0.605 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 74-83-9 | |
| Carbon disulfide | **<0.0962** | ug/L | 0.500 | 0.0962 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-15-0 | |
| Carbon tetrachloride | **<0.128** | ug/L | 0.500 | 0.128 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 56-23-5 | |
| Chlorobenzene | **<0.117** | ug/L | 0.500 | 0.117 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 108-90-7 | |
| Dibromochloromethane | **<0.140** | ug/L | 0.500 | 0.140 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 124-48-1 | |
| Chloroethane | **<0.192** | ug/L | 2.50 | 0.192 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-00-3 | |
| Chloroform | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 67-66-3 | |
| Chloromethane | **<0.960** | ug/L | 1.25 | 0.960 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 74-87-3 | |
| Cyclohexane | **<0.188** | ug/L | 1.00 | 0.188 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 110-82-7 | L0 |
| 1,2-Dibromo-3-chloropropane | **<0.276** | ug/L | 2.50 | 0.276 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 96-12-8 | |
| 1,2-Dibromoethane (EDB) | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 106-93-4 | |
| Dibromomethane | **<0.122** | ug/L | 0.500 | 0.122 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 74-95-3 | |
| 1,2-Dichlorobenzene | **<0.107** | ug/L | 0.500 | 0.107 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 95-50-1 | |
| 1,4-Dichlorobenzene | **<0.120** | ug/L | 0.500 | 0.120 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 106-46-7 | |
| Dichlorodifluoromethane | **<0.374** | ug/L | 2.50 | 0.374 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-71-8 | |
| 1,1-Dichloroethane | **<0.100** | ug/L | 0.500 | 0.100 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-34-3 | |
| 1,2-Dichloroethane | **<0.0819** | ug/L | 0.500 | 0.0819 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 107-06-2 | |
| 1,1-Dichloroethene | **<0.188** | ug/L | 0.500 | 0.188 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-35-4 | |
| cis-1,2-Dichloroethene | **<0.126** | ug/L | 0.500 | 0.126 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 156-59-2 | |
| trans-1,2-Dichloroethene | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 156-60-5 | |
| 1,2-Dichloropropane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 78-87-5 | |
| cis-1,3-Dichloropropene | **<0.111** | ug/L | 0.500 | 0.111 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 10061-01-5 | |
| trans-1,3-Dichloropropene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 10061-02-6 | |
| trans-1,4-Dichloro-2-butene | **<0.467** | ug/L | 5.00 | 0.467 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 110-57-6 | |
| Ethylbenzene | **<0.137** | ug/L | 0.500 | 0.137 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 100-41-4 | |
| 2-Hexanone | **<0.787** | ug/L | 5.00 | 0.787 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 591-78-6 | |
| n-Hexane | **<0.749** | ug/L | 5.00 | 0.749 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 110-54-3 | |
| Iodomethane | **<0.554** | ug/L | 5.00 | 0.554 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 74-88-4 | |
| Isopropylbenzene (Cumene) | **<0.105** | ug/L | 0.500 | 0.105 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 98-82-8 | |
| 2-Butanone (MEK) | **<1.19** | ug/L | 5.00 | 1.19 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 78-93-3 | |
| Methylene Chloride | **<0.430** | ug/L | 2.50 | 0.430 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-09-2 | |
| 4-Methyl-2-pentanone (MIBK) | **<0.478** | ug/L | 5.00 | 0.478 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 108-10-1 | |
| Methyl-tert-butyl ether | **<0.101** | ug/L | 0.500 | 0.101 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 1634-04-4 | |
| n-Propylbenzene | **<0.0993** | ug/L | 0.500 | 0.0993 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 103-65-1 | |
| Styrene | **<0.118** | ug/L | 0.500 | 0.118 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 100-42-5 | |
| 1,1,1,2-Tetrachloroethane | **<0.147** | ug/L | 0.500 | 0.147 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 630-20-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.133** | ug/L | 0.500 | 0.133 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 79-34-5 | |
| 1,1,2-Trichlorotrifluoroethane | **<0.180** | ug/L | 0.500 | 0.180 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 76-13-1 | L0 |
| Tetrachloroethene | **<0.300** | ug/L | 0.500 | 0.300 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 127-18-4 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## ANALYTICAL RESULTS

Project: Bozeman Landfill
Pace Project No.: 10636539

**Sample: Trip Blank** **Lab ID: 10636539016** Collected: 12/07/22 00:00 Received: 12/09/22 08:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **VOA (GC/MS) 8260D** | Analytical Method: EPA 8260D Preparation Method: 8260D<br>Pace National - Mt. Juliet | | | | | | | | |
| Tetrahydrofuran | **<0.929** | ug/L | 5.00 | 0.929 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 109-99-9 | |
| Toluene | **<0.278** | ug/L | 0.500 | 0.278 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 108-88-3 | |
| 1,1,1-Trichloroethane | **<0.149** | ug/L | 0.500 | 0.149 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 71-55-6 | |
| 1,1,2-Trichloroethane | **<0.158** | ug/L | 0.500 | 0.158 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 79-00-5 | |
| Trichloroethene | **<0.190** | ug/L | 0.500 | 0.190 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 79-01-6 | |
| Trichlorofluoromethane | **<0.160** | ug/L | 2.50 | 0.160 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-69-4 | |
| 1,2,3-Trichloropropane | **<0.237** | ug/L | 2.50 | 0.237 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 96-18-4 | |
| 1,2,4-Trimethylbenzene | **<0.322** | ug/L | 0.500 | 0.322 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 95-63-6 | |
| Vinyl acetate | **<0.692** | ug/L | 5.00 | 0.692 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 108-05-4 | C3 |
| Vinyl chloride | **<0.234** | ug/L | 0.500 | 0.234 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 75-01-4 | |
| Xylene (Total) | **<0.174** | ug/L | 1.50 | 0.174 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 1330-20-7 | |
| 1,4-Dioxane (p-Dioxane) | **<2.83** | ug/L | 100 | 2.83 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 123-91-1 | |
| 2-Propanol | **<1.65** | ug/L | 5.00 | 1.65 | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 67-63-0 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 99.2 | % | 80.0-120 | | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 89.9 | % | 77.0-126 | | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 90.9 | % | 70.0-130 | | 1 | 12/19/22 15:28 | 12/19/22 15:28 | 17060-07-0 | |

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## QUALITY CONTROL DATA

Project: Bozeman Landfill
Pace Project No.: 10636539

QC Batch: 1976678
QC Batch Method: 8260B
Analysis Method: EPA 8260D
Analysis Description: VOA (GC/MS) 8260D
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 10636539001, 10636539002, 10636539003, 10636539004, 10636539005, 10636539006, 10636539007, 10636539008, 10636539009, 10636539010, 10636539011, 10636539012, 10636539013, 10636539014, 10636539015, 10636539016

METHOD BLANK: R3873913-3
Matrix: Water
Associated Lab Samples: 10636539001, 10636539002, 10636539003, 10636539004, 10636539005, 10636539006, 10636539007, 10636539008, 10636539009, 10636539010, 10636539011, 10636539012, 10636539013, 10636539014, 10636539015, 10636539016

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Acetone | ug/L | <11.3 | 25.0 | 11.3 | 12/19/22 12:42 | |
| Acrylonitrile | ug/L | <0.671 | 5.00 | 0.671 | 12/19/22 12:42 | |
| Benzene | ug/L | <0.0941 | 0.500 | 0.0941 | 12/19/22 12:42 | |
| Bromodichloromethane | ug/L | <0.136 | 0.500 | 0.136 | 12/19/22 12:42 | |
| Bromochloromethane | ug/L | <0.128 | 0.500 | 0.128 | 12/19/22 12:42 | |
| Bromoform | ug/L | <0.129 | 0.500 | 0.129 | 12/19/22 12:42 | |
| Bromomethane | ug/L | <0.605 | 2.50 | 0.605 | 12/19/22 12:42 | |
| Carbon disulfide | ug/L | <0.0962 | 0.500 | 0.0962 | 12/19/22 12:42 | |
| Carbon tetrachloride | ug/L | <0.128 | 0.500 | 0.128 | 12/19/22 12:42 | |
| Chlorobenzene | ug/L | <0.117 | 0.500 | 0.117 | 12/19/22 12:42 | |
| Dibromochloromethane | ug/L | <0.140 | 0.500 | 0.140 | 12/19/22 12:42 | |
| Chloroethane | ug/L | <0.192 | 2.50 | 0.192 | 12/19/22 12:42 | |
| Chloroform | ug/L | <0.111 | 0.500 | 0.111 | 12/19/22 12:42 | |
| Chloromethane | ug/L | <0.960 | 1.25 | 0.960 | 12/19/22 12:42 | |
| Cyclohexane | ug/L | <0.188 | 1.00 | 0.188 | 12/19/22 12:42 | |
| 1,2-Dibromo-3-chloropropane | ug/L | <0.276 | 2.50 | 0.276 | 12/19/22 12:42 | |
| 1,2-Dibromoethane (EDB) | ug/L | <0.126 | 0.500 | 0.126 | 12/19/22 12:42 | |
| Dibromomethane | ug/L | <0.122 | 0.500 | 0.122 | 12/19/22 12:42 | |
| 1,2-Dichlorobenzene | ug/L | <0.107 | 0.500 | 0.107 | 12/19/22 12:42 | |
| 1,4-Dichlorobenzene | ug/L | <0.120 | 0.500 | 0.120 | 12/19/22 12:42 | |
| Dichlorodifluoromethane | ug/L | <0.374 | 2.50 | 0.374 | 12/19/22 12:42 | |
| 1,1-Dichloroethane | ug/L | <0.100 | 0.500 | 0.100 | 12/19/22 12:42 | |
| 1,2-Dichloroethane | ug/L | <0.0819 | 0.500 | 0.0819 | 12/19/22 12:42 | |
| 1,1-Dichloroethene | ug/L | <0.188 | 0.500 | 0.188 | 12/19/22 12:42 | |
| cis-1,2-Dichloroethene | ug/L | <0.126 | 0.500 | 0.126 | 12/19/22 12:42 | |
| trans-1,2-Dichloroethene | ug/L | <0.149 | 0.500 | 0.149 | 12/19/22 12:42 | |
| 1,2-Dichloropropane | ug/L | <0.149 | 0.500 | 0.149 | 12/19/22 12:42 | |
| cis-1,3-Dichloropropene | ug/L | <0.111 | 0.500 | 0.111 | 12/19/22 12:42 | |
| trans-1,3-Dichloropropene | ug/L | <0.118 | 0.500 | 0.118 | 12/19/22 12:42 | |
| trans-1,4-Dichloro-2-butene | ug/L | <0.467 | 5.00 | 0.467 | 12/19/22 12:42 | |
| Ethylbenzene | ug/L | <0.137 | 0.500 | 0.137 | 12/19/22 12:42 | |
| 2-Hexanone | ug/L | <0.787 | 5.00 | 0.787 | 12/19/22 12:42 | |
| n-Hexane | ug/L | <0.749 | 5.00 | 0.749 | 12/19/22 12:42 | |
| Iodomethane | ug/L | <0.554 | 5.00 | 0.554 | 12/19/22 12:42 | |
| Isopropylbenzene (Cumene) | ug/L | <0.105 | 0.500 | 0.105 | 12/19/22 12:42 | |
| 2-Butanone (MEK) | ug/L | <1.19 | 5.00 | 1.19 | 12/19/22 12:42 | |
| Methylene Chloride | ug/L | <0.430 | 2.50 | 0.430 | 12/19/22 12:42 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## QUALITY CONTROL DATA

Project: Bozeman Landfill
Pace Project No.: 10636539

METHOD BLANK: R3873913-3 Matrix: Water

Associated Lab Samples: 10636539001, 10636539002, 10636539003, 10636539004, 10636539005, 10636539006, 10636539007, 10636539008, 10636539009, 10636539010, 10636539011, 10636539012, 10636539013, 10636539014, 10636539015, 10636539016

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| 4-Methyl-2-pentanone (MIBK) | ug/L | <0.478 | 5.00 | 0.478 | 12/19/22 12:42 | |
| Methyl-tert-butyl ether | ug/L | <0.101 | 0.500 | 0.101 | 12/19/22 12:42 | |
| n-Propylbenzene | ug/L | <0.0993 | 0.500 | 0.0993 | 12/19/22 12:42 | |
| Styrene | ug/L | <0.118 | 0.500 | 0.118 | 12/19/22 12:42 | |
| 1,1,1,2-Tetrachloroethane | ug/L | <0.147 | 0.500 | 0.147 | 12/19/22 12:42 | |
| 1,1,2,2-Tetrachloroethane | ug/L | <0.133 | 0.500 | 0.133 | 12/19/22 12:42 | |
| 1,1,2-Trichlorotrifluoroethane | ug/L | <0.180 | 0.500 | 0.180 | 12/19/22 12:42 | |
| Tetrachloroethene | ug/L | <0.300 | 0.500 | 0.300 | 12/19/22 12:42 | |
| Tetrahydrofuran | ug/L | <0.929 | 5.00 | 0.929 | 12/19/22 12:42 | |
| Toluene | ug/L | <0.278 | 0.500 | 0.278 | 12/19/22 12:42 | |
| 1,1,1-Trichloroethane | ug/L | <0.149 | 0.500 | 0.149 | 12/19/22 12:42 | |
| 1,1,2-Trichloroethane | ug/L | <0.158 | 0.500 | 0.158 | 12/19/22 12:42 | |
| Trichloroethene | ug/L | <0.190 | 0.500 | 0.190 | 12/19/22 12:42 | |
| Trichlorofluoromethane | ug/L | <0.160 | 2.50 | 0.160 | 12/19/22 12:42 | |
| 1,2,3-Trichloropropane | ug/L | <0.237 | 2.50 | 0.237 | 12/19/22 12:42 | |
| 1,2,4-Trimethylbenzene | ug/L | <0.322 | 0.500 | 0.322 | 12/19/22 12:42 | |
| Vinyl acetate | ug/L | <0.692 | 5.00 | 0.692 | 12/19/22 12:42 | |
| Vinyl chloride | ug/L | <0.234 | 0.500 | 0.234 | 12/19/22 12:42 | |
| Xylene (Total) | ug/L | <0.174 | 1.50 | 0.174 | 12/19/22 12:42 | |
| 1,4-Dioxane (p-Dioxane) | ug/L | 8.17J | 100 | 2.83 | 12/19/22 12:42 | J |
| 2-Propanol | ug/L | <1.65 | 5.00 | 1.65 | 12/19/22 12:42 | |
| Toluene-d8 (S) | % | 102 | 80.0-120 | | 12/19/22 12:42 | |
| 4-Bromofluorobenzene (S) | % | 92.1 | 77.0-126 | | 12/19/22 12:42 | |
| 1,2-Dichloroethane-d4 (S) | % | 88.6 | 70.0-130 | | 12/19/22 12:42 | |

LABORATORY CONTROL SAMPLE: R3873913-1

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Acetone | ug/L | 25.0 | 26.5 | 106 | 19.0-160 | |
| Acrylonitrile | ug/L | 25.0 | 26.5 | 106 | 55.0-149 | |
| Benzene | ug/L | 5.00 | 5.16 | 103 | 70.0-123 | |
| Bromodichloromethane | ug/L | 5.00 | 5.09 | 102 | 75.0-120 | |
| Bromochloromethane | ug/L | 5.00 | 5.25 | 105 | 76.0-122 | |
| Bromoform | ug/L | 5.00 | 5.55 | 111 | 68.0-132 | |
| Bromomethane | ug/L | 5.00 | 6.70 | 134 | 10.0-160 | |
| Carbon disulfide | ug/L | 5.00 | 5.77 | 115 | 61.0-128 | |
| Carbon tetrachloride | ug/L | 5.00 | 4.85 | 97.0 | 68.0-126 | |
| Chlorobenzene | ug/L | 5.00 | 5.60 | 112 | 80.0-121 | |
| Dibromochloromethane | ug/L | 5.00 | 5.63 | 113 | 77.0-125 | |
| Chloroethane | ug/L | 5.00 | 6.30 | 126 | 47.0-150 | |
| Chloroform | ug/L | 5.00 | 5.12 | 102 | 73.0-120 | |
| Chloromethane | ug/L | 5.00 | 4.98 | 99.6 | 41.0-142 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## QUALITY CONTROL DATA

Project: Bozeman Landfill
Pace Project No.: 10636539

LABORATORY CONTROL SAMPLE: R3873913-1

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cyclohexane | ug/L | 5.00 | 6.33 | 127 | 71.0-124 | L0 |
| 1,2-Dibromo-3-chloropropane | ug/L | 5.00 | 5.45 | 109 | 58.0-134 | |
| 1,2-Dibromoethane (EDB) | ug/L | 5.00 | 5.22 | 104 | 80.0-122 | |
| Dibromomethane | ug/L | 5.00 | 5.43 | 109 | 80.0-120 | |
| 1,2-Dichlorobenzene | ug/L | 5.00 | 5.47 | 109 | 79.0-121 | |
| 1,4-Dichlorobenzene | ug/L | 5.00 | 5.36 | 107 | 79.0-120 | |
| Dichlorodifluoromethane | ug/L | 5.00 | 5.48 | 110 | 51.0-149 | |
| 1,1-Dichloroethane | ug/L | 5.00 | 5.33 | 107 | 70.0-126 | |
| 1,2-Dichloroethane | ug/L | 5.00 | 5.15 | 103 | 70.0-128 | |
| 1,1-Dichloroethene | ug/L | 5.00 | 5.81 | 116 | 71.0-124 | |
| cis-1,2-Dichloroethene | ug/L | 5.00 | 5.05 | 101 | 73.0-120 | |
| trans-1,2-Dichloroethene | ug/L | 5.00 | 5.49 | 110 | 73.0-120 | |
| 1,2-Dichloropropane | ug/L | 5.00 | 5.37 | 107 | 77.0-125 | |
| cis-1,3-Dichloropropene | ug/L | 5.00 | 5.16 | 103 | 80.0-123 | |
| trans-1,3-Dichloropropene | ug/L | 5.00 | 5.05 | 101 | 78.0-124 | |
| trans-1,4-Dichloro-2-butene | ug/L | 5.00 | 3.17 | 63.4 | 33.0-144 | |
| Ethylbenzene | ug/L | 5.00 | 5.51 | 110 | 79.0-123 | |
| 2-Hexanone | ug/L | 25.0 | 28.0 | 112 | 67.0-149 | |
| n-Hexane | ug/L | 5.00 | 6.15 | 123 | 57.0-133 | |
| Iodomethane | ug/L | 25.0 | 29.2 | 117 | 33.0-147 | |
| Isopropylbenzene (Cumene) | ug/L | 5.00 | 5.24 | 105 | 76.0-127 | |
| 2-Butanone (MEK) | ug/L | 25.0 | 25.9 | 104 | 44.0-160 | |
| Methylene Chloride | ug/L | 5.00 | 5.28 | 106 | 67.0-120 | |
| 4-Methyl-2-pentanone (MIBK) | ug/L | 25.0 | 28.5 | 114 | 68.0-142 | |
| Methyl-tert-butyl ether | ug/L | 5.00 | 5.05 | 101 | 68.0-125 | |
| n-Propylbenzene | ug/L | 5.00 | 5.21 | 104 | 77.0-124 | |
| Styrene | ug/L | 5.00 | 5.12 | 102 | 73.0-130 | |
| 1,1,1,2-Tetrachloroethane | ug/L | 5.00 | 5.37 | 107 | 75.0-125 | |
| 1,1,2,2-Tetrachloroethane | ug/L | 5.00 | 5.05 | 101 | 65.0-130 | |
| 1,1,2-Trichlorotrifluoroethane | ug/L | 5.00 | 6.70 | 134 | 69.0-132 | L0 |
| Tetrachloroethene | ug/L | 5.00 | 5.32 | 106 | 72.0-132 | |
| Tetrahydrofuran | ug/L | 5.00 | 4.85 | 97.0 | 41.0-146 | |
| Toluene | ug/L | 5.00 | 5.38 | 108 | 79.0-120 | |
| 1,1,1-Trichloroethane | ug/L | 5.00 | 5.28 | 106 | 73.0-124 | |
| 1,1,2-Trichloroethane | ug/L | 5.00 | 5.53 | 111 | 80.0-120 | |
| Trichloroethene | ug/L | 5.00 | 5.60 | 112 | 78.0-124 | |
| Trichlorofluoromethane | ug/L | 5.00 | 6.01 | 120 | 59.0-147 | |
| 1,2,3-Trichloropropane | ug/L | 5.00 | 5.52 | 110 | 73.0-130 | |
| 1,2,4-Trimethylbenzene | ug/L | 5.00 | 5.19 | 104 | 76.0-121 | |
| Vinyl acetate | ug/L | 25.0 | 14.2 | 56.8 | 11.0-160 | |
| Vinyl chloride | ug/L | 5.00 | 6.09 | 122 | 67.0-131 | |
| Xylene (Total) | ug/L | 15.0 | 16.3 | 109 | 79.0-123 | |
| Toluene-d8 (S) | % | | | 101 | 80.0-120 | |
| 4-Bromofluorobenzene (S) | % | | | 96.2 | 77.0-126 | |
| 1,2-Dichloroethane-d4 (S) | % | | | 97.3 | 70.0-130 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## QUALITY CONTROL DATA

Project: Bozeman Landfill
Pace Project No.: 10636539

LABORATORY CONTROL SAMPLE: R3873913-2

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| 1,4-Dioxane (p-Dioxane) | ug/L | 1000 | 1070 | 107 | 13.0-160 | |
| 2-Propanol | ug/L | 50.0 | 42.6 | 85.2 | 10.0-160 | |
| Toluene-d8 (S) | % | | | 103 | 80.0-120 | |
| 4-Bromofluorobenzene (S) | % | | | 95.4 | 77.0-126 | |
| 1,2-Dichloroethane-d4 (S) | % | | | 101 | 70.0-130 | |

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## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# QUALITY CONTROL DATA

Project: Bozeman Landfill
Pace Project No.: 10636539

QC Batch: 1977404
QC Batch Method: 8260B
Analysis Method: EPA 8260D
Analysis Description: VOA (GC/MS) 8260D
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 10636539005, 10636539007, 10636539014, 10636539015

METHOD BLANK: R3874292-4 Matrix: Water
Associated Lab Samples: 10636539005, 10636539007, 10636539014, 10636539015

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| 2-Propanol | ug/L | <1.65 | 5.00 | 1.65 | 12/20/22 23:40 | |
| Toluene-d8 (S) | % | 104 | 80.0-120 | | 12/20/22 23:40 | |
| 4-Bromofluorobenzene (S) | % | 95.5 | 77.0-126 | | 12/20/22 23:40 | |
| 1,2-Dichloroethane-d4 (S) | % | 94 | 70.0-130 | | 12/20/22 23:40 | |

LABORATORY CONTROL SAMPLE: R3874292-3

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| 2-Propanol | ug/L | 50.0 | 44.5 | 89.0 | 10.0-160 | |
| Toluene-d8 (S) | % | | | 101 | 80.0-120 | |
| 4-Bromofluorobenzene (S) | % | | | 91.0 | 77.0-126 | |
| 1,2-Dichloroethane-d4 (S) | % | | | 102 | 70.0-130 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# QUALITY CONTROL DATA

Project: Bozeman Landfill
Pace Project No.: 10636539

QC Batch: 859575
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10636539002, 10636539003, 10636539004, 10636539005, 10636539006, 10636539007, 10636539008, 10636539009, 10636539010, 10636539013, 10636539014, 10636539015

METHOD BLANK: 4542008 Matrix: Water
Associated Lab Samples: 10636539002, 10636539003, 10636539004, 10636539005, 10636539006, 10636539007, 10636539008, 10636539009, 10636539010, 10636539013, 10636539014, 10636539015

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.39 | 1.2 | 0.39 | 12/21/22 07:34 | |
| Sulfate | mg/L | 0.77J | 1.2 | 0.43 | 12/21/22 07:34 | |

LABORATORY CONTROL SAMPLE: 4542009

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 50 | 51.4 | 103 | 90-110 | |
| Sulfate | mg/L | 50 | 51.2 | 102 | 90-110 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4542010 4542011

| Parameter | Units | 10637557001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 149 | 250 | 250 | 403 | 401 | 101 | 101 | 80-120 | 0 | 20 | |
| Sulfate | mg/L | 64.8 | 50 | 50 | 109 | 109 | 89 | 89 | 80-120 | 0 | 20 | E |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4542012 4542013

| Parameter | Units | 10636911002 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 534 | 500 | 500 | 1050 | 1050 | 103 | 102 | 80-120 | 0 | 20 | E |
| Sulfate | mg/L | 23.4 | 500 | 500 | 539 | 535 | 103 | 102 | 80-120 | 1 | 20 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

## QUALITY CONTROL DATA

Project: Bozeman Landfill
Pace Project No.: 10636539

QC Batch: 859102 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10636539001, 10636539002, 10636539003, 10636539004, 10636539005, 10636539006, 10636539007, 10636539011, 10636539012, 10636539014, 10636539015

METHOD BLANK: 4540433 — Matrix: Water
Associated Lab Samples: 10636539001, 10636539002, 10636539003, 10636539004, 10636539005, 10636539006, 10636539007, 10636539011, 10636539012, 10636539014, 10636539015

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Nitrogen, NO2 plus NO3 | mg/L | <0.031 | 0.10 | 0.031 | 12/19/22 11:17 | |

LABORATORY CONTROL SAMPLE: 4540434

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Nitrogen, NO2 plus NO3 | mg/L | 1 | 0.96 | 96 | 90-110 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4540435 4540436

| Parameter | Units | 10636420003 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, NO2 plus NO3 | mg/L | <0.10 | 1 | 1 | 0.63 | 0.63 | 63 | 63 | 90-110 | 1 | 20 | M3 |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4540437 4540438

| Parameter | Units | 10636872001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, NO2 plus NO3 | mg/L | ND | 1 | 1 | 1.1 | 1.1 | 103 | 104 | 90-110 | 1 | 20 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# QUALIFIERS

Project: Bozeman Landfill
Pace Project No.: 10636539

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## WORKORDER QUALIFIERS

WO: 10636539

[1]

## ANALYTE QUALIFIERS

| | |
|---|---|
| B | Analyte was detected in the associated method blank. |
| C0 | Result confirmed by second analysis. |
| C3 | The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable. |
| C5 | The reported concentration is an estimate. The continuing calibration standard associated with this data responded high. Data is likely to show a high bias concerning the result. |
| E | Analyte concentration exceeded the calibration range. The reported result is estimated. |
| J | Analyte detected below the reporting limit, therefore result is an estimate. This qualifier is also used for all TICs. |
| L0 | Analyte recovery in the laboratory control sample (LCS) was outside QC limits. |
| M3 | Matrix spike recovery was outside laboratory control limits due to matrix interferences. |

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bozeman Landfill
Pace Project No.: 10636539

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| 10636539001 | LF-2 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539002 | LF-3 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539003 | MW-6 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539004 | MW-8A | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539005 | MW-9A | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539005 | MW-9A | 8260D | 1977404 | EPA 8260D | 1977404 |
| 10636539006 | MW-12 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539007 | MW-13 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539007 | MW-13 | 8260D | 1977404 | EPA 8260D | 1977404 |
| 10636539008 | MW-17 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539009 | MW-18 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539010 | MW-20 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539011 | McIlhattan Seep | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539012 | DUP 1 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539013 | DUP 2 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539014 | Blank 1 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539014 | Blank 1 | 8260D | 1977404 | EPA 8260D | 1977404 |
| 10636539015 | Blank 2 | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539015 | Blank 2 | 8260D | 1977404 | EPA 8260D | 1977404 |
| 10636539016 | Trip Blank | 8260D | 1976678 | EPA 8260D | 1976678 |
| 10636539002 | LF-3 | EPA 300.0 | 859575 | | |
| 10636539003 | MW-6 | EPA 300.0 | 859575 | | |
| 10636539004 | MW-8A | EPA 300.0 | 859575 | | |
| 10636539005 | MW-9A | EPA 300.0 | 859575 | | |
| 10636539006 | MW-12 | EPA 300.0 | 859575 | | |
| 10636539007 | MW-13 | EPA 300.0 | 859575 | | |
| 10636539008 | MW-17 | EPA 300.0 | 859575 | | |
| 10636539009 | MW-18 | EPA 300.0 | 859575 | | |
| 10636539010 | MW-20 | EPA 300.0 | 859575 | | |
| 10636539013 | DUP 2 | EPA 300.0 | 859575 | | |
| 10636539014 | Blank 1 | EPA 300.0 | 859575 | | |
| 10636539015 | Blank 2 | EPA 300.0 | 859575 | | |
| 10636539001 | LF-2 | EPA 353.2 | 859102 | | |
| 10636539002 | LF-3 | EPA 353.2 | 859102 | | |
| 10636539003 | MW-6 | EPA 353.2 | 859102 | | |
| 10636539004 | MW-8A | EPA 353.2 | 859102 | | |
| 10636539005 | MW-9A | EPA 353.2 | 859102 | | |
| 10636539006 | MW-12 | EPA 353.2 | 859102 | | |
| 10636539007 | MW-13 | EPA 353.2 | 859102 | | |
| 10636539011 | McIlhattan Seep | EPA 353.2 | 859102 | | |
| 10636539012 | DUP 1 | EPA 353.2 | 859102 | | |
| 10636539014 | Blank 1 | EPA 353.2 | 859102 | | |
| 10636539015 | Blank 2 | EPA 353.2 | 859102 | | |

## REPORT OF LABORATORY ANALYSIS

# WO# : 10636539

10636539

## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



**Section A**
**Required** Client Information:

| | |
|---|---|
| Company: | Tetra Tech |
| Address: | 851 Bridger Drive, Suite 6 |
| | Bozeman, MT 59715 |
| Email To: | shane.matolyak@tetratech.com |
| Phone: 406-582-8780 | Fax: 406-582-8790 |
| Requested Due Date/TAT: | 10 day |

**Required** Project Information:

| | |
|---|---|
| Report To: | Shane Matolyak |
| Copy To: | |
| Purchase Order No.: | |
| Project Name: | Bozeman Landfill |
| Project Number: | |

**Section C**
Invoice Information:

| | |
|---|---|
| Attention: | Deb Lloyd |
| Company Name: | (same as Section A) |
| Address: | |
| Pace Quote Reference: | |
| Pace Project Manager: | Jennifer Gross |
| Pace Profile #: | 21198 |

**REGULATORY AGENCY**

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☒ OTHER Solid Waste

Site Location STATE: MT

**Section D**
**Required** Client Information

**Valid Matrix Codes**

| MATRIX | CODE |
|---|---|
| DRINKING WATER | DW |
| WATER | WT |
| WASTE WATER | WW |
| PRODUCT | P |
| SOIL/SOLID | SL |
| OIL | OL |
| WIPE | WP |
| AIR | AR |
| OTHER | OT |
| TISSUE | TS |

**SAMPLE ID**
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED COMPOSITE START DATE | COLLECTED COMPOSITE START TIME | COLLECTED COMPOSITE END/GRAB DATE | COLLECTED COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Y/N | Analysis Test: 8260D LL VOCs* | 353.2 N+N | 300.0-Cl, SO4 | ~~6020B Metals~~** | ~~7470A Low Level Hg~~ | See Tables 1&2 | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | LF-2 | WT | G | | | 12-7-22 | 12:45 | | 2 | | X | | X | | | | | | X | X | | | | X | | 001 |
| 2 | LF-3 | | | | | 12-7-22 | 12:15 | | 3 | X | X | | X | | | | | | | X | X | | | | | 002 |
| 3 | MW-6 | | | | | 12-8-22 | 12:00 | | 3 | X | X | | X | | | | | | | X | X | | | | | 003 |
| 4 | MW-8A | | | | | 12-7-22 | 15:40 | | 3 | X | X | | X | | | | | | | X | X | | | | | 004 |
| 5 | MW-9A | | | | | 12-8-22 | 10:30 | | 3 | X | X | | X | | | | | | | X | X | | | | | 005 |
| 6 | MW-12 | | | | | 12-7-22 | 16:15 | | 3 | X | X | | X | | | | | | | X | X | | | | | 006 |
| 7 | MW-13 | | | | | 12-8-22 | 11:15 | | 3 | X | X | | X | | | | | | | X | X | | | | | 007 |
| 8 | MW-17 | | | | | 12-7-22 | 14:30 | | 2 | X | | | X | | | | | | | | X | | | | | 008 |
| 9 | MW-18 | | | | | 12-7-22 | 15:15 | | 2 | X | | | X | | | | | | | | X | | | | | 009 |
| 10 | MW-20 | | | | | 12-7-22 | 13:45 | | 2 | X | | | X | | | | | | | | X | | | | | 010 |
| 11 | McIlhattan Seep | | | | | 12-7-22 | 13:00 | | 2 | | X | | X | | | | | | | X | | | | | | 011 |
| 12 | DUP 1 | ↓ | ↓ | | | 12-7-22 | 13:15 | | 2 | | X | | X | | | | | | ↓ | X | | | | ↓ | | 012 |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *8260 LL VOCs: SUB to PACE-TN | Shane Matolyak / Tt | 12-8-22 | 14:00 | Nancy / Pace | 12/1/22 | 850 | 2.6 2.9 | Y | Y | Y |
| **6020: As, Ba, Cd, Cr, Co, Cu, Pb, Ni, Se, Ag, Tl, V, Zn | | | | | | | | | | |
| Metals & Hg NOT required | | | | | | | | | | |

| SAMPLER NAME AND SIGNATURE | | | |
|---|---|---|---|
| PRINT Name of SAMPLER: | Shane Matolyak | | |
| SIGNATURE of SAMPLER: | | DATE Signed (MM/DD/YY): | 12-8-22 |

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)



*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical
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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | Tetra Tech | Report To: | Shane Matolyak | Attention: | Deb Lloyd |
| Address: | 851 Bridger Drive, Suite 6 | Copy To: | | Company Name: | (same as Section A) |
| | Bozeman, MT 59715 | | | Address: | |
| Email To: | shane.matolyak@tetratech.com | Purchase Order No.: | | Pace Quote Reference: | |
| Phone: 406-582-8780 | Fax: 406-582-8790 | Project Name: | Bozeman Landfill | Pace Project Manager: | Jennifer Gross |
| Requested Due Date/TAT: | 10 day | Project Number: | | Pace Profile #: | 21198 |

REGULATORY AGENCY: ☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☒ OTHER Solid Waste

Site Location STATE: MT

Section D Required Client Information

**SAMPLE ID** (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

| MATRIX | CODE |
|---|---|
| DRINKING WATER | DW |
| WATER | WT |
| WASTE WATER | WW |
| PRODUCT | P |
| SOIL/SOLID | SL |
| OIL | OL |
| WIPE | WP |
| AIR | AR |
| OTHER | OT |
| TISSUE | TS |

Requested Analysis Filtered (Y/N)

| ITEM # | Sample ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED Composite Start DATE | Composite Start TIME | Composite End/Grab DATE | Composite End/Grab TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test Y/N | 8260D LL VOCs* | 353.2 N+N | 300.0-Cl, SO4 | ~~6020B Metals**~~ | ~~7470A Low-Level Hg~~ | See Tables 1 & 2 | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DUP 2 | WT | G | | | 12-7-22 | 14:45 | | 2 | X | | | X | | | | | | X | | X | | | X | | 013 |
| 2 | Blank 1 | ↓ | ↓ | | | 12-7-22 | 10:10 | | 3 | X | X | | X | | | | | | X | X | X | | | X | | 014 |
| 3 | Blank 2 | ↓ | ↓ | 12-7-22 | | ~~Blank~~ | 10:30 | | 3 | X | X | | X | | | | | | X | X | X | | | X | | 015 |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *8260 LL VOCs: SUB to PACE-TN | Shane Matolyak / TT | 12-8-22 | 14:00 | Nancy / Pace | 12/9/22 | 8:50 | 2.6 2.9 | Y | Y | Y |
| **6020: As, Ba, Cd, Cr, Co, Cu, Pb, Ni, Se, Ag, Tl, V, Zn | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Shane Matolyak

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 12-8-22

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)



*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

**Sample Condition Upon Receipt**

**Client Name:** Tetra Tech

**Project #:** **WO#: 10636539**

**PM: JMG** **Due Date: 12/22/22**
**CLIENT: 11 Tetra-MT**

**Courier:** [X] FedEx [ ] UPS [ ] USPS [ ] Client [ ] Pace [ ] SpeeDee [ ] Commercial

**Tracking Number:** 770721621469144411 [ ] See Exceptions ENV-FRM-MIN4-0142

**Custody Seal on Cooler/Box Present?** [X] Yes [ ] No **Seals Intact?** [X] Yes [ ] No **Biological Tissue Frozen?** [ ] Yes [ ] No [X] N/A

**Packing Material:** [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other **Temp Blank?** [X] Yes [ ] No

**Thermometer:** [ ] T1 (0461) [ ] T2 (1336) [ ] T3 (0459) [ ] T4 (0254) [ ] T5 (0178) [ ] T6 (0235) [ ] T7 (0042) [ ] T8 (0775) [X] T9(0727) [ ] 01339252/1710

**Type of Ice:** [X] Wet [ ] Blue [ ] Dry [ ] None [ ] Melted

**Did Samples Originate in West Virginia?** [ ] Yes [X] No **Were All Container Temps Taken?** [ ] Yes [ ] No [X] N/A

*Temp should be above freezing to 6 °C* **Cooler temp Read w/Temp Blank:** 2.6, 2.9 °C

**Correction Factor:** True **Cooler Temp Corrected w/temp blank:** 2.6, 2.9 °C

**Average Corrected Temp (no temp blank only):** _____ °C
[ ] See Exceptions ENV-FRM-MIN4-0142 [ ] 1 Container

**USDA Regulated Soil:** [X] N/A, water sample/other: _____)

**Date/Initials of Person Examining Contents:** 12/9/22 NV

Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? [ ] Yes [ ] No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? [ ] Yes [ ] No

**If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.**

| **Location (Check one):** [ ] Duluth [X] Minneapolis [ ] Virginia | | | | **COMMENTS** |
|---|---|---|---|---|
| Chain of Custody Present and Filled Out? | [X] Yes | [ ] No | | 1. |
| Chain of Custody Relinquished? | [X] Yes | [ ] No | | 2. |
| Sampler Name and/or Signature on COC? | [X] Yes | [ ] No | [ ] N/A | 3. |
| Samples Arrived within Hold Time? | [X] Yes | [ ] No | | 4. If fecal: [ ] <8 hrs [ ] >8 hr, <24 [ ] No |
| **Short Hold Time Analysis (<72 hr)?** | [ ] Yes | [X] No | | 5. [ ] Fecal Coliform [ ] HPC [ ] Total Coliform/E.coli [ ] BOD/cBOD [ ] Hex Chrom [ ] Turbidity [ ] Nitrate [ ] Nitrite [ ] Orthophos [ ] Other |
| **Rush Turn Around Time Requested?** | [ ] Yes | [X] No | | 6. |
| Sufficient Sample Volume? | [X] Yes | [ ] No | | 7. |
| Correct Containers Used? | [X] Yes | [ ] No | [ ] N/A | 8. |
| -Pace Containers Used? | [X] Yes | [ ] No | | |
| Containers Intact? | [ ] Yes | [X] No | | 9. 2 trip blanks broken (2 out of 6) |
| Field Filtered Volume Received for Dissolved Tests? | [ ] Yes | [ ] No | [X] N/A | 10. Is sediment visible in the dissolved container? [ ] Yes [ ] No |
| Is sufficient information available to reconcile the samples to the COC? | [X] Yes | [ ] No | | 11. **If no, write ID/Date/Time of container below:** 3 vials per Sample [ ] See Exceptions ENV-FRM-MIN4-0142 |
| Matrix: [X] Water [ ] Soil [ ] Oil [ ] Other | | | | |
| All containers needing acid/base preservation have been checked? | [X] Yes | [ ] No | [ ] N/A | 12. Sample # 001-007, 011-012, 014-015 |
| All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide) | [X] Yes | [ ] No | [ ] N/A | 1/1 [ ] NaOH [ ] HNO3 [X] H2SO4 [ ] Zinc Acetate |
| Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.) | [X] Yes | [ ] No | [ ] N/A | Positive for Residual Chlorine? [ ] Yes [ ] No [ ] See Exceptions ENV-FRM-MIN4-0142 |
| | | | | **pH Paper Lot #** |
| | | | | Residual Chlorine: 0-6 Roll 208422 / 0-6 Strip: / 0-14 Strip: |
| Headspace in Methyl Mercury Container? | [ ] Yes | [ ] No | [X] N/A | 13. |
| Extra labels present on soil VOA or WIDRO containers? | [ ] Yes | [ ] No | [X] N/A | 14. [ ] See Exceptions ENV-FRM-MIN4-0142 |
| Headspace in VOA Vials (greater than 6mm)? | [ ] Yes | [X] No | [ ] N/A | |
| 3 Trip Blanks Present? | [X] Yes | [ ] No | [ ] N/A | 15. |
| Trip Blank Custody Seals Present? | [X] Yes | [ ] No | [ ] N/A | Pace Trip Blank Lot # (if purchased): 101022-JCYR |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** [ ] Yes [ ] No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

**Project Manager Review:** _____ **Date:** 12/9/22

NOTE: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers).

**Labeled By:** NV **Line:** 3

***Table 1. Bozeman Landfill December Groundwater Monitoring Analyses***

| Groundwater Monitoring Station | VOCs [1] | Chloride and Sulfate | Nitrate + Nitrite as Nitrogen |
|---|---|---|---|
| Method | 8260 (Low Level) | 300.0 | 353.2 |
| LF – 2 | X | | X |
| LF – 3 | X | X | X |
| MW – 6 | X | X | X |
| MW - 8A | X | X | X |
| MW - 9A | X | X | X |
| MW – 12 | X | X | X |
| MW – 13 | X | X | X |
| MW – 17 | X | X | |
| MW – 18 | X | X | |
| MW – 20 | X | X | |
| McIlhattan Seep | X | | X |
| Dup 1 | X | | X |
| Dup 2 | X | X | |
| Blank 1 | X | X | X |
| Blank 2 | X | X | X |
| Trip Blank | X | | |

"X" Indicates that sample is to be analyzed for this constituent. Blank cell indicates no analysis for this constituent for respective sample.

[1] Refer to Table 2 for list of VOCs.

# Internal Transfer Chain of Custody

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☐ Samples Pre-Logged into eCOC.

**State Of Origin:** MT
**Cert. Needed:** ☐ Yes ☒ No
**Owner Received Date:** 12/9/2022 **Results Requested By:** 12/23/2022

**Workorder:** 10636539 **Workorder Name:** Bozeman Landfill

| Report To | Subcontract To |
|---|---|
| Jennifer Gross<br>Pace Analytical Minnesota<br>1700 Elm Street<br>Minneapolis, MN 55414<br>Phone (612)607-1700 | Pace National<br>12065 Lebanon Rd<br>Mt. Juliet, TN 37122<br>Phone (615) 758-5858 |

L1567471

| Item | Sample ID | Sample Type | Collect Date/Time | Lab ID | Matrix | Preserved Containers: VOA HCl | 8260D Low Level VOCs (PACE-TN) | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|
| 1 | LF-2 | PS | 12/7/2022 12:45 | 10636539001 | Water | 3 | X | -01 |
| 2 | LF-3 | PS | 12/7/2022 12:15 | 10636539002 | Water | 3 | X | -02 |
| 3 | MW-6 | PS | 12/8/2022 12:00 | 10636539003 | Water | 3 | X | -03 |
| 4 | MW-8A | PS | 12/7/2022 15:40 | 10636539004 | Water | 3 | X | -04 |
| 5 | MW-9A | PS | 12/8/2022 10:30 | 10636539005 | Water | 3 | X | -05 |
| 6 | MW-12 | PS | 12/7/2022 16:15 | 10636539006 | Water | 3 | X | -06 |
| 7 | MW-13 | PS | 12/8/2022 11:15 | 10636539007 | Water | 3 | X | -07 |
| 8 | MW-17 | PS | 12/7/2022 14:30 | 10636539008 | Water | 3 | X | -08 |
| 9 | MW-18 | PS | 12/7/2022 15:15 | 10636539009 | Water | 3 | X | -09 |
| 10 | MW-20 | PS | 12/7/2022 13:45 | 10636539010 | Water | 3 | X | -10 |
| 11 | McIlhattan Seep | PS | 12/7/2022 13:00 | 10636539011 | Water | 3 | X | -11 |
| 12 | DUP 1 | PS | 12/7/2022 13:15 | 10636539012 | Water | 3 | X | -12 |
| 13 | DUP 2 | PS | 12/7/2022 14:45 | 10636539013 | Water | 3 | X | -13 |
| 14 | Blank 1 | PS | 12/7/2022 10:10 | 10636539014 | Water | 3 | X | -14 |
| 15 | Blank 2 | PS | 12/7/2022 10:30 | 10636539015 | Water | 3 | X | -15 |
| 16 | Trip Blank | PS | 12/7/222 00:00 | 10636539016 | Water | 4 | X | -16 |

| Transfers | Released By | Date/Time | Received By | Date/Time | Comments |
|---|---|---|---|---|---|
| 1 | CSM/Pace | 12-13-22 14:10 | | | 5923 7143 2366 |
| 2 | | | | | 3.9+0=3.9 |
| 3 | | | | 12/14/22 | 9:10 |

| Cooler Temperature on Receipt ____ °C | Custody Seal (Y) or N | Received on Ice Y or N | Samples Intact Y or N |
|---|---|---|---|

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

L1567471

J017

Sample Receipt Checklist

| | | | |
|---|---|---|---|
| COC Seal Present/Intact: | Y N | If Applicable | |
| COC Signed/Accurate: | Y N | VOA Zero Headspace: | Y N |
| Bottles arrive intact: | Y N | Pres.Correct/Check: | Y N |
| Correct bottles used: | Y N | | |
| Sufficient volume sent: | Y N | | |
| RAD Screen <0.5 mR/hr: | Y N | | |

# APPENDIX D DATA VALIDATION

# DATA REVIEW, VERIFICATION, & VALIDATION REPORT

## 1. INTRODUCTION

| General Project Information | | | |
|---|---|---|---|
| **Project Name:** | Bozeman Landfill | **Date Validated:** | 3/13/2023 |
| **Tetra Tech Project Number:** | 114-710326H | **Data Validated By:** | Shane Matolyak, Tetra Tech |
| **Sample Start and End Dates:** | 12/7/2022 – 12/8/2022 | **Laboratory Name:** | Pace Analytical |
| **Sample Matrix:** | Aqueous | **Laboratory Project ID#:** | 10636539 |
| **Analytical Parameters:** | VOCs by Method 8260D (low), Anions (sulfate and chloride) by Method 300.0, and Nitrogen (as NO2+NO3) by Method 353.2 | | |
| **Name & Date of Approved SAP, QAPP, Work Plan, Etc.** | Groundwater Monitoring Sampling and Analysis Plan for the Bozeman Landfill. Prepared for City of Bozeman by Tetra Tech. Dated November 12, 2015 (as amended in December 2020). | | |

## 2. LABORATORY METHODS AND SAMPLE HANDLING

***Validation Criteria Used:***

X Groundwater Monitoring Sampling and Analysis Plan for the Bozeman Landfill. Prepared for City of Bozeman. Prepared by Tetra Tech. Dated November 12, 2015. As modified by Approval for Request to Reduce Frequencty of Groundwater Sampling for Metals and Anions. Prepared Montana DEQ. December 9. 2020.

X National Functional Guidelines for Organic Superfund Methods Data Review. OLEM 9355.0-136, EPA-540-R-2017-002. Dated January 2017.

X National Functional Guidelines for Inorganic Superfund Methods Data Review. OLEM 9355.0-135, EPA-540-R-2017-001. Dated January 2017.

## 3. LIST OF SAMPLES VALIDATED IN THIS REPORT

***List all samples in the sample delivery group that were validated in this report.***

| Validated Samples | | |
|---|---|---|
| **Field Sample ID#** | **Laboratory Sample ID#** | **Sample Type** (Natural, Duplicate, Field Blank, Etc.) |
| LF-2 | 10636539001 | Natural |
| LF-3 | 10636539002 | Natural |
| MW-6 | 10636539003 | Natural |
| MW-8A | 10636539004 | Natural |
| MW-9A | 10636539005 | Natural |
| MW-12 | 10636539006 | Natural |
| MW-13 | 10636539007 | Natural |
| MW-17 | 10636539008 | Natural |
| MW-18 | 10636539009 | Natural |
| MW-20 | 10636539010 | Natural |
| McIlhatten Seep | 10636539011 | Natural |
| DUP 1 | 10636539012 | Duplicate of McIlhatten Seep |
| DUP 2 | 10636539013 | Duplicate of MW-17 |
| Blank 1 | 10636539014 | Equipment Blank fo equipment used during December 2022 monitoring event. |
| Blank 2 | 10636539015 | Equipment Blank fo equipment to be used during June 2023 monitoring event. |
| Trip Blank | 10636539016 | Trip blank |

## 4. FIELD COMPLIANCE WITH PROJECT REQUIREMENTS

***Were all the required samples collected as specified in the SAP/QAPP, and field and analytical methods? Discuss.***

The "Valley Veiw Vet Well" sample was inadvertently omitted from sampling however contstituent concentrations are typically non-detectable at this location. A request to reduce the sampling frequency at this location will be submitted to DEQ.

All other samples were collected as per the SAP and DEQ's 2022 approval to implent passive sampling techniques (in lieu of submersible pumps and disposable bailers) (DEQ. 2022. Memo Re: Approved – Sampling and Analysis Plan (SAP) Updates. September 16, 2023).

## 5. Data Qualifiers

Data qualifiers used for this project are those in the National Functional Guidelines and are listed below.

| Data Evaluation Qualifiers | |
|---|---|
| **Data Qualifier** | **Qualifier Description** *(as per USEPA 2017 National Functional Guidelines)* |
| U | The analyte was analyzed for but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method. |
| J | The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL). |
| J+ | The result is an estimated quantity that may be biased high due to associated laboratory QA/QC result being outside control limits. |
| J- | The result is an estimated quantity that may be biased low due to associated laboratory QA/QC result being outside control limits. |
| B | The analyte has been detected in the associated method blank. |
| M1 | Matrix spike recovery exceeded QC limits. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |

Laboratory-specific data qualifiers are provided in the analytical laboratory report. Laboratory qualifiers are for informational purposes and do not necessarily signify that the data requires qualification.

## 6. LABORATORY NARRATIVE, CHAIN-OF-CUSTODY, AND SAMPLE RECEIPT

***Was a laboratory narrative provided and were there any non-conformance issues with the analytical data? Identify and discuss.***

The laboratory provided a general narrative that stated the results reported in the report conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

The analytical laboratory (Pace Analytical) listed multiple QC deviations or anomalies. These include:

<u>General Information</u>

C5: The reported concentration is an estimate. The continuing calibration standard associated with this data responded high. Data is likely to show a high bias concerning the result.

- MW-13 (Lab ID: 10636539007), vinyl chloride
- MW-18 (Lab ID: 10636539009), vinyl chloride

QC Batch: 1976678

C3: The reported result is estimated. The continuing calibration standard associated with the data responded low. Method sensitivity check is acceptable.

- Blank 1 (Lab ID: 10636539014), vinyl acetate
- Blank 2 (Lab ID: 10636539015), vinyl acetate
- DUP 1 (Lab ID: 10636539012), vinyl acetate
- DUP 2 (Lab ID: 10636539013), vinyl acetate
- LF-2 (Lab ID: 10636539001), vinyl acetate
- LF-3 (Lab ID: 10636539002), vinyl acetate
- MW-12 (Lab ID: 10636539006), vinyl acetate
- MW-13 (Lab ID: 10636539007), vinyl acetate
- MW-17 (Lab ID: 10636539008), vinyl acetate
- MW-18 (Lab ID: 10636539009), vinyl acetate
- MW-20 (Lab ID: 10636539010), vinyl acetate
- MW-6 (Lab ID: 10636539003), vinyl acetate
- MW-8A (Lab ID: 10636539004), vinyl acetate
- MW-9A (Lab ID: 10636539005), vinyl acetate
- McIlhattan Seep (Lab ID: 10636539011), vinyl acetate
- Trip Blank (Lab ID: 10636539016), vinyl acetate

QC Batch: 859575

C0: Result confirmed by second analysis.

- LF-3 (Lab ID: 10636539002), chloride, sulfate
- MW-18 (Lab ID: 10636539009), chloride, sulfate
- MW-20 (Lab ID: 10636539010), chloride, sulfate
- MW-9A (Lab ID: 10636539005), chloride, sulfate

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 4542010), sulfate
- MS (Lab ID: 4542012), chloride
- MS (Lab ID: 4542011), sulfate
- MS (Lab ID: 4542013), chloride

Laboratory Control Spikes

QC Batch: 1976678

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.

- LCS (Lab ID: R3873913-1), 1,1,2-tricholorfluoromethane, cyclohexane

Matrix Spike / Matrix Spike Duplicates

QC Batch: 859102

M3: Matrix spike recovery was outside laboratory control limits due to matrix interferences.

- MS (Lab ID: 4540435), nitrogen, NO2 plus NO3
- MSD (Lab ID: 4540436), nitrogen, NO2 plus NO3

Method Blank

QC Batch: 859575

B: Analyte was detected in the associated method blank.

• BLANK for HBN [WETA/545 *Lab ID: 4542008), sulfate

***Were sample Chain-of-Custody (COC) forms complete? Describe.***

Yes. All required fields of the COC were completed and the forms signed by field and laboratory personnel.

***Were any issues or discrepancies noted on the Sample Receipt Checklist (a.k.a. Non-Conformance Form)? Were samples received in a sealed cooler, good condition, at proper temperatures? Identify and discuss.***

The Sample Condition Upon Receipt Form indicated the samples were received in good condition and at the correct temperature. Two of the six VOA vials for the two trip blanks were received broken however the remaining vial(s) were suitable for analysis. No headspace was observed by the laboratory in any of the VOA vials of the sample set.

***Were the requested analytical methods in compliance with project requirements (i.e., QAPP, SAP, etc.)? Explain and, if not in compliance, discuss how this affects the data.***

Yes. The water samples were analyzed for, VOCs (analytical method 8260B), chloride and sulfate (analytical method 300.0), and nitrite plus nitrate (NO2+NO3) as nitrogen (analytical method 353.2).

## 7. LABORATORY COMPLIANCE WITH PROJECT REQUIREMENTS

***Were samples analyzed within method-specified or technical holding times? Explain any exceptions and how this may affect the results.***

Yes, all analyses were completed within specified holding times.

***Do the laboratory reports include all constituents requested to be analyzed on the CoC or under the QAPP, SAP, or other applicable document? Explain.***

All samples were analyzed as required per the SAP.

***Were reported units appropriate for the associated sample matrix/matrices and method(s) of analyses? Explain.***

Yes. The samples were analyzed by the methods specified in the SAP and data for anions and nitrogen were reported as milligrams per liter (mg/L) and for VOCs as micrograms per liter (ug/L). This was for comparison to standards/screening levels and previous results.

***Were detection limits reported by the laboratory in accordance with the project requirements? Discuss and list.***

All sample results were reported to the method detection limit. Some VOCs required dilutions as indicated in the laboratory report. These dilutions were from 5 to 50 times the volume of the natural sample. Reporting limits were adjusted accordingly. No qualification is required.

***Results qualified by the laboratory based on the laboratory reporting limit. Discuss, as needed.***

Results were qualified by the laboratory based on detection of concentrations between the MDL and PQL (qualified with a 'J'). If the analyte was detected in the associated method blank the data were qualified with a 'B'. Other data qualifiers are discussed in Sections 5 and 6. Qualified results are identified in the Analytical Results section of the analytical report.

## 8. LABORATORY QA/QC

### *8a. Continuing Calibration Verification (CCV) Standard*

***Was there indication from the laboratory that the initial or CCV results were within acceptable limits? Explain and include discussion on how any out-of-control results affect the accuracy of the data.***

As reported in Section 6, the continued calibration standard returned values that were biased high or low for certain constituents (i.e., biased high for vinyl choride in samples MW-13 and MW-18, and biased low for vinyl acetate in all samples).

Vinyl chloride results for MW-13 and MW-18 were consistent with previous data suggesting bias not significantly influence comparison of these data to groudwater protection standards. Vinyl acetate was not detected during the December 2022 or previous monitoring events and therefore the low bias for this constituent does not appear to affect interpretation of the December 2022 data. Results for chloride or sulfate were either confirmed by second analysis or flagged as an estimated value.

### *8b. Laboratory Control Samples (LCSs)*

***Was the reference material used for the laboratory control standard (LCSs) the correct matrix and concentration? Explain and include a discussion on how any matrix differences affects the accuracy of the data.***

Yes, all LCSs were of aqueous matrix consistent with analytical media analyzed and the concentration of analytes within the natural samples.

***Was the total number of LCSs analyzed equal to at least 5% (1 in 20) of the total number of samples, or analyzed as required by the method? Explain.***

Yes. Three LCSs were analyzed for VOC samples, three for sulfate and chloride samples, and one for nitrogen samples.

***Were LCSs prepared the same way as the associated samples? Explain and include a discussion of how any deviations affect the accuracy of the data.***

Yes, the samples were prepared the same way as the associated samples.

***Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within laboratory QC limits? Explain and discuss on how any out-of-control results affect the accuracy of the data.***

All LCS percent recoveries were within control limits with the following exceptions.

QC Batch: 1976678

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.

• LCS (Lab ID: R3873913-1), 1,1,2-tricholorfluoromethane, cyclohexane

All of these analytes were below the MDL in all samples during the December 2022 and previous monitoring events.

### *8c. Laboratory Blank Samples*

***Was the total number of method blank samples prepared equal to at least 5% (1 in 20) of the total number of samples, or analyzed as required by the method? Explain.***

Yes. Two method blanks were analyzed for VOC samples, one method blank was analyzed for chloride and sulfate samples, and one method blank was analyzed for nitrogen samples.

***Were laboratory blank samples free of analyte contamination? Explain.***

One method blank had a concentration of sulfate that was above the MDL but below the PQL. Data for this analyte are considered biased low due to sampling equipment issues as explained in Section 3.2.2 of the December 2022 Groundwater Monitoring Report.

All other method blanks were free of analyte contamination.

### *8d. Matrix Spike / Matrix Spike Duplicates*

***What project-specific samples were used to prepare the MS and MSD samples?***

No project-specific samples were used to prepared MS or MSD samples.

Non-project-specific samples included (Lab ID nos.): 1063691102, 1063642003, 1063872001, and 10637557001.

***Was the total number of MS samples prepared equal to at least 5% (1 in 20) of the total number of samples, or analyzed as required by the method? Explain.***

Yes. A total of three MSs were analyzed (not counting MSDs) which equates to 20% of the total number of samples submitted for analysis.

***Were MS percent recoveries and all MS/MSD relative percent differences (RPDs) within data validation or laboratory QC limits? Explain and include a discussion on how this affects the data.***

All matrix spike RPDs were within control limits with the following exceptions:

QC Batch: 859102

M3: Matrix spike recovery was outside laboratory control limits due to matrix interferences.

- MS (Lab ID: 4540435), nitrogen, NO2 plus NO3
- MSD (Lab ID: 4540436), nitrogen, NO2 plus NO3

Data for this analyte are considered biased low due to sampling equipment issues as explained in Section 3.2.2 of the December 2022 Groundwater Monitoring Report.

### *8e. Laboratory Duplicates*

***Were laboratory duplicate RPD values within laboratory-specified limits? Explain and include discussion of how this affects the data.***

All duplicate RPDs were within control limits.

### *8f. Surrogates*

***Were surrogate recoveries within laboratory QC limits? Explain and include discussion on how this affects the data.***

All surrogate recoveries were within control limits.

## 9. FIELD QA/QC

### *9a. Trip and Field Blanks*

***Were the number of equipment, trip, or field blanks collected equal to at least 10% of the total number of samples, or as required by the project requirements, QAPP, or SAP? Explain and include how this affects the data.***

One trip blank was analyzed, one for each cooler used to ship the samples as per the SAP. One cooler was used to ship all samples during this monitoring event.

One event-specific equipment blank was collected and was representative of the single batch of distilled water used to fill all of the passive diffusion samplers used during the monitoring event.

***Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination? Explain and include discussion of how this affects the data.***

The trip blank was free of analyte contamination.

The equipment blank had detectable concentrations of 2-butanone, 2-propanol, 4-methyl-2-pentanone, acetone, and tetrahydrofuran. Discussions with the equipment manufacturer suggest these analytes could have diffused into the sampler through the air during shipping and storage. Concentrations of these analytes in natural samples are considered biased high for the December 2022 monitoring event and alternative sampling methodologies are being evaluated for future events.

### *9b. Field Duplicates*

***Were the field duplicates collected as required by the project requirements, QAPP or SAP? Include a table of duplicate samples. Explain and include discussion of how this affects the data.***

Yes. Two field duplicates were analyzed per the SAP and subsequent DEQ-approved revisions:

| Duplicate | Natural Sample |
|---|---|
| DUP 1 | McIlhattan Seep |
| DUP 2 | MW-17 |

***Were field duplicate RPD values within data validation QC limits? Explain and discuss how this affects the data.***

QC limits were met for all constituents in both duplicate-natural sample pairs.

## 10. OTHER

***Did EPA or other entities collect split samples? If so, explain how those results compare to the natural sample.***

No.

***Other comments or observations.***

There are no other comments.

## 11. SUMMARY OF QUALIFIED DATA

The sample data qualified in this data validation effort is presented in the analytica laboratory report. The data qualifier 'J' denotes an estimated concentration which is the concentration between the MDL and PQL. Additoinal data qualifiers are listed and explained in Section 6.

## 12. DEVIATIONS FROM THE QAPP

***List and discuss deviations from the QAPP identified during this review.***

None.

## 13. ACCEPTABILITY AND USABILITY OF THE DATA

A review of the chain of custody forms and laboratory case narratives indicate that proper chain of custody was maintained. The appropriate preparation and analysis methods were performed on the samples based on the intended use of the data. The cooler temperatures were measured upon laboratory receipt and were within control limits. All samples were received preserved, in intact, and in good condition.

Laboratory quality control (QC) sample analyses performed for each analytical method are summarized as part of the laboratory analytical package.

The following Stage 2A verification and manual validation checks were performed as part of this project:

1. Requested methods were performed;
2. Method dates for handling, preparation and analysis were present, as appropriate;
3. Sample-related QC data and QC acceptance criteria were provided in the laboratory report and linked to the project samples including the field QC samples (trip blank);
4. Requested spike analytes were added, as appropriate;
5. Sample holding times were evaluated;
6. Frequency of QC samples was checked and considered appropriate; and
7. Sample results were evaluated by comparing holding times and sample-related QC data to EPA and project data validation guidelines.

***Precision***

Precision is the measure of agreement among individual measurements of the same property under similar conditions. Precision for this project has been expressed in terms of the relative percent difference (RPD) between two samples. Duplicate samples can be evaluated quantitatively for precision only when contaminants are detected in both the sample and the duplicate. Duplicates with RPDs within the control limits indicate adequate sampling practices and/or good analytical precision. Duplicates with RPDs outside the control limits may result from inappropriate sampling procedures, matrix interferences, or non-homogeneity of the sample matrix. In addition, poor precision can be attributed to deviations from the analytical methodology or to poor reproducibility of target analyte concentrations at or near the detection limits.

Precision was evaluated for this project by comparing field duplicate results, laboratory control sample/laboratory control sample duplicate (LCS/LCSD) RPD results, and matrix spike/matrix spike duplicate (MS/MSD) RPD results for project samples. Project-specific MS/MSDs were analyzed by the laboratory. However, if the laboratory duplicate or MS/MSD analysis was performed by the laboratory on samples for another client's project within the same method batch, any qualifiers applied to the data are not applicable to this project's samples. This is not the case in the December 2020 sample set.

All LCS/LCSD, laboratory duplicate, field duplicates, and MS/MSD RPDs for the sample set were within the QC limits or did not require qualification except as noted in Section 6.

***Accuracy***

The assessment of accuracy is evaluated by comparing the percent recoveries (%R) computed from the known concentration of analyte spikes and their recovered concentrations versus the analytical method acceptance criteria. Spike recoveries provide an indication of bias, where the reported data may either overestimate or underestimate the actual concentration of detected compounds and/or the detection limits. Accuracy was assessed using surrogate recovery data, LCS/LCSD recovery data, and MS/MSD recovery data for project samples. The LCS/LCSD, MS/MSD, surrogate recoveries, and internal standard response and retention times were within control limits except as noted in Section 6.

***Representativeness***

Representativeness of the environmental sample analytical data was assessed by evaluating holding times, trip blank, and laboratory method blank results.

- Holding Times. Some anlaytes were analyzed outside the method-required preparation and analytical holding times.
- Trip blanks were non-detect except as noted in Section 9a. No other blanks were collected.
- Laboratory method blanks were free of contamination.

***Comparability***

All samples were collected and handled using industry standard procedures and analyzed using appropriate EPA analytical methods. Sample results were reported in appropriate units. The analytical methods are considered acceptable for generating analytical data for the purpose of this project.

***Completeness***

Completeness is the quantitative measure of the amount of data obtained from a measurement process compared with the amount expected to be obtained under the conditions of measurement. The data collected during this project are considered 100 percent complete. The overall data quality objective for completeness for the sampling events is >90%.

***Sensitivity***

Reporting limits and method detection limits were below the screening levels, with exception of those reporting limits that were elevated due to sample matrix or dilution requirements. When a reporting limit exceeded the screening level, the corresponding MDL was evaluated. Data with MDLs below the screening levels required no further evaluation. If a compound was detected below the PQL, but above the MDL, the laboratory qualified the value as estimated and assigned a “J” qualifier. These laboratory-assigned “J” qualified results are considered estimated results as noted in the table above.

The laboratory assigned notations/qualifiers are often for informational purposes. These notations/qualifiers do not necessarily indicate that the results should be considered estimated but may help in evaluating whether results should be considered estimated through this data validation effort. Howerver, exceptions include those samples that were specified by the laboratory to be estimated due to issues or concerns identified within the data package. There are no issues or concerns in this data package.

***Summary***

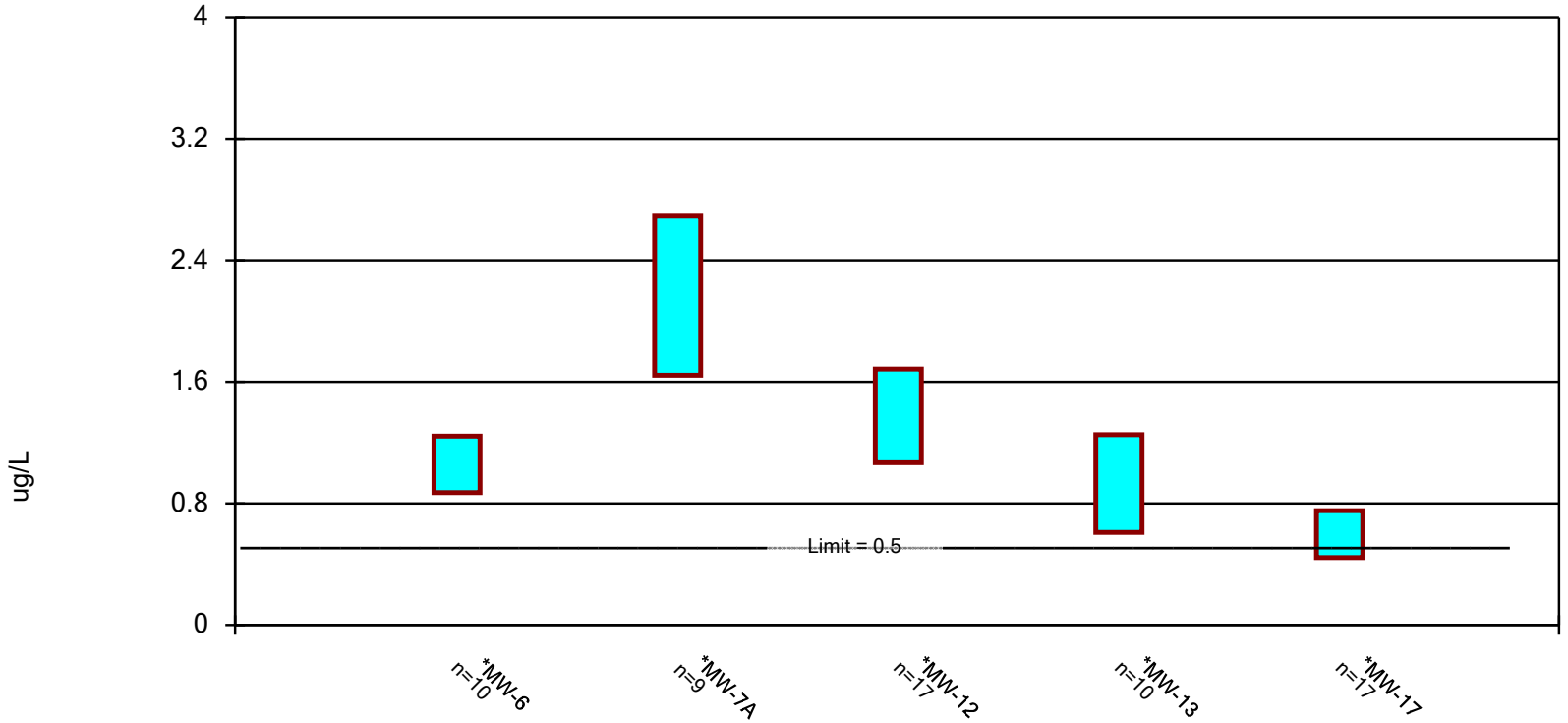
Overall the analytical data are considered acceptable and have met the quality control and quality assurance objectives and goals of this project. No data were rejected due to performance of the analytical laboratory. All results, as qualified, are considered usable for meeting project objectives. Qualifications made during this project are discussed above.

Cross contamination of certain VOCs and low bias of anion concentrations were observed to the the use of Passive Diffusion Samplers for groundwater sampling. These occurrences are discussed in Section 3.2.2 of the December 2022 Groundwater Monitoring Report.

# APPENDIX E STATISTICAL EVALUATION WORKSHEETS

# Parametric Confidence Interval, Corrective Action Mode

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

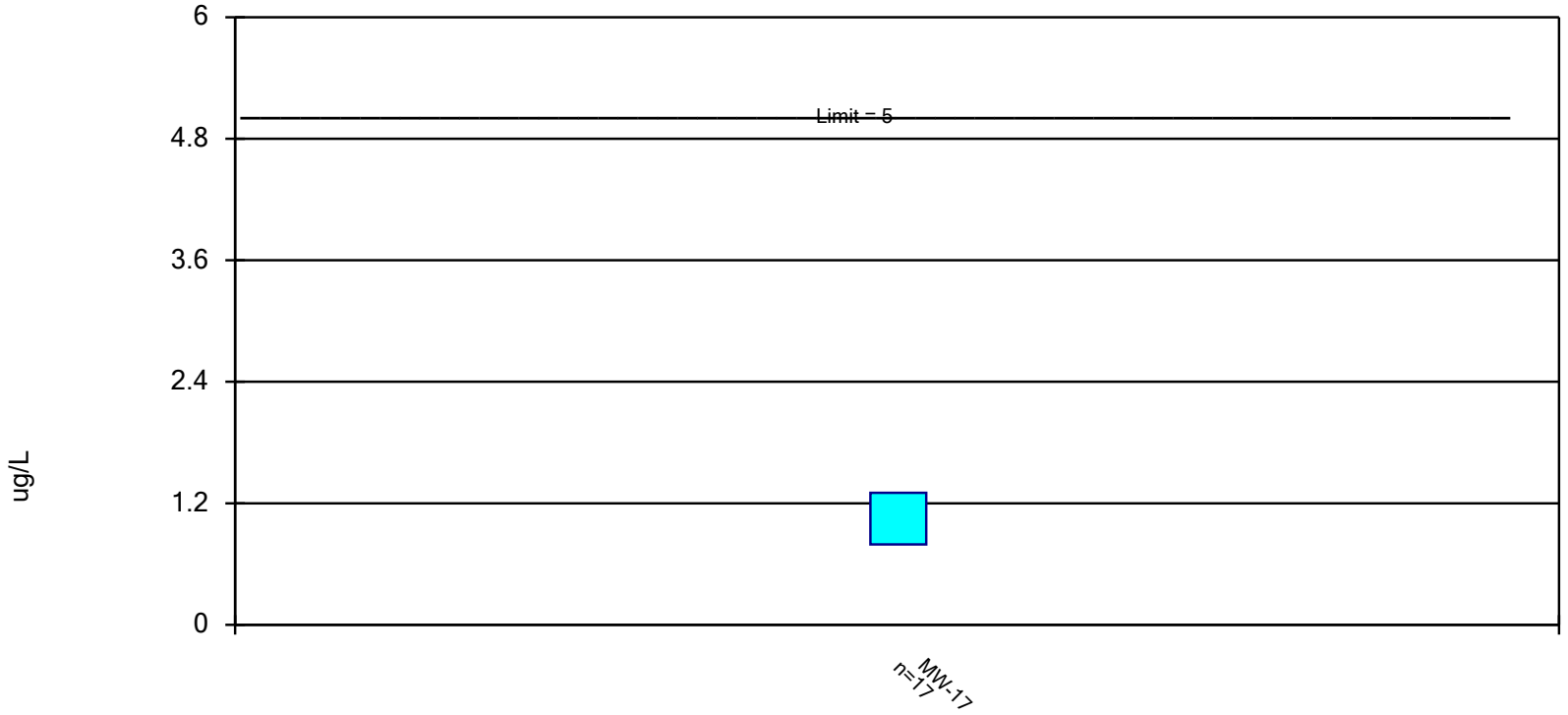



Constituent: 11-Dichloroethane Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

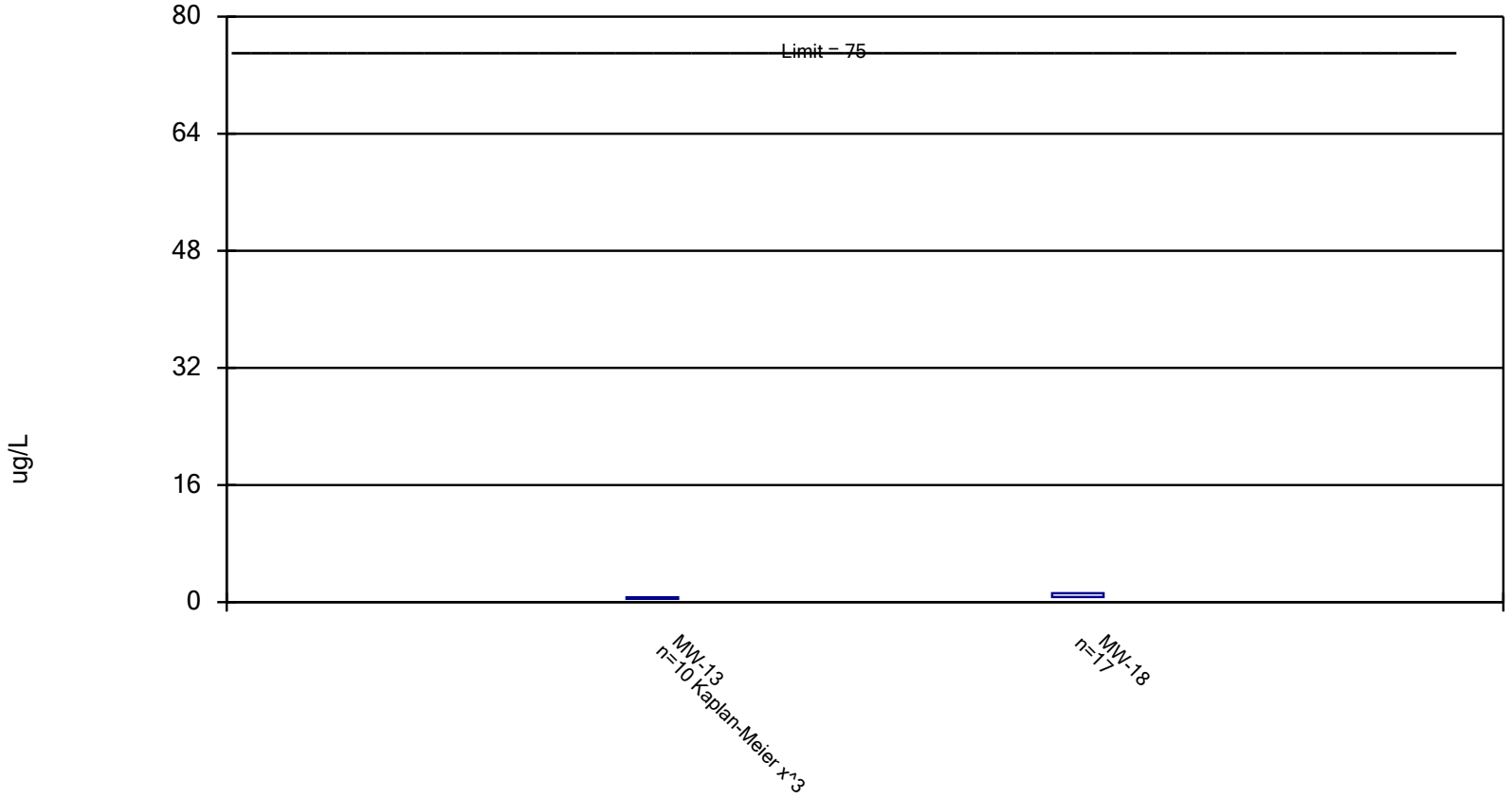



Constituent: 12-Dichloropropane Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

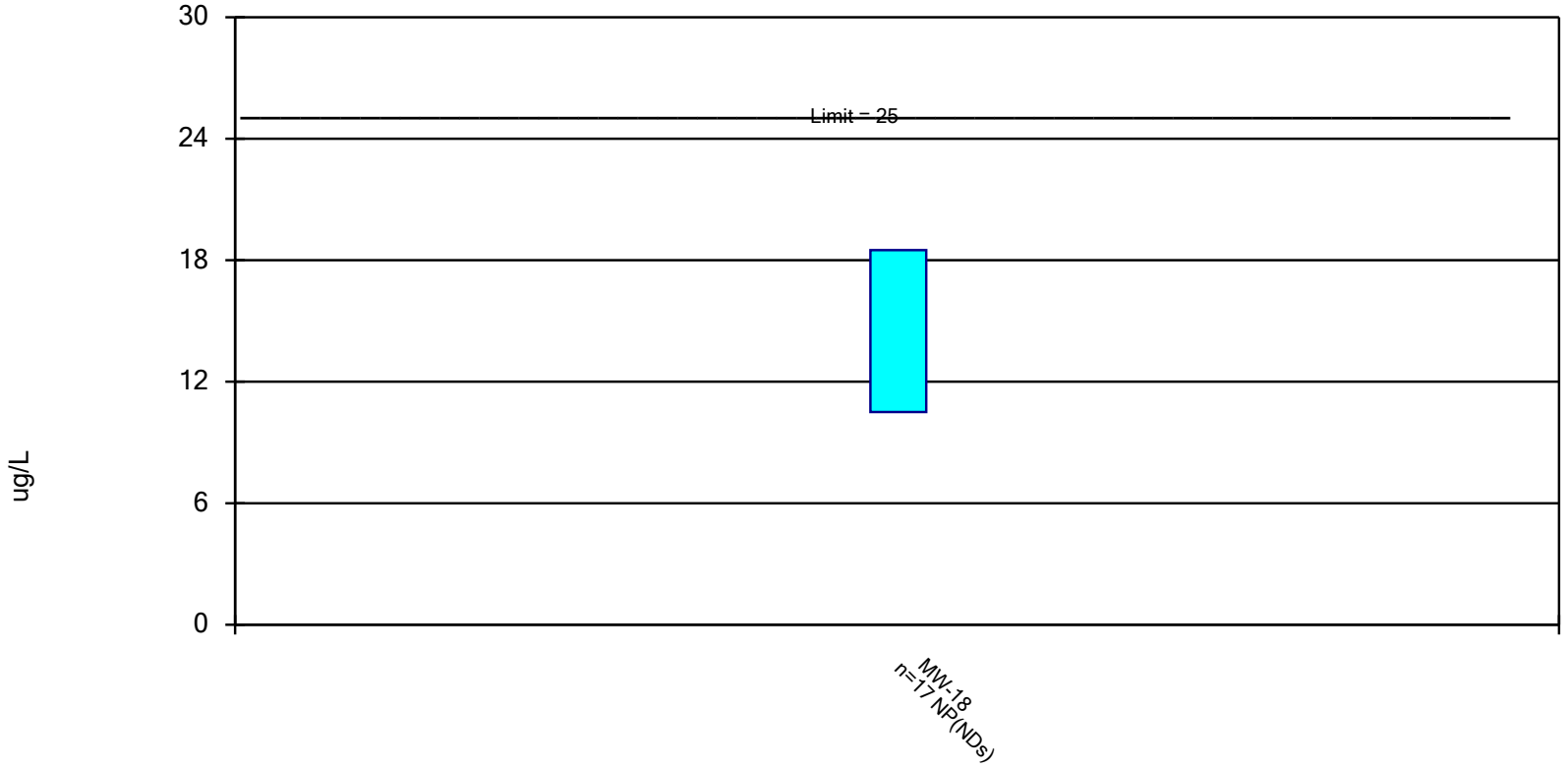



Constituent: 14-Dichlorobenzene Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Non-Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01.

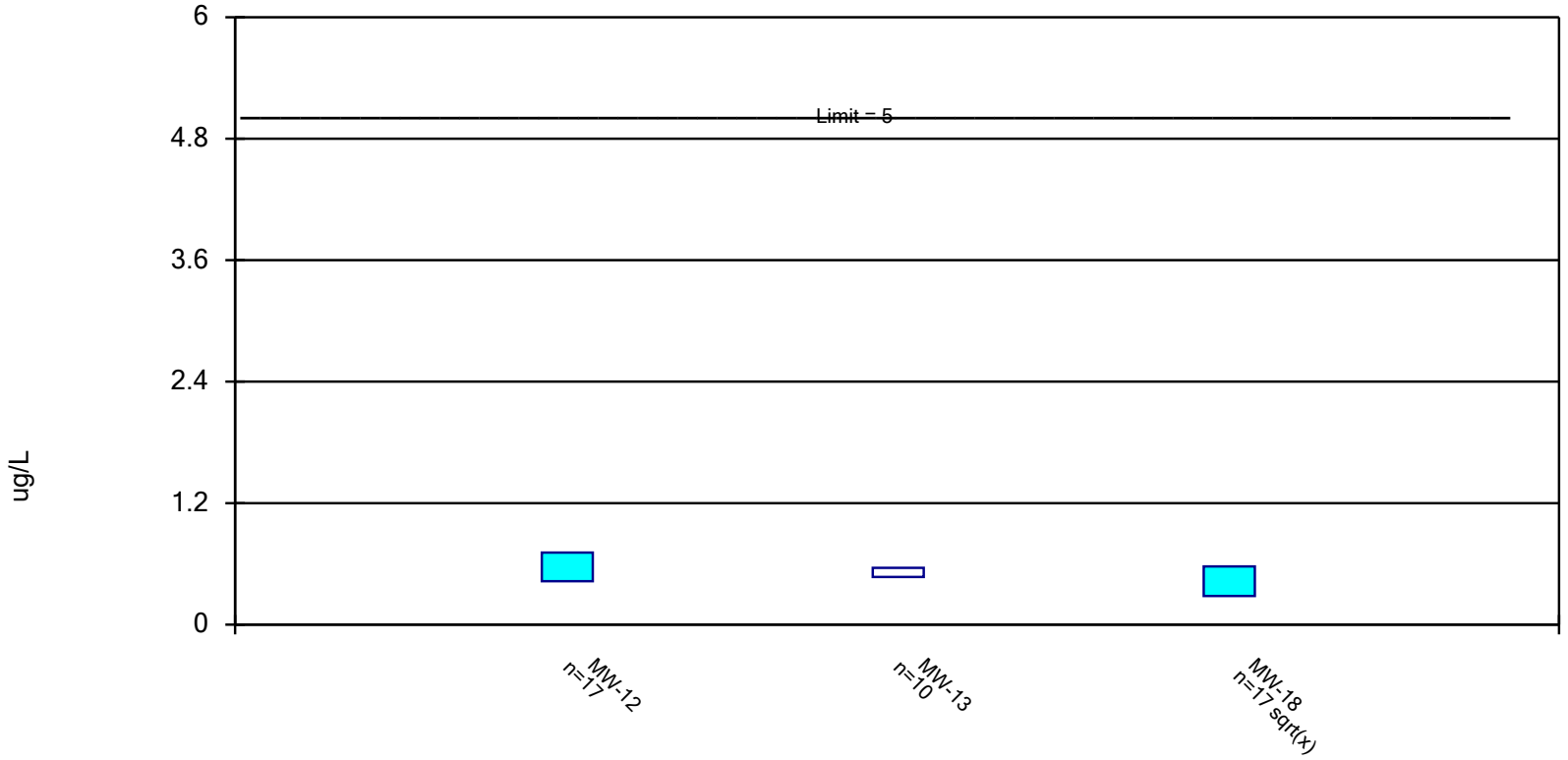



Constituent: Acetone Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

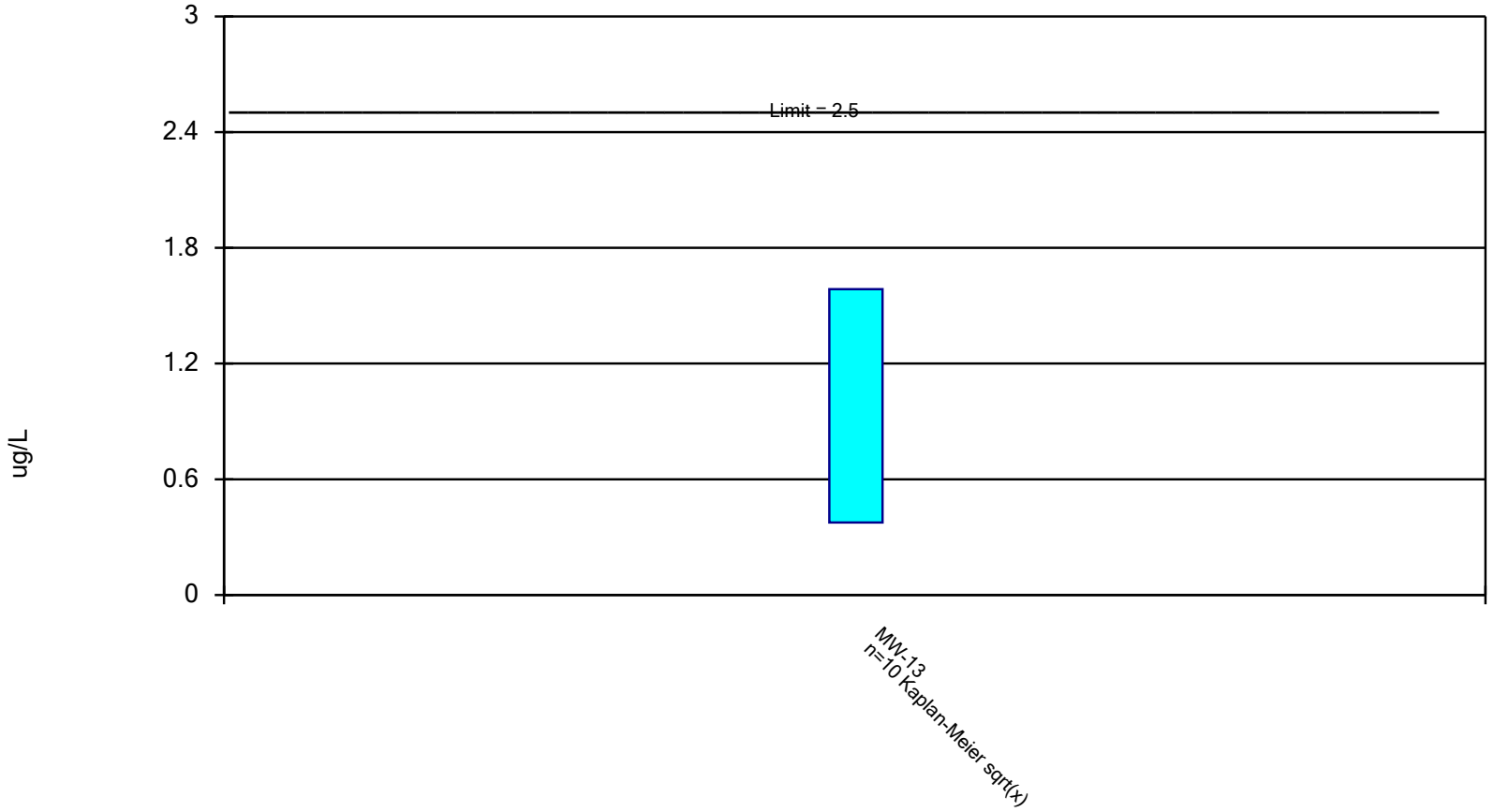



Constituent: Benzene Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

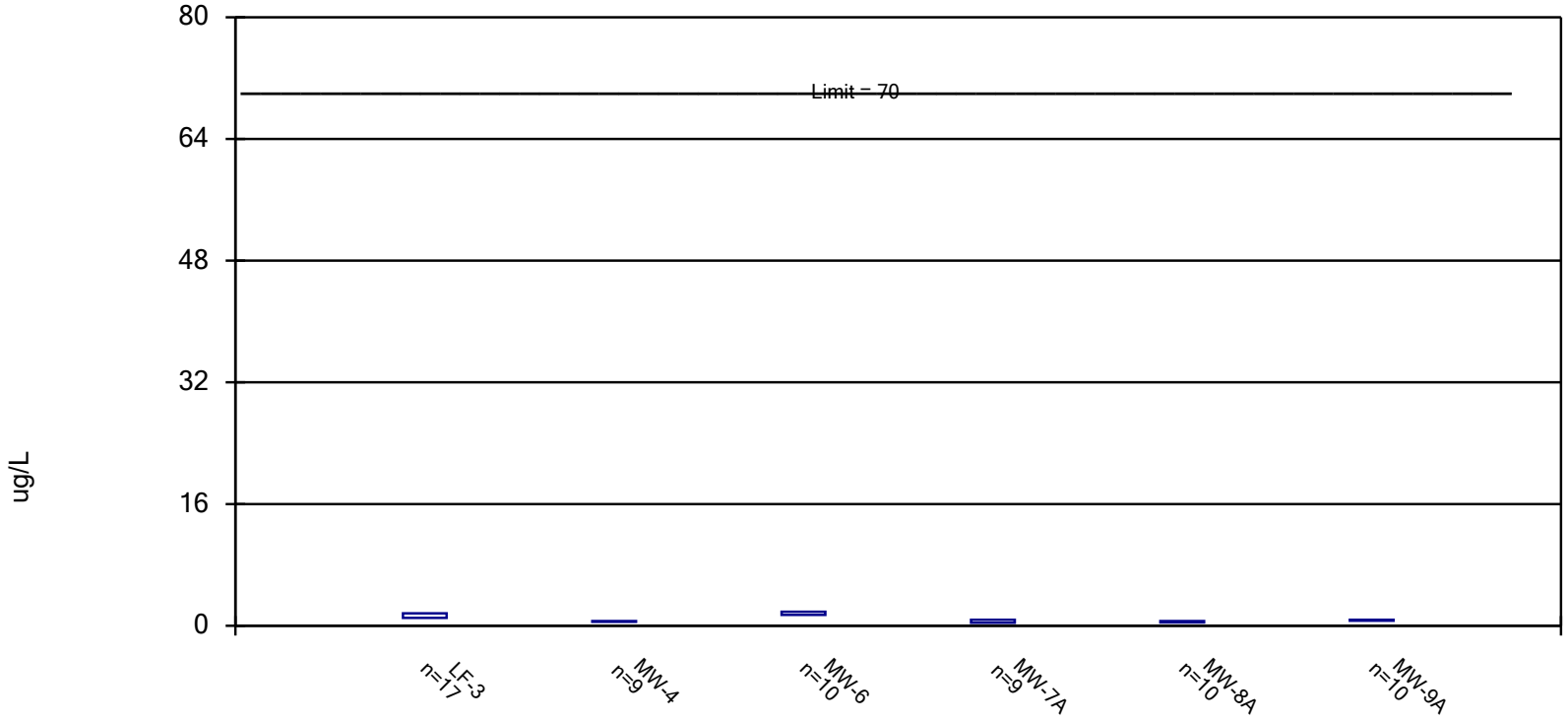



Constituent: Chloroethane Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



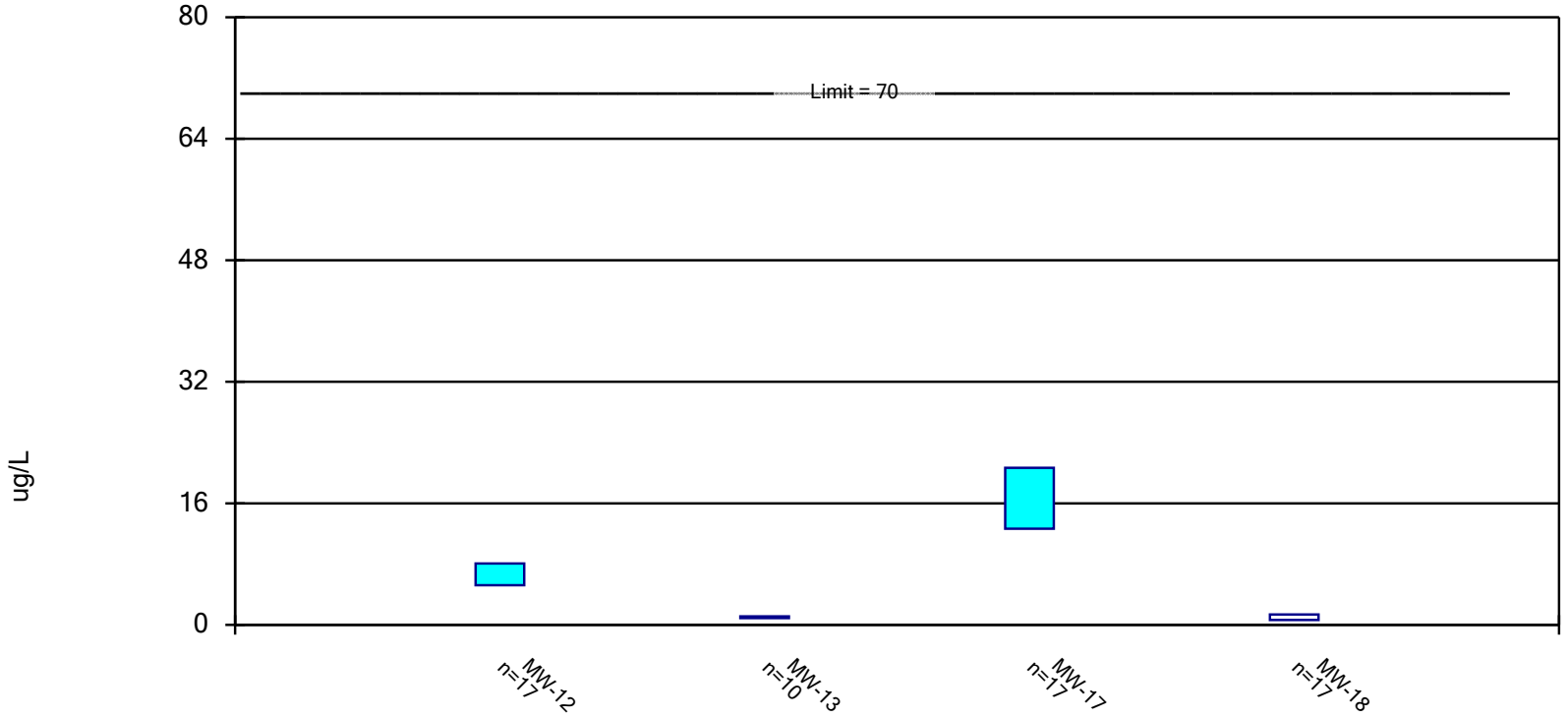

Constituent: cis-12-Dichloroethene

Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.




Constituent: cis-12-Dichloroethene

Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric and Non-Parametric (NP) Confidence Interval, Corrective Action Mode

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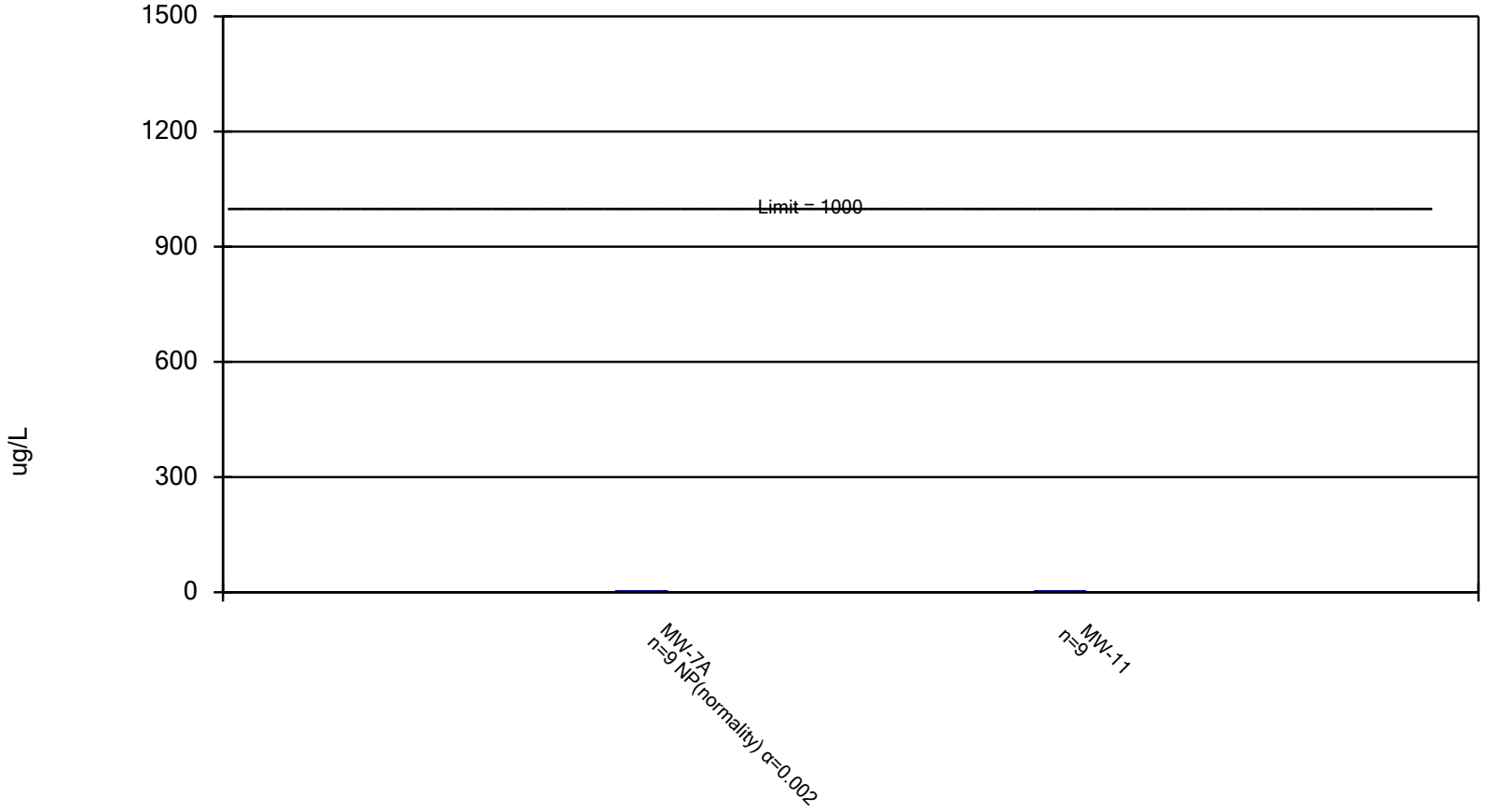
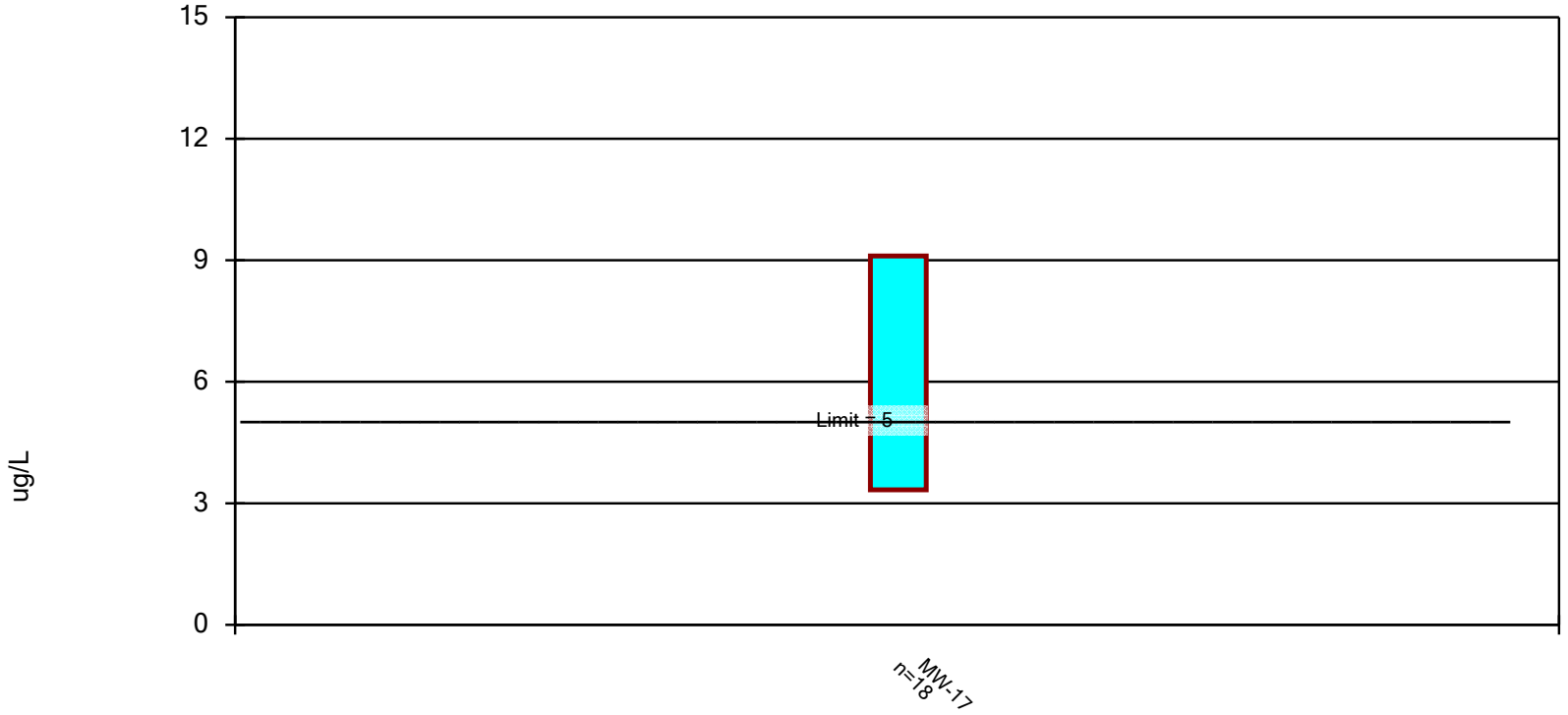



Constituent: Dichlorodifluoromethane Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

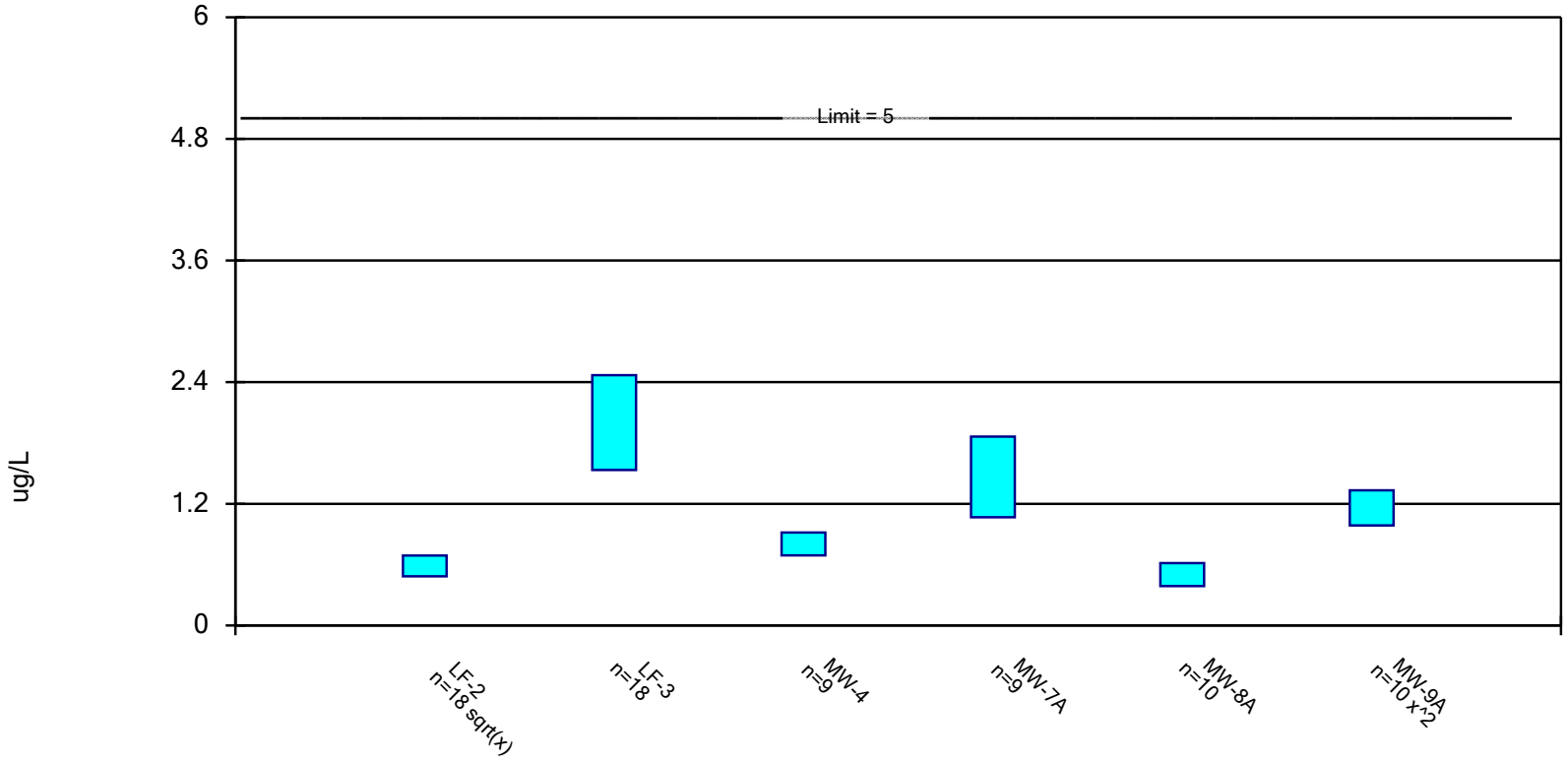



Constituent: Methylene Chloride Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

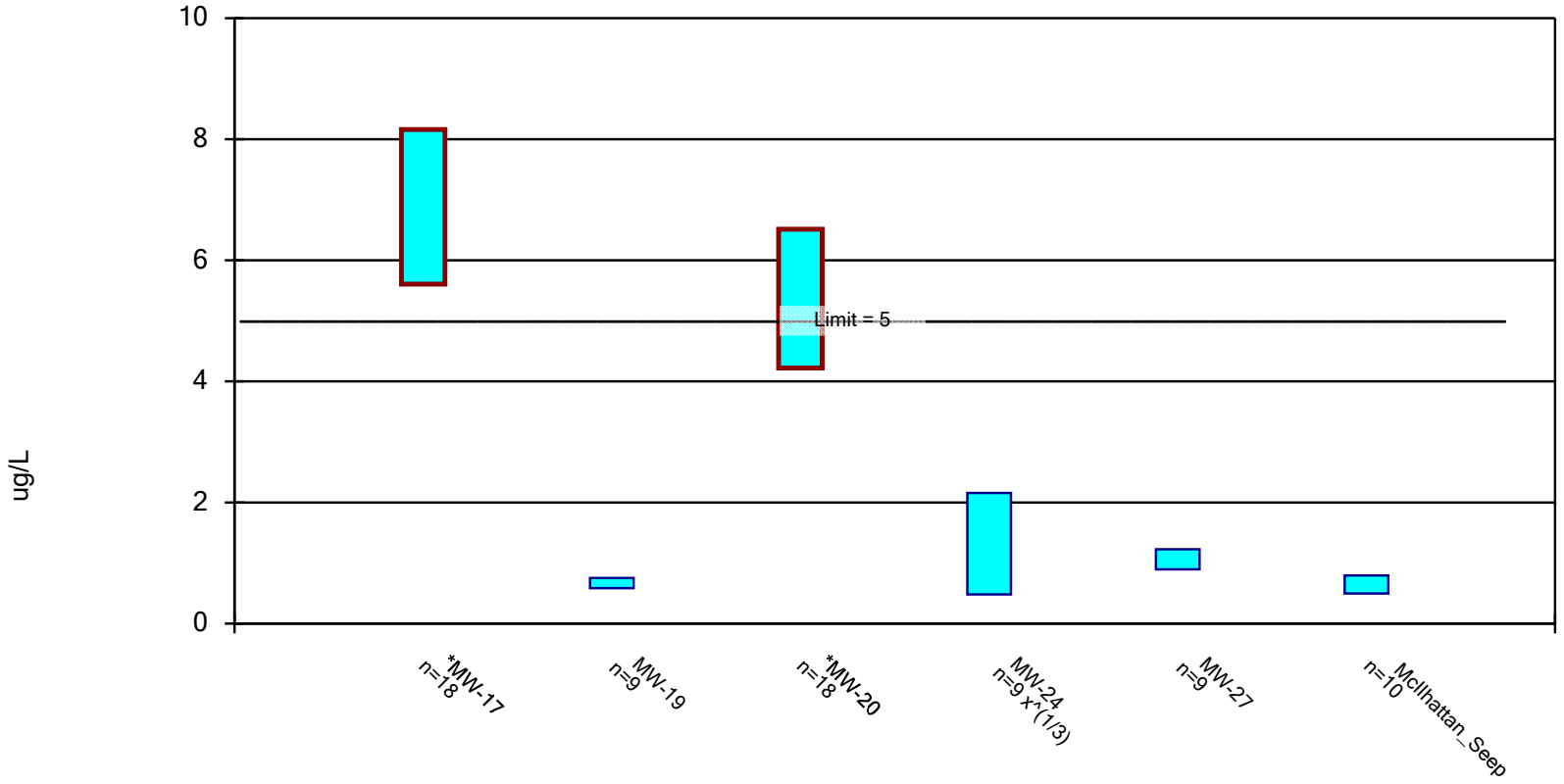



Constituent: Tetrachloroethene Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

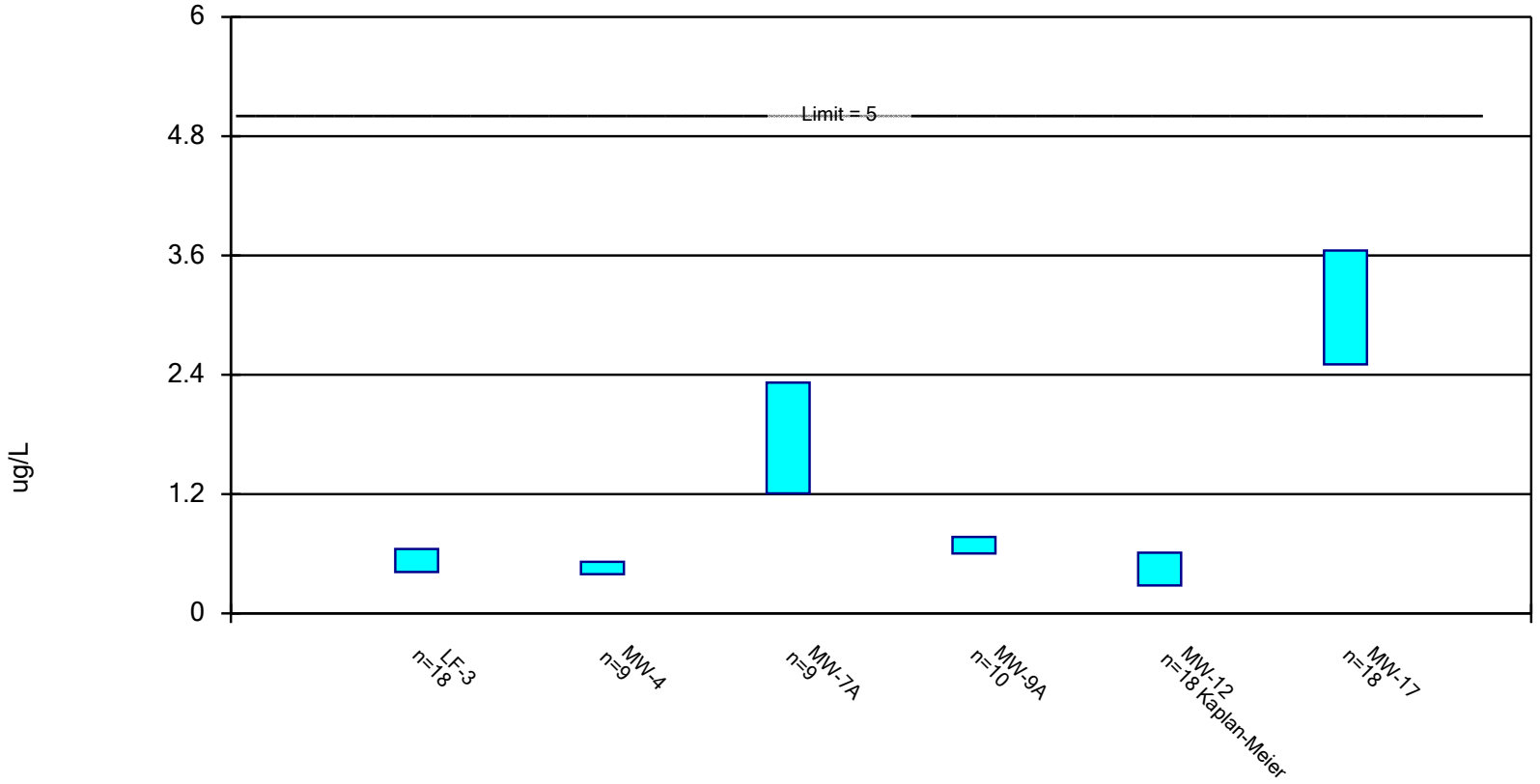



Constituent: Tetrachloroethene Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

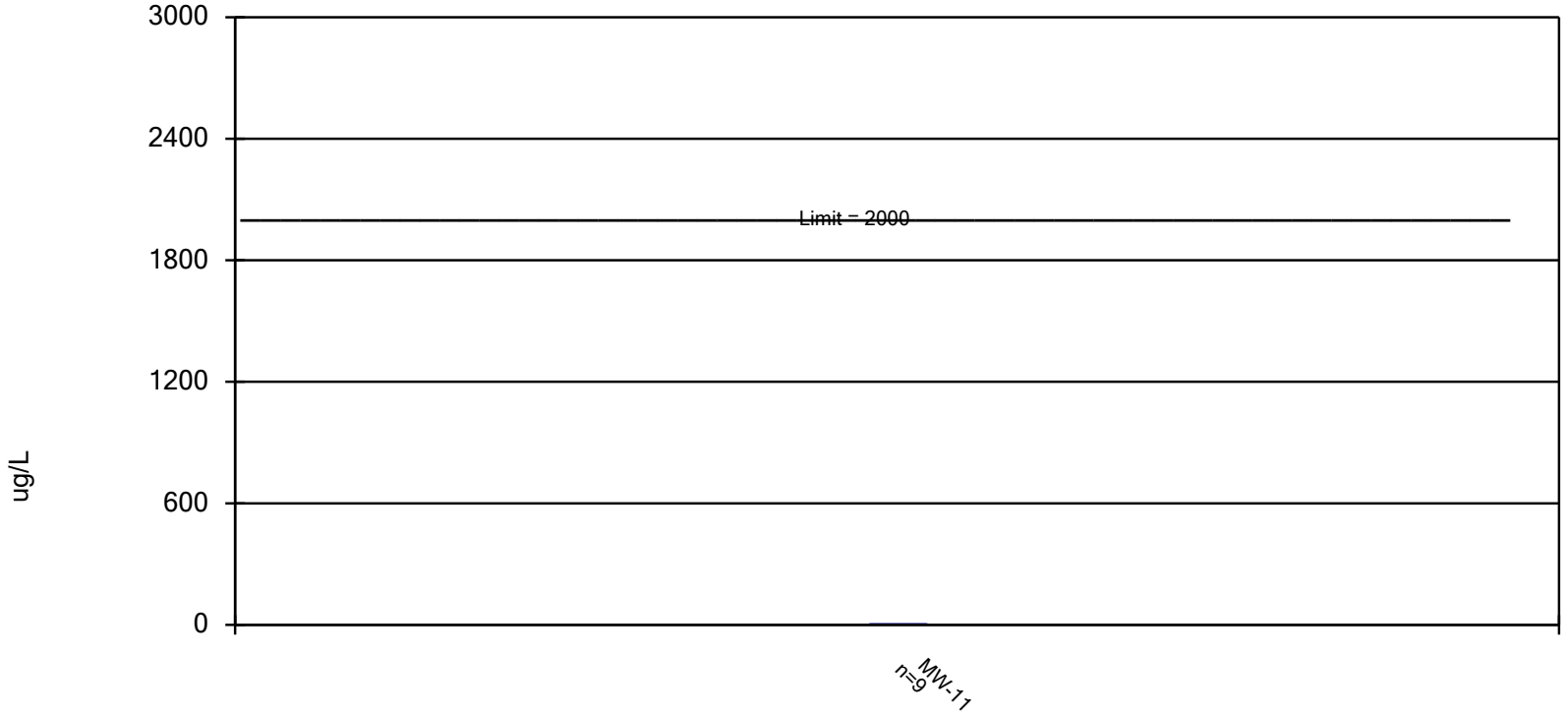



Constituent: Trichloroethene Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric Confidence Interval, Corrective Action Mode

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

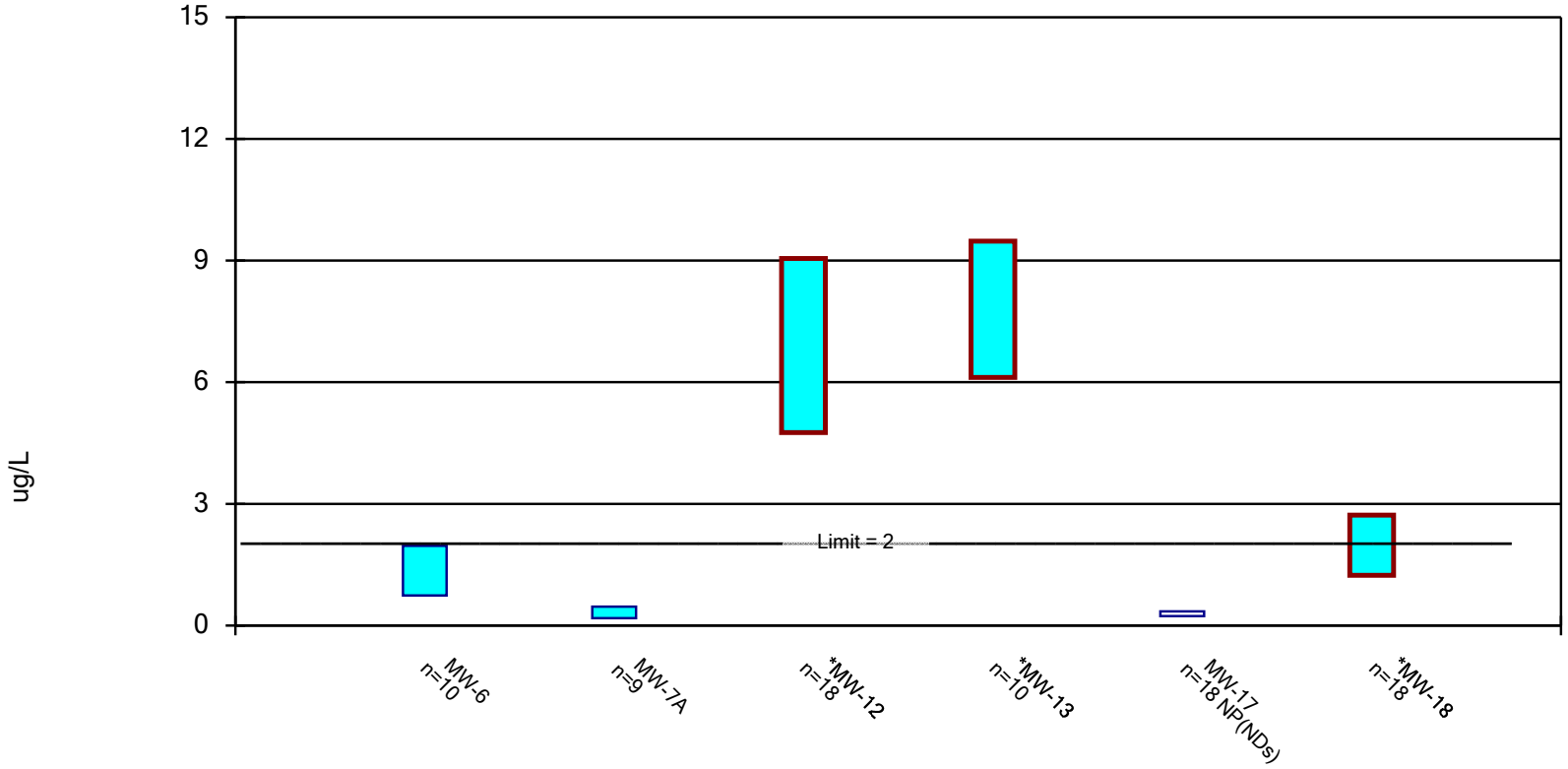



Constituent: Trichlorofluoromethane Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Parametric and Non-Parametric (NP) Confidence Interval, Corrective Action Mode

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

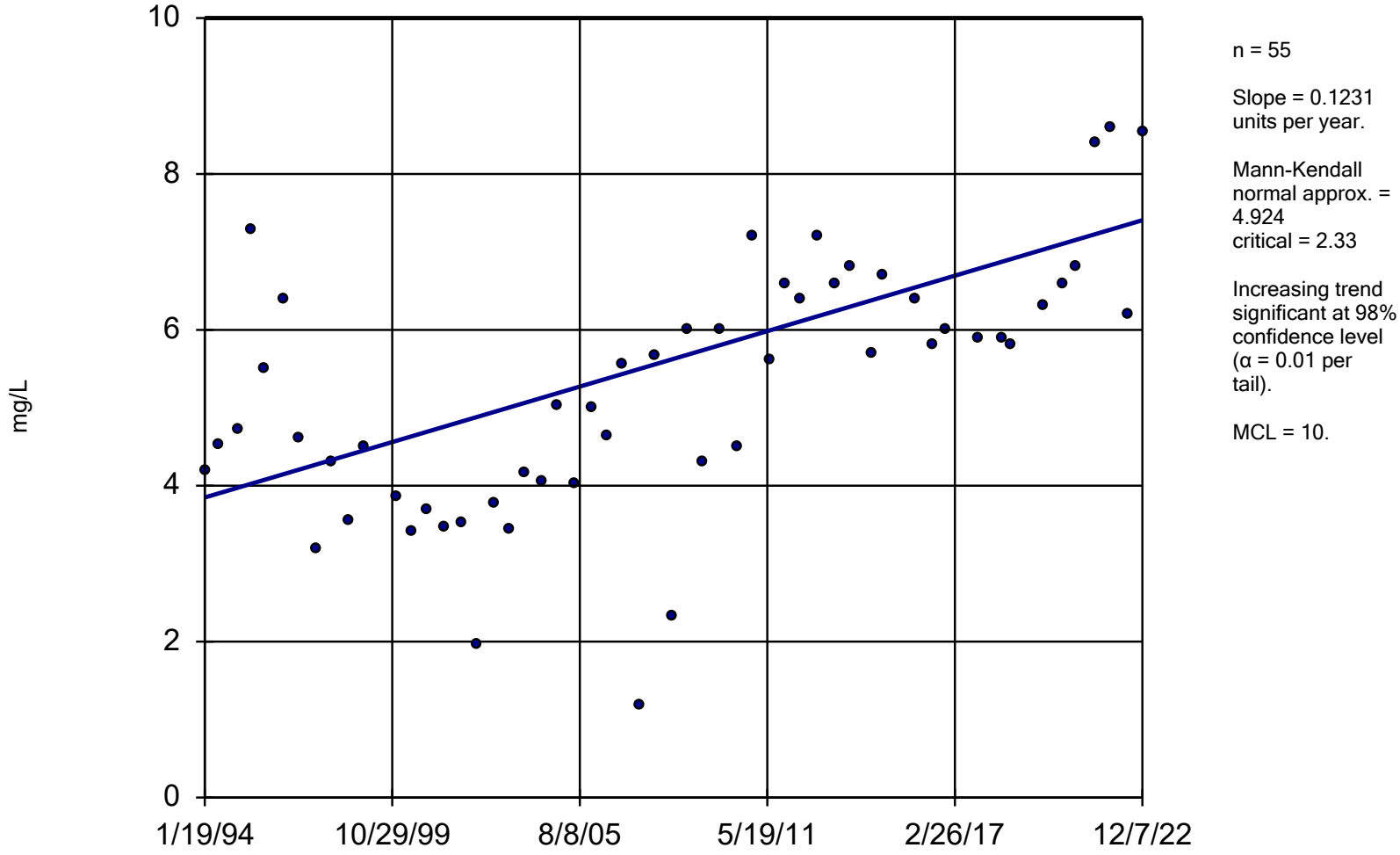



Constituent: Vinyl chloride Analysis Run 3/27/2023 4:31 PM View: 2022.12 Double Quant

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Sen's Slope Estimator

## McILHATTAN_SEEP




n = 55

Slope = 0.1231 units per year.

Mann-Kendall normal approx. = 4.924
critical = 2.33

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

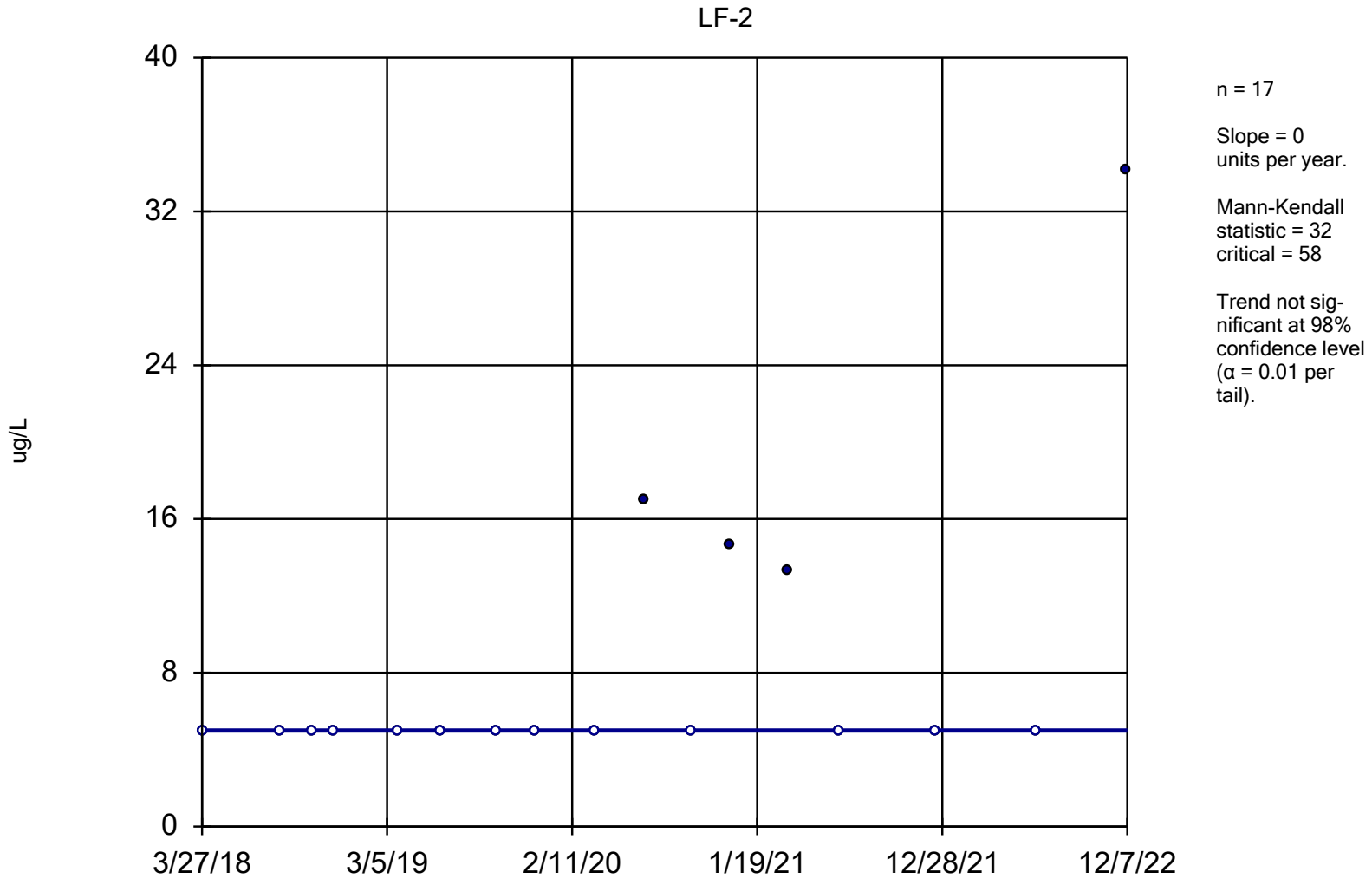
MCL = 10.

Constituent: Nitrogen, NO2 plus NO3  Analysis Run 3/27/2023 7:14 PM

Bozeman Landfill  Client: Tetra Tech, Inc.  Data: Bozeman Lf Inorganics

Hollow symbols indicate censored values.

# Sen's Slope Estimator

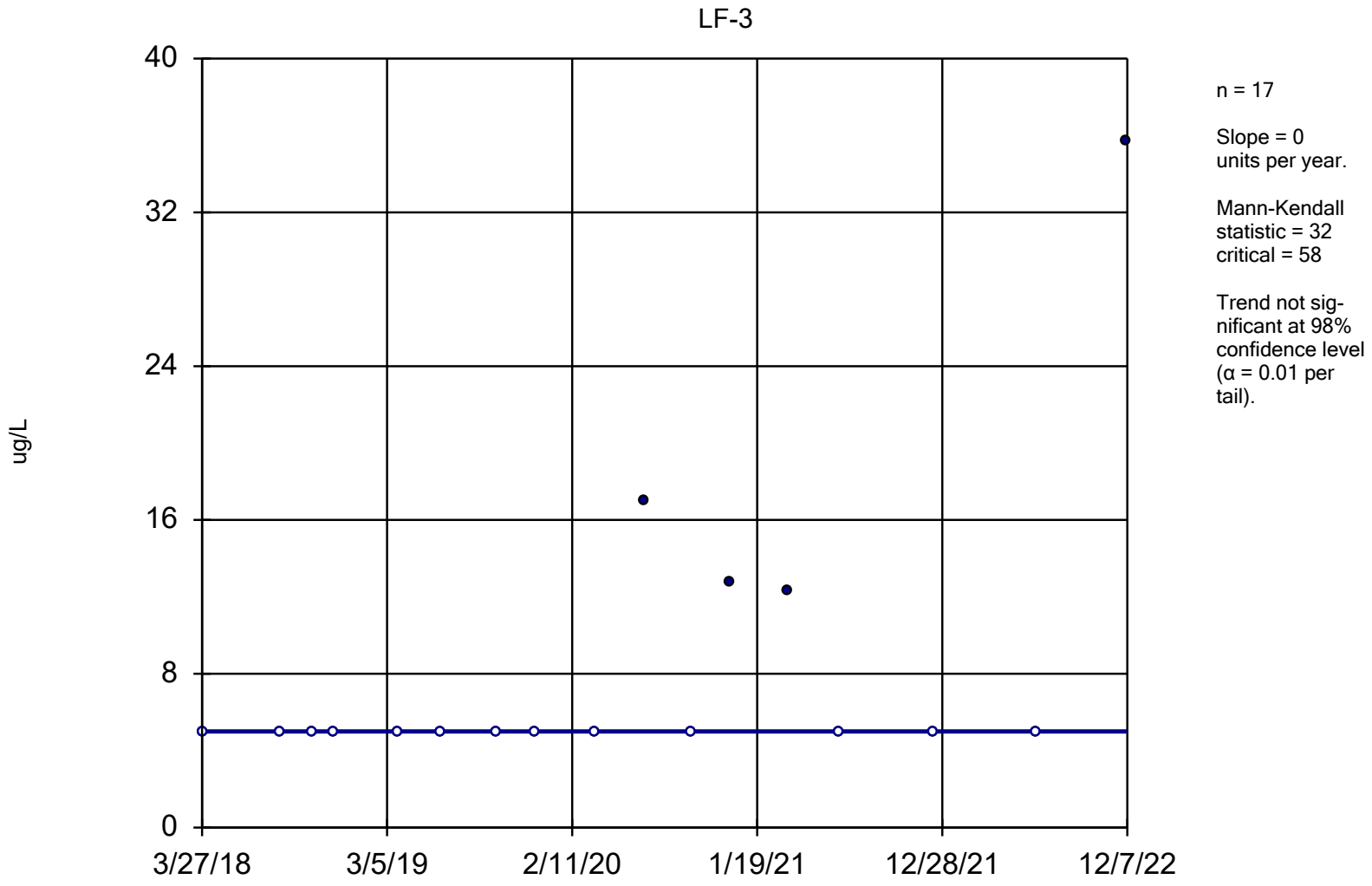



Constituent: 2-Propanol  Analysis Run 3/27/2023 6:08 PM

Bozeman Landfill  Client: Tetra Tech, Inc.  Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

# Sen's Slope Estimator

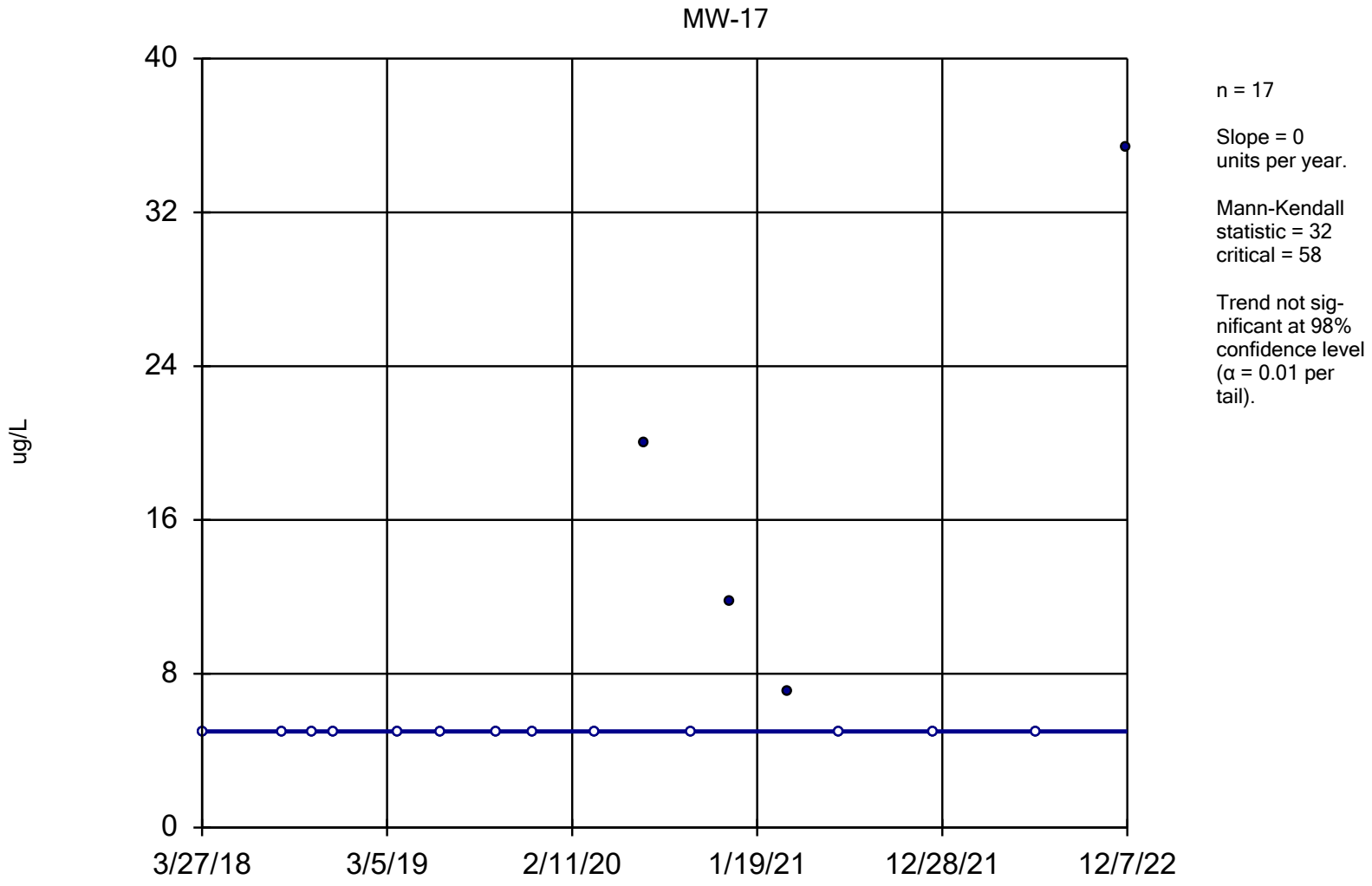



Constituent: 2-Propanol  Analysis Run 3/27/2023 6:08 PM

Bozeman Landfill  Client: Tetra Tech, Inc.  Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

# Sen's Slope Estimator

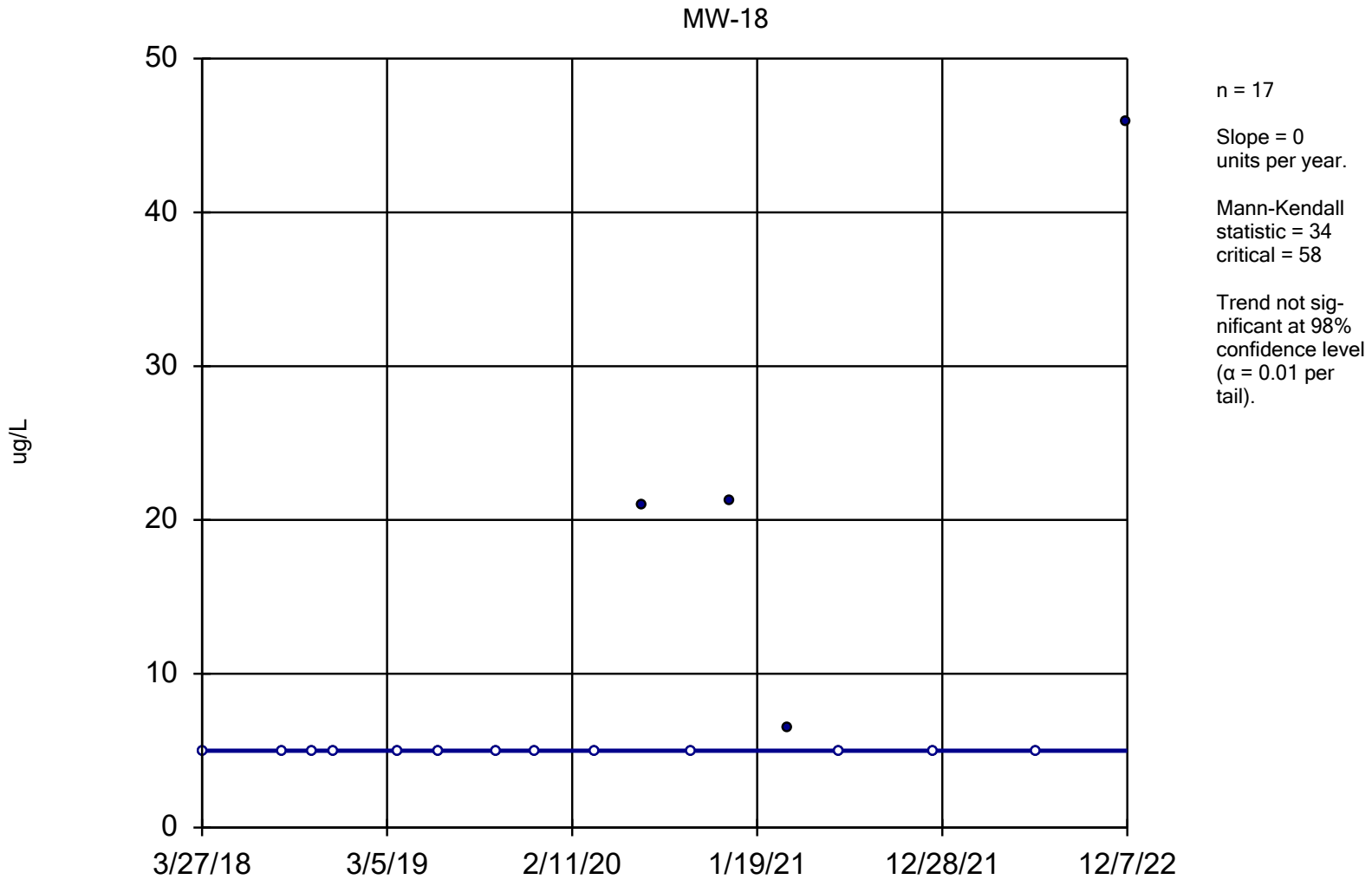



Constituent: 2-Propanol  Analysis Run 3/27/2023 6:08 PM

Bozeman Landfill  Client: Tetra Tech, Inc.  Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

# Sen's Slope Estimator

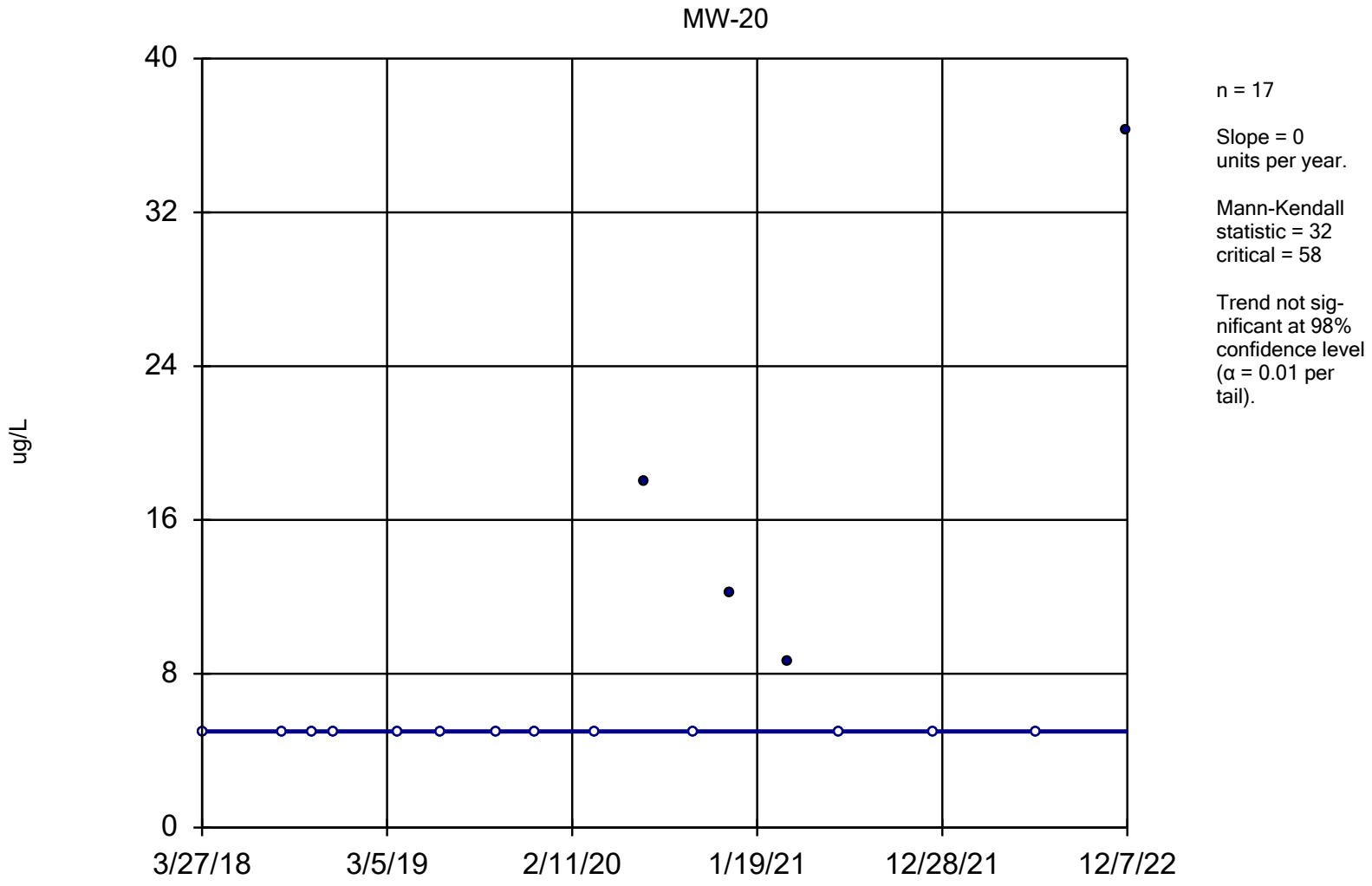



Constituent: 2-Propanol  Analysis Run 3/27/2023 6:08 PM

Bozeman Landfill  Client: Tetra Tech, Inc.  Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

# Sen's Slope Estimator

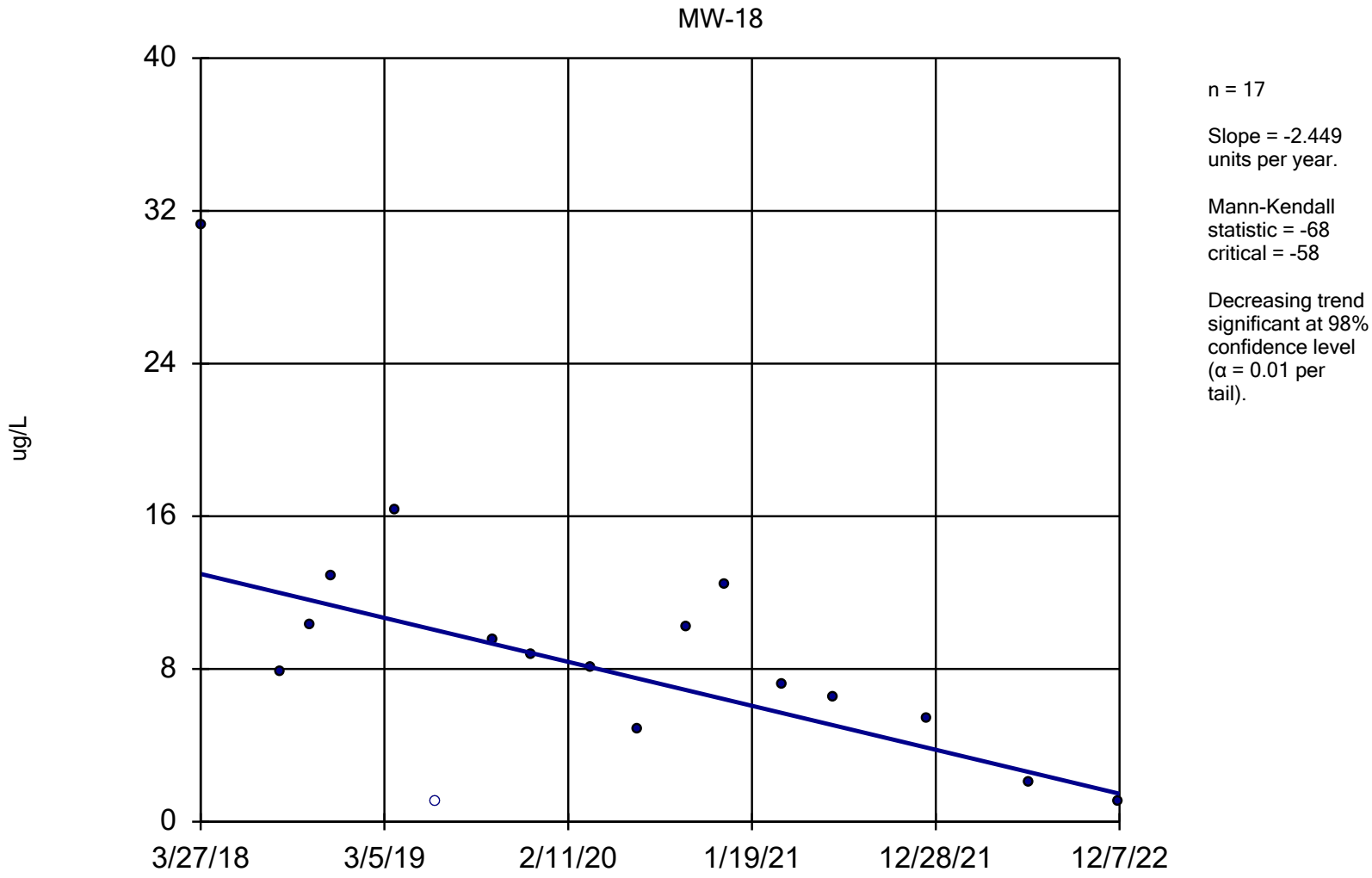



Constituent: 2-Propanol  Analysis Run 3/27/2023 6:08 PM

Bozeman Landfill  Client: Tetra Tech, Inc.  Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

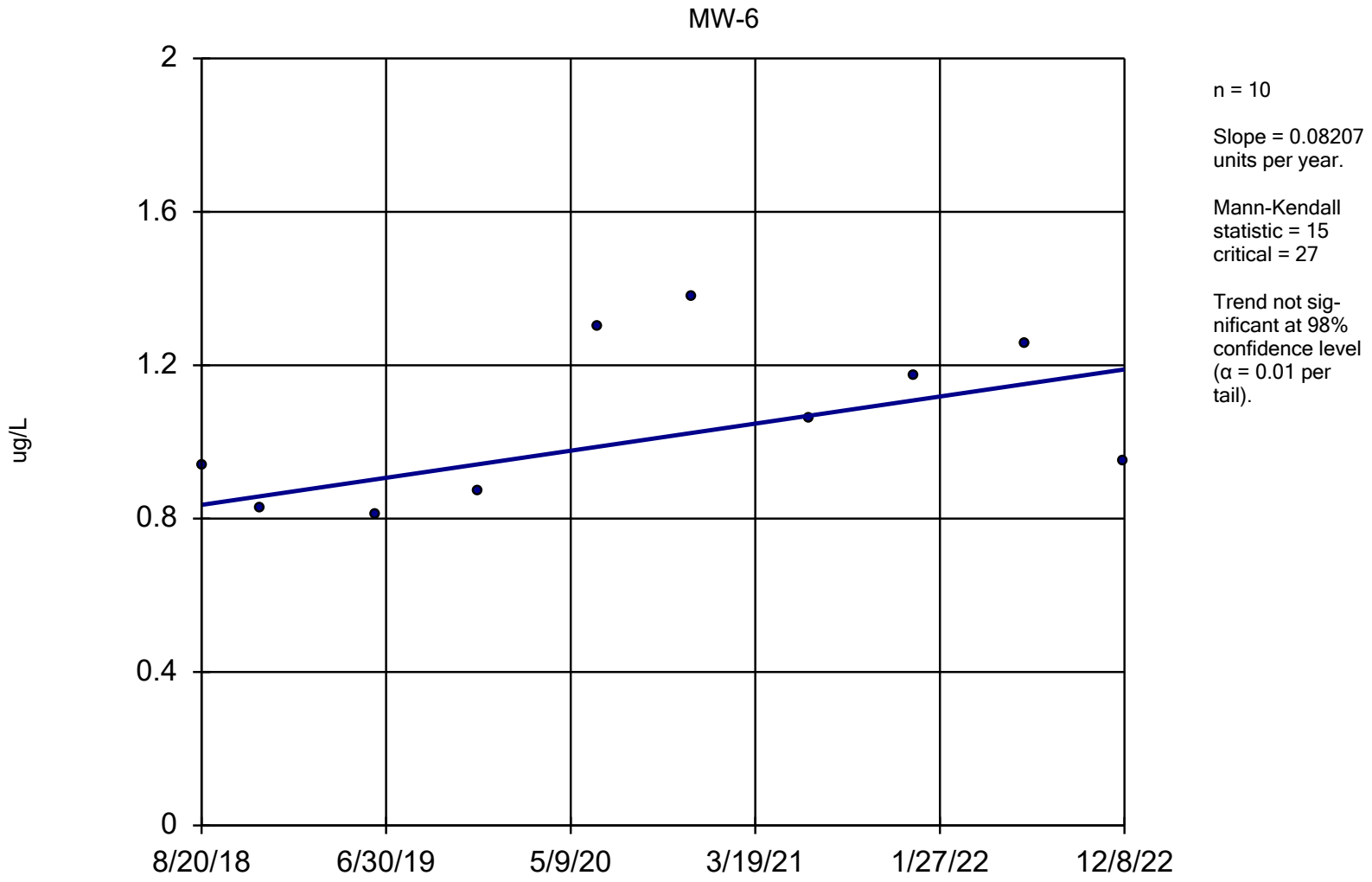
# Sen's Slope Estimator




Constituent: Tetrahydrofuran Analysis Run 3/28/2023 1:51 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

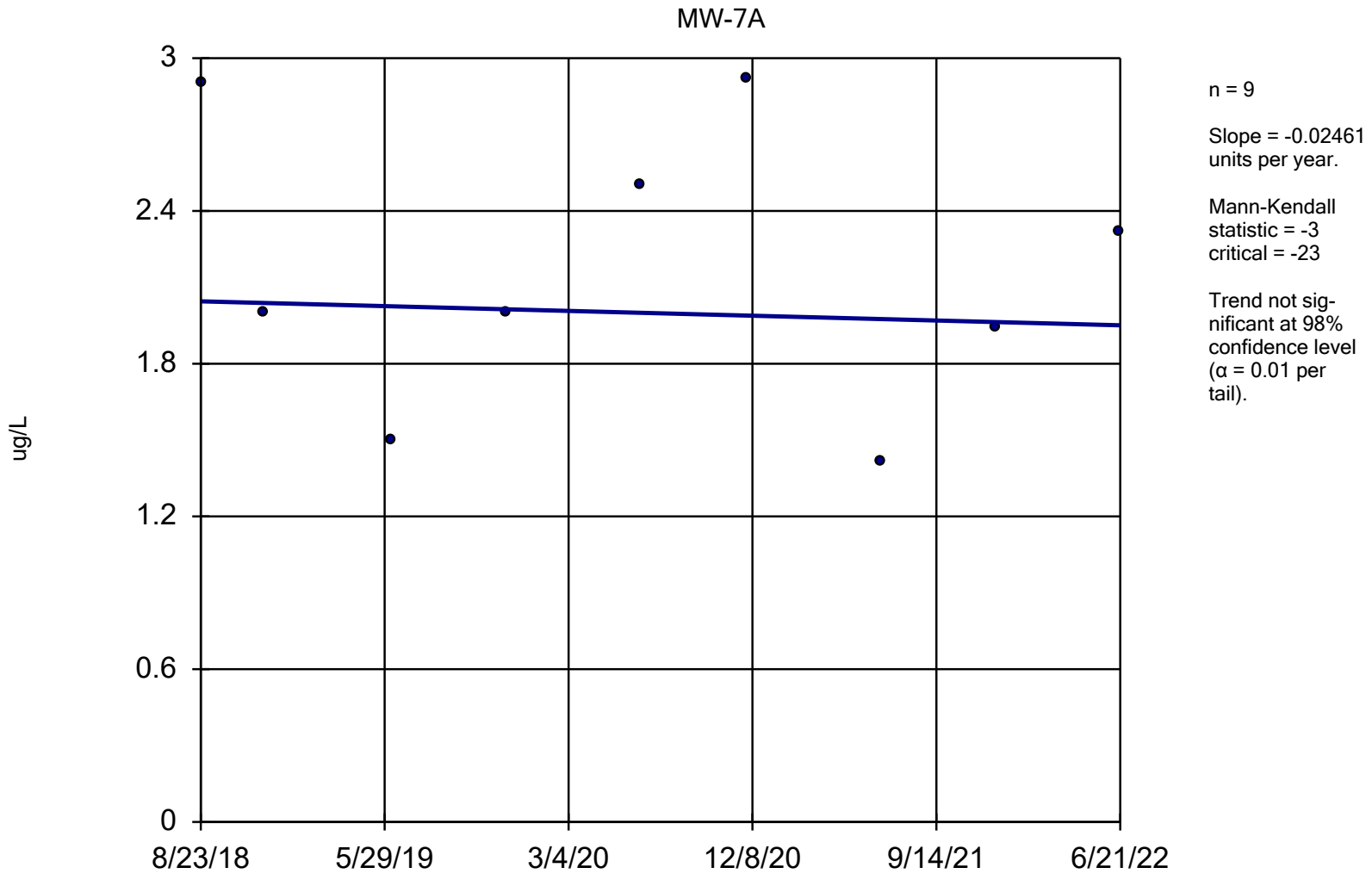
# Sen's Slope Estimator




Constituent: 11-Dichloroethane Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Sen's Slope Estimator

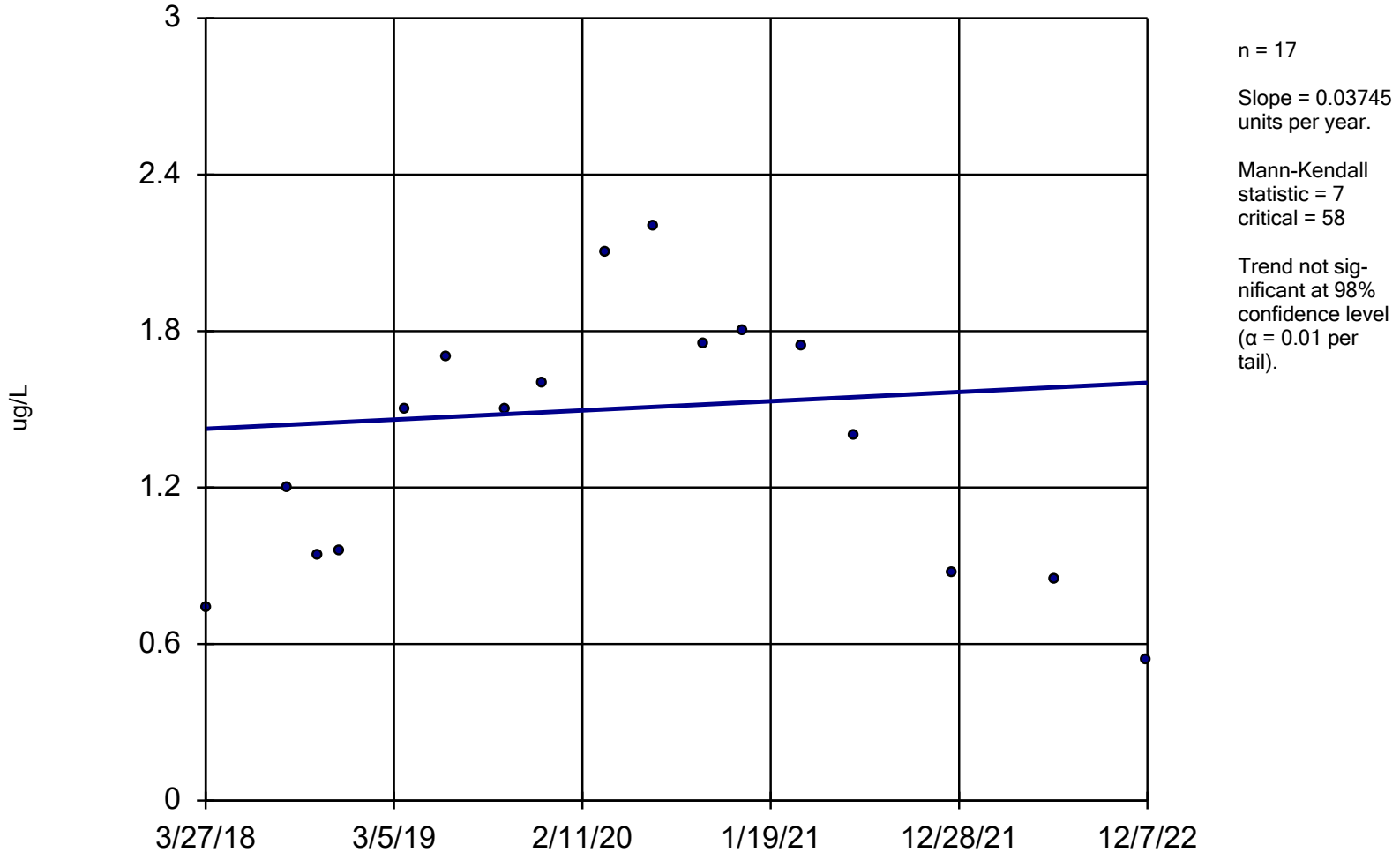



Constituent: 11-Dichloroethane Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Sen's Slope Estimator

MW-12




n = 17

Slope = 0.03745 units per year.

Mann-Kendall statistic = 7
critical = 58

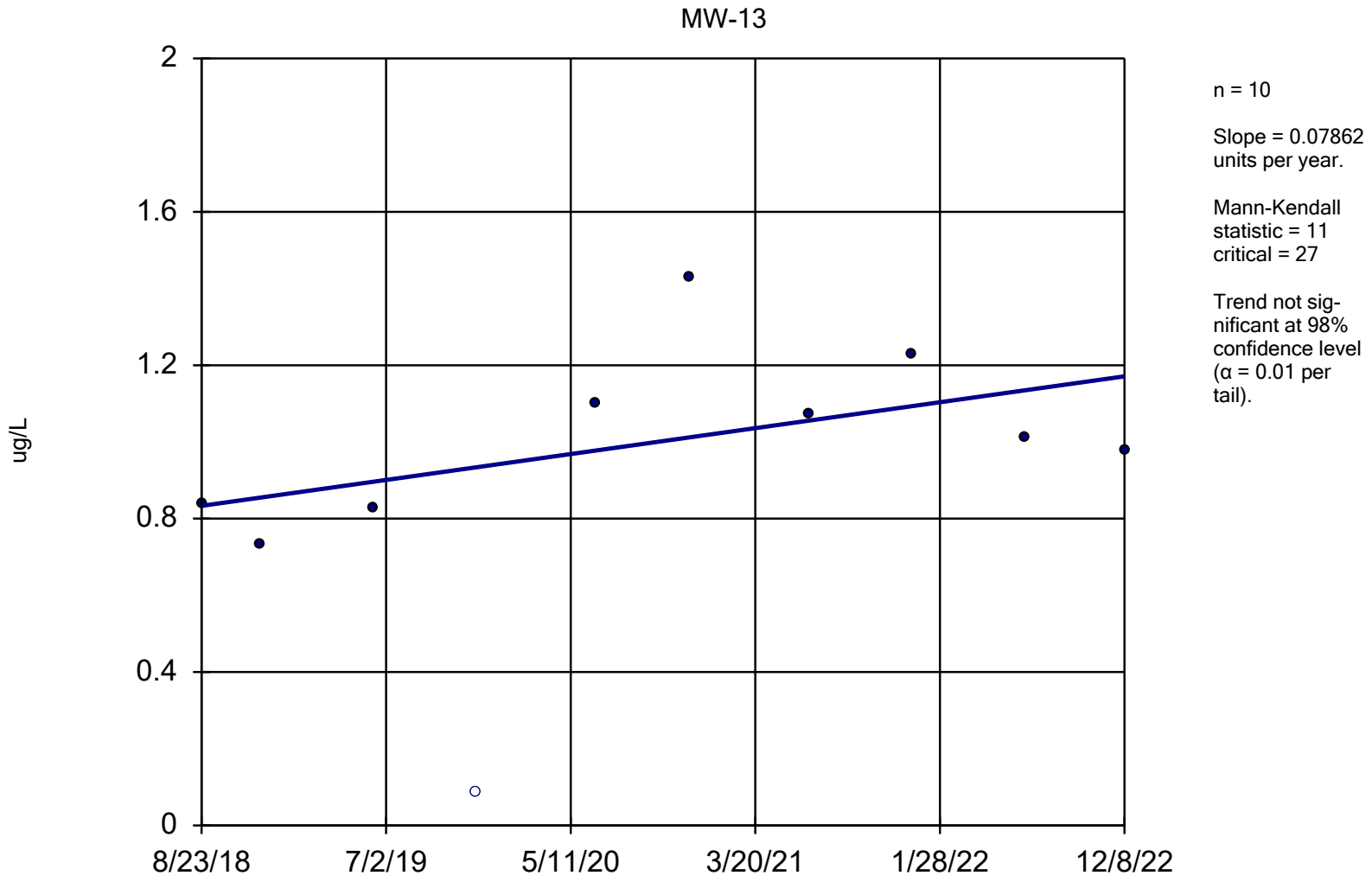
Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: 11-Dichloroethane Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

# Sen's Slope Estimator

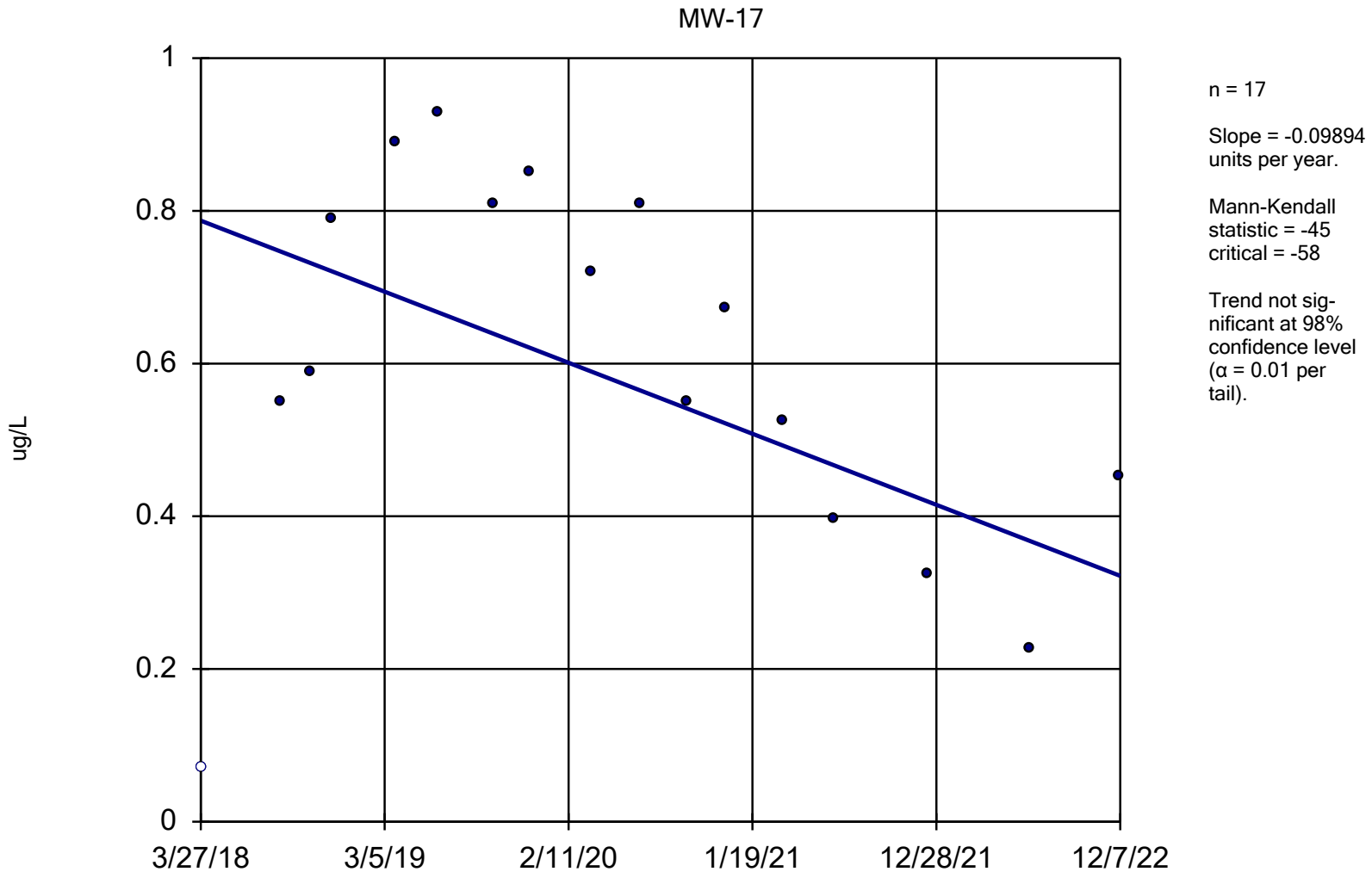



Constituent: 11-Dichloroethane Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

# Sen's Slope Estimator

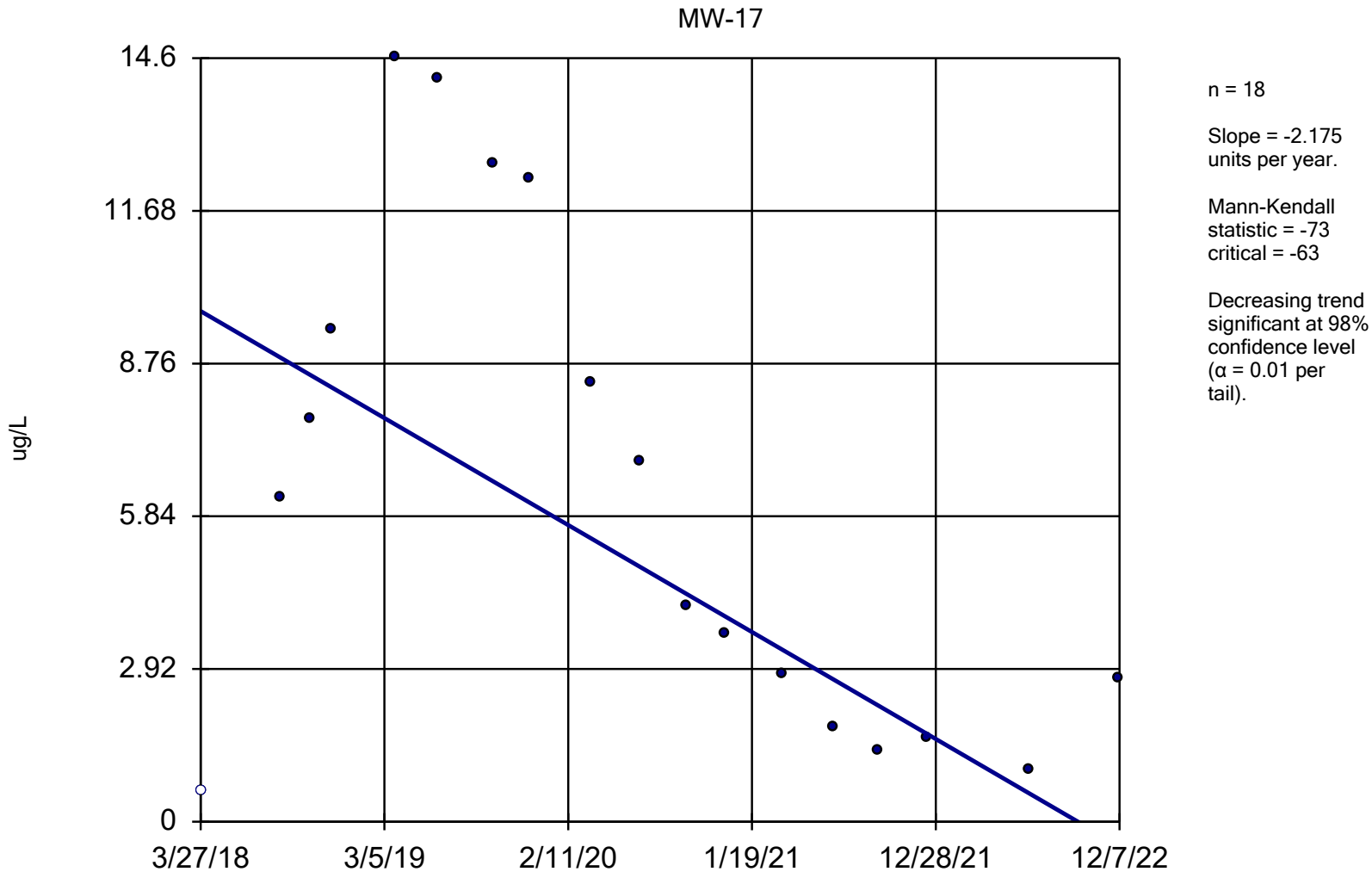



Constituent: 11-Dichloroethane Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

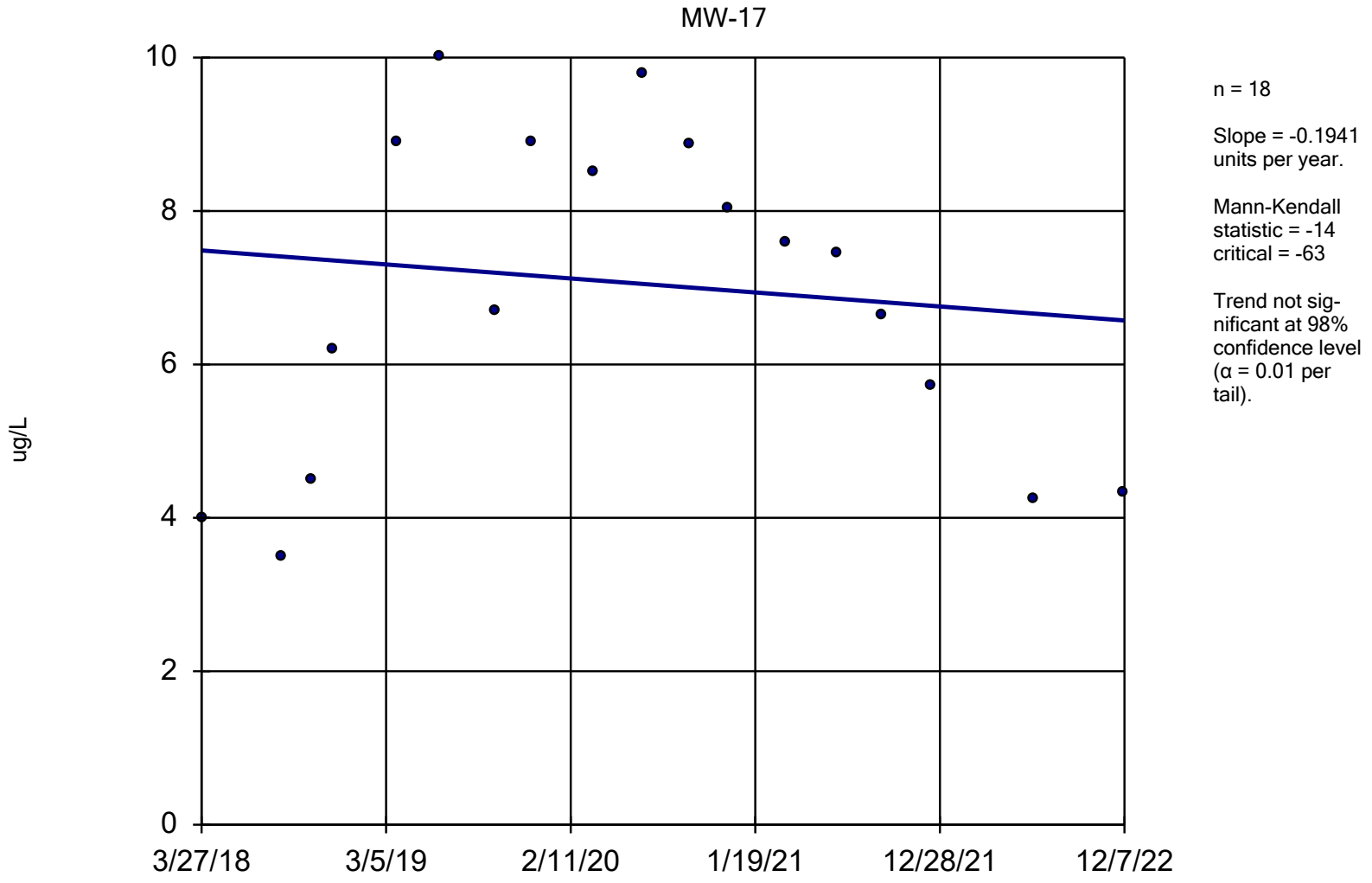
# Sen's Slope Estimator




Constituent: Methylene Chloride Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Sen's Slope Estimator

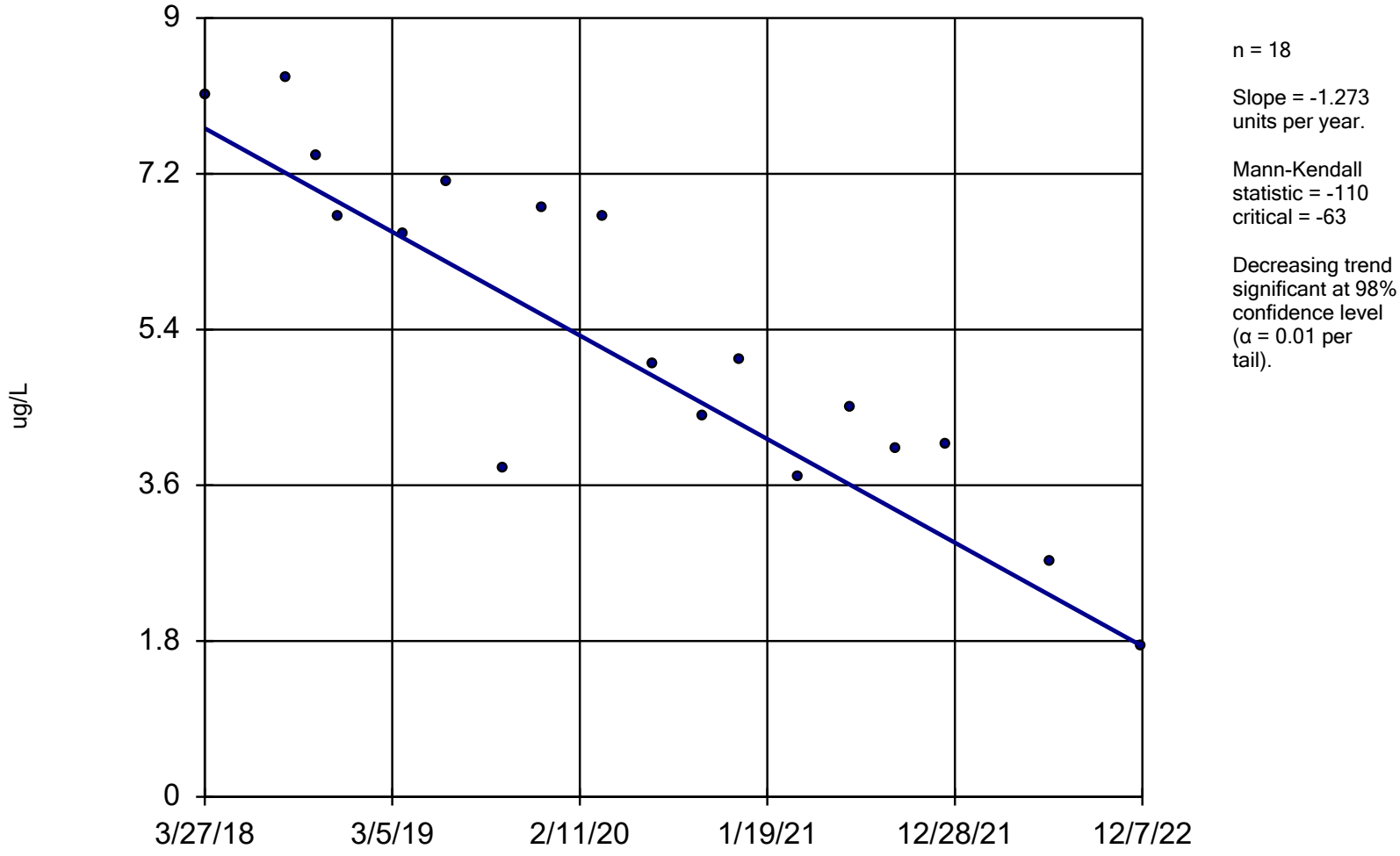



Constituent: Tetrachloroethene Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Sen's Slope Estimator

MW-20




n = 18

Slope = -1.273 units per year.

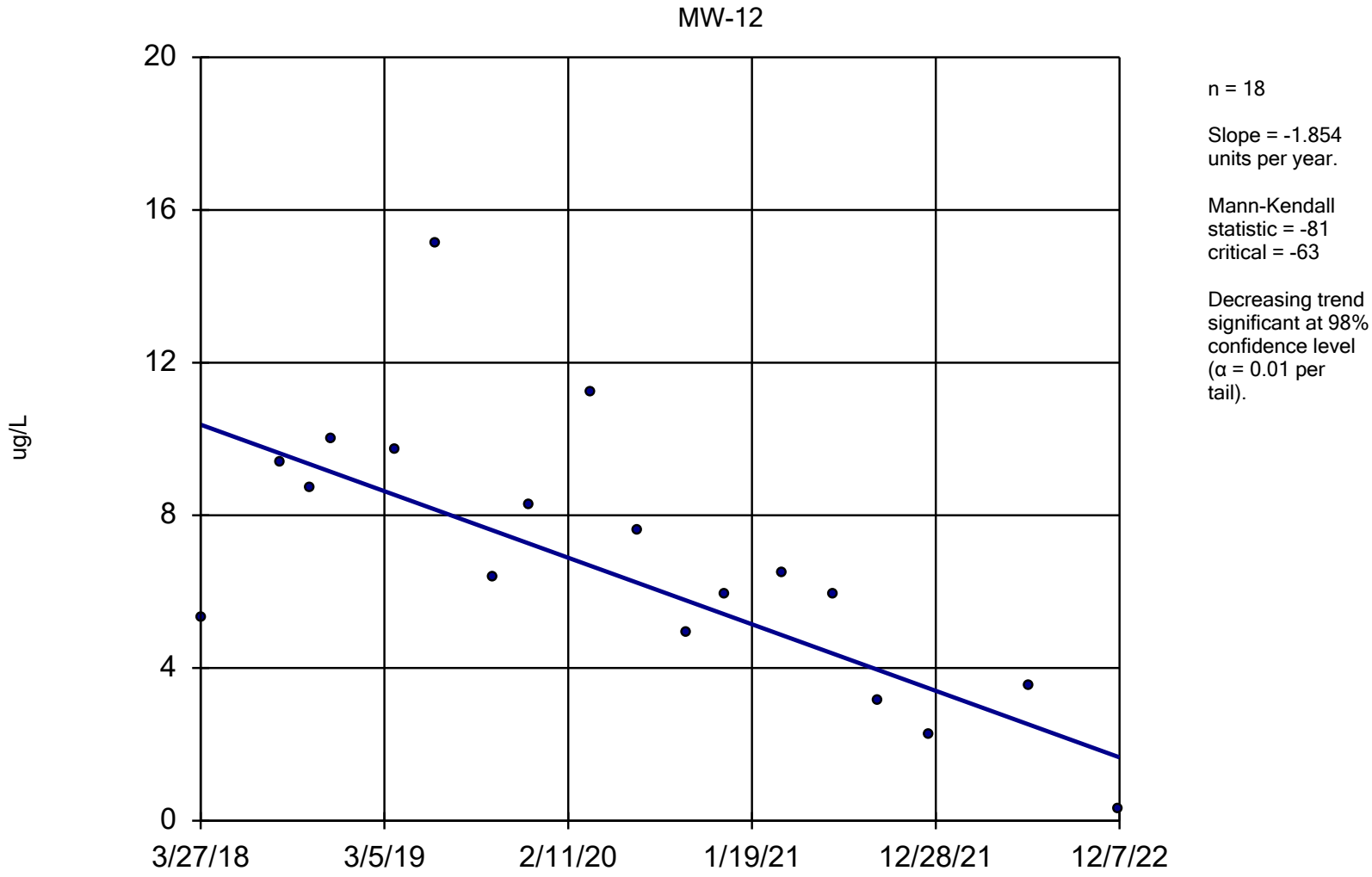
Mann-Kendall statistic = -110
critical = -63

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Tetrachloroethene Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

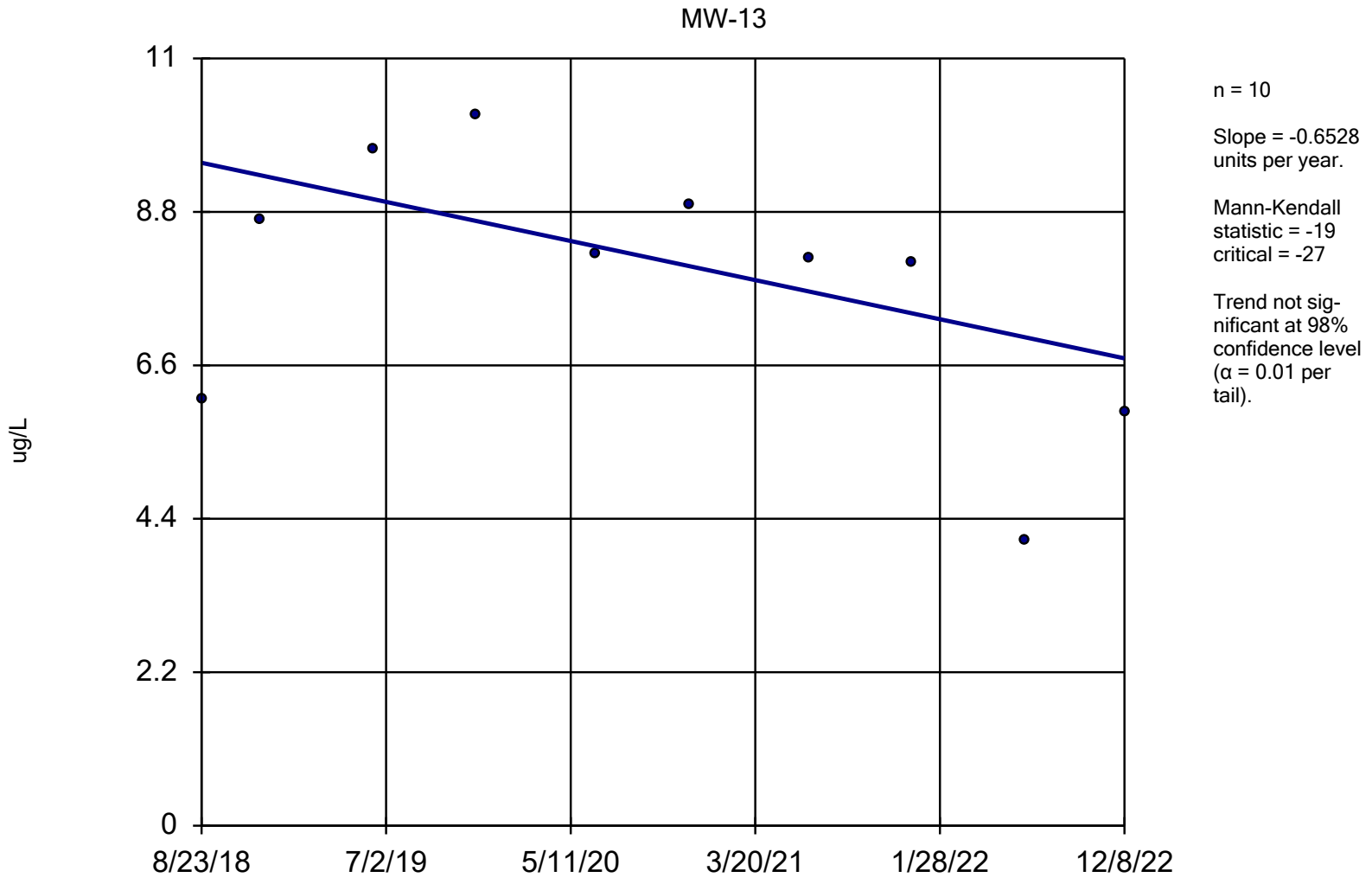
# Sen's Slope Estimator




Constituent: Vinyl chloride Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

# Sen's Slope Estimator

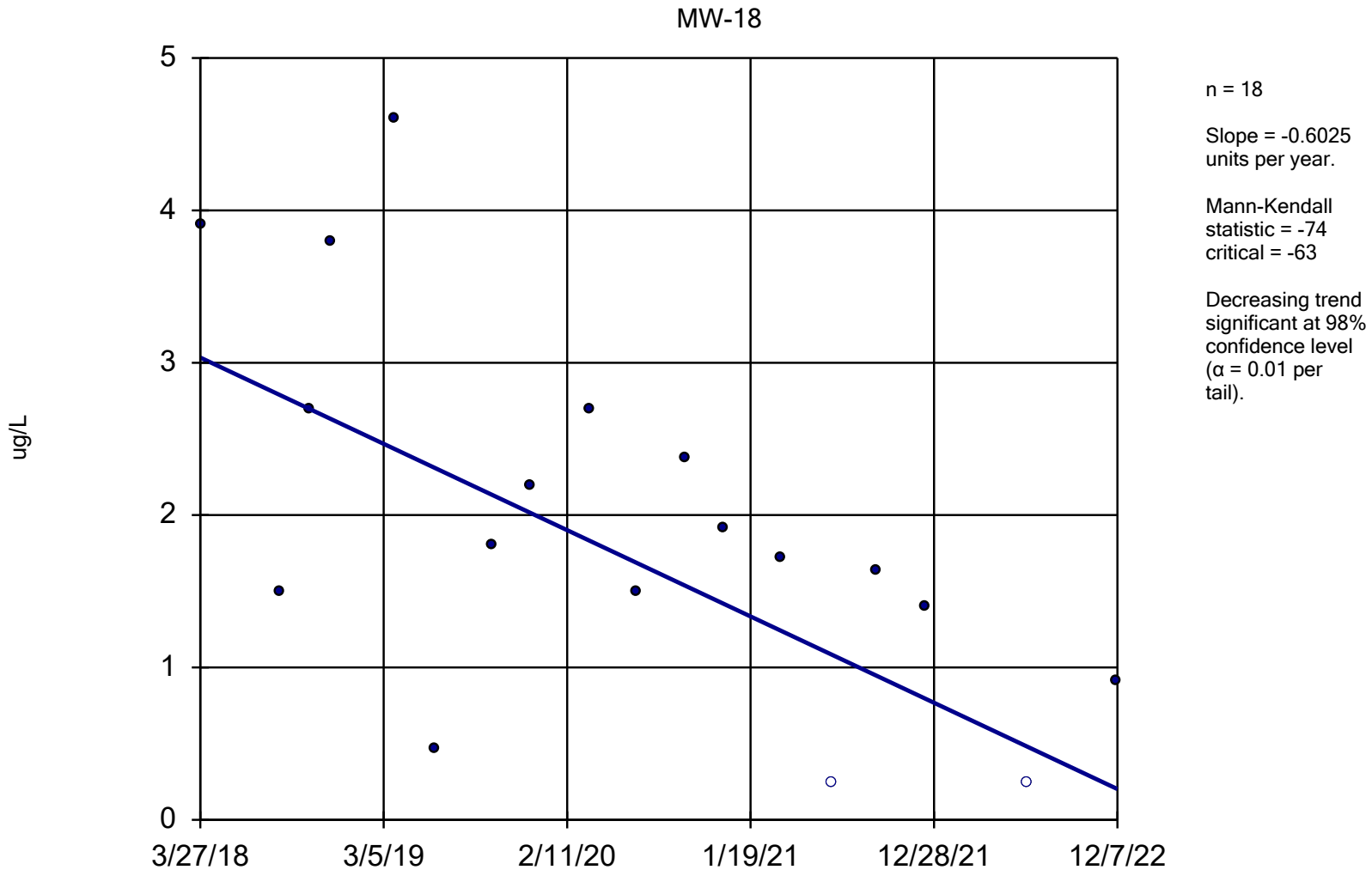



Constituent: Vinyl chloride Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics

Hollow symbols indicate censored values.

# Sen's Slope Estimator




Constituent: Vinyl chloride Analysis Run 3/27/2023 6:37 PM

Bozeman Landfill Client: Tetra Tech, Inc. Data: Bozeman Lf Organics